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Vascular Surgeons' Views on Ejaculation Disorders After Abdominal Aortic Surgery: Results of a Dutch Survey

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Background: The aim of this study is to evaluate vascular surgeons' knowledge and appreciation of ejaculatory dysfunction after open aortic aneurysm repair and the knowledge of possible nerve-preserving techniques.

Methods: A Dutch national survey was conducted on sexual counseling in the case of open aortic surgery. For this purpose, a designed questionnaire based on a review of the literature in the field and on other surveys aiming to analyze care for sexual health by medical specialists was used.

Results: The response rate was almost 60%. All responders were familiar with the occurrence of postoperative neurogenic complications. Sixty percent preoperatively informs their patients, but only one-third inquires whether such complications have occurred postoperatively. Most respondents estimated the incidence of postoperative neurogenic complications due to dissection of the periaortic tissues between 5% and 25%. Almost 75% take nerve anatomy into consideration when exposing the abdominal aorta, but only 29% mention the correct structures, and only 37% mention possible correct nerve-sparing techniques.

Conclusions: Dutch vascular surgeons are well aware of the occurrence of postoperative sexual disorders after infrarenal aortic reconstruction. A gap in knowledge of pathophysiology and anatomy exists. Furthermore, a significant part of vascular surgeons seems to lack skills in sexual counseling. Therefore, more education should be offered during vascular surgical training.

What this article adds: This article addresses iatrogenic neurogenic complications affecting sexual health following open aortic surgery. It opens the discussion on possible gaps in modern training of vascular surgeons and on sexual health in relation to postoperative quality of life and shared decision-making.

INTRODUCTION

Impaired ejaculation is a common complication after aortoiliac aneurysm reconstruction. It is reported with a wide-spread incidence and may occur in as many as 63% of male patients undergoing this type of surgery.¹⁻⁶ Ejaculatory dysfunctions may consist of retrograde, diminished, or absent ejaculation.¹ Disruption of efferent sympathetic pathways, supplying the bladder neck, the vas deferens, and the prostate is widely accepted to be the cause of postoperative dysfunctional ejaculation.¹⁻⁴ Especially the lumbar splanchnic nerves, superior hypogastric plexus, hypogastric nerves, abdominal aortic

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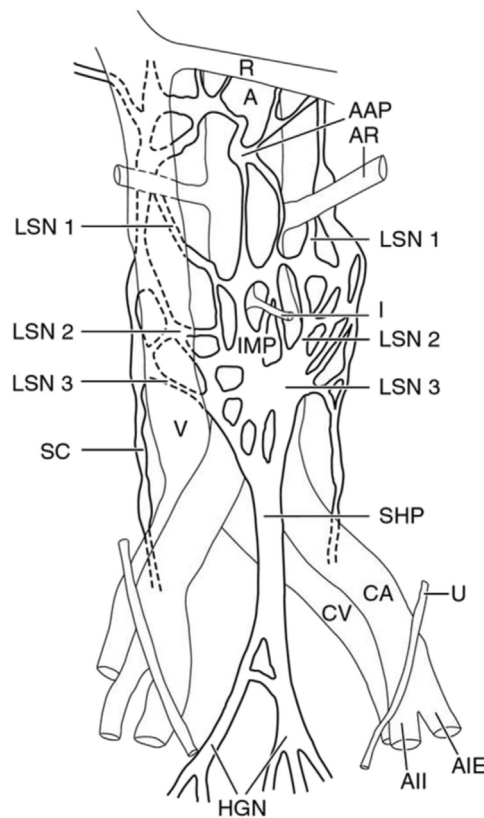


Fig. 1. Schematic representation of main sympathetic pathways that supply intrapelvic organs. A, Abdominal aorta; AAP, abdominal aortic plexus; AIE, external iliac artery; AII, internal iliac artery; AR, renal artery; CA, common iliac artery; CV, common iliac vein; I, inferior mesenteric artery; LSN 1, 2, 3, lumbar splanchnic nerves from lumbar level 1, 2, 3; R, left renal vein; SC, sympathetic chain; U, ureter; V, inferior vena cava.

plexus, and inferior mesenteric plexus are at risk of disruption during periaortic exposure (Fig. 1).⁷ Particularly, in aortic aneurysm surgery, the risk of disruption is high when compared with aortic reconstruction for occlusive disease because of the need for the extended exposure. In contrast to the high mortality and morbidity rates associated with central vascular reconstructions, postoperative ejaculation disorders were probably seen as minor inevitable complications. Over the past 20 years, there is an increasing attention and focus on impaired quality of life caused by urogenital and sexual dysfunction due to damage to autonomous nervous structures after various types of surgery. Depending on what type of nervous structures are damaged, sexual dysfunction may include erectile disorders, ejaculatory disorders, and lubrication impairment. Studies on sexual functioning after central vascular reconstruction have mainly focused on erectile disorders due to impaired perfusion. Up to date, no

quality of life studies discussing the effects of autonomous interruption after central vascular reconstruction are available.

Increasing knowledge of the anatomy of the periaortic autonomic plexuses has led to nerve-preserving techniques in vascular, as well as urologic and colorectal, surgery.^{7–9} It is, however, not mentioned in the literature that these are routinely implemented in clinical practice. This could be explained by a lack of knowledge about the etiology and prevention or an underestimation of the prevalence and relevance of this postoperative complication. Specific studies addressing vascular surgeons' views on postoperative ejaculation disorders in clinical practice are lacking. Furthermore, it is not clear to what extent vascular surgeons inform their patients about possible postoperative ejaculatory dysfunction or whether they routinely inquire about it postoperatively.

More awareness of the incidence and implications of postoperative sexual complications will lead to better preoperative counseling and might improve the application of nerve-sparing techniques. The aim of this study was to evaluate vascular surgeons' knowledge and appreciation of postoperative ejaculatory dysfunction and the knowledge of possible nerve-preserving techniques.

MATERIALS AND METHODS

Questionnaires

In 2014, all 52 teaching hospitals with a vascular surgery unit in the Netherlands were contacted and sent a specially designed questionnaire (supplementary material). The questionnaire was designed by the authors based on a review of the literature in the field, and on other surveys aiming to analyze care for sexual health by medical specialists.^{10–12} A multidisciplinary expert panel consisting of urologists, sexologists, and vascular surgeons with experience in developing surveys reviewed the questionnaire for comprehensiveness and quality. Three vascular surgeons piloted the questionnaire to assess the time needed for completion and applicability to vascular surgical practice. A total of 52 vascular surgical teaching units together with 179 vascular surgeons were asked to participate in the survey. The 9-item questionnaire addresses vascular surgical experience, knowledge of, and attitudes on postoperative ejaculation disorders, nerve-sparing exposure techniques, and outpatient clinic-related practices. The survey was accompanied by a cover letter, explaining the objectives of the study. Nonresponders were contacted 3 months after the initial

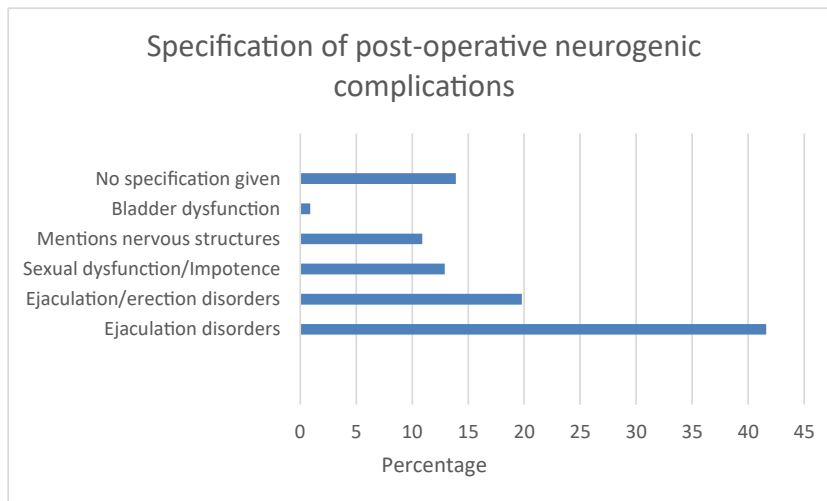


Fig. 2. Specification of possible postoperative neurogenic complications. Answers to question 2 of the questionnaire.

mailing and sent a second questionnaire. The patients were not compensated for participation. All data were collected anonymously. Ethical approval for questionnaires in medical professionals is not required in the Netherlands.

RESULTS

Questionnaire Results

A total of 101 consultant vascular surgeons completed the questionnaire (response rate, 56.4%). All surveys returned were complete, that is, over 80% of the applicable questions were answered. A percentage of 75.3% of the surgeons worked in a district general teaching hospital and 25.7% in a university hospital. Response rates differed between the district general teaching hospitals (53.1%) and university hospitals (69.4%). A percentage of 58.5% of vascular surgeons individually performed between 10 and 20 open abdominal aortic reconstructions per year. A percentage of 23.7% performed less than 10 or more than 20 (16.8%).

One of the questions of this survey was whether vascular surgeons are familiar with the occurrence of postoperative neurogenic complications due to dissection of the periaortic and peri-iliac tissues. If the answer was "yes", specification of the answer was asked for. All 101 responders replied "yes" to this question (Fig. 2).

To the question "Do you inform or consent about neurological complications preoperatively?" almost sixty percent (59.4%) replied "yes," 7.9% replied "never," and 32.7% replied "sometimes". When asked if they inquired routinely whether such

complications had occurred postoperatively, 35.6% replied "yes", 43.6% "sometimes," and 20.8% replied "never". Of the 41 surgeons who do not inform their patients routinely preoperatively, 89% do not ask for encountered complications routinely postoperatively. 45% of surgeons who inform their patients about possible effects on sexual function, do not ask about these complications after the operation (Fig. 3).

Most respondents estimated the incidence of postoperative neurogenic complications due to dissection of the periaortic tissues between 5% and 25% (66.4%) (Fig. 4). Most surgeons expect their patients to appreciate these complications as purely "inconvenient" (45.6%). Many, however, gave multiple answers or state "variable", thereby addressing the heterogeneity of the appreciation by the patient (40.5%), and a minority estimated their patients to appreciate these complications as "no problem" (10.9%) or "invalidating" (2.0%) (Fig. 5).

Twenty percent of the surgeons would consider performing an extra-anatomic bypass to avoid these complications all together in selected cases, particularly in young patients.

To the question "Do you take specific nervous structures into consideration while dissecting the periaortic and peri-iliac tissues? please specify," 26.7% of respondents replied "no," and 73.3% replied "yes". The specification that respondents provided was deemed correct if it included any of the terms "(superior) hypogastric plexus, hypogastric nerve, lumbar splanchnic nerves, aortic plexus, presacral nerve, presacral plexus, preaortic autonomous plexus, sympathetic fibers, or autonomic nervous system" (Fig. 6).

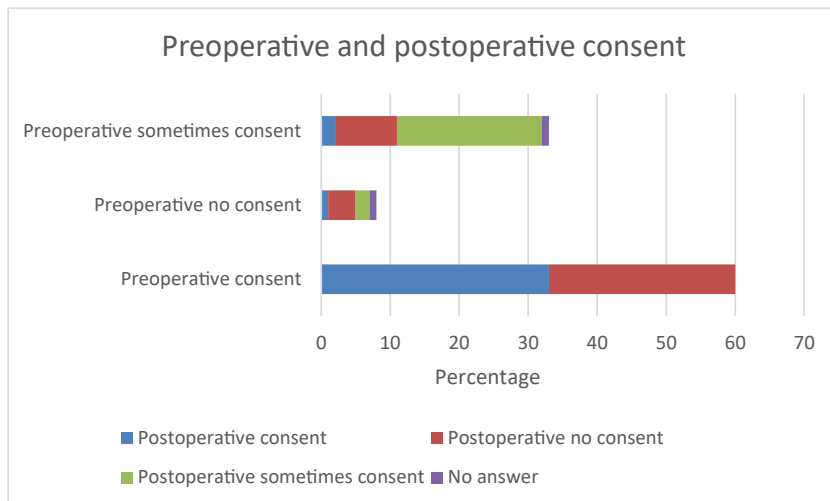


Fig. 3. Preoperative and postoperative consent for neurogenic complications. Answers to questions 3 and 4.

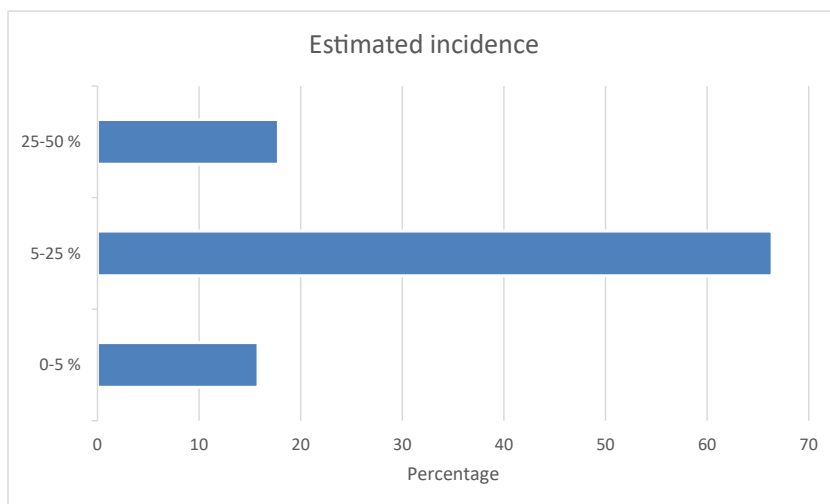


Fig. 4. Estimated incidence of neurogenic complications. Answers to question 5.

Finally, when asked to explain the technique, the responding vascular surgeons would use to protect certain nervous structures; 61 (60.4%) of the surgeons provided an answer. The answer was deemed correct if it constituted elements of a lateral approach, limited dissection at the level of the aortic bifurcation, lateralizing the preaortic tissues, tunneling the preaortic tissues, or making a separate incision across the left common iliac artery when a bifurcated graft was used (Fig. 7).

DISCUSSION

This survey was conducted to investigate the position of postoperative autonomic nerve injury after open aortic reconstruction in Dutch vascular surgical clinical practice.

There are surprisingly little data available on the incidence of ejaculation disorders after aortic reconstruction. Most information comes from the studies published before 1990. The reported patient series are very heterogeneous, and incidences vary greatly from 3% to 63%.^{1,13} One of the difficulties in interpreting these data is that the sexual disorders mentioned are seldom objectively defined. Furthermore, the indication for surgery, occlusive or aneurysmal disease, or the type of procedure and technique is usually poorly documented. The large randomized controlled trials from the last 2 decades, comparing open surgery for aneurysmal disease with endovascular repair, do not mention ejaculation disorders in their outcome measures.^{14,15} A more recent trial, published by Lederle et al. comparing open surgery versus endovascular treatment for

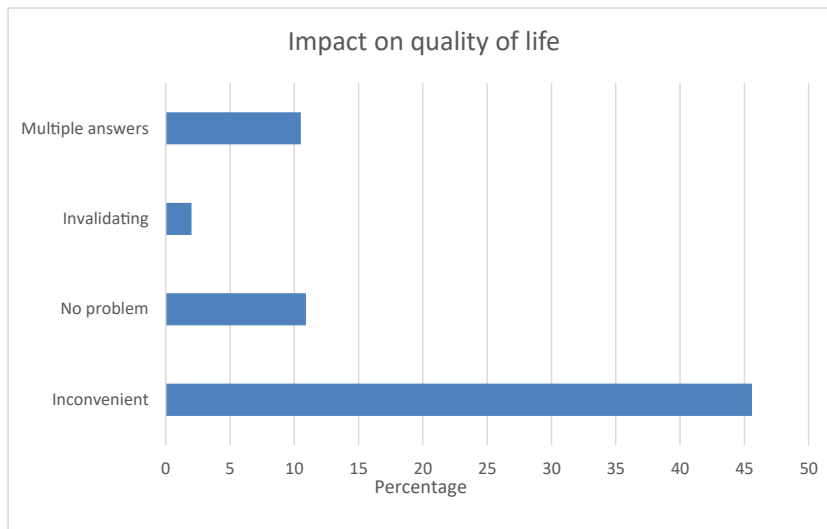


Fig. 5. Impact on quality of life of neurogenic complications. Answers to question 6.

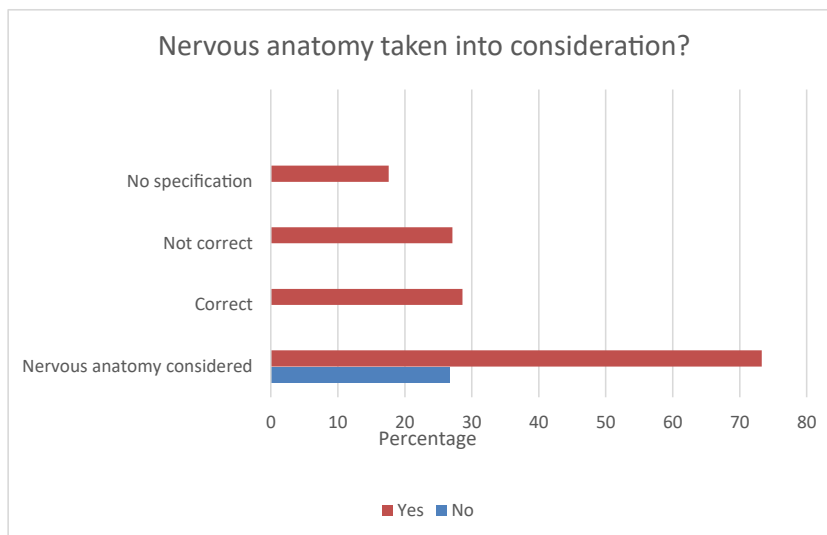


Fig. 6. Nervous anatomy taken into consideration while exposing the aorta? Answers to question 8.

small aneurysms, found a low incidence for retrograde ejaculation of 3%.¹³ Most respondents in the present study estimate the incidence of postoperative neurogenic complications due to dissection of the periaortic tissues between 5% and 25% (66.4%) and between 25% and 50% (17.8%), indicating it is acknowledged as a common complication. These estimations are based on personal experience and clinical observations as the available literature gives us no guidance as to what incidence should be mentioned in consenting our patients. The occurrence of postoperative sexual disorders should be included in national patient registries to fill this important clinical gap.

All respondents claimed that they were familiar with postoperative disorders due to autonomic nerve disruption. This finding suggests that the subject is either well discussed during surgical training, or much encountered in clinical practice. However, there may be a selection bias in which surgeons who are familiar with the topic of the questionnaire were more likely to respond. Furthermore, although surgeons can be familiar with postoperative disorders due to autonomic disruption, the degree of knowledge in this field most likely varies substantially. When asked to specify the exact nature of this disorder, only 41.6% correctly mentioned only ejaculatory disorders. Approximately, 20% also

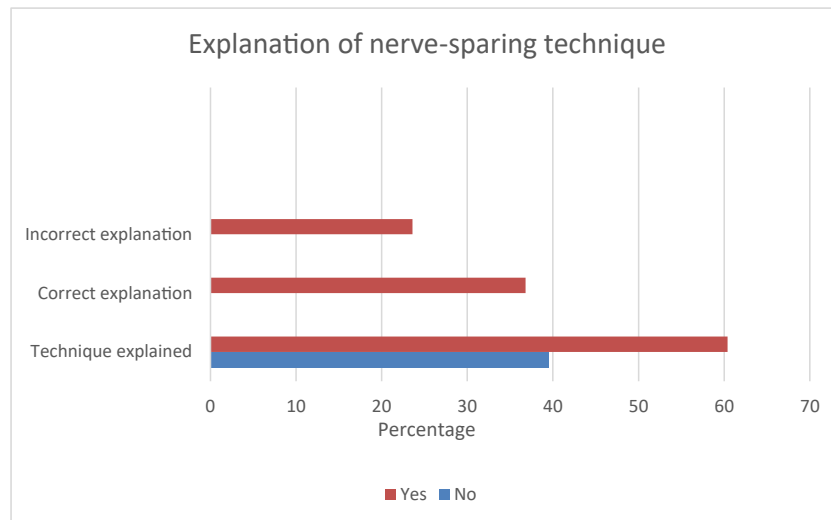


Fig. 7. Nerve-sparing technique used. Answers to question 9.

included erection disorders, which are most likely caused by hemodynamic events such as embolism to the internal iliac arteries or thrombosis in preoperatively severely diseased pelvic vessels.^{16,17} The neurogenic mediation of erection is mainly a parasympathetic process with a pathway that runs via the sacral nerve roots and the inferior hypogastric plexus.¹⁸ More general terms such as “sexual dysfunction” or “impotence,” or specific nerve structures mentioned by 23.8% indicate a general level of knowledge of postoperative sexual disorders but a lack of knowledge about the exact pathological mechanism.

Over 70% of surgeons take the specific nervous anatomy into consideration while exposing the abdominal aorta. When asked to specify which nerve structures they focus on during their nerve sparing operations, nearly 40% mentioned the elements of the sympathetic pathway correctly. This indicates that most surgeons do realize that damage to specific nerve structures is the cause of postoperative ejaculatory disorders, but exact knowledge of nomenclature and possibly topography is often limited. Several authors have addressed nerve sparing maneuvers or techniques for aortic exposure in the past.^{3,7,19,20} Most of these techniques include a right lateral approach of the infrarenal aorta and minimal dissection at the level of the bifurcation to avoid damage to the main trunk of the superior hypogastric plexus. When a bifurcated graft is used, the left leg should be tunneled either through the common iliac artery or below the tissue compartment containing the nerve tissue. Exposure of the left common or external iliac artery should be via a separate incision. Over 60% of the respondents replied to use some form of a nerve-sparing approach. Analyzing their

specification, only 61% mentioned one of the aforementioned elements of previously described nerve-sparing maneuvers. The findings suggest that the current level of education of vascular surgeons on sexual function and the causes of postoperative sexual disorders is insufficient. Therefore, vascular surgical training should include this topic.

Almost 60% of vascular surgeons routinely inform their patients preoperatively about postoperative neurogenic complications. That means that a significant number of patients are not consented or consented incompletely or wrongly. Surgeons inquiring about sexual function preoperatively are more likely to ask about sexual function postoperatively. In this survey, almost one-third of vascular surgeons decide to inform some of their patients. When asked to specify when they chose to inform their patients, the only reply was “in young and fit patients”. These adjectives were not clarified or defined and seem to be at the surgeons’ discretion. This attitude is also reflected in the fact that 20% of the respondents would consider performing an extra-anatomic bypass only in young and fit patients. This may seem sound reasoning at first, but it is difficult, however, to predict which patient will experience loss of quality of life after ejaculation disorders and which will not. Although sexual activity declines with aging, a significant amount of senior patients are sexually active. In a national probability sample of 3,005 adults in the United State between the age of 57 and 85 years, 53% of respondents aged 65–74 years and 26% of patients aged 75–85 years reported sexual activity.²¹ These results are in line with similar studies in various medical specialty fields, such as oncology, plastic and reconstructive surgery, and orthopedic surgery and

nephrology, which urge toward a greater emphasis on education and practical training.^{10–12}

Most surgeons will develop expectations on the impact on quality of life of specific complications based on their clinical experience. The literature has shown that patients are often afraid or feel embarrassed to bring up a sensitive issue such as sexuality. Dumas et al. demonstrated that just 2% of patients disclosed erection disorders spontaneously to a physician.²² Accordingly, Chun et al. and Giuliano et al. have shown that more than 65% of hypertensive men with erection disorders remain undiagnosed even though most states a wish for treatment.^{23,24} It is, therefore, very likely that vascular surgeons underestimate the burden of such complications. Over 45% of the respondents expect their patients to appreciate these complications as purely “inconvenient”. Many respondents provided multiple answers or suggested that patient appreciation was “variable” (40.5%). Given the heterogeneity and comorbidities associated with vascular patients, it is indeed likely that impaired ejaculation will have a very variable impact on quality of life in individual patients. No studies have been performed that focus on quality of life loss associated with postoperative ejaculation disorders after aortic reconstruction. It has been shown, however, that sexual activity is an important component of overall quality of life in male urologic patients.²⁵ Furthermore, evidence exists that impaired ejaculatory function leads to increased levels of anxiety and depression and decreased orgasmic intensity and satisfaction.^{26,27} This shows that postoperative impaired ejaculation after aortic reconstruction might very well have a significant impact on quality of life.

This study has some limitations. As in most other studies on this topic, physician responses were self-reported. In this case, self-reports may have resulted in overestimation of physician history-taking practices. Attempts were made to reduce this bias by making the survey anonymous. We used a nonvalidated questionnaire in which cultural and religious components were not taken into account, but these characteristics may have affected physicians’ willingness to participate and their responses to the studied items because they can influence people’s perspectives on sexuality and their openness about it. To optimize the response rate, the survey was kept as short as possible.

In conclusion, Dutch vascular surgeons are well aware of the occurrence of postoperative ejaculation disorders after infrarenal aortic reconstruction. However, based on the current survey, a gap in knowledge of pathophysiology and anatomy exists. Furthermore, a significant part of the surgeons

seem to lack skills in sexual counseling. Because of this, a significant part of patients undergoing vascular surgery is insufficiently consented preoperatively and will not get answers about the sudden ejaculation disorder postoperatively. Inquiring after and informing about sexual health should be a routine part of preoperative and postoperative evaluation. Therefore, more education and training with regard to sexual function should be offered during vascular surgical training.

Authors’ contributions: JvS and JH conceived of the presented idea. JvS collected the data. JvS took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and writing the manuscript.

SUPPLEMENTARY DATA

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.avsg.2020.02.021>.

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