Female sexual function in urological practice

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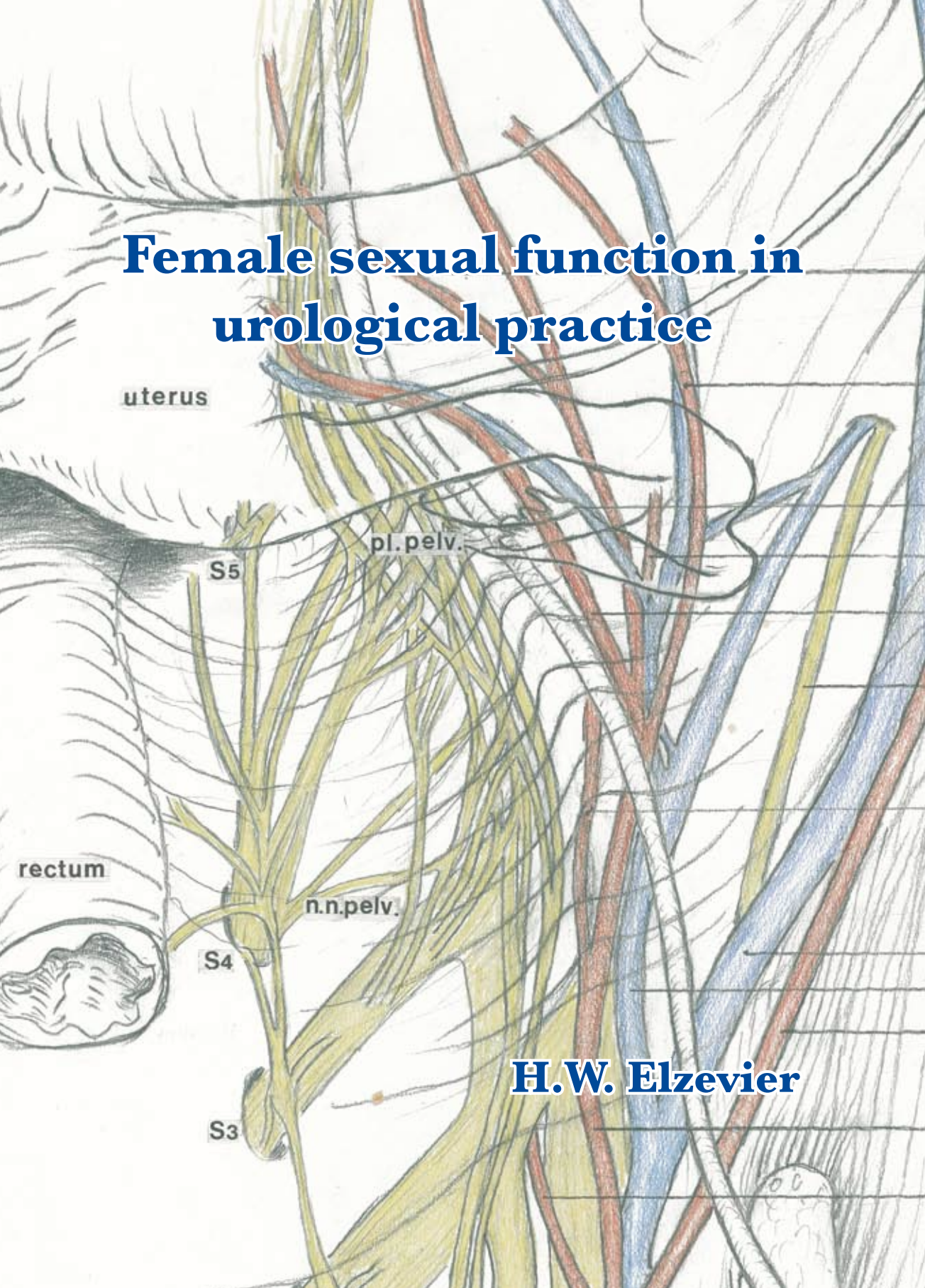

H.W. Elzevier

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HENK ELZEVIER

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Female sexual function in urological practice

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Contents

Voor Peet en Quinten
Voor mijn ouders

CHAPTER I

General introduction

UROLOGY AND FEMALE SEXUAL FUNCTION

Sexual dysfunction in women is a multifactorial and multidimensional condition combining several biological, psychological, medical, interpersonal and social components. The World Health Organization defined Sexual dysfunction as "the various ways in which an individual is unable to participate in a sexual relationship as he or she would wish". The Report of the International Consensus Development Conference on Female Sexual Dysfunction (FSD) classified sexual dysfunction in women into sexual desire disorders, namely, hypoactive sexual desire disorder (HSDD) and sexual aversion disorder, female sexual arousal disorder (FSAD), sexual orgasmic disorder and sexual pain disorders (dyspareunia, vaginismus and non-coital sexual pain disorder) (1). According to the National Health and Social Life Survey, the most frequently cited study (2) approximately 43% of American women suffer of sexual disorders. Unfortunately, this study does not provide information on prevalence rates in women over the age of 59 and does not include in the definition an element of personal distress caused by the dysfunction.

Why should the urologist play a role in managing female sexual dysfunction?
The relation between urological disorders and female sexual function was poorly studied and understood. The contributions of urologists like Raz (3), McGuire and Kursh (4) supplied a more holistic few on female urology including female sexual function. Women's specific anatomy, and specially the role of the pelvic floor, was reconsidered, with increasing attention to the physiologic role of sexual hormones and bladder, genitals and sexual response.
Based on everyday clinical practice and according to the most recent publications (5-7), there is a relevant correlation between urogynaecological conditions and FSD. In this scenario, the role of the urologist in the management of FSD should be to attempt to reveil, diagnose and treat sexual disorders in female patients suffering from urological problems or refer patients to a sexologist. Besides that, urologist and other surgeons should try to avoid FSD as collatereal damage due to surgical procedures.

UROLOGICAL ANATOMY EN FEMALE SEXUAL FUNCTION

Although 30%–50% of women suffer from sexual dysfunction, only recently has more medical and clinical research been focused on the problems related to urological and surgical and gynecological operations (8-10). The inferior hypogastric plexus, also called 'pelvic plexus', is the pathway for efferent and

afferent sympathetic and parasympathetic autonomic nerves and some sensory nerves supplying the rectum, uterus, vagina, vastibular bulbs,the clitoris, bladder and urethra. The superior hypogastric plexus and the hypogastric nerves are mainly sympathetic; the pelvic splanchnic nerves mainly parasympathetic. Theoretically, disruption of the pelvic plexus could lead to altered vascular function during sexual arousal and possibly disordered orgasm. The pelvic plexus supplies the blood vessels of the internal genitals and is involved in the neural control of vasocongestion and, consequently, the lubrication-swelling response. The innervation of the vaginal wall originates mostly from the pelvic plexus. In addition, significant devascularization of the clitoris often occurs with removal of the distal urethra, affecting subsequent sexual arousal and desire. Recently Yucel et al reported that the cavernous nerve supplies the female urethral sphincter complex and clitoris (11). The branches of the cavernous nerve were noted to join the clitoral "dorsal" nerve at the hilum of the clitoral bodies. These branches stain positive for neuronal nitric oxide synthase. The cavernous nerves originate from the vaginal plexus component of the pelvic plexus. They travel at the 2 and 10 o'clock positions along the anterior vaginal wall, and then at the 5 and 7 o'clock positions along the urethra. In this study the cavernous nerves in fetuses were clearly demonstrated, highlighting the importance of further studies in adults to define the anatomy accurately to preserve their integrity during reconstructive and ablative surgery. The sensation of the external genitalia is not related to the pelvic plexus: pudendal nerve branches are the somatosensory pathways for the vulva.

UROLOGICAL COMPLAINTS, DISEASES AND FEMALE SEXUAL FUNCTION

FSD is commonly reported in relation to Lower Urinary Tract Symptoms (LUTS) in general (12-14) and Urinary Incontinence (UI) (15). Also related to pelvic floor disorders FSD is prevalent and a challanging problems. These disorders include prolapse of the uterus, cervix, vagina, bladder and rectum as well as incontinence. Women with pelvic floor disorders often have co-existing urological, gynecological, faecal and sexual complaints (16).
UI in women is a highly prevalent condition in urological and gynecological practice. In 2002, Shaw (15) reported the results of a review of all primary epidemiological articles reporting the prevalence of "sexual incontinence" and the impact of UI on sexual function in women. Notwithstanding the great methodological heterogenecity of the different studies, the analysis showed a prevalence of FSD ranging between 0.6 and 64% among studies. In a review by Barber et al (17) there was a greater incidence of sexual dysfunction in women who

were incontinent or had LUTS, compared to the general population.
In a review published by Salonia et al.(18), the diagnosis of overactive bladder (OB) negatively the quality of life and sexual function of women.
In specific urological diseases like Interstitial Cystitis/Pelvic Pain Syndrome (IC) sexual dysfunction is an important issue (19-21). IC is characterized by chronic urinary urgency, frequency, and/or pelvic pain in the absence of any known etiology. Several studies have focused attention on dyspareunia as one of IC related symptoms in female patients (22-25). The importancy of sexual counseling in relation to IC is clear.
The influence of Spina Bifida on female sexual function was nicely reviewed by de Vylder et al (26). Because of the growing life expectancy of Spina Bifida patients, there is more interest in sexual functioning. How to deal with this topic in Spina Bifida treatment is nicely described by Verhoef et al (27). She gives a good advice and format of the interview on sex education, relationship and sexuality for young adults with Spina Bifida.

IMPACT OF UROLOGICAL SURGERY ON FEMALE SEXUAL FUNCTION

The impact of urological surgery on female sexual function may be the result of neurovascular damage or disturbance of vaginal anatomy.
Female sexual dysfunction is prevalent after radical cystectomy, and especially in a younger population, sexual dysfunction is an important concern. With improved detection and oncological control of bladder cancer, earlier surgical therapy can be tailored allowing preservation of neurovascular bundles and other adjacent structures such as the vagina and cervix. Historically, radical cystectomy removed or damaged the neurovascular bundles on the lateral walls of the anterior vagina, causing significant devascularization of the clitoris. Clitoral devascularization also occurs with removal of the distal urethra. Urethral sparing and neurovascular preservation potentially saves the nerves and vasculature of this region. The first publication on radical cystectomy in relation to female sexual function was published in 1985 by Schover et al (28). More studies on sexual implications followed (29-31). Only recently the first manuscript on nerve sparing cystectomy in relation to female sexual function was published (32).
The close anatomical proximity of the bladder and urethra to the vaginal canal allows an association between lower urinary tract dysfunction and sexual difficulties. The alteration of vaginal anatomy after surgery is another issue related to radical cystectomy but also in relation to vaginal surgery like prolaps (33;34) and incontinence operations. The maintenance of sexual function requires preservation of a vaginal length and caliber adequate for sexual intercourse and

preservation of the innervation of the clitoral nerves.
Another issue is the influence of surgery on body image in general but also specific to operations like urostoma (35). The impact of the urostoma on female sexual function is seldom discussed by urologists and hopefully discussed by the stoma-care nurse. This is an area of sexual function in urological practice that needs attention.

SEXUAL ABUSE IN UROLOGICAL PRACTICE

The importance of discussing abuse with a patient before performing an invasive gynaeco-urological examination is clear. Survivors of sexual abuse rated the gynecological care experience more negatively than the controls, experienced more intensely negative feelings, and reported being more uncomfortable during almost every stage of the gynecological examination than the controls.
In urological practice, studies on the prevalence of sexual abuse are rare. In gynecological and obstetric care abuse was prevalent in 10-20% (36-40) and 19,4-27,5% in pelvic pain patients (41-43). In general physicians mention many barriers to ask women about sexual abuse, including lack of time and resources of support, fear of offending women, lack of training, fear of opening the "Box of Pandora". Actually, this is still a "black box" in urology, demanding research and education of urologists.

PELVIC FLOOR & SEXUALITY RESEARCH GROUP LEIDEN

The Department of Urology of the Leiden University Medical Center has a long tradition of male sexual function related research started by Donker who after his retirement described the surgical anatomy of the pelvic autonomic nerves in detail in 1986. Earlier he published with Walsh the article on nerve-sparing radical prostatectomy, as a result of a visit of Walsh to Donker in Leiden in 1981 (44). It is of interest that in the same period Donker did a lot of neuroanatomical research on female cadavers. We were unaware of these dissections until when recently the anatomical archive was moved to a new building. A detail of one of these drawings, is illustrating the cover of this thesis.
In 2004 the Department of Urology founded the Pelvic Floor & Sexuality Research Group Leiden. The aspiration, mission, of the research group is initiating pelvic floor and sexual function related research. In 2004 the first manuscript was published by the group (45) and in the same year Pfizer and "stichting Amsterdam 98" supported the research group by unrestricted grants.

OUTLINE OF THE THESIS

The principle aim of the study was to investigate the prevalence of sexual (dys) function in a urological clinic. Also the prevalence and detection of sexual abuse are discussed as well as the impact of urological treatment on female sexual function.
The study was initiated by the in 2004 founded Pelvic Floor & Sexuality Research Group Leiden.
In chapter two we describe the results on the prevalence of female sexual function in an outpatient urologic clinic related to different urological complaints.
Sexual abuse appeared to be a quite frequent problem in urological practice. During a pelvic floor evaluation by our physiotherapist 32% of 141 female patients with pelvic floor complaints had a history of sexual abuse. In chapter three sexual abused patients are evaluated in relation to their pelvic floor complaints in order to estimate which patients are prone to have a history of sexual abuse. Chapter four reports an evaluation of a self-administered questionnaire versus a taken questionnaire administered by a pelvic floor clinician in relation to sexual abuse in patients with pelvic floor complaints. The reliability of a self-administered questionnaire in detecting sexual abuse is discussed. Also the literature in relation to pelvic floor complaints and sexual abuse is reviewed.
Research on the influence of urological surgery on sexual function is relative rare in female in contrast to male patients. In chapter five we describe the influence of Tension-free Vaginal Tape (TVT) incontinence surgery on sexual function. Whether the impact of surgical treatment of stress urinary incontinence (SUI) on female sexual function is related to the procedure as such, in chapter six the influence of TransObturator suburethral Tape (TOT) or Tension Free Vaginal Tape Obturator (TVT-O) is discussed. Also some novel questions are introduced to get more neuro-sexuological specific information after the incontinence operation.
In chapter seven we evaluate the female sexual function and activity following cystectomy. In this study the sexual function after cystectomy and continent urinary tract diversion for benign indications is reported. In order to diminish the impact of a cystectomy procedure on sexual function, the effect of a partial cystectomy procedure of a 32-year-old woman with radiation cystitis is described in chapter eight.
Finally, in chapter nine the results of the presented studies and future prospects are discussed.

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CHAPTER 2

Evaluation of sexual function in women attending an outpatient urological clinic; a survey study of 326 patients

Based on:
Elzevier HW, Beck JJ, Putter H, Pelger RCM, Voorham- van der Zalm PJ, Lycklama a Nijeholt AAB. Evaluation of sexual function in women attending an outpatient urological clinic; a survey study of 326 patients

INTRODUCTION

Well-designed, random-sample, community-based epidemiological investigations of women with sexual dysfunction (SD) are limited. The most widely cited study is based on the U.S. National Health and Social Life Survey of 1992 (1). Female sexual function was evaluated before in the general population, SD is a highly prevalent problem for 15% to 43% of women (1-5) and a result of multicausal and multidimensional factors; emotional, physical, biological, psychological, and interpersonal domains interfering with the sexual function of women (6). In this respect, urogynecologic patients may even be at a higher risk of sexual complaints (48%-64%) for multiple reasons, including advanced age and pelvic floor dysfunction (7;8). Urogynecological complaints may lead to sexual dysfunction, but are probably more due to prolapse and urinary symptoms. Our study is expanding on prior literature by not only evaluating urogynecological complaints, but also other urological complaints. To evaluate sexual function we used the SD classification of sexual desire disorders, sexual arousal disorder, orgasmic disorder and sexual pain disorders described by The International Consensus Development Conference on Female Sexual Dysfunction (9).
The first aim of this study was to evaluate sexual function in an outpatient urological clinic related to a variety of urological complaints. Secondly we wanted to know which urological complaints were most likely to be related to sexual complaints.

MATERIALS AND METHODS

All female patients, aged 18-years and older, in a period of 2.5 years, who presented at our outpatient urological university clinic for urological evaluation for the first time, were included in this study. All patients gave informed consent. The patients were asked to fill out a self-administered questionnaire evaluating referal indications including urological complaints (see Appendix); the Female Sexual Function Index (FSFI) (10) and the Golombok Rust Inventory of Sexual Satisfaction GRISS (11;12) , who are both validated for the Dutch language (13;14). The FSFI is a validated instrument that characterizes six domains of female sexual function. The FSFI consists of 19 items, assessing the extent to which women experience sexual problems (19). There are six subscales: desire (2 items; range, 1-5), arousal (4 items; range, 0-5), lubrication (4 items; range, 0-5), orgasm (3 items; range, 0-5), satisfaction (3 items; range, 0-5) and pain (3 items; range, 0-5). The data were scored using the scoring system as described by Rosen et al. (10). "Low FSFI score" was defined as an adjusted FSFI cut-off below 26.55 which could be a sign of sexual complaints (15). FSFI score above 26.55 was defined as a "High

FSFI score".
The GRISS is a, short 28-item, questionnaire for assessing the existence and severity of sexual problems. It measures the most common psychosexual complaints and has been chosen to assess the degree of bother as described before by ter Kuile et al. (16), because no validated bother questionnaire was available in the Dutch language at the start of the study. For this study, only seven items were used for analyses. These items comprised the subscales for "non-communication" (scoring ranges: 2-10) and female dissatisfaction (scoring ranges: 4-20), following the question "do you enjoy sexual intercourse with your partner" (score between 1-5). Higher scores indicate more dissatisfaction. The subscales of the GRISS was used to evalute the difference in bother between the "Low FSFI score" and "High FSFI score" group
All data were collected anonymously. The data were analysed using SPSS version 14. Differences in quantitative variables and frequencies were evaluated using Student's t test and Pearson's chi-square test, respectively. A two-sided P-value <0.05 was considered statistically significant. Our Institutional Review Board approved the study.

RESULTS

Of a total of 1383 patients presenting at the clinic for the first time, 410 (30%) agreed to participate after reading the informed consent form. Of them 326 (80%) completed and returned the questionnaires.
Of the remaining 326 patients 83.4% (n=272) had a partner, 119 (36.5%) were sexually inactive and 207 (63.5%) patients were sexually active. The reasons for sexual inactivity and the urological complaints (a patient could give more than one complaint) of the inactive patients are listed in Table 1 and 2. In a few extra questions we asked whether patients thought that there was an urological related reason for their sexual inactivity. Incontinence during sexual activity was the main reason for sexual inactivity in 7.6% (n=9) of the total inactive sample and in 13.2% of the patients with incontinence (n=68). For 16.1% (n=18) of the 119 sexually inactive patients, the main reason for sexual inactivity was pain during intercourse, for 23.2 % (n=26) loss of libido. The mean age of the inactive population was 59.0 (sd 14.6) years, which is significantly higher than the mean age of 45.6 (sd 13.7) of the sexually active group (p<0.001). Differences between active versus inactive patients are listed in Table 3.

Table 1

Reason for sexual inactivity (n=119)		
No partner	52	42.9%
Partner-related issues like illness or Erectile Dysfunction	18	14.3%
Patient-related issues	10	8.9%
Combination of problems	36	32.1%
Unknown	3	1.8%
Total	119	100%

Table 2

Urological complaints of the sexually inactive patients (n=119)		
Complaints	n	Percentage
Loin pain	16	13.4%
Heamaturia	26	21.8%
Urinary tract infection	54	45.4%
LUTS (urge and frequency)	76	63.9%
Incontinence	72	60.5%
Lower abdominal Pain	35	29.4%
Abnormality on X-ray	6	5.0%
Consult by other specialist	47	39.5%
Otherwise	20	16.8%

Table 3

Sexual active versus sexual inactive

	Sexual active	Sexual inactive	n
Age	45.5	58.5	>0.001
Partner	97.6%	58.8%	>0.001
Smoking	16.9%	22.0%	0.255
Alcohol	59.5%	44.4%	0.090
Cardio vascular disease	41.2%	53.8%	0.028
High blood pressure	39.7%	51.3%	0.044
Diabetes	39.2%	53.0%	0.017
Neurological complaints	39.2%	53.0%	0.017
Psychological complaints	36.8%	50.9%	0.014
Menstruation			
Regular	43.2%	8.8%	
Not regular	13.6%	6.8%	
Few months not any more	6.8%	4.3%	
Few years anymore	36.4%	70.1%	>0.001
Sexual abuse	14%	22.0%	0.064

Note. Differences between sexually active and inactive patients are also significant in the subgroup of women with a partner.

Table 4

Female Sexual Function Index (n=207)

		Domains						Total
Complaints	n	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	
Loin pain	26	3.6 (1.8-6.0)	4.2 (1.8-6.0)	5.9 (2.7-6.0)	4.6 (1.2-6.0)	5.2 (1.2-6.0)	6.0 (0.0-6.0)	28.0 (13.1-36.0)
Haematuria	51	3.6 (1.2-6.0)	4.2 (0.0-6.0)	5.4 (0.0-6.0)	5.2 (0.0-6.0)	5.2 (1.2-6.0)	5.6 (0.0-6.0)	28.4 (3.9-36.0)
Urinary tract infection	93	3.6 (1.2-6.0)	4.5 (0.0-6.0)	5.4 (0.0-6.0)	5.2 (0.0-6.0)	4.8 (1.2-6.0)	4.8 (0.0-6.0)	28.2 (4.6-36.0)
LUTS (urge and frequency)	95	3.6 (1.2-6.0)	3.9 (0.0-6.0)	4.8 (0.0-6.0)	4.4 (0.0-6.0)	4.8 (0.8-6.0)	4.0 (0.0-6.0)	24.9 (5.4-36.0)
Incontinence	93	3.6 (1.2-6.0)	4.5 (0.0-6.0)	5.4 (0.0-6.0)	4.8 (0.0-6.0)	4.8 (0.8-6.0)	4.8 (0.0-6.0)	26.9 (4.6-34.5)
Lower abdominal Pain	62	3.6 (1.2-6.0)	3.9 (0.0-6.0)	4.8 (0.0-6.0)	4.4 (0.0-6.0)	4.4 (0.8-6.0)	4.0 (0.0-6.0)	25.3 (5.4-36.0)
Abnormality on X-ray	18	3.0 (1.2-5.4)	4.1 (1.8-5.7)	5.4 (1.2-6.0)	4.6 (1.2-6.0)	4.8 (2.8-6.0)	3.8 (0.0-6.0)	26.5 (11.4-34.5)
Consult other specialist	48	3.6 (1.2-4.8)	3.8 (0.0-6.0)	4.4 (0.0-6.0)	4.4 (0.0-6.0)	4.6 (1.2-6.0)	3.6 (0.0-6.0)	24.3 (4.8-34.4)
Otherwise	33	3.6 (1.2-6.0)	4.2 (0.0-6.0)	5.4 (0.0-6.0)	4.8 (0.0-6.0)	4.8 (1.2-6.0)	4.8 (0.0-6.0)	27.0 (3.9-34.5)

A total of 207 patients were sexually active and filled out the FSFI and the 7 items of the GRISS questionnaire. The total FSFI score was 28.3 (3.9-36), of these 41.7% had a low FSFI score. FSFI scores and domains of the different urological complaints are listed in Table 4. Only age and menopause were significantly different between the Low FSFI score group versus High FSFI score group.The mean age of the Low FSFI score group (48.2 years, sd 13.1) was significantly higher than the mean age of the High FSFI score group" (42.2 years, sd 13.2, p<0.005). No significantly difference was seen in co-morbidity between both groups. Only significantly more patients were postmenopausal in the Low FSFI score group (p<0.01).
When comparing sexually active patients in the Low FSFI score group with the total sample, we found patients with complaints of LUTS (p<0.001), lower abdominal pain (p<0.05) and "consultation by another specialist" group (p<0.01) were more likely to have sexual complaints. Only 15 of the 48 patients of the "consultation by another specialist" group had no urological complaints. Of the rest of these patients (n=33) 45.5% had complaints of LUTS, and 33% reported complaints of lower abdominal pain.
The mean score of GRISS noncommunication domain of the sexually active patients was 4.9 (sd 1.7). The mean score of the Low FSFI score group was 5.3 (sd 1.7) versus 4.3 (sd 1.5) for the High FSFI score group (p<0.001). This finding indicates that the Low FSFI score group found it more difficult to discuss sexual issues with their partner.
The mean GRISS female dissatisfaction score was 7.7 (sd 3.2). The mean score of the Low FSFI score group was 8.8 (sd 3.3) versus 6.0 (sd 2.1) for the High FSFI score group (p<0.001). The mean score of the question "do you enjoy sexual contact" was 1.9 (sd 1.0). The mean score of the Low FSFI score group was 2.3 (sd 1.1) versus 1.2 (sd 0.4) of the High FSFI score group (p<0.001). The Low FSFI score group was more dissatisfied with the time devoted to sex and reported less enjoyment with sexual contact with their partner.
The question "Did you have negative sexual experiences in the past" which could indicate sexual abuse, was answered positive in 16.9% of the total population, no significant difference was seen between the active versus inactive population.

DISCUSSION

This study was performed in a tertiary referral center of an outpatient urological university clinic. In contrast to urogynecology clinic studies (8;17) also patients without urogynaecological related complaints were included. In the total sample we found sexual inactivity in 34.4% of patients, of them 46.9% was incontinence, pain or libido related, and in the sexually active patients we found

a low FSFI score (<26.55) in 41.7%. In total we found 42.6% sexual inactivity due to incontinence,pain or loss of libido or low FSFI (which could be indicative of sexual complaints). This was almost the same as the 50% sexual dysfunction in the study by Geiss et al (7).
The reason of inactivity or Low FSFI score is multicausal; we discuss some aspects in detail. Having a partner is probably the most important reason for sexual inactivity (Table3). The mean age of the inactive population was significantly higher than the sexually active group. Declining sexual activity in the elderly has been reported by others (18-21). Also the Low FSFI score group, who might be at risk for female sexual dysfunction, was significantly older.
The influence of menopausal status on sexual function has recently been reviewed (22-25). In our study 70.1% of the inactive patients were postmenopausal, in contrast to 36.4% of the sexually active population (Table 3). Age and menopausal status may influence sexual activity and sexual dysfunction in this study although recently Hayes et al. (26) concluded that relationship factors were more important to low desire than age or menopause, whereas physiological and psychological factors were more important to low genital arousal and low orgasmic function than relationship factors.
There are several studies dealing with the negative effects of urinary problems on an individual's sexual life (27-30). Problems related to urinary incontinence, especially leakage during intercourse, wetness at night, odor and bedwetting, have been associated with sexual problems such as a decrease in frequency of coitus, anorgasmia and dyspareunia. Temml et al. reported that 25.1% of incontinent women had some form of impairment in sexual function, and the majority of affected women reported that stress incontinence and urge incontinence during coitus were the most bothersome (31). Incontinence complaints were the main reason for sexual inactivity in 13.2%. In our patients who were sexually active, incontinence was seen in 44.9%. The median FSFI score of these patients was 26.9 (4.6-34.5). A total of 51.2% had a Low FSFI score. In the total incontinence complaint group 41% of the patients were sexual inactive due to incontinence complaints or had a low FSFI score. This outcome is higher than Temml et al reported.
Routine screening for sexual abuse was reported to be rare in a study of health care practitioners and gynaecologists (respectively 1,3 and 0,5%) (32;33). In our study 16.9 % of the patients reported to have experienced sexual abuse. The prevalence of sexual abuse in relation to pelvic floor and urological related problems was recently reviewed (34;35). Beck et al recently concluded that patients with multiple pelvic floor complaints related to pelvic floor dysfunction are more likely to have a history of sexual abuse than patients with isolated complaints (36).
A response rate of 24% is low. We offer two reasons for this low response rate.

Firstly, subjects had to be actively recruited by the urologist or resident in that s/he was to ask at any first visit whether the patient had received a letter including informed consent. Asking for participation was not always appreciated and so not always done by all urologist and residents, so this may have led to a decreased participation. The patients were required to return the questionnaire by mail or to hand it in at the second visit. The latter again required active input of the urologist or resident and could likely have resulted in not all patients handing in the questionnaire in case she was not asked to. Secondly, a part of the patients who wanted to participate may have been embarrassed by the content of the questionnaire.

In the study of Pauls et al. the majority of sexually active patients completed the FSFI questionnaire, while only a small group voiced embarrassment at the questions (8). Based on these findings, they felt comfortable incorporating this questionnaire into their introductory patient packages. In our study, 20 % of the patients who wanted to participate did not return the questionnaire. Also a large part of the patients did not want to participate after reading the informed consent. Although the FSFI was accepted as a sexual evaluation tool, probably the evaluation with sexual function questionnaires in a standard urological practice is not an option. More research is needed to select urological complaints were standard sexual evaluation of sexual function is an option. Voorham et al. has given some good advice in relation to pelvic floor complaints evaluation (37;38).

On the other hand, a few sexual function questions like "do you have sexual problems" and "do you have a history of sexual abuse" or "have you had any negative sexual experiences in the past" before vaginal examination is performed, is in our opinion necessary. Important in this matter is the physician's attitude towards female sexual complaints like Berman et al. described in relation to seeking help for sexual function complaints in gynecological practice (39). This attitude is not only gynecological related only, but is needed in the medical profession in general. Female sexual problems are frequent in many clinical conditions, but are not yet a routine part of diagnostic workup and therapeutic planning. It is crucial, as Berman at al. suggested, that further research is carried out in this area, as well as more timely evaluations of what is actually going on in medical schools and postdoctoral professional training around sexual topics. With potential treatments available, women are going to come forward seeking help more than ever and, it is hoped, will feel more and more entitled to full sexual lives.

Tools are needed, like Bitzer et al. have developed, to help physicians in different clinical settings to evaluate sexual problems of the female patients (40). We noticed in our study that physicians (residents and urologists) had difficulties in asking about sexual function or participation in this study even though we had informed patients about the study by mail before the first visit of our outpatient

clinic. Although we did not evaluate this difficulties by a questionnaire some remarks can be made related to this subject. First patients were not reffered for sexual problems, so in some cases (for example; stones in the kidney or kidney tumor on radiological examination) the relation between sexual and urological complaint is difficult to make and makes it more difficult to explain the importancy of participation in this study. Secondly female sexual function is not a subject in wich urologist are educated in contrast to erectile dysfunction. Probably also the sexual attitude of the physician it self plays an important role in asking sexual questions.
A few other limitations of the study have to be discussed. Personal distress in relation to sexual dysfunction in the inactive patient group was not evaluated. Another limitation of the study could be the potential for selection bias as a substantial proportion of patients refused to fill in the questionnaire. Those that responded may be different from the non-responders.
Lastly, the university clinic patient population may have more co-morbidity, which could negatively influence the the prevalence of sexual function complaints. Nevertheless, we believe that this first study performed in a urological clinic shows, that female sexual function is an important issue in urological practice.

CONCLUSION

In urological practice female sexual function is a common problem, therefore we recommend integrating female sexual function questionnaires in standard urological care.

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APPENDIX

QUESTIONNAIRES

1 *Date of Birth* _____

2 *Do you have a partner?* ☐ yes ☐ no

3 *How many children do you have?* _____

4 *Do you smoke?* ☐ yes ☐ no

5 *Do you have*

Vascular or heart problems	☐ yes	☐ no
High blood pressure	☐ yes	☐ no
Diabetes	☐ yes	☐ no
Neurological complaints	☐ yes	☐ no
Psychiatric complaints	☐ yes	☐ no

6 *Do you menstruate?*

☐ Yes, regularly
☐ Yes, but not regularly
☐ No, I haven't had a period since a few months
☐ No, I haven't had a period for more than a year

7 *Did you have negative sexual experiences in the past* ☐ yes ☐ no

Would you be willing to provide some more information about this?

_____

8 *What medication do you use currently?*

_____

9 *Did you have any operations in the past, if yes, please list them here*

_____

Urological complaints (more than one urological complaint can be entered)

10 *Do you experience pain in the region of the kidney?* ☐ yes ☐ no

11 *Do you have blood in your urine?* ☐ yes ☐ no
Microscopic ☐ yes ☐ no
Macroscopic ☐ yes ☐ no

12 *Urinary tract infection* ☐ yes ☐ no

13 *Urinating complaints* ☐ yes ☐ no

14 *Incontinence* ☐ yes ☐ no

15 *Abdominal pain* ☐ yes ☐ no

16 *Abnormalities on radiological examination* ☐ yes ☐ no

17 *Consultation by other specialist but I have no urological complaints* ☐ yes ☐ no

18 *Other, please explain* ☐ yes ☐ no

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19 This question refers to the reason, why you weren't sexually active
Was this the result of:
☐ Not having a partner
☐ Partner related problems as, for example, illness, impotence, age
☐ Patient related problems as, for example illness, age
☐ A combination of these factors

If you would like to give an explanation, you can write it underneath

---

The reason for not being sexually active anymore was due to the next problems?

20 *Incontinence during sexual intercourse* ☐ yes ☐ no

21 *Pain during sexual intercourse* ☐ yes ☐ no

22 *No sexual desire* ☐ yes ☐ no

Next FSFI and GRISS

CHAPTER 3

Multiple pelvic floor complaints are correlated with sexual abuse history

Based on:
Beck JJ, Elzevier HW, Pelger RCM, Putter H, Voorham – van der Zalm PJ. Multiple pelvic floor complaints are correlated with sexual abuse history. J Sex Med 2008 accepted

INTRODUCTION

International estimates of the prevalence of sexual abuse are high. In a review from Kellogg and the Committee on Child Abuse and Neglect in 2005, it is suggested that each year, approximately 1% of children experience some form of sexual abuse, resulting in the sexual victimization of 12 - 25% of girls and 8 - 10% of boys by 18 years of age (1).
Results of a national telephone survey conducted in 2001-2003 in the United States indicate that 1 in 59 U.S. adults (2.7 million women and 978,000 men) experienced unwanted sexual activity in the 12 months preceding the survey and that 1 in 15 U.S. adults (11.7 million women and 2.1 million men) have been forced to have sex during their lifetime (2).
The relationship between sexual abuse and urinary tract symptoms, sexual abuse and gastrointestinal symptoms, or sexual abuse and sexual dysfunction has been described in many articles, but it has not been quantified statistically (3-11). The pelvic floor controls isolated and integrated functions, sustains proper anatomic relationships between pelvic visceral organs and its outlets, and shares the basic mechanism with various visceral organs that control their function. The pelvic floor, consisting of muscular and fascial components, is the binding element between these organs. It is also considered to be an influential factor in dysfunction and subsequently behavior of the genital system in both men and women (12). However, literature is scarce on the topic of the diagnostic investigation of pelvic floor, and there is a lack of uniformity in the description of the anatomy per se and the nomenclature of the pelvic floor (13-15). A relationship between the complaints of micturition, defecation, and sexual dysfunction related to the pelvic floor dysfunction and a history of sexual abuse has been suspected, but has not been previously examined or reported upon to date.
The first aim of this study was to document the prevalence rates of reported sexual abuse in a large sample of female patients with complaints of the pelvic floor. The second aim was to evaluate the frequency of complaints in the different domains of the pelvic floor, such as complaints of micturition, defecation, and sexual function, in female patients reporting sexual abuse, and comparing these data with female patients without a history of sexual abuse.
Our hypothesis was that patients referred to a tertiary center with complaints of micturition, defecation, and/or sexual dysfunction related to the pelvic floor dysfunction are more likely to have of a history of sexual abuse than women with complaints in fewer domains of the pelvic floor.

METHODS

All female patients referred between January 2004 and November 2007 by urologists, gynecologists, surgeons, or gastroenterologists to our out patient pelvic floor center for pelvic floor evaluation because of complaints of micturition, defecation, and /or sexual dysfunction possibly related to pelvic floor dysfunction were included.
The pelvic floor clinician assessed the medical history of the patients. This consisted of a pelvic floor questionnaire in which different domains of the pelvic floor (micturition, defecation and sexual function) were structurally evaluated. The Pelvic Floor Inventories Leiden (PelFIs), a validated questionnaire, was used (16). At the start of the development of the PelFIs, the type of sexual abuse was not specified, only a history of sexual abuse was recorded. Later on, the PelFIs was improved addressing the nature of sexual abuse: incest, sexual intimidation, rape, marital rape, sexual harassment, including forcible fondling, or not (otherwise) specified. The PelFIs is only validated in Dutch. An English version is currently validated in several English native speaking countries. A retrospective search was performed to evaluate if the referring physician has documented the type of sexual abuse in the patients' medical record.
For the analysis, patients were divided in two groups: patients with a history of sexual abuse (Group I) and patients without a history of sexual abuse (Group II). If a patient had at least one of the following complaints related to the different domains of the pelvic floor, we defined her as positive for that domain. The domains are the urological domain, gastrointestinal domain, and sexual domain (Table 1). The data were analysed using SPSS version 14 (SPSS Inc., Chicago, IL., USA). Differences in frequencies were evaluated using Pearson's chi-square test or Fisher's exact test when cells with less than 5 expected subjects were present.. A two-sided P-value <0.05 was considered statistically significant.

RESULTS

A total of 185 female patients were retrospectively included and evaluated by a pelvic floor physiotherapist. No patients were excluded. The mean age of the population was 47.1 years (standard deviation, 15.5 years). Twenty-three percent of the patients (42/185) reported a history of sexual abuse. In the total group of patients, the mean age of the sexually abused patients (Group I) was not significantly different from the not sexually abused patients (Group II) (43.7 vs. 48.1 ; p= 0.106).
The type and frequency of sexual abuse are listed in Table 2. The type of abuse could not be determined in 23.8% of the abused patients (10/42). Questions

regarding sexual abuse were added in a follow-up version of the PelFIs. In an earlier version sexual abuse was not specified by the patient, pelvic floor clinician or documented in the patients' medical record by the referring physician.
In the sexually abused group 7.2% (3/42) of the patients had complaints in one domain of the pelvic floor vs. 17.5% (25/143) in the nonabused group. Differences in two and three domains are 9.5% (4/42) in the abused group vs. 34.2% (49/143) in de nonabused group, and 83.3% vs. 48.3 % (69 /143), respectively ($p<0.0001$) (Table 3).

Table 1: Specification of complaints in the three domains of the questionnaire.

Urological Domain	Gastro-intestinal Domain	Sexual Domain
Urgency / frequency	Frequency	Dyspareunia
Hesitation	Blood loss	
Weak urinary stream	Inappropriate emptying	
Intermittent urinary stream	Defecation in tempi	
Straining when urinating	Straining	
Residual awareness	Peri-anal skin complaints	
Urinary tract infections	Soiling	
Painful voiding	Incontinence of stool or flatus	
	Peri-anal pruritus	
	Painful emptying	

Table 2: Frequency and percentage of reported sexual abuse.

Type of abuse	N	%
Incest	11	26,2
Sexual intimidation	4	9,5
Rape	3	7,2
Marital rape	9	21,4
Sexual harassment	5	11,9
Unknown	10	23,8
Total	**42**	**100.0**

Tabel 3: Number of domains with complaints of patients with or without sexual abuse.

Domains	Group I (Abused +)	Group II (Abused -)	n	p-value
1	3 (7.2 %)	25 (17.5 %)	28 (15.1 %)	
2	4 (9.5 %)	49 (34.2 %)	53 (28.7 %)	
3	35 (83.3 %)	69 (48.3 %)	104 (56.2 %)	
Total	**42 (100 %)**	**143 (100%)**	**185 (100%)**	**<0.001**

Domains: number of domains of the pelvic floor with complaints
Abused +: number of patients with a history of sexual abuse
Abused -: number of patients without a history of sexual abuse

DISCUSSION

A sexual abuse prevalence of 23% at our outpatient academic pelvic floor center is comparable to earlier published data, in which a prevalence of 4 - 38% has been described (3;17-24). Kellogg reported a child sexual abuse prevalence of 12 - 25% (1). In a prevalence study in a gynecologic outpatient clinic of a large urban teaching hospital, Peschers et al. reported that one fifth of the patients (20.1%) had been forced to engage in sexual activities (21).
Many studies have shown that sexual abuse might lead to a variety of symptoms in one domain of the pelvic floor (3-6;9-11;17;21;22;25-30). To our knowledge, this is the first publication about the relationship of complaints of micturition, defecation and sexual dysfunction related to the pelvic floor dysfunction and a history of sexual abuse. Our study demonstrated a significantly higher rate of sexually abused women with complaints in the three domains of the pelvic floor compared to women with complaints in fewer domains. One of the limitations of this study is that we only included dyspareunia as a sexual dysfunction issue. In 2005 the Pelvic Floor Clinical Assessment Group of the International Continence Society described the domains of the pelvic floor including also pelvic pain and pelvic organ prolaps (31). Our study was started in 2004, so we did not include pelvic pain and a more specific definition of sexual dysfunction. Nor did we specify the type of sexual behavior that occurred during the abuse in genital penetration vs. touch or forced oral sex. Another limitation of our study is that our sample is self-selected. Therefore more patients with complaints of micturition, defecation and/or sexual dysfunction related to the pelvic floor dysfunction can be found in our research population. We believe that if this study would be performed in a urological, gynaecological, gastroenterological, or surgical outpatient office, the difference may be even more significant, because the probability of selection is much lower.
The fact that only 28 out of 185 of the women had only a single complaint could indicate that having only a single complaint is rare. We believe that this is the result of a selection bias, because referrers think of a pelvic floor dysfunction sooner in patients with multiple pelvic floor complaints. Certainly, we have not demonstrated that women with pelvic floor problems have a higher prevalence of sexual abuse than women in the general population, based on our small self-selected sample. Another limitation is that instead of studying two large cohorts, one of sexual abused women and non abused controls, and then looking at pelvic floor domains, we used two groups which are already a pathological sample — women who went to a pelvic floor clinic with at least one pelvic floor problem. There is no real control group since both groups have already pathology.
Women forced to engage in oral sex with a perpetrator may have very different sexual problems compared to women who had forced intercourse. Additionally, a

sexual abuse experience that includes fondling is very different from a sexual abuse that includes intercourse, and can have a different impact for the functioning of the pelvic floor. So, analyzing sexual abuse as a homogenous experience can influence the outcome of the study. The importance of discussing abuse before performing a gynaecological examination is clear. Survivors of sexual abuse rated the gynaecological care experience more negatively than the controls, experienced more intensely negative feelings, and reported being more uncomfortable during almost every stage of the gynaecological examination than the controls. Survivors also reported more trauma-like responses during the gynaecological examination, including overwhelming emotions, intrusive or unwanted thoughts, memories, body memories, and feelings of detachment from their bodies (32-36). Physicians should also consider that any kind of gynaecological examination in these women may trigger a flashback of the primary situation and retraumatize the concerned women (37). Farley et al. demonstrated a decreased probability of screening for cervical cancer at women who have been sexually abused, indicating that women who have been sexually abused tend to avoid routine gynaecological care (38).
The clinical significance of the findings in this study suggests that a holistic view is needed in the treatment of pelvic floor dysfunction treatment and all domains need to be assessed in a questionnaire as early as possible during history taking, as was already described by Devroede (39). A hypothesis for complaints in more domains in the abused group could be that they are related to a general pelvic floor disorder. This disorder is probably related to a overactive rest tone of the pelvic floor (15;40).
For example, Leroi et al. reported that patients with a history of sexual abuse have a significantly more disturbed anorectal motility and a increased resting pressure at the lower part of the anal canal compared to non-abused patients with anismus (7).
The pelvic floor comprises several layers: from superficial to deep, the supportive connective tissue of the endopelvic fascia, the pelvic diaphragm (levator ani and coccygeus muscle), the perineal membrane (urogenital diaphragm) and the superficial layer (bulbospongiosus, ischiocavernosus and superficial transverse perineal muscles) (12;40). The iliococcygeus, pubococcygeus, and puborectal muscles make up the levator ani muscle and play an important role in prevention of pelvic organ prolapse and incontinence. The perineal membrane is a fibrous muscular layer directly below the pelvic diaphragm. The current concept is that the muscular contents of this layer are formed by the distal part of the external urethral sphincter muscle (compressor urethra and urethrovaginalis part of the external urethral sphincter). The bulbospongiosus and ischiocavernosus muscles of the superficial layer also have a role in sexual function, while the superficial transverse perineal muscle has a supportive role. Pelvic floor muscle contraction presumably involves contraction of these muscles groups (41-43). We conclude that

sexual abuse survivors may have a dysfunction of the aforementioned muscles, giving rise to urological complaints, gastro-intestinal complaints and/ or sexual dysfunction. Perhaps pelvic floor hypertonus may be related to state or trait anxiety, developed as a holding pattern or defense mechanism. However, there is no literature to support this idea. This issue should be explored further in the future, and investigators should assess and describe their findings in both women and men, with pelvic floor dysfunction and sexual abuse, in relation to complaints of micturition, defecation, sexual dysfunction and/or pelvic pain syndrome.

CONCLUSIONS

Twenty-three percent of the female patients in a pelvic floor center reported a history of sexual abuse. In our sample, patients with multiple pelvic floor complaints related to pelvic floor dysfunction are more likely to have a history of sexual abuse than patients with isolated complaints. Further research is needed to assess the impact of pelvic floor dysfunction and sexual abuse in relation to complaints of micturition, defecation and/or sexual dysfunction.

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CHAPTER 4

How reliable is a self administered questionnaire in detecting sexual abuse: a retrospective study in patients with pelvic floor complaints and a review of literature

Based on:
Elzevier HW, Voorham- van der Zalm PJ, Pelger RCM: How reliable is a self administered questionnaire in detecting sexual abuse: a retrospective study in patients with pelvic-floor complaints and a review of literature. J Sex Med 2007;4:956-963

INTRODUCTION

Female Sexual Dysfunctions (FSDs) are very prevalent and multifaceted problems, but are under-recognized and under treated (1). Sexual abuse, a significant contributing factor to sexual dysfunction, may even be more difficult to discuss with patients than the sexual problem itself. It is of utmost importance to recognize sexual abuse because of its impact not only on gynaecological complaints but on pelvic floor complaints in general. However, there is little data available regarding the superiority of one method over another in detecting sexual abuse. We wondered if a self-administered questionnaire designed for pelvic floor complaints would be comparable in terms of suitability and reliability to a questionnaire administered by a dedicated clinician to detect sexual abuse in daily practice.

In a study of health care practitioners and gynaecologist routine screening for sexual abuse was mentioned to be rare (respectively 1,3 and 0,5%) (2;3).

The prevalence of sexual abuse depends on the underlying definition and research population. The incidence in general population of child sexual abuse is 8-32% (4-15), in gynaecological and obstetric care 10-20% (3;14;16-18) and 19,4-27,5% in pelvic pain patients (19-21). One of the major problems in studies on sexual abuse is the lack of agreement on the definition and description of sexual abuse, like child abuse, rape or intimate partner abuse. Child abuse can be defined as any activity with a child before the age of legal consent that is for the sexual gratification of an adult or a substantially older child (22). These activities include oral-genital, genital-genital, genital-rectal, hand-genital, hand-rectal, or hand-breast contact; exposure of sexual anatomy; forced viewing of sexual anatomy; and showing pornography to a child or using a child in the production of pornography. In a recent study of Banyard et al child sexual abuse victims reported a lifetime history of multiple exposures to various trauma and higher levels of mental health symptoms (23). The distress outcome may be diverse. Sexual violence is associated with lower rates of cervical cancer screening (24) and increased risk of posttraumatic stress disorder (PTSD) (25;26) and depression (27). Already in 1993 a good overview of the problems related to this subject was given by The Panel on Research on Child Abuse and Neglect (28).

The interest in sexual dysfunction also increases the focus on symptoms and patterns associated with sexual problems in relation to pelvic floor complaints. Klevan et al conclude that urinary tract symptoms following sexual abuse are common (29). In this study 20% of the victims of sexual abuse complained of one or more genitourinary symptoms. Davilla et al conclude that sexual abuse survivors have a significantly higher incidence of genitourinary dysfunction symptoms, including stress and urge incontinence, and voluntary urinary retention (30). In this study 72% of the survivors of abuse reported ever

experiencing urinary incontinence symptoms. Recently Jundt et al reported significantly more women (30.6%) with overactive bladder had been previously physically and/or sexually abused than women with stress urinary incontinence (17.8%) and of the control group (17.5%) (31). Also women with chronic pelvic pain were found to have a higher lifetime prevalence of sexual abuse (19;32-34). The influence of early sexual abuse on later adult sexual functioning has been found to pertain in particular to problems in desire, sexual arousal and orgasm (35-37). Sarwer et al, found that childhood abuse involving sexual penetration or the use of physical force, was related to adult sexual dysfunction (38). Meston et al showed that the relationship between child sexual abuse and negative sexual affect was independent from symptoms of depression and anxiety, suggesting that the impact of child sexual abuse on sexual self-schemas may be independent from the impact that the abuse may have in other areas of the survivor's life (39). In a review article on factors predisposing women to chronic pelvic pain by Latthe et al, sexual abuse was associated with dyspareunia and also to non-cyclical pelvic pain (40).
The importance of discussing abuse before performing a gynaecological examination is clear. Survivors of sexual abuse rated the gynaecological care experience more negatively than the controls, experienced more intensely negative feelings, and reported being more uncomfortable during almost every stage of the gynaecological examination than the controls. Survivors also reported more trauma-like responses during the gynaecological examination, including overwhelming emotions, intrusive or unwanted thoughts, memories, body memories, and feelings of detachment from their bodies (41-45). In the study of Robohm et al, eighty-two percent of the survivors had never been asked about a history of sexual abuse or assault by the gynaecological care provider (41). The importance of asking about sexual abuse was clearly illustrated by Davy in relation to endoscopic procedures (46) and Schachter et al in relation to physical therapists (47). It should be pointed out that her work refers to general physiotherapy and not pelvic floor practice suggesting how much more relevant it is in pelvic floor physiotherapy practice.
Physicians should also consider that any kind of gynaecological examination in these women may trigger a flashback of the primary situation and retraumatize the concerned women (48).
Our institute has recently developed and validated the Pelvic Floor Leiden Inventories (PelFIs), a 144 items new condition-specific pelvic floor assessment questionnaire, in an attempt to increase the quality of care and to get more uniformity in pelvic floor physiotherapy practice. During the validation of the PelFIs in the total population with and without pelvic floor complaints a high percentage (13,3%) of sexual abuse was reported .
A selection of patients has been evaluated in our Pelvic Floor Center. This outpatient Pelvic Floor Center is a specialized part of our Urological department

and consist a surgeon, gynecologist, urologist and a pelvic floor physiotherapist. Routinely all new patients were sent in advance a voiding dairy and a questionnaire on pelvic floor complaints to be completed at home and discussed at the first visit of our Pelvic Floor Center. This questionnaire contains questions on defecation, lower urinary tract symptoms, obstetric information and also sexual complaints. One of the questions is about sexual abuse.
We were interested how reliable this standard self-administered questionnaire is in detecting the number of patients admitting sexual abuse.

MATERIALS AND METHODS

From June 2005 to August 2006 during the validation of a new administered questionnaire (PelFIs) by a pelvic floor physiotherapist 26 out of 81 patients (32%) admitted sexual abuse.
We retrospectively evaluated if these patients had visited our Pelvic Floor Center in an earlier phase. In this center a self-administered pelvic floor questionnaire is standard of care before visiting our Pelvic Floor Center. The questionnaire is sent by mail and returned by the patient on its first visit. It appeared that 20 out of 26 patients had completed this standard self-administered pelvic floor questionnaire. The other 6 abused female patients that had completed the PelFIs were excluded because they had not been evaluated at the Pelvic Floor Center before, but had been evaluated at the department of Urology.
This self-administered questionnaire is not a validated pelvic floor questionnaire, but is used for efficiency and consists out of five parts. Part 1 contains nine questions on lower urinary tract symptoms (urgency, frequency, incontinence, urinary tract infections), part 2 four questions on gynecological complaints (prolaps, abdominal pain, delivery), part 3 two questions on defecation, part 4 questions on medical and surgical history related to pelvic floor complaints and part 5 four questions on sexual function (Table 1).
The PelFIs is a 144 item questionnaire administered by a pelvic floor physiotherapist and consists of 6 parts. Part 1 contains thirty-seven questions on general health, part 2 thirty-seven questions on lower urinary tract symptoms, part 3 thirty-three questions on defecation, part 4 nineteen questions on gynaecological complaints, part 5 nine questions on pelvic pain and part 6 nine questions on sexual function (Table 1).

Table 1: summery of described questions

Domain	self-administered questionnaire	PeLFIs
Questionnaire Time	5-10 min	20-30 min
General Health	7	37
LUTS	9	37
Gynecology/ prolaps	3	19
Defecation	2	33
Pain	3	9
Sex	1. Do you have a sexual partner? (Male, Female, None) 2. Do you have sexual complaints? (Yes, No) 3. If yes, - do you experience urine lost during intercourse? (Yes, No) - do you experience pain during intercourse? (Yes, No) 4. Did you have negative sexual experience in the past? - if you would like to give a comment, you can write it underneath	1. Do you have sexual intercourse? (Yes, No) 2. Pain during intercourse? (Yes, No) 3. If yes, - during introduction of the penis - deep penetration of penis 4. Do you have sexual problems because of your pelvic floor complaint? (Yes, No) 5. If yes, - urine lost during intercourse - urine lost during orgasm - stools during intercourse 6. Did you have negative sexual experience in the past? (Yes, No) 7. If yes, did you have therapy for it? (Yes, No) 8. Can you deal with it now? (Yes, No) 9. If not, do you want therapy? (Yes, No)
Total	28	144

PeLFIs = Pelvic Floor inventories Leiden; LUTS = Lower Urinary Tract Symptoms

At our Pelvic Floor Center one single physiotherapist with almost two decades of experience on pelvic floor treatment and skills in recognizing sexual abuse has been administering the PelFIs. We reviewed the self-administered questionnaires of all patients who admitted sexual abuse during the PelFIs by the pelvic floor physiotherapist. Patients with sexual abuse were offered sexual treatment by an urologist with a sexual education.
We tried to evaluate the reliability of the self-administered questionnaire in detecting sexual abuse using the PelFIs as "gold standard". Because both questionnaires are used routinely in our clinic we did not need institutional review board approval for this evaluation.

RESULTS

20 Patients admitting sexual abuse during administration of the PelFIs had visited our Pelvic floor Center in earlier phase and completed a self-administered questionnaire. At first consultation the mean age of these 20 patients was 44,5 year (range 19-68 years). Only 6 of them (30%) with a mean age of 50,2 year (range 38-68 years) noted in the self-administered questionnaire they did not have a history of sexual abuse, but later on admitted sexual abuse during administration of the PelFIs. Sexual child abuse was reported in 13 out of the 20 patients, 6 patients reported a history of rape and 1 intimate partner abuse. 13 Out of the 14 patients, with a mean age 42,1 year (range 19-63years), who completed the self-administered questionnaire described the type of sexual abuse: sexual child abuse (8), rape (4) or intimate partner abuse (1). The only patient who did not describe the kind of sexual abuse later admitted she had been the victim of sexual child abuse.

DISCUSSION

A history of sexual abuse is a common problem in pelvic floor practice (18;29-31;49-56). The pelvic floor not only contains pelvic visceral organs within the pelvic cavity; it also controls individual and integrated functions, sustains proper anatomic relationships, and shares the basic mechanism with various visceral organs that control their function. The pelvic floor is the binding element between these organs. Although pelvic floor dysfunction has long been related to the lower urinary tract and, more recently to lower gastrointestinal symptoms also, it is now considered to be an influential factor in the normal function and behavior of the genital system in both men and women (57). Devroede described the pelvic floor as a muscular structure, pierced by the urological, genital and

distal intestinal tract (58). Normal function can be replaced by dysfunctions of several kinds, overlapping voiding, sexual, genital and defecatory behaviour. He already mentioned that if the pelvic floor was not considered as an integrated muscular structure, unsuspected pathology would lie outside the spectrum of activities of the given speciality. Thus, in relation to pelvic floor complaints, it is important to evaluate sexual function in general (59), including abuse,. Bachmann (60) recently published a study to obtain pilot data on physicians' knowledge, perceptions, and practices regarding FSDs, which may help uncover means of facilitating future dialog between physicians and patients. A total of 1,946 survey physicians and other health professionals used a self-administered reply questionnaire. Most respondents (60%) estimated that one- to three-quarters of their patients had FSDs. Low sexual desire was the most prevalent FSD observed. A total of 58% of participants reported initiating the first discussion of FSDs in one-quarter or less of patients. Obstacles to discuss sexual health included limited time and training, embarrassment, and absence of effective treatment options. She concluded that healthcare professionals are aware of the high prevalence of FSDs but infrequently initiate a discussion of sexual function with their female patients or fail to conduct a comprehensive evaluation for FSDs. In discussing sexual dysfunction sexual abuse is probably a more delicate topic to address.
A study of MacMillan et al about a maltreatment history in childhood using a self-administered questionnaire , concluded that child abuse may be more prevalent in younger women compared with older women, or there may be a greater willingness among younger women to report abuse (12). The women in our study who admitted abuse in the self-administered questionnaire had a mean age of 42,1 year. The patients who did not report sexual abuse in the questionnaire had a mean age of 50,2 year. Although the number of patients (n=20) is too small to make conclusions on age difference between the two groups. It might indicate the older the patient the less sexual abuse is reported in a self-administered questionnaire. Marital status (in both groups 50% was maried), history of psychological counseling in the past did not influence the womens decision to fill in the self-administered questionnaire.
"Did you have negative sexual experiences in the past" used in the questionnaire is of course not equal to "did you experiences sexual abuse in the past" but in the Dutch language it is considered to be almost similar. This is confirmed by the responses of patients: all patients admitted abuse and 13 out of 14 patients described the type of negative sexual experience as sexual abuse.
How forthcoming a patient is about his or her medical, sexual, and sexual abuse history may strongly be influenced by the level of comfort created by the physician taking the history. Particularly, discussing a history of sexual abuse or sexual assault with a patient is usually emotionally very difficult. This raises the question whether patients are more forthcoming when completing a self-

administered questionnaire or talking to a physician. In this study 20 patients reported sexual abuse during administration of the PelFIs by a physiotherapist. 14 Out of these 20 patients (70%), completed the sexual abuse question admitting sexual abuse in the routine questionnaire before visiting our outpatient Pelvic Floor Center and talking to a physician. This high percentage of patients admitting sexual abuse during the self-administered "screening" questionnaire raises the question: "is a concerned physician needed in detecting abuse?" Or is the anonymous self-administered questionnaire avoiding a face to face contact with a physician "safer" and less embarrassing for the patient reporting sexual abuse.

This is in contrast to the conclusion of the study of Nusbaum et al describing women to be more prone to discuss sexual issues with physicians who appear to be concerned, comfortable, and informed about FSDs (61). The rate of women reporting sexual abuse to a physician varies between less than 2% (62) to 28% (63). Although the response to the question on sexual abuse was 70% in the self-administered questionnaire compared to the administered questionnaire by a female physiotherapist, it still may be very helpful in daily practice in order to detect sexual abuse.

This raises the question if gender of the therapist influences the outcome of the study. In literature regarding this subject "the sex of the therapist" the gender of the therapist was not a major problem (64-66). Kaplan stated that: "the question of therapist gender and its effect on therapy with women highlights an issue of therapist self-awareness and growth rather than one of the patient's selection process" (64). Probably, the therapist' sensitivity and value system regarding the sexual abuse issue, is the most important factor.

In general physicians cite many barriers to ask women about sexual abuse, including lack of time and resources of support, fear of offending women, lack of training, fear of opening the "Box of Pandora".

It is clear considering the impact of sexual abuse on the pelvic floor; sexual abuse is an import issue in routine pelvic floor care. However, the practice of a universal screening warrants further investigation. As Garcia-Moreno indicated it is not feasible in certain settings and may even be dangerous if caregivers lack sufficient training to ensure women's safety during and after disclosure (67).

Physicians that are uncomfortable with this topic and do not feel qualified enough to deal with the responses they might receive or observe ongoing distress in there patients should refer these women to clinicians that are familiar with these issues (68).

Essential is appropriate medical education and training in order to improve in women the identification and management of FSDs including sexual abuse, realizing we still have a long way ahead of us (60;69-73).

We acknowledge several limitations of our study. This study relies exclusively

on data of women evaluated in an outpatient Pelvic Floor Center. Moreover, it is unclear if our sample is representative for other Pelvic Floor Centers. We know that the percentage of 32% of sexual abuse is higher than was seen at our Department of Gynaecology. In a study of 325 patients at our outpatient Gynaecology Department in 1996, 15.4% reported sexual abuse and 7.4% physical molestation (74).
Also is important to mention the cultural context in which the study took place. Only patients who were able to understand and read the Dutch language could be included. This excludes a part of the not Dutch-speaking immigrants. In that matter we need more questionnaires in different language to optimizing the likelihood of disclosure.
How forthcoming a patient is about his or her medical history, history of sexual and sexual abuse may strongly be influenced by the level of comfort provided by the physician taking the history. Our physiotherapist with almost two decades of experience on pelvic floor treatment and skills in recognizing sexual abuse has been administering the PelFIs. This could have had a positive impact on the level of detection. Also the impact of screening needs to be addressed. Screening is only possible in a setting with caregivers with sufficient sexual training. Although screening may be a helpful tool in detecting abuse and may give both patients and physicians comfort as illustrated in the studies of Brown et al describing abuse screening in the family practice setting (75;76).
Further research is needed to confirm our findings in other patient groups and to determine the threshold for admitting sexual abuse during interviews or self-administered questionnaires. Another important issue that needs to be addressed is the explanation of the relationship between sexual abuse and pelvic floor complaints.

CONCLUSION

In our opinion the interaction of a patient and clinician during the administration of a questionnaire is essential in order to gain the patients' trust and thus acquire a true perspective of past or prevalent sexual abuse and FSDs. We believe that a questionnaire administered by a clinician should be preferred to a self-administered questionnaire. However, in order to recognize sexual abuse a self-administered questionnaire can still be helpful and thus may offer healthcare physicians a helping hand in dealing with sexual abuse of their female patients in daily practice.

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CHAPTER 5

Sexual function after tensionfree vaginal tape (TVT) for stress incontinence: results of a mailed questionnaire

Based on:
Elzevier HW, Venema PL, Lycklama à Nijeholt AAB. Sexual function after tension-free vaginal tape (TVT) for stress incontinence: results of a mailed questionnaire. Int Urogynecol J 2004; 15: 313-318

INTRODUCTION

The tension-free vaginal tape (TVT) is a relatively new procedure to correct stress incontinence (1). Recent data indicate that its efficacy and untoward effects are similar to those of the best of other commonly performed anti-incontinence procedures, such as retropubic urethropexy (Burch) and suburethral sling procedures (2;3). Genuine stress urinary incontinence (SUI) is defined as urinary leakage due to a sudden increase in the intra-abdominal pressure through some kind of physical stress, without evidence of bladder contractions and/or an unstable urethra. Urinary incontinence during sexual intercourse is a common symptom in patients with SUI (4-11). Sutherst et al. found that sexuality was negatively affected in nearly half of women attending an incontinence clinic. Women with genuine stress incontinence had significantly fewer sexual problems than those with bladder instability (9).
Studies on the effect of vaginal surgery for benign conditions on sexual function are rare. The anatomical explanation for sexual dysfunction after vaginal surgery may be due to the relation of the female urethra and the clitoris. The clitoris consist of two corporal bodies and the glans clitoris, with a neurovascular bundle dorsally and wide urethral plate ventrally. The distribution and course of the neurovascular bundle of the clitoris is similar to that of the penis. The wide urethral plate is adherent to the corporal bodies, causing ventral chordee (12). OConnell et al. described the urethra as a pelvic and perineal conduit embedded in the anterior vaginal wall but in all other directions surrounded by the erectile tissue of the clitoris (13).
It is expected that sexuality would improve after TVT, particularly among those patients who had either dyspareunia or leakage during intercourse. However, it is also possible that TVT could be detrimental to sexual activity owing to surgical damage. This retrospective study was undertaken to assess the effect on sexual function of TVT procedures for stress urinary incontinence.

MATERIALS AND METHODS

From January 1999 to November 2002, 128 patients had a TVT inserted for the treatment of SUI. Genuine stress incontinence was confirmed objectively by urodynamic assessment. None of the women presented with detrusor or urethral instability. On cystoscopy no pathological findings were observed in the urethra and/or bladder. Patients with a pelvic organ prolapse who needed more extensive surgical treatment were excluded. All patients had had surgery at least 3 months prior to this follow-up study, with a maximum of 1 year.
In the absence of a conventionally accepted sexual function index for women

with incontinence we evaluated our patients with the questionnaire developed by Lemack et al. (14) (see Appendix). The questionnaire, as well as an introduction letter stating the goal of the study, was mailed to all 128 patients. The McNemar test was used for statistical analysis.

RESULTS

Of the 96 women who responded to the mailing, 69 were sexually active and 27 were not. Four sexually active patients were excluded, two had had no partner before, and another had no partner after the TVT operation. One patient sent an incomplete questionnaire. The reason for sexual inactivity in 27 patients is shown in Table 1. The mean age of the 65 sexually active women was 50.5 years (range 36–77).

Table 1 Reason for sexual inactivity

	n=27	
No partner	12	(44%)
Partner-related issues	6	(22%)
Patient-related issues	3	(11%)
Both	4	(15%)
Not specified	2	(8%)
Mean age of sexually inactive women (yrs)	63	(46–77)

Table 2 presents the surgical history of the sexually active women. Preoperative characteristics are presented in first column of Table 3. Most women had intercourse once or twice a week (51%), or one to three times per month (30%). Overall, 75% of women described intercourse before the operation as pleasurable. Only three women reported dyspareunia preoperatively (5%). Thirty-five women reported preoperative leakage at some point during intercourse (54%).

Table 2 Abdominal or vaginal surgery before TVT in sexually active women

	n=65	
No surgery	38	(58%)
Surgery	17	(26%)
Abdominal hysterectomy	7	
Vaginal hysterectomy	1	
Stamey procedure	2	
Raz procedure	1	
Burch procedure	4	
Caesarean section	5	
Colporraphia anterior	1	
Unknown	10	(16%)

Table 3 Results of questionnaire on intercourse before and after TVT in sexually active women

		n= 65			
		Preoperative		Postoperative	
Frequency of intercourse	More than twice/week	5	(8%)	5	(8%)
	1–2 times/week	33	(51%)	32	(50%)
	1–3 times/month	20	(30%)	20	(30%)
	less than once/month	7	(11%)	8	(13%)
Sexual intercourse is	Pleasurable	49	(75%)	50	(78%)
	Neither pleasurable nor painful	13	(20%)	12	(17%)
	Painful	3	(5%)	3	(5%)
	Other	0	(0%)	0	(0%)
Do you experience leakage during intercourse?	No	30	(46%)	57	(88%)
	Yes, rarely	4	(6%)	6	(9%)
	Yes, occasionally	21	(32%)	0	(0%)
	Yes, frequently	5	(8%)	1	(1,5%)
	Yes, always	5	(8%)	1	(1,5%)

Postoperative data (Table 3) showed almost no difference in frequency or appreciation of intercourse. Dyspareunia remained in three women. One of them noticed that pain was reduced after operation. Only six women (9%) reported occasional leakage during intercourse. One patient had no benefit from the TVT operation and remained incontinent frequently during intercourse. One woman described worsening of intercourse after the operation, describing an increase in incontinence after TVT. The other women were postoperatively dry during intercourse (88%). Overall, 17 women (26%) described intercourse as being better than prior to surgery (Table 4). Seven of them stated that the absence of leakage made intercourse more pleasurable. One of them reported vaginal narrowing as the reason for better sexual intercourse.

Table 4 Overall sexual appreciation after TVT in sexually active woman

		n= 65	
Overall, how would you describe intercourse postoperatively	Better than prior to surgery	17	(26%)
	Worse than prior to surgery	1	(1%)
	No different than prior to surgery	47	(73%)
	Other	0	(0%)
Does your sexual partner postoperatively report[a]	Pain due to vaginal narrowing	3	(5%)
	Narrowing but no pain	2	(3%)
	Pain due to dryness or other	10	(15%)
	Both narrowing and dryness	1	(1%)
	None of the above	46	(71%)
	Unknown	3	(5%)

[a] Because these aspects were not well documented preoperatively, they are not compared with the preoperative situation

The questionnaire contained also questions on the discomfort of the partner postoperatively. Three women reported that their partner reported pain due to vaginal narrowing. Pain due to dryness was described in 16%. Half of them had mentioned complaints of dryness before the operation. These problems subsided after using gel. One woman reported that her partner noted both vaginal narrowing and dryness.
The McNemar test was used for statistical analysis and showed that the improvement in sexual intercourse is highly significant.

DISCUSSION

One of the first publications on the effect of vaginal surgery for benign conditions on sexual function was made by Iosif, who interviewed 156 patients before and after colpocystourethropexy (7). Thirty-two percent of women with stress incontinence had sexual problems before surgery. This proportion decreased after surgery to 10%. Iosif had already stated that change of self-image, because of the absence of urinary leakage during intercourse after the operation, might explain

the decrease in sexual dysfunction. Lemack et al. published a nice overview of studies related to vaginal surgery and sexual function (15). In this study, 10 patients underwent a modified four-corner bladder neck suspension, or anterior vaginal wall suspension (AVWS), for the treatment of stress incontinence with or without a mild to moderate cystocele. Overall, 20% of patients described intercourse postoperatively better than prior to surgery. However, another 20% described it as worse than prior to surgery. Although the number of patients is small, it points to the potential of sexual problems related to vaginal surgery.
TVT was introduced into clinical practice in 1994–95. More than 150 000 TVT operations have been carried out so far (1). Recently, Maaita et al. published the first retrospective results of TVT in relation to sexual function. Worsening of sexual function after surgery was reported in 14% (16). In this study some patients underwent combined procedures, and it could be that these patients had more sexual problems after surgery. However, other studies showed that overall sexual satisfaction appeared to be independent of diagnosis or therapy for urinary incontinence or prolapse (17;18).
Only after specific operations, such as Burch colposuspension and posterior colporrhaphy, did Weber et al. (19) find an increased risk of dyspareunia.
In our study 26% of women described intercourse as better than prior to surgery. Because the existence of the partners discomfort was scored only postoperatively, we have no information on partners discomfort preoperatively. A relatively high percentage of partner discomfort was mentioned in our study (24%).
Only a few patients stated that narrowing and dryness were due to the operation. It is obvious that these aspects need to be addressed properly in a prospective way to obtain a clear picture of partner discomfort.
Bearing in mind the anatomical relation of the erectile tissue of the clitoris and the urethra, described by OConnell et al., operations in the vicinity of the urethra, such as AVWS, may damage erectile tissue, which may explain up to 20% of sexual dysfunction after operation (20). The clitoris was well visualized in an MRI study by Suh et al. (21). It looks as though the clitoral crus is the only part of the clitoris that can be perforated during a TVT procedure. It is unlikely that such interference occurs between the tape and the body of the clitoris, because the tape is placed paraurethrally. This could explain the absence of sexual dysfunction after TVT in this study.
Another issue in this respect might be the G-spot, a small area of erotic sensitivity in the ventral vaginal wall, previously mentioned by Maaita et al.
In a recent study on vaginal electric activity by Shafik et al., a pacemaker was postulated to exist in the upper vagina. Thiswould seem to represent the G-spot (22). If the G-spot is localized ventrally in the upper vagina it is not expected that a TVT procedure would have any influence on it.
Interesting is the presence and tissue distribution of PDE5 in the human vagina,

recently published by DAmati et al. (23). This suggests the existence of an integrated system of nitric oxide synthase-PDE5, which may play a physiological role in female sexuality. Damage to this system could be an explanation for loss of arousal after vaginal surgery, as reported by Maaita et al. (24).
It is clear that further investigation on the relation of AVWS or TVT to the erectile tissue of the clitoris, as well as research into the role of PDE5, is needed.

CONCLUSION

This study highlights sexual function after TVT placement for genuine stress incontinence. The majority of women described intercourse as better than before the operation. In contrast to AVWS, no women reported intercourse to be worse postoperatively, except for one patient with increased incontinence postoperatively. Of the women 26% found intercourse better than prior to surgery. This in contrast to the study of Maaita et al., who reported 14% sexual dysfunction after TVT. Improvement often resulted from cessation of urinary incontinence. It is clear that in studies like these, improvement in incontinence and local surgical effects as potential opposing aspects need to be addressed separately for their effects on sexual function. The potential impact of these two aspects is difficult to distinguish. Also, proper attention should be paid to the partner. Partner discomfort due to vaginal narrowing and dryness has been reported in 25%. The possible causes for vaginal narrowing and dryness require further investigation. In relation to urogynecologic surgery such as TVT, prospective studies need to be done with validated global sexual function questionnaires.

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EDITORIAL COMMENT

The impact of urogynecologic surgery on sexual function is unclear. For those who are incontinent with intercourse, cure of incontinence may improve sexual activity at the price of potential damage to the vaginal anatomy. In this study sexual function following the TVT procedure was evaluated. The authors report that sexual frequency was overall unchanged, and many patients felt that

intercourse improved. It appears that much of this improvement is probably related to cure of the incontinence rather than any specific features of the TVT. Although the study is flawed by its retrospective design and a long interval between the procedure and the questionnaire, the results overall are reassuring.

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APPENDIX

QUESTIONNAIRES

The next questions refer to the situation one year before operation

1 *Were you last year sexually active?* ☐ yes ☐ no

If you answered this question with no please answer next question.
If you answered yes, you can skip answer 2

2 *This question refers to the reason why you werent sexually active before operation.*
Was this the result of:
☐ Not having a partner
☐ Partner related problems as, for example, illness, impotence, age
☐ Patient related problems as, for example illness, age
☐ A combination of these factors

If you would you like to give an explanation, you can write it underneath

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The reason for not being sexually active anymore was due to the next problems?

Incontinence during sexual intercourse ☐ yes ☐ no
Pain during sexual intercourse ☐ yes ☐ no

3 The next questions refer to sexual activity before the operation
A. Frequency of sexual activity with penetration
☐ More than 2 times a week
☐ 1–2 times a week
☐ 1–3 times a month
☐ less than once a month

B. Sexual activity with penetration is?
☐ Enjoyable
☐ Neither enjoyable nor painful
☐ Painful

C. Was there a question of incontinence, loss of urine during sexual intercourse?
☐ No
☐ Yes, but rarely
☐ Yes, occasionally
☐ Yes, frequently
☐ Yes, always

The next questions refer to the situation after the operation

4 *Were you sexually active after operation?* ☐ yes ☐ no

If you answered this question with no please answer next question.
If you answered yes, you can skip answer 5

5 *This question refers to the reason why you werent sexually active after operation*
Was this the result of?
☐ Not having a partner
☐ Partner-related problems, for example illness, impotence, age
☐ Patient-related problems, for example illness, age
☐ A combination of these factors

If you would you like to give an explanation, you can write it underneath

---

The reason for not being sexually active anymore was due to the next problems?

Incontinence during sexual intercourse ☐ yes ☐ no
Pain during sexual intercourse ☐ yes ☐ no

6 *The next questions refer to sexual activity after the operation*
A. Frequency of sexual activity with penetration
☐ More than 2 times a week
☐ 1–2 times a week
☐ 1–3 times a month
☐ less than once a month

B. Sexual activity with penetration is?
☐ Enjoyable
☐ Neither enjoyable nor painful
☐ Painful

C. Was there a question of incontinence, loss of urine during sexual intercourse?
☐ No
☐ Yes, but rarely
☐ Yes, occasionally
☐ Yes, frequently
☐ Yes, always

7. How would you describe having sexual intercourse after the operation?
☐ Better than before the operation
☐ Worse than before the operation
☐ No difference between before or after the operation

If you would you like to give an explanation, you can write underneath.

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8. *At last some questions for your partner (if applicable) concerning penetration*

Did you experience pain during sexual intercourse due to vaginal narrowing	☐ yes	☐ no
There is question of narrowing but this is not painful	☐ yes	☐ no
Pain because of dryness	☐ yes	☐ no
None of the above	☐ yes	☐ no

If there are other problems after the operation you can write it underneath.

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9. Did you have other abdominal operations before this one? ☐ yes ☐ no

When the answer is yes would you write down which operations you had in the past

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CHAPTER 6

Female sexual function after surgery for stress urinary incontinence: Transobturator Suburethral Tape (TOT) versus Tension-free Vaginal Tape Obturator (TVT-O)

Based on:
Elzevier HW, Putter H, Pelger RCM, Delaere KPJ, Venema PL, Lycklama à Nijeholt AAB Female sexual function after surgery for stress urinary incontinence: Transobturator Suburethral Tape (TOT) versus Tension-free Vaginal Tape Obturator (TVT-O) J sex Med 2008;5:400-406

INTRODUCTION

The surgical treatment of female stress urinary incontinence (SUI) due to urethral hypermobility has been profoundly changed a few years ago when Ulmsten described a new concept in 1995: the Tension-free Vaginal Tape (TVT) (1). To reduce the complications of the TVT, particularly with high-risk patients like those who have been operated on before in the lower pelvis, an alternative approach with a transobturator passage of the tape has been developed, the transobturator suburethral tape (TOT) (2) not long there after the Tension Free Vaginal Tape Obturator (TVT-O) (3).
TOT and TVT-O appear to be equally efficient as TVT for surgical treatment of stress urinary incontinence in women at 1-year follow-up (4-7).
There are several studies dealing with the negative effects of urinary problems on an individual's sexual life (8-11). Problems related to urinary incontinence, especially leakage during intercourse, wetness at night, odor and bedwetting, have been associated with sexual dysfunction such as decrease in frequency of coitus, anorgasmia and dyspareunia. The influence non surgical (12;13) and surgical treatment like TVT on sexual function has described before (14-20). Also the first results in relation to the TOT has been published (21;22). Only sexual function in both TOT studies is a minor part of the Qol evaluation.
The aim of the present study was to assess the influence of outside-in TOT procedure and inside out TVT-O procedure for the surgical treatment of SUI, on female sexual function.

MATERIALS AND METHODS

From January 2005 to December 2005, 78 sexual active patients had a TOT and TVT-O inserted for treatment of SUI. Patients with a pelvic organ prolapse who needed more extensive surgical treatment were excluded. The procedure was performed according to the technique of Delorme or de Leval in two different clinics with a long experience on incontinence surgery. We used a non-validated sexual questionnaire developed by Lemack (23) translated in Dutch and a few novel neuroanatomical questions (Appendix). The questionnaire, as well as an introduction letter stating the goal of the study was mailed 3 to 4 months after the procedure to the patients. The study was approved by our institutional review board.
Differences in percentages were evaluated using Pearson's chi-square test. A two-sided P-value of <0.05 was considered statistically significant.

RESULTS

Introduction:
We evaluated 102 TVT-O and TOT patients. Only 78 of them (76,4%) were sexual active. A total of 44 TOT (OB-TAPE Porges) patients (n=44, mean age 52.0 yr) and 34 TVT-O patients (n=34, mean age 53.2 yr) could be included. All patients completed the questionnaire 3 to 4 months after placement of the tape.

Postoperative TOT and TVT-O:
Almost no difference in frequency of sexual intercourse and an improvement of the continence during intercourse: continence was reported in 33 patients (42,3%) before and 67 patients (78,4%) after operation. The appreciation of sexual intercourse was improved in 15 patients (19.2%) and worsened in 8 patients (10,3%). The appreciation of sexual intercourse was improved in 7 patients (20,6%) and worsened in 2 patients (5,9%) in the TVT-O procedure and improved in 8 patients (18,2%) and worsened in 6 patients (13,6%) in the TOT procedure (Table 1,2).

Postoperative TVT-O vs TOT:
Due to the operation, no difference was seen in loss of lubrication, clitoral tumescence reduction and clitoral sensibility reduction between both procedures. Pain because of vaginal narrowing was seen significantly more in the TOT procedure group (Table 3).

Table 1 Results of questionnaire on intercourse before and after TOT and TVT-O procedures in sexually active women

		N = 78	
		Preoperative	**Postoperative**
Frequency of intercourse	More than twice per week	10 (12.8%)	8 (10.3%)
	One to two times per week	30 (38.5%)	28 (35.9%)
	One to three times per month	31 (39.7%)	33 (42.3%)
	Less than once per month	7 (9.0%)	9 (11.5%)
Sexual intercourse is	Pleasurable	64 (82.1%)	58 (74.4%)
	Neither pleasurable nor painful	8 (10.3%)	10 (12.8%)
	Painful	6 (7.7%)	10 (12.8%)
Do you experience leakage during intercourse?	No	33 (42.3%)	69 (78.4%)
	Yes, rarely	11 (14.1%)	4 (5.1%)
	Yes, occasionally	21 (26.9%)	4 (5.1%)
	Yes, frequently	8 (10.3%)	0 (0%)
	Yes, always	5 (6.4%)	1 (1.3%)

Table 2 Overall sexual appreciation after TOT and TVT-O procedures

	Overall, how would you describe intercourse postoperatively?					
	OT		**TVT-O**		**TOT**	
	Frequency	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
Better than prior to surgery	15	19.2%	7	20.6%	8	18.2%
Worse than prior to surgery	8	10.3%	2	5.9%	6	13.6%
No different than prior to surgery	55	70.5%	25	73.5%	30	68.2%
Total (N)	78		34		44	

OT = obturator tape; TVT-O = tension-free vaginal tape obturator; TOT = transobturator suburethral tape.

Table 3 Sexual function and vaginal anatomical changes after operation TVT-O vs. TOT

		TVT-O		TOT		P
		N	%	N	%	
My lubrication during sexual activity is less since the operation.	Yes	6	18.2	7	18.4	0.612
	No	27	81.8	31	31	
The sensibility of my clitoris is less since the operation.	Yes	3	9.1	6	15	0.346
	No	30	90.9	34	85	
The tumescence (swelling) of my clitoris is decreased by the operation.	Yes	2	6.1	6	15.8	0.181
	No	31	93.9	32	84.2	
Do you experience pain because of vaginal narrowing due to the operation?	Yes	1	3	8	20.5	0.026
	No	31	97	31	79.5	
Since the operation, I don't like to have sex anymore. Is that true?	Yes	0	0	3	7.9	0.148
	No	33	100	35	92.1	

TVT-O = tension-free vaginal tape obturator; TOT = transobturator suburethral tape.

Partner evaluation

42 Of the TOT partners completed the partner questionnaire. No difference was seen in pain due to vaginal dryness pre and postoperative. 4 Partners (9.5%) experienced vaginal narrowing after the operation. A total of 3 patients were able to have intercourse without pain in spite of feeling the tape.

33 Of the TVT–O partners completed the partner questionnaire. No difference was seen in pain due to vaginal dryness. A total of 2 partners (6.1%) complained about vaginal narrowing without pain. Only one partner noticed the tape during intercourse and complained about pain due to the tape.

DISCUSSION

Female sexual dysfunction (FSD) as a clinical term includes a variety of sexual problems. Although 30%–50% of women suffer from sexual dysfunction, only recently has more medical and clinical research been focused on the problems related to urological and gynecological operations (24;25).
During a TVT procedure theoretically the pelvic plexus branches, which supply the blood vessels of the internal genitals and are involved in the neural control of vasocongestion and, consequently, the lubrication-swelling response, can be damaged. Also the pudendal nerve branches can be injured during this procedure. In contrast, the TOT and TVT-O procedure have no relation to the pelvic plexus branches. But there could be a relation to the pudendal nerve. As a consequence, if there is an alteration of sexual function it probably will affect the somatosensory pathway of the vulva. However, during recent anatomical studies the tape was not disturbing the pudendal nerve (26;27).
In contrast to the anatomical studies we find in our study detoration in tumescence of the clitoris in 6.1% in TVT-O patients and 15.8% in TOT patients. This outcome and also the changes in clitoral sensibility should be an important issue for future studies.
Not only the innervation of the clitoris can be disturbed but the vaginal anatomy as well. An altered vaginal anatomy as a result of vaginal surgery has described before. Vaginal narrowing/shortening following posterior repair has been reported to result in sexual dysfunction in 17% of the women surveyed (28). Also colpoperineorrhaphy may result in dyspareunia due to narrowing of the vagina (29).
The localization of the TOT or TVT-O tape could result in vaginal narrowing. In this study vaginal narrowing was significantly seen more in the TOT procedure compared to the TVT-O procedure. The reason could be that more vaginal tissue (perineal membrane) in the outside-in procedure is included and therefore more vaginal narrowing is seen. Because of the question “Is sexual intercourse better because of the reduction of urine loss during sexual intercourse” we know the positive influence of incontinence treatment on sexual function was 100% related to the reduction of incontinence during intercourse. In the TOT study of Lukban (30), 6% (n=33) of the patients concluded that they were less able to have a sexual relationship. Also 14,9% of the patients experienced vaginal pain, pressure or protrusion. These results are comparable with our study results of 12.5% pain due to vaginal narrowing in the total population. It is interesting that in Lukban’s study 33% of the patients was better able to have a sexual relationship and in 61% it was about the same. In our study 19.2% described an improvement and 70.5% no different than prior to surgery.
Compared to our TVT-study (31) more sexual problems were seen after TVT-O

and TOT procedures. In that TVT-study only 1 patient of 65 (1.5%) had more problems during sexual intercourse because of increase of incontinence.
Some of the limitations of this study have to be discussed. The translated Lemack-questionnaire and the neuroanatomical sexual questions we used are not validated. One of the reasons was we wanted to compare the TOT/TVT-O data with our TVT-study. On the other hand at this moment we do not have neuroanatomical sexual questionnaires or questionnaires related to vaginal anatomy changes due to vaginal surgery. Therefore we tried to introduce some more specific clitoral function and vaginal anatomy questions. In our study vaginal narrowing was seen in 19,5% of the TOT patient population. In the study of Weber et al the difference between patients' perception and objective measures of vaginal dimensions after prolaps or incontinence surgery is intriguing.
However, they could not correlate symptoms with objective changes in vaginal length/caliber in those with sexual dysfunction after surgery. It is remarkable that in our study 9.8% of the partners of the TOT group and 6.7% of the TVT-O group also experience vaginal narrowing and a few noticed the tape during intercourse.
The operations were performed in 2 different hospitals by 2 different surgeons, this could give a bias. Therefore we asked two surgeons with a long experience in incontinence surgery to perform the operation they prefered. The best way to study female sexual function in relation to both procedures is a randomized multicenter study, with enough power, as initiated by clinicaltrials.gov in relation to TVT and TOT; the TOMUS study (Trial of Mid-urethral Slings - comparing TVT to TOT).
The retrospective design, without baseline measurement, could be qualified as limitation of the study as well, though we do not know the influence of prospective sexual function study itself on sexual behavior of the patients. Maybe the questionnaire could have a positive input on sexual function. In the study of Ghezzi et al (32), frequency of sexual intercourse significantly increased in contrast to other TVT studies. Maybe the frequency was increased to please the investigating doctor in order to know if leakage during intercourse was still there after the TVT procedure? The influence of questionnaires itself on sexual behavior has not been investigated before.

CONCLUSION

In this descriptive non-randomized cohort study 3-4 months postoperatively the technique of TOT (outside-in) gave rise to more sexual dysfunction than TVT-O (inside-out). However, because of the successful outcome on incontinence, both procedures have overall a positive effect on sexual function. The possible

cause of significant more pain during intercourse after the TOT procedure as a result of vaginal narrowing requires further investigation. In short, this study demonstrated that TOT and TVT-O could have both a positive and a negative outcome on sexual function and that it is of importance to discuss this issue in the informed consent.

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APPENDIX

QUESTIONNAIRES

1 *Date of Birth* _____

2 *Operation date* _____

3 *Do you have menstruation*
☐ Yes, regular (every 4 weeks)
☐ Yes, but not regular
☐ No, since a few months not anymore
☐ No, since more than 1 year not anymore

4 *Did you have other abdominal or vaginal operation before the incontinence operation* ☐ yes ☐ no

4a *If yes, please write down the kind of operation you have.*

_____

The next questions refer to the situation one year before operation

5 *Were you last year sexually active?* ☐ yes ☐ no

If you answered this question with no please answer next questions. If you answered yes, you can go to answer 10

6 *This question refers to the reason why you were not sexually active before operation.* Was this the result of:
☐ Not having a partner
☐ Partner related problems as, for example, illness, impotence, age
☐ Patient related problems as, for example illness, age
☐ A combination of these factors

6a *If you would you like to give an explanation, you can write it underneath.*

_____

The reason for not being sexually active anymore was due to the next problems?

7 *Incontinence during sexual intercourse* ☐ yes ☐ no

8 *Pain during sexual intercourse* ☐ yes ☐ no

9 *Lost of libido* ☐ yes ☐ no

The next questions refer to sexual activity before the operation

10 *Frequency of sexual activity with penetration*
☐ More than 2 times a week
☐ 1–2 times a week
☐ 1–3 times a month
☐ less than once a month

11 *Sexual activity with penetration is?*
☐ Enjoyable
☐ Neither enjoyable nor painful
☐ Painful

12 *Was there a question of incontinence, loss of urine during sexual intercourse?*
☐ No
☐ Yes, but rarely
☐ Yes, occasionally
☐ Yes, frequently
☐ Yes, always

The next questions refer to the situation after the operation

13 *Were you sexually active after operation?* ☐ yes ☐ no

If you answered this question with no please answer next question.
If you answered yes, you can go to question 18

This questions refers to the reason why you werent sexually active after operation

14 *Was this the result of?*
☐ Not having a partner
☐ Partner-related problems, for example illness, impotence, age
☐ Patient-related problems, for example illness, age
☐ A combination of these factors

14a If you would you like to give an explanation, you can write it underneath

---

The reason for not being sexually active anymore was due to the next problems?

15 *Incontinence during sexual intercourse* ☐ yes ☐ no

16 *Pain during sexual intercourse* ☐ yes ☐ no

17 *Lost of libido* ☐ yes ☐ no

The next questions refer to sexual activity after the operation

18 *Frequency of sexual activity with penetration*
☐ More than 2 times a week
☐ 1–2 times a week
☐ 1–3 times a month
☐ less than once a month

19 *Sexual activity with penetration is?*
☐ Enjoyable
☐ Neither enjoyable nor painful
☐ Painful

20 *Was there a question of incontinence, loss of urine during sexual intercourse?*
☐ No
☐ Yes, but rarely
☐ Yes, occasionally
☐ Yes, frequently
☐ Yes, always

21 *How would you describe having sexual intercourse after the operation?*
☐ Better than before the operation
☐ Worse than before the operation
☐ No difference between before or after the operation

If you answered the question with <u>better</u> please answer the next question.

22 *Is sexual intercourse better because of the reduction of urine loss during sexual intercourse* ☐ yes ☐ no

22a If there is another reason plaese write it underneath

If you answered the question with <u>worse</u> please answer the next question.

23 *Please give some comment why sexual intercourse is worsened*

Sexual neuroanatomical questions

24 *My lubrication during sexual activity is less since the operation* ☐ yes ☐ no

25 *The sensibility of my clitoris is less since the operation* ☐ yes ☐ no

26 *The tumescence (swelling) of my clitoris is decreased by the operation* ☐ yes ☐ no

27 *Do you experience pain because of vaginal narrowing due to the operation* ☐ yes ☐ no

28 *Since the operation I don't like to have sex anymore, is that true* ☐ yes ☐ no

Male questionnaire

The next questions refer to sexual activity before the operation

1 *Did you experience pain during sexual intercourse due to vaginal narrowing* ☐ yes ☐ no

2 *There is question of narrowing but this is not painful* ☐ yes ☐ no

3 *Pain because of dryness* ☐ yes ☐ no

4 *Vaginal dryness without pain* ☐ yes ☐ no

The next questions refer to sexual activity after the operation

5 *Did you experience pain during sexual intercourse due to vaginal narrowing* ☐ yes ☐ no

6 *There is question of narrowing but this is not painful* ☐ yes ☐ no

7 *Pain because of dryness* ☐ yes ☐ no

8 *Vaginal dryness without pain* ☐ yes ☐ no

9 *Are there other problems after the operation:*

---

10 *Do you feel the tape during sexual intercouse* ☐ yes ☐ no

11 *If yes, is it painfull* ☐ yes ☐ no

12 *How would you describe having sexual intercourse after the operation?*

☐ Better than before the operation
☐ Worse than before the operation
☐ No difference between before or after the operation

12a *If you want to give som comment on it please write it underneath*

CHAPTER 7

Female Sexual Function and Activity Following Cystectomy and Continent Urinary Tract Diversion for Benign Indications: A Clinical Pilot Study and Review of Literature

Based on:
Elzevier HW, Nieuwkamer BB, Pelger RCM, Lycklama à Nijeholt AAB Female Sexual Function and Activity Following Cystectomy and Continent Urinary Tract Diversion for Benign Indications: A Clinical Pilot Study and Review of Literature. J Sex Med 2007;4:406–416

INTRODUCTION

In 1950 Bricker introduced the ureteroileal urostomy, which has become the standard for urinary diversion during the last 55 years (1). Several studies have indicated that, as a consequence of noncontinent diversions for faeces or urine, patients restrict social and sexual activities (2-4). Techniques aiming for continence after radical cystectomy (RC) for bladder cancer, e.g. continent cutaneous urinary diversion and orthotopic bladder substitution have become well-accepted alternatives to ileal conduit diversion in selected patients. The advantages of a competent reservoir are a non-protruding "dry" stoma, intact peristomal skin, absence of odor and no need for a collecting appliance. Indications for cystectomy are mainly cancer, such as muscle invasive bladder cancer and bladder infiltrating malignancies or, in a minority, benign diseases leading to progressive bladder dysfunction.

In women, RC and hysterectomy (5) may cause sexual dysfunction because the neurovascular bundles, located lateral to the vaginal wall, are usually excised or damaged by removal of the bladder, urethra and anterior vaginal wall. The pelvic plexus, also called the "inferior hypogastric plexus", consisting of afferent and efferent sympathetic and predominantly parasympathetic autonomic nerves and some sensory pudendal nerve branches, is supplying the network of pathways innervating the rectum, uterus, vagina, vestibular bulbs, clitoris, bladder and urethra. Centrally these nerves are derived from the sacral nerves (mainly parasympathetic) connected to the superior hypogastric plexus and hypogastric nerves (mainly sympathetic).

Theoretically, disruption of the pelvic plexus could lead to impaired vascular function during sexual arousal and possibly a disordered orgasm. The pelvic plexus supplies the blood vessels of the internal genitals and is involved in the neural control of vasocongestion and, consequently, the lubrication-swelling response. The innervation of the vaginal wall originates predominantly from the pelvic plexus.

In addition, significant devascularization of the clitoris often occurs with removal of the distal urethra, affecting subsequently sexual arousal and desire. The sensation of the external genitalia is not related to the pelvic plexus: pudendal nerve branches are the somatosensory pathways for the vulva and clitoris.

Most of the literature on cystectomy and sexual function is cancer and male-related. Female sexual function in relation to cystectomy for benign (non-oncological) indications is rarely investigated (6-9). In the group of bladder dysfunction patients, for example, interstitial cystitis, preoperative sexual dysfunction may exist as a result of the disease. As mentioned, the cystectomy itself may influence sexual function as well (10). A simple cystectomy performed for a benign indication could result in less neurovascular complications in

comparison to a RC (11).
Moreover, postoperatively female sexuality is not only influenced by the surgical technique as such, but also by other factors, such as impaired body image, concomitant disease, hormonal influences like menopause (12) and partnership. Although it is difficult to separate all items, which could influence sexual function after cystectomy, it is important for the purpose of informed consent, to know how patients with a continent diversion function sexually following cystectomy for benign indications.
The aims of the present study on female sexual function was to describe the impact of cystectomy and continent urinary diversion for benign indications and to review literature investigating changes in women's sexual function after cystectomy.

MATERIALS AND METHODS

Between 1985 and 2004, cystectomy including bladder substitution was performed in 27 female patients for a benign indication. In the early years a Kock pouch was used (13;14), as a heterotopic diversion, later on an Indiana pouch (15). The Mainz pouch technique (16) was used for orthotopic reconstruction or, depending on surgeon's preference, an ileal neobladder technique as described by Hautmann (17). Patients were selected out of a database. All patients available for evaluation were informed by telephone about the aim of the study. Following consensus a questionnaire was sent .
Because of the retrospective nature of the questions about sexual function we could not use the Female Sexual Function Index (FSFI) (18) to evaluate sexual function before operation. Instead we asked patients if they had sexual problems before operation and if the problems were pain, incontinence or libido related. Furthermore, we asked if the patient was informed about the potential consequences of the operation on her sexual function.
Postoperative sexual function was evaluated, in case of sexual inactivity, by questions relating to the reason of sexual inactivity and FSFI. In sexually active women, sexual function was assessed using the FSFI, and questions on overall sexual appreciation following operation. (Appendix A)
Review has been performed by a search on pubmed with the key words: cystectomy, bladder, sexuality, quality of life, female, female sexual function, female sexual dysfunction, urinary diversion, ileal conduit, nerve-sparing.

RESULTS

Of the total of 27 female patients, 2 had died and 2 were lost to follow-up. All remaining 23 patients agreed to participate in the study. 21 Of the 23 patients actually responded (91%) by returning the questionnaires and were available for analysis. The mean age, at operation date, was 47.3 yr (range 25-66 yr) with a mean follow-up of 11.9 years (range 3.08-20.33 yr) after the operation.

Preoperative data

Preoperative data are summarized in Table 1. Out of the 21 patients, 10 (48%) had sexual complaints before operation. Most common complaints were incontinence during intercourse (70%), pain (60%), and loss of libido (50%). Preoperatively, four out of 21 patients (19%) were sexual inactive. Of these inactive patients, two had sexual complaints, one had no partner and one patient was inactive because of partner related problems.
In 70% of women sexual function was not discussed by the treating physician prior to operation, one patient could not remember if she was asked about her sexuality. The potential consequences on sexual function were discussed only in 38% of patients.
The indications for cystectomy and continent diversion are listed in Table 2.

Table 1 Preoperative: Sexual function and counseling data (n=21, mean age 47 year, range 25-66years)

	Yes	No
Asked about sexual function	6 (30%)	14 (70%)*
Informed about consequences	8 (38%)	13 (62%)
operation on sexual function		
Sexual problems before operation	10 (48%)	11 (52%)
Sexually active	17 (81%)	4 (19%)
Sexual problems before operation due to (n=10):		
Incontinence during sexual intercourse	7 (70%)	3 (30%)
Pain during sexual intercourse	6 (60%)	4 (40%)
Loss of libido	5 (50%)	5 (50%)
* One patient did not answer the question because she did not remember.		

Tabel 2 Preoperative: bladder disease (n=21)

	n	%	Sexually active postoperatively (n)
Interstitial cystitis	15	71.4	12
Eosinofilic cystitis	1	4.8	-
Chronic infection bladder	2	9.5	2
Sensory-urge complaints	1	4.8	-
Neurogenic bladder	2	9.5	2
	21	**100**	**16**

Operative data

The kind of cystectomy, with or without preservation anterior vaginal wall, and diversions are listed in Table 3. A small part of the anterior vaginal wall was resected in 3 women (14%), two of them received an Indiana pouch and one a Kock pouch. The remaining patients underwent a simple cystectomy.

Tabel 3 Operative: technique of cystectomy and urinary diversion (n=21)

Operation	n	%	Preservation anterior vaginal wall (n)	Sexually active postoperative (n)
Kock pouch	6	28.6	5	5
Indiana pouch	8	38.1	6	4
Mainz pouch	3	14.3	3	3
Hautmann	4	19.0	4	4
	21	**100**	**18**	**16**

Postoperative data

Sexual activity:
Fourteen out of the 17 preoperatively sexually active patients are still sexually active postoperatively (82%). Nine out of these 14 active patients still are active at the present time. Two out of the four preoperative sexual inactive patients became sexual active again, one because of reduction of incontinence and one patient without a partner preoperatively started a relation. The mean age of the 16 postoperatively sexual active patients at the date of operation was 45.7 years (range 25-65yr) with a mean follow-up of 12.8 years (range 3.08-20.08yr).

Sexual inactivity:
The reasons for sexual inactivity are shown in Table 4. The mean age of the five direct postoperatively sexually inactive patients at the date of operation was 52.7 years (range 46-66yr) with a mean follow-up of 9.2 years (range 4.3-20.3years). Sexual inactivity developed in an extra five patients during follow-up (mean age at the date of operation 46 years (range 25-65years), mean follow up of 14.9 (range 8.08-20.08) years).
The most frequently reported reasons of sexual inactivity are patient-related (30%) or combinations of patient- and partner-related issues (40%). The most common complaints reported by sexually inactive women are: pain during intercourse (50%), libido loss (40%) and impaired body image (30%). Two patients reported vaginal narrowing, although an anterior vaginal wall resection was not performed. The majority of sexually inactive patients, 7 out of 10 (70%), had already sexual complaints before operation. The other three patients (30%) without sexual problems before operation reported having pain during intercourse and loss of libido. Two of them complained about impaired body image and one about vaginal narrowing making penetration impossible.

Table 4 Postoperative: reasons for sexual inactivity (n=10, mean age 52.7 year range 46-66years)

	Postop n = 5	Acquired n = 5*	Total n=10
Overall reason:			
No partner	1	1	2 (20%)
Partner-related issues	0	1	1 (10%)
Patient-related issues	2	1	3 (30%)
Both	2	2	4 (40%)
Specified reason:**			
Incontinence during sexual intercourse	0	1	1 (10%)
Pain during sexual intercourse	2	3	5 (50%)
Loss of libido	3	1	4 (40%)
Impaired body image	2	1	3 (30%)
My partner doesn't want have sex with me anymore	1	1	2 (20%)
Vaginal narrowing so penetration is impossible	0	2	2 (20%)

* Sexually active postoperatively but not sexually active at present time
** A patient can indicate one or more reasons

Perception of change in sexual function:
The overall sexual appreciation after operation is listed in Table 5. The majority of the women (62.5%) described improved or unchanged intercourse after operation. Of the improved patients, four had incontinence during sexual intercourse before operation, two of them had had loss of libido and two had pain. Only two patients had no sexual problems before operation. Six patients had a declined sexual function after the operation, three became sexually inactive and three are still sexually active. These three constitute 27% of the sexually active patients at the present time, none of them having sexual complaints preoperatively. Out of these three, one experienced penetration problems because of vaginal narrowing. Anterior vaginal wall resection was not performed in six patients with postoperatively declined sexual function.

Table 5 Postoperative: overall sexual appreciation in sexually active women (n=16, mean age 45.7year, range 25-65years)

Overall, how would you describe intercourse postoperatively	Better than prior to surgery	6	37.50%
	No different than prior to surgery	4	25.00%
	Worse than prior to surgery	6	37.50%
Vaginal narrowing postoperatively	Penetration impossible	1	6.25%
	Penetration possible but difficult	5	31.25%
	Penetration possible without problem	10	62.50%

Sexual function at present:
Eleven out of the total of 16 sexually active patients immediately postoperatively, are still sexually active. The mean age of the 11 patients (52%) who still are sexually active at the present time is 57.7 years (range 42-70yr), with a mean follow-up of 11.86 years (range 3.08-20.08yr). Table 6 shows the present FSFI scores of the 11 sexually active patients. The domains of desire, arousal, lubrication, orgasm and pain, scores are above average. The domain of satisfaction shows results below average. Table 7 shows the present FSFI scores of the sexually inactive patients. All domains are below average.

Tabel 6 Postoperative: domain characteristics sexually active patients at present time (n=11, mean age 57.7 year, range 42-70 years)

Domain Question No.	Item	Score range	score by item	score by domain
Desire:				
1	Frequency	1-5	3.7	
2	Level	1-5	3.7	4.44
Arousal:				
3	Frequency	0-5	4.3	
4	Level	0-5	4.1	
5	Confidence	0-5	3.9	
6	Satisfaction	0-5	3.1	4.62
Lubrication:				
7	Frequency	0-5	3.3	
8	Difficulty	0-5	3.7	
9	Maintenance frequency	0-5	2.4	
10	Maintenance difficulty	0-5	3.9	3.99
Orgasm:				
11	Frequency	0-5	3.0	
12	Difficulty	0-5	4.3	
13	Satisfaction	0-5	2.4	3.88
Satisfaction:				
14	Closeness with partner	0-5	2.0	
15	Sexual relationship	1-5	2.2	
16	Overall sex life	1-5	2.5	2.68
Pain:				
17	During vaginal penetration	0-5	3.8	
18	Following vaginal penetration	0-5	3.9	
19	Level	0-5	3.9	4.64
FSFI Full scale score		2.0-36.0		24.25

Tabel 7 Postoperative: domain characteristics sexually inactive patients at present time (n=10, mean age 61.5 year, range 46-75 years)*

Domain Question No.	Item	Score range	score by item	score by domain
Desire:				
1	Frequency	1-5	1.3	
2	Level	1-5	1.5	1.68
Arousal:				
3	Frequency	0-5	0.9	
4	Level	0-5	0.4	
5	Confidence	0-5	0.8	
6	Satisfaction	0-5	0.6	0.75
Lubrication:				
7	Frequency	0-5	0.4	
8	Difficulty	0-5	0.1	
9	Maintenance frequency	0-5	0.1	
10	Maintenance difficulty	0-5	0.1	0.24
Orgasm:				
11	Frequency	0-5	0.6	
12	Difficulty	0-5	0.3	
13	Satisfaction	0-5	0.1	0.40
Satisfaction:				
14	Closeness with partner	0-5	0.0	
15	Sexual relationship	1-5	3.0	
16	Overall sex life	1-5	3.0	2.4**
Pain:				
17	During vaginal penetration	0-5	0.0	
18	Following vaginal penetration	0-5	0.0	
19	Level	0-5	0.0	0.0
FSFI Full scale score		2.0-36.0		5.47

** Nine out of the 10 sexually inactive patients were willing to complete the FSFI.*

*** Only three patients answered question 15 and 16.*

DISCUSSION

According to Albarran, Pawlick first performed a cystectomy in a woman more than a century ago including diversion of the ureters into the vagina (19). The patient was almost continent and survived for 16 years. However, others were unable to reproduce this result and a multitude of different techniques was developed subsequently to reconstruct the lower urinary tract in women. Recently there has been a marked increase in interest in continent urinary diversions. Porter (20) published a systematic review and critical analysis of the literature on the health related quality of life (HRQOL) after radical cystectomy (RC) and urinary diversions for bladder cancer. He stated that the current body of published literature is insufficient to conclude that one form of urinary diversion is superior to another based on HRQOL outcomes.

In relation to cystectomy and urinary diversion, few reports on sexual function have been published as part of quality of life studies. Most of them are related to cystectomy because of malignancy and are male sexual function related. Only few studies refer to female sexual function separately (21-29). (Table 8)

Recently, surgeons have acknowledged the impact of pelvic surgery on female sexual function by attempting to preserve the vagina and its neurovascular innervation during removal of the bladder (30-33).

A good option in benign indications is simple cystectomy as described by Neulander (34). Simple cystectomy consist of removal of the bladder without the adjacent structures, including adnex, urethra and part of vagina. This type of procedure was performed in 86% of our patients.

Zippe demonstrated that female sexual dysfunction is a prevalent problem, with 52% of preoperatively sexually active women becoming dysfunctional after RC for transitional cell carcinoma of the bladder (35). The baseline and follow-up data were obtained from 27 sexual active female patients who underwent RC. He suggested some surgical modifications may be appropriate in sexually active women: (a) in selected diversions routine preservation of the distal urethra in order to preserve the clitoral neurovasculature; (b) preservation of the anterior vaginal wall (as much as possible) to maintain vaginal lubrication and neurovascular innervations; and (c) tubular reconstruction of the vagina (versus posterior flap rotation) to preserve vaginal depth and maintain pain-free intercourse.

Table 8 Studies on female sexual function after cystectomy and urinary diversion

Author	Study design	N	Bladder disease Maligne (M) Benigne (B)	
Schover (1985) 19	Prospective Interview	9	M 9	
Nordström (1992)6	Prospective Interview	26	M 11 B 15	
Bjerre (1997) 7	Retrospective Interview	33	M 13 B 4 M 8 B 8	
Sullivan (1998) 20	Retrospective Questionnaire	8	Unknown	
Henningsohn (2002) 21	Cohort Questionnaire	9	M	
Zippe (2003) 22	Prospective Questionnaire	27	M 10 M 7 M 10	
Protogerou (2004)23	Cohort Interview	18	M 13 M 5	
Volkmer (2004) 8,9	Retrospective Questionnaire	29	M 21 B 8	

M= Maligne, B= Benigne

	Diversion procedure	Age at operation	Results on postoperative sexual function
	Ileal conduit	59 (44-77)	2/9 inactive, 6/9 unchanged, 1/9 decreased
	Ileal conduit	58 (43-67)	5/6 decreased, 1/6 unchanged, 5 unchanged inactive
	Ileal conduit	46 (20-64)	2/10 decreased, 1/10 unchanged, 7/10 increased, 5 unchanged inactive
	Ileal conduit	64 (29-76)	3/17 coital freq. unchanged, more often, 14/17 decrease/cessation (29% dyspareunia or vaginal dryness, 36% decrease in desire, 36% feel less atractive)
	Kock pouch	40 (19-66)	7/16 coital freq. unchanged, more often, 9/16 decrease/cessation (33% dyspareunia or vaginal dryness, 33% decrease in desire, 22% feel less atractive)
	Hetrotopic	Unknown	4/8 adversely affected sex life
	Kock neobladder	Unknown	6/9 sexual desire < 1/mo, 6/8 no intercourse, 1/2 lubrication problems (2 patients sexually active)
	Studer	55	No difference between the three groups. 14/27 decreased satisfaction, 13/27 successful vaginal intercourse, 12/27orgasm problems, 11/27decrease Lubrication, 10/27 Decreased sexual desire, 6/27dyspareunia
	Indiana	58	
	Ileal conduit	66	
	Ileal conduit	Unknown	Vaginal dysfunction: 6/13 not at all, 5/13 Sometimes, 1/13 Often, 1/13 very often
	S-pouch neobladder		Vaginal dysfunction: 3/5 not at all, 1/5 Sometimes, 1/5 Often
	Hautmann	61	17/29 preoperative. sexual active, 6/17 became inactive, 1/12 became active In 12/29 active patients FSFI unchanged after cystectomy

It is of interest that the only patient in our study with anterior vaginal wall resection who still is sexual active had no vaginal narrowing problems. On the other hand, 6 patients (29%) that underwent a simple cystectomy had vaginal narrowing postoperatively making penetration impossible in one and difficult in 5. 3 Out of them became sexual inactive during follow-up. In a recent study Volkmer concluded that resection of the upper part of the anterior vaginal wall did not affect lubrication, vaginal sensibility or the ability to perform sexual intercourse (36). With regard to the urinary diversion Zippe concluded that the type of continent diversion did not affect sexual function (37). Bjerre et al found a higher frequency of dyspareunia among patients with a continent reservoir compared to an ileal conduit (38).

Women that undergo radical cystectomy are a considerable older group. Completely different populations are patients that need a cystectomy because of bladder function problems like interstitial cystitis or severe incontinence. First, these patients are usually younger and secondly, in contrast to bladder cancer, a long history of severe daily bladder complaints has already impacted on sexual function. In our study 48% had sexual problems before operation, in 3out of 10 patients improvement was seen after operation, sexual function was worsened in1 and unchanged in 6 patients. Improvement in 2 of the 3 patients was related to regaining continence.

Interstitial cystitis has a devastating impact on sexuality, leading to decreased interest in sexual interactions in most women and to painful sensations during intercourse in 60% to 90% of patients (39;40). Some interstitial cystitis patients have a progressive course with rapid development of a small contracted bladders and intractable symptoms. Major surgery should be reserved for this desperate group of patients with severe unremitting symptoms not controlled by other measures. Sexual dysfunction, like vulvar pain disorders, is common in this population and it seems plausible that the positive impact of cystectomy and continent deviation on sexual function is primarily attributable to relief of this distressing condition.

In our study 15 patients with IC, with a mean age at operation date of 45,9 years (range 25-66yr) and mean follow-up of 14,9 years (range 5,7-20,3yr) after the operation, underwent a cystectomy with a continent diversion. 6 Of them (40%) had sexual difficulties preoperatively with complaints as incontinence (100%), dyspareunia (100%) and loss of libido (67%). Shortly after operation 12 are sexual active (80%), at the present time 8 patients still are active (53%). Inactivity in 7 IC patients (47%), including the patients who became inactive later on, was related to dyspareunia (29%), urine leakage during intercourse (10%), loss of libido (57%), feeling of unattractiveness due to surgery (43%), less interest of the partner (29%) or vaginal narrowing (43%).

In our study 4 (19%) of the patients have body image complaints; 3 of them, all IC

patients, indicated this as one of the main reasons of sexual inactivity. The impact on body image was described before by Sullivan, who observed an adverse affect on sex life in 4 of 8 women stating that these problems were cosmetic (41).
Interesting are the postoperative FSFI scores of sexual active patients at the present time. The domains desire, arousal, lubrication, orgasm and pain scores are above average.
The domain of satisfaction shows results below average. This domain consists of questions on closeness with partner, sexual relationship and overall sex life. Adequate communication is a prerequisite for solving this problem. Maybe sexual counseling, with partner, is a good option to help to increase patients' satisfaction after cystectomy. Van Driel nicely described some practical guidelines (42). It is of note that none of the patients in our study wanted to participate in a follow-up study on sexual counseling after cystectomy.
It is of importance that the lubrication and orgasm scores are above average in sexual active patients, which could suggest an intact clitoral function. It is important to mention that in women may also induced by erotic stimulation of nongenital sites. The clitoris and vagina are the most usual sites of stimulation, but stimulation of the periurethral glans, breast/nipple or mons, mental-imagenary/ fantasy or hypnosis have been reported to induce orgasm as well (43-47). So orgasm and lubrication are not synonymous with intact clitoral function. To know if clitoral function is still intact an objective investigation, like MRI, is needed to demonstrate the clitoral function after operation (48).
Postoperatively female sexuality is not only influenced by the surgical technique as such, but also by other factors like menopause (49).
We are not informed about the hormonal situation pre and postoperatively. In our study out of all 21 patients, 18 patients (86%) are not menstruating at the present time, 2 patients (10%) have a regular menstrual cycle and 1 patient (4%) has stopped menstruating since a few months. 9 Of the 11 sexually active patients at the present are not menstruating, 1 is menstruating normal and 1 patient has stopped menstruating since a few months. The mean age of these sexually active patients is 57,7 years (range 42-70 years).
Of the patients with non-preserved sexual function, 5 are directly related to the operation. Another 5 patients became sexually inactive during follow-up. Of these, 2 were partner related (partner deceased and ED) and 3 patients had complaints summarized in table 4. All 3 patients are not menstruating at the present time. The postoperative interval to the start of sexual inactivity is unknown. We only know the reason of inactivity of these 3 patients: pain in all patients, lost of libido in 1 and body image complaints in 2. This kind of complaints can be also related to hormonal status, age (50), sexual relationship and not exclusively related to operation.

The present paper is a novel report on an area only described by few authors and in those cases mainly in relation to cystectomy for malignancy. Although the study is flawed by its retrospective design and a long interval between the procedure and the questionnaire, overall the results of 62,5% improved or unchanged intercourse are reassuring in relation to available literature on female sexual function after cystectomy (table 8).
It is difficult to separate the different items that may influence the outcome of sexual function, the most relevant being the bladder disease related preoperative problems, the cystectomy procedure as such and the type of urinary diversion. Many questions need to be addressed in relation to urologic surgery such as cystectomy and prospective multicenter studies are needed using validated global sexual function questionnaires like FSFI and sexual distress scale like Female Sexual Distress Scale (51;52). Also both neurovascular related anatomical studies as well as more specified questionnaires are needed. Furthermore, the role of postoperative sexual counseling needs more attention.

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APPENDIX

QUESTIONNAIRES

1 *Date of Birth* _____

2 *Do you have menstruation*
☐ Yes, regular (every 4 weeks)
☐ Yes, but not regular
☐ No, since a few months not anymore
☐ No, since more than 1 year not anymore

3 *Did they ask you about your sexual function* ☐ yes ☐ no

4 *Did they preoperative informed you about the consequence on sexual function* ☐ yes ☐ no

5 *Did you have any sexual problems before operation* ☐ yes ☐ no

If Yes, was this because of:

6 *Incontinence during sexual intercourse* ☐ yes ☐ no

7 *Pain during sexual intercourse* ☐ yes ☐ no

8 *Libido loss* ☐ yes ☐ no

A. The next questions refer to the situation <u>after</u> the operation.

9 *Were you sexually active after operation?* ☐ yes ☐ no

Did you answer this question with no please answer next question.
Did you answer yes, go to section B.

10 *This question refers to the reason, why you weren't sexual active after operation*
Was this the result of?
☐ Not having a partner
☐ Partner related problems as, for example, illness, impotence, age
☐ Patient related problems as, for example illness, age
☐ A combination of these factors

Would you like to give an explanation, you can write it underneath.

The reason for not being sexual active anymore was due to the next problems?

11 *Incontinence during sexual intercourse* ☐ yes ☐ no

12 *Pain during sexual intercourse* ☐ yes ☐ no

13 *Libido loss* ☐ yes ☐ no

14 *I don't want to have sex because since the operation I am not attractive anymore* ☐ yes ☐ no

15 *My partner don't want to have sex with me anymore* ☐ yes ☐ no

16 *Since the operation my vagina is narrowed so penetration is impossible. Is this true?* ☐ yes ☐ no

If you would like to give an explanation, you can write it underneath.

B. If you are sexual active we ask you to fill in the following questions and the two sexual questionnaires.

17. *How would you describe having sexual intercourse after the operation?*
☐ Better than before the operation
☐ Worse than before the operation
☐ No difference between before or after the operation

If you like to give an explanation why it is better ore worse, you can write underneath.

---

18. *Is because of the operation the vagina narrowed so penetration is impossible?*

☐ It is impossible
☐ It is possible but difficult
☐ Is penetration without problem possible

Next FSFI

CHAPTER 8

Sexual function after partial cystectomy and urothelial stripping in a 32-year-old woman with radiation cystitis

Based on:
Elzevier HW, Gaarenstroom KN, Lycklama à Nijeholt AAB. Sexual function after partial cystectomy and urothelial stripping in a 32-year-old women with radiation cystitis. Int Urogynaecol J, 2005; 16:412-4.

INTRODUCTION

It is generally known that radiotherapy can cause severe bladder problems. Sometimes cystectomy is the only possible solution. Preserving sexual function during this procedure in women is likely to be forgotten. The urological literature contains little information on female sexual function after radical cystectomy, in contrast to the increasing data on the sexual dysfunction of men after cystectomy. Radical cystectomy and hysterectomy (1) in women may cause sexual dysfunction because the neurovascular bundles located lateral to the vaginal wall are usually excised or damaged by removal of the bladder, urethra, and anterior vaginal wall. This pelvic plexus, also called the inferior hypogastric plexus, including afferent and efferent sympathetic and mainly parasympathetic autonomic nerves as well as some sensory pudendal nerve branches is the network of pathways supplying the rectum, uterus, vagina, vestibular bulbs, clitoris, bladder, and urethra. More cranial these nerves are connected to the superior hypogastric plexus and hypogastric nerves (mainly sympathetic) and the sacral nerves (mainly parasympathetic).

Theoretically, disruption of the pelvic plexus could lead to altered vascular function during sexual arousal and possibly disordered orgasm. The pelvic plexus supplies the blood vessels of the internal genitals and is involved in the neural control of vasocongestion and, consequently, the lubrication-swelling response. The innervation of the vaginal wall originates mostly from the pelvic plexus. In addition, significant devascularization of the clitoris often occurs with removal of the distal urethra, affecting subsequent sexual arousal and desire. The sensation of the external genitalia is not related to the pelvic plexus: pudendal nerve branches are the somatosensory pathway for the vulva. This case describes a partial cystectomy, indicated in a patient with a crippled bladder after radiotherapy. Hence, there was no need for radical cystectomy. Normally, a simple cystectomy is done in our clinic in benign cases. In this case, after radiotherapy it was difficult to perform a simple cystectomy without damaging the neurovascular bundle. Thus, we introduced this novel approach of partial cystectomy and stripping off the remaining urothelium to preserve sexual function, which can be helpful in a selected group of patients.

CASE REPORT

A 32-year-old woman presented in November 2002 with gross hematuria, urgency, urge incontinence, frequency, and lower abdominal pain at the Department of Urology. In December 2000 she had been treated for cervical cancer stage IB1 (2). Pelvic lymphadenectomy was performed with postoperative radiation

therapy because of lymph node metastases. The uterus remained in situ. Before treatment she had a normal sex life. Because of ileus, related to radiation enteritis, she underwent ileocecal resection in October 2001. Cystoscopy showed severe radiation cystitis with ulcers. Transurethral bladder biopsy indicated radiation cystitis and no evidence of recurrent disease.

The symptoms, consisting of pain, urgency, frequency, and incontinence, increased despite conservative treatment with tolterodine, oral and intravesical oxybutynin, and pain medication (morphine). Hematuria was not a major problem. Repeated cystoscopies revealed progression of the ulcers. She also developed pain in the kidney region. Ultrasonography indicated hydronephrosis of both kidneys, necessitating percutaneous nephrostomies.

Because of the increasing crippling of the bladder, including pain, we advised a cystectomy and urinary diversion. Because of the previous bowel operation a continent reservoir was not regarded as a good option, and therefore an ileal conduit was selected.

Another important issue in this young woman was her wish to retain sexual functions, e.g., sexual arousal and orgasm, to the best possible extent because she was still sexually active. Her clitoral function was normal. However, penetration was difficult because she had dyspareunia, related to some narrowing of the vagina due to radiation therapy.

Because of her wish to remain as sexually active as possible after the operation, we decided to do a partial cystectomy to spare the neurovascular bundle. After resection of the dome of the bladder, the rest of the urothelium was stripped out of the remaining bladder. The stripped bladder was covered with omentum to promote the healing process. Subsequently, an ileal conduit was constructed and dilatation of the vagina was performed. Pelvic pain subsided and then disappeared after the operation. Postoperatively, the patient used a vibrator for vaginal self-dilatation.

Three months after the operation her clitoral and other sexual functions were intact, including normal sexual arousal and orgasm. This indicated an intact neurovascular bundle. The patient still has penetration problems, because of the preexistent vaginal narrowing, but this is no longer relevant in her sex life.

DISCUSSION

Approximately 1.5–2.5% of patients with a history of pelvic radiation become a bladder cripple and require urinary diversion with or without cystectomy (3). Hematuria, pain, urgency, frequency, and incontinence refractory to conservative therapy make operations like these mandatory. Because of the morbidity of the bladder problems, sexual function is likely to be forgotten. A few reports

on sexual function were part of quality of life studies. Most of them conceived cystectomies for oncological indications and were related to male sexual function. Only a few reports were related to female sexual function (4-7). Zippe at al. demonstrated that impairing female sexual function is a prevalent problem, with 52% of preoperatively sexually active women becoming dysfunctional after radical cystectomy . They suggested that some surgical modifications may be appropriate in sexually active women: (a) routine preservation of the distal urethra in selected cases in an effort to preserve the clitoral neurovasculature, (b) preservation of the anterior vaginal wall (as much as possible) to maintain vaginal lubrication and neurovascular innervation, and (c) tubular reconstruction of the vagina (versus posterior flap rotation) to preserve vaginal depth and maintain pain-free intercourse.

How to perform a nerve-sparing radical cystectomy was nicely reviewed by Venn et al. (8). Preservation of sexual function in males and females undergoing cystectomy without compromising oncological results was described incidentally (9). Only three women were included in these data with little information on sexual function.

It is more difficult to find information in the literature on benign cases like ours. Cystectomy after radiotherapy almost always damages the neurovascular bundle. Furthermore, the vagina is likely to be opened and subsequently to be narrowed. Such a procedure results in a nonpenetrable vagina without clitoral function. Supravesical diversion without cystectomy is an option, although morbidity from the crippled bladder remaining in situ is high (28–67%), so that serious consideration should be given to primary cystectomy performed simultaneously with the supravesical diversion. Particularly patients with chronically infected bladders, obstructed bladders, and interstitial cystitis are at risk (10;11).

Simple cystectomy described by Neulander et al. (12) implies removal of the bladder without the adjacent structures, including adnexa, urethra, and part of the vagina. Also with this operation technique the neurovascular bundle is likely to be damaged in patients who had previous radiotherapy.

In our opinion, the procedure described in this report is a good, novel alternative in women who are candidates for cystectomy because of a crippled bladder and want to retain sexual function.

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CHAPTER 9

Summery and future perspectives

CHAPTER 1

In this chapter we give a short overview of the relation between urology and female sexual function. Different aspects are discussed, like anatomy, urological complaints, pelvic and vaginal surgery and sexual abuse. The question "Why should the urologist play a role in managing female sexual dysfunction?" is asked. In order to answer this question the outline of this thesis is described.

CHAPTER 2

Introduction
Recent studies have demonstrated a relationship between urogynecological complaints and female sexual dysfunction; evaluation of female sexual function in an urological outpatient clinic has not been undertaken before.

Aim
The aim of this study was to assess the prevalence of female sexual complaints in an outpatient urological clinic related to a variety of urological complaints.

Methods
We evaluated 326 female patients during the first visit at an outpatient urological university clinic using a general questionnaire, urological complaints questionnaire and two sexual questionnaires: Female Sexual Function Index (FSFI) for evaluating sexual function and the subscales; non-communication and female dissatisfaction of the Golombok Rust Inventory of Sexual Satisfaction (GRISS) as bother scales.

Results
A total of 326 patients were included in the study, 119 (36.5%) were sexually inactive and 207 (63.5%) patients were sexually active. The major reasons for sexual inactivity were related to not having a partner, and to partner- and patient related health issues. The total FSFI score of the sexually active patients was 28.3 (3.9-36) and of these, 41.4% had a FSFI score below 26.55, which could be indicative of sexual complaints. Female patients with urological complaints such as lower abdominal pain and lower urinary tract symptoms (LUTS) were more likely to have sexual complaints. In the FSFI score below 26.55 group the patients reported more difficulties to discuss sexual issues with their partner, were more dissatisfied and experienced sexual contact as less enjoyable.

Conclusion
In urological practice female sexual complaints are common. We therefore recommend integrating female sexual function questionnaires in standard urological care.

CHAPTER 3

Introduction
The relationship between sexual abuse and urinary tract symptoms, sexual abuse and gastrointestinal symptoms, or sexual abuse and sexual dysfunction have been described before. A correlation between all these symptoms and sexual abuse has not yet been reported.

Aims
The first aim of this study was to document the prevalence rates of reported sexual abuse in a large sample of female patients with complaints of the pelvic floor. The second aim was to evaluate the frequency of complaints in the different domains of the pelvic floor, such as complaints of micturition, defecation and sexual function in female patients reporting sexual abuse and comparing these data with female patients without a history of sexual abuse.

Methods
Female patients with pelvic floor complaints were evaluated in a tertiary referral center. History taking was assessed by a pelvic-floor clinician. The number of domains with complaints of patients with a history of sexual abuse was compared to the number of domains with complaints of patients without sexual abuse.

Results
Twenty-three percent (42/185) of the patients reported a history of sexual abuse. Female patients with a history of sexual abuse had significantly more complaints in three domains of the pelvic floor (35/42) compared to non-abused (69/143) (83% vs. 48%, $p<0.001$).

Conclusions
Twenty-three percent of the female patients in a pelvic floor center evaluated by a pelvic- floor clinician reported a history of sexual abuse. This is comparable to the percentage of sexual abuse observed in the population at large. In our sample, patients with multiple pelvic floor complaints (micturition, defecation and sexual function) related to pelvic floor dysfunction were more likely to have a history of sexual abuse than patients with isolated complaints.

CHAPTER 4

Introduction
Sexual abuse and sexual functioning are topics that health professionals find difficult to discuss. Women who present with pelvic floor complaints often experience sexual difficulties; therefore, questions regarding sexual function should be a routine part of screening. Furthermore, pelvic floor complaints are correlated with sexual abuse and asking about abuse should be a routine part of screening as well. Considering the fact that many practitioners have difficulty enquiring about abuse, we have suggested that a questionnaire may be helpful in improving the recognition and management of patients who have a history of sexual abuse. The aim of the study was to assess the accuracy in the efficiency of detecting sexual abuse of a self-administered questionnaire

Methods
Report of sexual abuse in a self-administered pelvic floor questionnaire before visiting our outpatient pelvic floor department was evaluated with the Pelvic Floor Leiden Inventories (PelFIs) administered by a pelvic floor clinician in a later stage.
The percentage of sexual abuse detected by a taken questionnaire administered by a pelvic floor clinician not mentioned in a previous self-administered questionnaire was taken as main outcome measure.

Results
Sexual abuse was reported in 20 patients with pelvic floor dysfunction during administration of the PelFIs and were also evaluated on our pelvic floor department. Six of them (30%) did not mention in the self-administered questionnaire their history of sexual abuse.

Conclusion
A self-administered questionnaire for pelvic floor complaints does contribute substantially in detecting sexual abuse and can be helpful in daily practice

CHAPTER 5

In a retrospective study we evaluated sexual function after tension-free vaginal tape (TVT) placement for urinary stress incontinence based on responses to a mailed questionnaire at least 3 months after the operation, to a maximum of 1 year. From 1999 to 2002, a sexual function questionnaire was mailed to 128 women (and their partners) who had undergone a TVT procedure for genuine

urinary stress incontinence, without pelvic organ prolapse or detrusor instability. The questionnaire was returned by 96 women (75%), 69 (72%) of whom reported being sexually active. Mean frequency of intercourse did not change. Overall, 26% described improved intercourse compared to before the operation. Only one patient described worsening of intercourse after the TVT operation because of an increase in her incontinence. Overall, in this study the technique of tension-free vaginal tape as such seems to have no negative impact on sexual function. However, because of its successful outcome on incontinence, it has a positive overall effect on sexual function. The possible causes of postoperative partner discomfort require further investigation.

CHAPTER 6

Introduction
Transobturator suburethral tape (TOT) and tension free vaginal tape obturator (TVT-O) procedures are relative new incontinence treatment procedures. Studies on influence on sexual function as a result of these procedures are limited. The aim of the study was to investigate the influence of TOT or TVT-O for the surgical treatment of stress urinary incontinence (SUI) on female sexual function.

Methods
We evaluated 77 sexual active patients after TVT-O (n=34, mean age 53.2 years) and TOT (OB-TAPE, Porges) (n=44, mean age 52.0 years) placement for SUI based on responses to a mailed questionnaire 3 months after operation. Difference in postoperative sexual complaints related to the TVT-O (inside-out) and TOT (outside-in) procedure was taken as main outcome measure.

Results
Postoperative TOT and TVT-O
There was almost no difference in frequency of sexual intercourse and an improvement of the continence during intercourse: continence was reported in 33 patients (42.3%) before and 67 patients (78.4%) after operation. The appreciation of sexual intercourse was improved in 15 patients (19.2%) and worsened in 8 patients (10.3%).
Postoperative TVT-O vs TOT
No difference was seen in lost of lubrication, clitoral tumescence reduction and clitoral sensibility reduction between both procedures. Pain because of vaginal narrowing was seen significantly more in the TOT procedure group.
Conclusion
Overall, in this study the technique of TOT gave rise to more sexual dysfunction

than TVT-O. However, because of the successful outcome on incontinence, both procedures had overall a positive effect on sexual function. The cause of significant more pain during intercourse as a result of vaginal narrowing in the TOT procedure requires further investigation. Like other studies this study demonstrated that incontinence surgery can have a positive and negative outcome on sexual function. It is important to include this issue in the informed consent.

CHAPTER 7

Introduction
There are limited data on female sexual function after cystectomy for benign indications.
To evaluate postoperative sexual items following cystectomy and continent urinary diversion for benign indications (e.g. severe incontinence, interstitial cystitis) in female patients. Furthermore, to review the studies investigating changes in women's sexual function after cystectomy were the aims of this study.

Methods
In a retrospective study 21 out of 23 patients (91%) that underwent a cystectomy for a benign indication completed a questionnaire. These women had a median age at the date of operation of 47.3 yr (range 25-66yr) and mean follow-up of 11.9 yr. Questions on preoperative and postoperative sexuality, postoperative sexual activity, sexual appreciation and the Female Sexual Function Index (FSFI) in patients at present were evaluated. Electronic databases were searched for published studies investigating female sexual function after cystectomy.

Results
Sexual complaints before operation were present in 48% of the patients. The most common complaints reported were incontinence during intercourse, pain and loss of libido. Seventeen out of 21 patients (81%) were sexual active preoperatively, 14 were still active postoperatively, and two preoperative inactive patients became active. Sexual inactivity postoperative is mainly due to patient-related or combination of patient- and partner-related issues (70%), such as pain during intercourse, loss of libido and impaired body image. In the sexual active group, the majority (62.5%) showed improved or unchanged intercourse postoperatively. In the FSFI in 11 sexual active patients at present (52%), domains of desire, arousal, lubrication, orgasm and pain scored above average. The domain of satisfaction scored below average.

Conclusions
Despite extensive surgery, female sexuality may remain unchanged or even improve, following cystectomy and continent diversion for benign indication. Sexual inactivity postoperatively needs more attention in respect to sexual counseling. Overall the results are reassuring.

CHAPTER 8

We report a case of a 32-year-old woman who underwent a partial cystectomy to preserve sexual function. After radiotherapy for stage IB1 cervical cancer, cystectomy was indicated because of severe radiation cystitis. During this procedure we resected the upper part of the bladder followed by stripping off urothelium of the remaining bladder to spare the neurovascular bundle. Follow-up after 3 months indicated intact sexual function including orgasm. In our opinion the cystectomy procedure described in this case report is a good, novel option in women who are candidates for cystectomy because of a crippled bladder, after radiotherapy, and want to retain sexual function.

FUTURE PERSPECTIVES

Female sexual (dys)function is a relative new topic in urological practice. This thesis illustrates the importancy of this issue. The most important final question is "How can we incorporate female sexual function in urological practice".
More research has to be done in order to incorporate female sexual function as one of the outcome measurements in relation to uro-gynecological practice and operations, as was the case with erectile function in relation to radical prostatectomy. We state that the impact of an operation in the small pelvis on sexual function needs to be part of informed consent.
In order to achieve this goal in general, sexology should be an integrated part of clinical urological practice.
We realize that discussing sexuality is not only difficult for patients but also for physicians. However, this should not refrain patients and physicians to address these issues. Sexual patient care, as part of quality of life, should be independent of the interest of an individual doctor on the subject of sexual function. We need to create opportunities, to incorporate sexual function in clinical care
At the end I ask again: "Why should the urologist play a role in managing female sexual dysfunction?" Hopefully this thesis has illustrated that female sexual function is an important part of urological practice.

CHAPTER 10

Samenvatting en toekomstperspectieven

Seksuele disfunctie bij de vrouw is een frequent voorkomend probleem dat diverse oorzaken kan hebben. Uit analyse van de data van National Health and Social Life Survey blijkt dat 43% van de Amerikaanse vrouwen lijdt aan een seksuele functiestoornis.
De vraag is gesteld waarom de uroloog zich moet interesseren in vrouwelijke seksuele functieproblematiek in zijn urologische praktijk.
In **hoofdstuk 1** worden enkele facetten besproken. Allereerst de nauwe relatie tussen de "urologische" anatomie en seksuele functie. Vervolgens de invloed van urologische klachten op het seksueel functioneren evenals de invloed van chirurgisch ingrijpen. Als laatste wordt het onderwerp van seksueel misbruik besproken.
In 2004 werd de Pelvic Floor & Sexuality Research Group Leiden opgericht die als doel heeft seksuologisch en bekkenbodemonderzoek te genereren en te faciliteren. Om dit onderzoek te steunen hebben Pfizer en Stichting Amsterdam 98 "unrestricted grants" geschonken.

Recente studies hebben een relatie aangetoond tussen urogynaecologische klachten en seksueel disfunctioneren bij vrouwen. Een evaluatie van seksueel functioneren in de urologische praktijk, gerelateerd aan urologische klachten, is nog niet verricht.
In **hoofdstuk 2** wordt de prevalentiestudie beschreven welke werd verricht op de Polikliniek Urologie. Het doel van de studie was de seksuele functie te evalueren bij vrouwen op de polikliniek urologie in relatie tot verschillende urologische klachten. Alle nieuwe vrouwelijke patiënten die zich meldden bij de polikliniek urologie werd gevraagd een vragenlijst in te vullen. Deze vragenlijst bevat een algemeen niet-medisch deel, de medische voorgeschiedenis, de urologische klacht en een seksuologische vragenlijst: de Female Sexual Function Index (FSFI, zie Appendix) en de Golombok Rust Inventory of Sexual Satisfaction (GRISS). Uiteindelijk werden 326 vrouwen geïncludeerd in de studie. Van de 326 patiënten waren 119 (36,5%) seksueel inactief en 207 (63,5%) seksueel actief. De belangrijkste reden van inactiviteit was geen partner en vervolgens ziekte van de patiënte en/of haar partner. De totale FSFI-score van de seksueel actieve patiënten was 28,3 (3,9-36), bij 41.4% was sprake van een FSFI-score lager dan 26,55 (lage FSFI-score groep) wat kan passen bij seksuele klachten. Patiënten met urologische klachten als pijn in de onderbuik en LUTS (urgency en frequency) scoorden gemiddeld ruim onder de FSFI-score van 26,55. In de lage FSFI-score groep melden patienten dat ze het moeilijker vinden om partner te zeggen wat ze prettig en niet prettig vinden in de seksuele relatie. Daarnaast zijn ze ontevredener over hun seksuele relatie en genieten er minder van.
We kunnen concluderen dat seksuele problemen frequent voorkomen bij vrouwen met urologische klachten. Daarom adviseren wij om standaard seksuologische vragenlijsten te gebruiken in de urologische praktijk.

In de periode van patiëntinclusie in de prevalentiestudie werden bij evaluatie van patiënten met bekkenbodemklachten opvallend veel patiënten gezien met een voorgeschiedenis van seksueel misbruik. **Hoofdstuk 3** beschrijft onderzoek naar de prevalentie van seksueel misbruik op een bekkenbodemcentrum. Daarnaast werd onderzocht of er verschil was in de prevalentie van seksueel misbruik in de voorgeschiedenis, bij klachten in 1 of meerdere bekkenbodemdomeinen (mictie, defecatie en seksuele klachten). Daartoe werden patiënten met bekkenbodemklachten door een bekkenfysiotherapeut met behulp van een gevalideerde bekkenbodemvragenlijst, de Pelvic Floor Inventories Leiden (PelFIs), geëvalueerd. De frequentie van voorkomen van klachten in de verschillende domeinen van de bekkenbodem werden vergeleken in de groep van vrouwen met en respectievelijk zonder seksueel misbruik.
Van de 185 patiënten gaven 42 (23%) patiënten aan een voorgeschiedenis te hebben van seksueel misbruik. Klachten in alle 3 domeinen werd significant meer gezien in de groep van patiënten met een voorgeschiedenis van seksueel misbruik (35/42 in de seksueel misbruik groep en 69/143 in de niet seksueel misbruik groep, 83% versus 48%, $p<0.001$).
We kunnen concluderen dat een voorgeschiedenis van seksueel misbruik in 23% van de patiënten werd gezien die werden geëvalueerd door een bekkenfysiotherapeut op een bekkenbodemcentrum. Patiënten met klachten in alle drie domeinen van de bekkenbodem, betreffende mictie, defecatie en seksuele klachten, blijken een grotere kans te hebben op een voorgeschiedenis van seksueel misbruik.

Seksueel misbruik en seksualiteit in het algemeen vinden artsen moeilijk om te bespreken. Vrouwen die zich melden met klachten op het gebied van mictie en/of defecatie hebben vaak ook op seksueel gebied problemen, daarom zou de seksuologische anamnese een standaardonderdeel van de analyse moeten zijn bij deze patiënten. Zorgvuldig vragen naar seksueel misbruik zou, ook met het oog op invasieve urologische diagnostiek en behandeling, een vaste routine moeten zijn, aangezien bij patiënten met een zodanige voorgeschiedenis frequent bekkenbodemklachten voorkomen. Omdat artsen het vaak moeilijk vinden naar seksueel misbruik te vragen, is de gedachte geopperd dat een vragenlijst mogelijk zou kunnen helpen bij het detecteren van seksueel misbruik.
Hoofdstuk 4 beschrijft de uitkomst van een studie waarbij werd nagegaan in welke mate seksueel misbruik aangetoond kan worden met behulp van een opgestuurde vragenlijst voordat de patiënte zich op onze polikliniek meldde.
De uitkomst van deze vragenlijst werd vergeleken met de PelFIs, een vragenlijst die later, na verwijzing vanuit het Bekkenbodemcentrum, door een bekkenfysiotherapeut werd afgenomen. Het percentage seksueel misbruik dat niet werd aangegeven in de eerste vragenlijst werd als uitkomstmaat genomen om de waarde van de opgestuurde vragenlijst te bepalen.

Seksueel misbruik werd genoemd door 20 patiënten met bekkenbodemklachten die werden geëvalueerd middels de PelFIs. Deze patiënten waren ook al geëvalueerd op ons Bekkenbodemcentrum. Het bleek dat 6 van deze 20 patiënten (30%) in de opgestuurde vragenlijst niet aangegeven hadden dat zij vroeger seksueel zijn misbruikt.
Derhalve kunnen we concluderen dat een zelf in te vullen bekkenbodemvragenlijst voordat een patiënt de polikliniek bezoekt, waardevol is bij het detecteren van seksueel misbruik in de dagelijkse praktijk.

Incontinentieklachten hebben een impact op het seksuele functioneren van de vrouw. **Hoofdstuk 5** beschrijft een retrospectieve multicenter studie waarin de seksuele functie wordt geëvalueerd na een Tension-free Vaginal Tape (TVT) incontinentie-operatie middels een opgestuurde vragenlijst, minimaal 3 maanden en maximaal 1 jaar na de operatie. Van 1999 tot 2002 is een seksuologische vragenlijst opgestuurd naar 128 vrouwen en partners die een TVT- operatie hebben ondergaan voor stressincontinentie zonder, dat sprake was van prolapsklachten en detrusorinstabiliteit. De vragenlijst werd door 96 vrouwen (75%) teruggestuurd, 69 (72%) hiervan waren seksueel actief. De gemiddelde coïtusfrequentie na de operatie veranderde niet. In totaal meldde 26% een verbetering van seksuele functie. Slechts één patiënte gaf een verslechtering aan, vanwege toename van incontinentieklachten als gevolg van de operatie. In deze studie werd vrijwel geen negatieve impact gezien van de TVT-procedure op de seksuele functie. Dit was vooral te danken aan de positieve uitkomst wat betreft de continentie: de vermindering van urineverlies tijdens het vrijen resulteerde in een verbetering van de seksuele functie. De seks wordt immers beter gewaardeerd als urineverlies tijdens het vrijen is verminderd of verdwenen. De postoperatieve klachten die in deze studie door de partner werden gemeld, moeten verder worden onderzocht.

Aansluitend op de TVT-studie wordt in **hoofdstuk 6** een seksuologische vervolgstudie beschreven naar twee relatief nieuwe stress incontinentieoperaties: de Tension-free Vaginal Tape Obturator (TVT-O) en TransObturator suburethral Tape (TOT) . Het doel van de studie was de invloed van deze operaties op de seksuele functie te onderzoeken. Hiertoe werden 77 seksueel actieve patiënten middels een vragenlijst geëvalueerd 3 maanden nadat een TVT-O (n=34, gemiddelde leeftijd 53,2 jr.) of TOT (n=44, gemiddelde leeftijd 52,0 jr.) was uitgevoerd.
In de gehele groep (n=77) werd postoperatief vrijwel geen verschil in coïtale frequentie gezien. Wel werd een verbetering van continentie tijdens het vrijen beschreven: voor de operatie waren 33 patiënten (42,3%) continent en na de operatie 67 patiënten (78,4%). Een verbetering van seksuele functie werd beschreven door 15 patiënten (19,2%) en een verslechtering door 8 patiënten (10,3%).

Postoperatief TVT-O versus TOT: geen verschil werd in verminderde lubricatie, reductie van de clitorale tumescentie en clitorale sensibiliteit tussen beide procedures. Pijn als gevolg van vaginale vernauwing was significant meer aanwezig na de TOT-procedure.
Algemeen kan men stellen dat in deze studie de TOT-techniek meer seksuele disfunctie geeft dan de TVT-O. Door de positieve invloed op de incontinentie hebben beide procedures echter in het algemeen een positieve invloed op de seksuele functie, vooral door vermindering van incontinentie tijdens het vrijen.
De oorzaak van het significant meer voorkomen van vaginale vernauwing na de TOT-procedure moet verder worden onderzocht. Zoals in hoofdstuk 5 beschreven, wordt wederom aangetoond dat incontinentiechirurgie zowel een positieve als een negatieve invloed kan hebben op het seksueel functioneren. Dit dient besproken te worden voor de operatie.

Er is weinig bekend over de seksuele functie bij vrouwen na een cystectomie voor benigne indicatie. In **hoofdstuk 7** wordt een studie beschreven die als doel had de seksuele functie te evalueren na cystectomie vanwege onbehandelbare incontinentie of interstitiële cystitis. Daarnaast werd de literatuur gereviewed betreffende seksuele functie en cystectomie.
In een retrospectieve studie vulden 21 van de 23 patiënten (91%) die een cystectomie ondergingen voor een benigne indicatie, de vragenlijst in. Deze vrouwen hadden een gemiddelde leeftijd tijdens de operatie van 47,3 jaar (range 25-66 jaar), de gemiddelde follow-up was 11,9 jaar. Aan de hand van een vragenlijst werd de seksualiteit pre- en postoperatief de seksuele activiteit postoperatief, de kwaliteit van de seks en de huidige FSFI-score geëvalueerd.
Seksuele problemen waren pre-operatief aanwezig bij 48% van de patiënten. Meest voorkomende problemen waren incontinentie tijdens coïtus, pijn of minder zin in vrijen. Van de 21 patiënten waren er 17 (81%) pre-operatief seksueel actief. Veertien bleven postoperatief seksueel actief en 2 patiënten die pre-operatief inactief waren, werden postoperatie seksueel actief. Postoperatieve seksuele inactiviteit werd vooral veroorzaakt door patiënte danwel patiënte en partner gerelateerde problemen, zoals pijn tijdens de seks, afwezige libido en gestoord zelfbeeld (body image). Een groot deel (62,5%) van de pre-operatief seksueel actieve groep gaf aan dat de seksualiteit postoperatief onveranderd of verbeterd was. In de FSFI van de nog heden 11 seksueel actieve patiënten (52%) scoren de domeinen zin in vrijen, opwinding, lubricatie, orgasme en pijn boven gemiddeld. Alleen het domein satisfactie (bevrediging) scoort onder het gemiddelde.
Ondanks uitgebreid chirurgisch ingrijpen, als cystectomie met urinedeviatie, kan de vrouwelijke seksuele functie ongewijzigd blijven of zelfs verbeteren. Aan seksuele inactiviteit na de operatie moet middels counseling meer aandacht worden besteed.

In **hoofdstuk 8** wordt een casus beschreven van een 32-jarige vrouw waarbij met een aangepaste techniek een partiële cystectomie werd uitgevoerd ten einde seksuele functie te behouden. Na bestraling in verband met gemetastaseerd cervixcarcinoom ontwikkelde zij een ernstige radiatiecystitis. Conservatieve therapie had geen baat en uiteindelijk was een cystectomie noodzakelijk, in combinatie met een urinedeviatie (stoma). Aangezien patiënte nog seksueel actief was, werd een partiële cystectomie verricht. Bij deze procedure werd het dak van de blaas gereserceerd. Vervolgens werd de bodem ontdaan van het blaasslijmvlies (urotheel). Bij deze procedure werd de neurovasculaire bundel gespaard. Naar onze mening is de beschreven procedure een mogelijkheid die men kan toepassen om seksuele functie te behouden in een geselecteerde patiëntenpopulatie.

TOEKOMSTPERSPECTIEVEN

Vrouwelijke seksualiteit is een relatief nieuw aandachtsgebied in de urologische praktijk. Dit proefschrift laat het belang van dit onderwerp zien. De belangrijkste vraag aan het eind is hoe we vrouwelijke seksuologie kunnen incorporeren in de dagelijkse urologische praktijk.
Er is meer onderzoek noodzakelijk alvorens het seksueel functioneren als een van de uitkomstmaatstaven na uro-gynecologische operaties gesteld kan worden, zoals erectiele disfunctie dit al jaren is na een radicale prostatectomie.
Uiteindelijk zal seksuele functie dan een onderdeel zijn van informed consent bij de vrouwelijke patiënt.
In algemene zin dient de seksuologische problematiek gerelateerd aan verschillende ziektebeelden, als onderdeel van quality of life in de klinische danwel poliklinische setting, meer aan bod te komen.
We weten dat het bespreekbaar maken van seksualiteit moeilijk is voor patiënten maar ook voor artsen. Daarom is er een structuur (werkmethode) nodig, waarbij de vrouwelijke seksualiteit als onderdeel van quality of life van de patiënt besproken wordt, die onafhankelijk is van de interesse van de arts ten opzichte van het onderwerp seksualiteit. Dit impliceert dat seksuologische hulpverlening meer geïncorporeerd moet worden in de klinische en poliklinische setting.

Aan het eind stel ik wederom de vraag: “Waarom moet de uroloog zich interesseren in vrouwelijke seksuele functieproblematiek in zijn urologische praktijk?” Ik hoop dat met dit proefschrift een eerste antwoord is gegeven en dat aangetoond is dat vrouwelijke seksualiteit een belangrijk onderdeel is van de urologische praktijk.

APPENDIX

FEMALE SEXUAL FUNCTION INDEX

Deze vragen gaan over uw seksuele gevoelens en seksuele reacties gedurende de afgelopen 4 weken. Beantwoord deze vragen alstublieft zo eerlijk en duidelijk mogelijk. Uw antwoorden zullen strikt vertrouwelijk behandeld worden.

Bij het beantwoorden van de vragen zijn de volgende definities van toepassing:
Seksuele activiteit: dit kan zijn strelen, voorspel, masturbatie en vaginale geslachtsgemeenschap.
Geslachtsgemeenschap: hiermee wordt vaginale penetratie bedoeld (het binnengaan van de penis in de vagina).
Seksuele stimulatie: hieronder worden onder meer situaties verstaan als voorspel met een partner, zelfbevrediging (masturbatie), of fantaseren over seks.

Per vraag slecht één rondje aankruisen s.v.p

Seksuele verlangens: hieronder wordt verstaan zin hebben in seks, in willen gaan op het seksuele initiatief van een partner, en denken aan of fantaseren over het hebben van seks.

*1 Hoe **vaak** had u de afgelopen 4 weken seksuele verlangens?*
1 Bijna altijd of altijd
2 Meestal (meer dan de helft van de tijd)
3 Af en toe (ongeveer de helft van de tijd)
4 Een paar keer (minder dan de helft van de tijd)
Bijna nooit of nooit

*2 Hoe **sterk** vond u dat uw seksuele verlangens de afgelopen 4 weken waren?*
1 Zeer sterk
2 Sterk
3 Middelmatig
4 Zwak
5 Zeer zwak of niet aanwezig

Seksuele opwinding: hieronder wordt verstaan zowel de lichamelijke als geestelijke gevoelens van seksuele opwinding. Dit kunnen gevoelens zijn van warmte of tintelingen in de geslachtsdelen, vochtig ("nat") zijn, of het samentrekken van spieren.

*3 Hoe **vaak** voelde u zich de afgelopen 4 weken seksueel opgewonden ("geil") tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*4 Hoe **sterk** vond u dat uw seksuele opwinding (het "geil" zijn) was de afgelopen 4 weken tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Zeer sterk
3 Sterk
4 Middelmatig
5 Zwak
6 Zeer zwak of niet aanwezig

*5 Hoe **zeker** was u er de afgelopen 4 weken van dat u seksueel opgewonden zou worden tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Heel zeker
3 Zeker
4 Middelmatig
5 Onzeker
6 Heel onzeker

*6 Hoe **vaak** was u de afgelopen 4 weken tevreden over uw seksuele opwinding tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*7 Hoe **vaak** werd u de afgelopen 4 weken vochtig ("nat") tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)

4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*8 Hoe **moeilijk** was het de afgelopen 4 weken om vochtig ("nat") te worden tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Heel erg moeilijk of onmogelijk
3 Erg moeilijk
4 Moeilijk
5 Een beetje moeilijk
6 Niet moeilijk

*9 Hoe **vaak** bleef u de afgelopen 4 weken vochtig ("nat") totdat de seksuele activiteit of geslachtsgemeenschap voltooid was?*
1 Geen seksuele activiteit
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*10 Hoe **moeilijk** was het de afgelopen 4 weken om vochtig ("nat") te blijven totdat de seksuele activiteit of geslachtsgemeenschap voltooid was?*
1 Geen seksuele activiteit
2 Heel erg moeilijk of onmogelijk
3 Erg moeilijk
4 Moeilijk
5 Een beetje moeilijk
6 Niet moeilijk

*11 Hoe **vaak** heeft u de afgelopen 4 weken een orgasme (klaarkomen) gehad bij seksuele stimulatie of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*12 Hoe **moeilijk** was het de afgelopen 4 weken voor u om een orgasme (klaarkomen) te krijgen bij seksuele stimulatie of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Bijzonder moeilijk of onmogelijk
3 Zeer moeilijk
4 Moeilijk
5 Enigszins moeilijk
6 Niet moeilijk

*13 Hoe **tevreden** was u de afgelopen 4 weken over uw vermogen een orgasme te krijgen tijdens seksuele activiteit of geslachtsgemeenschap?*
1 Geen seksuele activiteit
2 Zeer tevreden
3 Redelijk tevreden
4 Ongeveer even tevreden als ontevreden
5 Tamelijk ontevreden
6 Zeer ontevreden

*14 Hoe **tevreden** was u de afgelopen 4 weken over de sterkte van de emotionele band tussen u en uw partner tijdens seksuele activiteit?*
1 Geen seksuele activiteit
2 Zeer tevreden
3 Redelijk tevreden
4 Ongeveer even tevreden als ontevreden
5 Tamelijk ontevreden
6 Zeer ontevreden

*15 Hoe **tevreden** was u de afgelopen 4 weken over uw seksuele relatie met uw partner?*
1 Zeer tevreden
2 Redelijk tevreden
3 Ongeveer even tevreden als ontevreden
4 Tamelijk ontevreden
5 Zeer ontevreden

*16 Hoe **tevreden** was u de afgelopen 4 weken met uw seksleven in het algemeen?*
1 Zeer tevreden
2 Redelijk tevreden
3 Ongeveer even tevreden als ontevreden
4 Tamelijk ontevreden
5 Zeer ontevreden

Vaginale penetratie: hiermee wordt bedoeld het binnengaan van de penis in de vagina.

*17 Hoe **vaak** had u de afgelopen 4 weken een ongemakkelijk gevoel of pijn tijdens vaginale penetratie?*

1 Niet geprobeerd om geslachtsgemeenschap te hebben
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*18 Hoe **vaak** had u de afgelopen 4 weken een ongemakkelijk gevoel of pijn nadat de vaginale penetratie voltooid was?*

1 Niet geprobeerd om geslachtsgemeenschap te hebben
2 Bijna altijd of altijd
3 Meestal (meer dan de helft van de tijd)
4 Af en toe (ongeveer de helft van de tijd)
5 Een paar keer (minder dan de helft van de tijd)
6 Bijna nooit of nooit

*19 Hoe **sterk** zou u het ongemakkelijke gevoel of de mate van pijn noemen die u de afgelopen 4 weken ervoer tijdens of na afloop van de vaginale penetratie?*

1 Niet geprobeerd om geslachtsgemeenschap te hebben
2 Zeer sterk
3 Sterk
4 Middelmatig
5 Zwak
6 Zeer zwak of niet aanwezig

CURRICULUM VITAE

The author of this thesis was born in Zwolle, the Netherlands, on April 1, 1964. He attended the Rijksscholengemeenschap de Schothorst Amersfoort, The Netherlands (1976-1984). After MAVO-3, MAVO-4 and HAVO-5, he obtained his VWO diploma in 1984. From 1984 to 1992 he studied medicine at the University of Amsterdam.
After receiving his medical degree (artsendiploma) in December 1993, he worked from 1994 till 1996 as a resident (AGNIO) at the surgical department of the Boven IJ Hospital and urological department of VU University Medical Center. He conducted his formal training in urology at St Antonius Hospital, Nieuwegein (1996-1998, dr T. J. Bast and dr P.M. Go, surgeons), at the Leyenburg Hospital, The Hague (1998-1999 and 2001-2002, dr P.L Venema, urologist) and at the Leiden University Medical Center (1999-2001, Prof. J. Zwartendijk, urologist). After finishing his residency he joined the staff at the Department of Urology of Leiden University Medical Center.
In 2001 he started his education and training as sexologist, resulting in registration as sexologist in 2007. In 2003 he started his research on female sexual function in urological practice. The results of the studies are presented in this thesis.
Henk is married to Petra Luberti and they have one son, Quinten.

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