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Quality assessment of laparoscopic hysterectomy

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Chapter 11

Summary

Transparency and measurement of quality of health care have received considerable attention in recent years. Quality indicators have been developed in an attempt to differentiate between high and low quality of healthcare processes. Assessing quality is an indispensable step to ensure patient safety, particularly in the field of minimally invasive surgery (MIS). In 2007 the report of the Dutch Health Care Inspectorate was published, in which concern was expressed regarding patient safety during MIS. This report stated that specific quality measures are needed to develop a formal quality system for laparoscopic procedures to enhance patient safety. However, most of the currently applied quality indicators are not corrected for case-mix characteristics; these are patient characteristics that affect (surgical) outcome (e.g., high BMI, enlarged uterus). Quality assessment without correction for case-mix characteristics will result in an invalid comparison of outcomes among healthcare providers

In this thesis, we developed a new quality assessment tool for laparoscopic hysterectomy (LH) and explored new methods to correctly measure, compare and improve the quality of surgical care.

First, we observed in **Chapter 2** a significant increase in the total number of advanced laparoscopically performed procedures in the Netherlands. The tremendous increase was mainly due to the major increase of the number of LHs performed. This was especially caused by a shift in indications, which we discussed in **Chapter 3**; a large uterus, low risk oncology and high BMI are nowadays also appropriate indications for LH.

Nowadays, case volume and surgical experience is often discussed as a proxy for quality assessment measurement. In **Chapter 2**, we showed that introducing an annually case volume of 20 advanced laparoscopic procedures would have considerable consequences for daily practice. Almost 40% of the practicing gynaecologists and 12% of the hospitals in the Netherlands would not meet this requirement. We consider that centralization of certain high-complex laparoscopic procedures is inevitable to accomplish a required case volume and to maintain individual surgical skills to perform these. However, case volume as quality assessment measurement should be introduced with caution. High volumes do not rule out suboptimal care, and lower volumes do not exclude high-quality surgery.

In **Chapter 2** we also described trends in the distribution of hysterectomies. A significant and preferable decrease in abdominal hysterectomy (AH) is observed in favour of the LH. However, an undesirable decrease in the number of vaginal hysterectomies (VHs) was also observed, which is a matter of concern, given that VH is still considered the approach of first choice for hysterectomy. In **Chapter 4** we observed that residents are even less interested in performing VH compared to AH. Furthermore, we found that residents are not sufficiently trained to perform advanced laparoscopic procedures without supervision. This includes the lack of proficiency to perform LH after residency, and additional training (in the form of

a fellowship) is required to perform these procedures without supervision. In addition, we observed that 63% to 96% of gynaecologists no longer perform any advanced laparoscopic procedures after graduating. Therefore, we advocate that training of advanced laparoscopic procedures should only be reserved to a selected group of residents, and preliminary selection during residency is recommended. Reliable quality assessment tools to measure the quality and skills of both residents and gynaecologists are therefore needed.

A first essential step towards reliable quality assessment of surgical performance is to get insight in case-mix variables. For a reliable interpretation and comparison of surgical outcomes, a correction for case-mix is of highest importance. To identify all relevant case-mix characteristics for surgical outcomes of LH, we conducted a systematic review as described in **Chapter 5**. We observed that higher BMI and high uterine weight are associated with less favourable surgical outcomes for LH such as blood loss, operative time, conversion and complications. Also, adhesions and previous operations seemed to be important predictors for the outcomes of LH.

In **Chapter 6** we describe the development and validation of a web-based real-time quality measurement tool for LH (www.qusum.org). This online application was (inter)nationally launched and more than 2000 LHs were registered by more than 80 gynaecologists. The primary function of this tool was to measure surgeon's performance, to provide immediate individual feedback, and to detect consistently suboptimal performance, all corrected for case-mix characteristics. The usability of the application was good to excellent. And the majority of participants reported that using the QUSUM application increased their awareness regarding their performance, surgical outcomes, and patient risk factors during the procedure.

Another important issue regarding quality assessment is that most of the published quality indicators are based on hospital outcomes and not on individual surgeon's outcome measures as the QUSUM application. In **Chapter 7** we observed that suboptimal outcomes of a lesser-skilled surgeon were masked by the superior skills of other surgeons in the same hospital, resulting in average quality outcome measure for the hospital. As a result, suboptimal care could potentially be delivered for an undue length of time, without the possibility to detect this. Therefore, we concluded that quality assessment should also be monitored on individual surgeon's level.

With our developed QUSUM application we created the possibility for clinicians to reflect and evaluate their individual performances by the implementation of a validated patient safety risk factor checklist. This list consisted of an adapted framework of risk factors in MIS, which could be entered by the surgeon (e.g., technical failures, communication problem). We observed that in 28% of LHs a risk factor checklist was entered and technology related risk factors were most important considering patient safety (**Chapter 8**).

Currently, the registration of clinical data is indispensable in the current duties of a clinician, which can be annoying and cumbersome. In this context, we hypothesized that gamification elements may offer opportunities to motivate and engage doctors to participate in medical registries. Gamification can be explained as the use of game elements in existing applications to motivate and engage users with a system. In a randomized control trial (**Chapter 9**) we observed that gamification elements did not show any advantages, and that it may even distract users from the primary goal of the application. Therefore, we recommend that new and existing registries should be simple, and exclusively collect data that are truly relevant and usable.

To conclude, quality assessment in surgical care is very important, though very difficult. With this thesis we attempted to overcome the limitations of currently used quality indicators and developed a dynamic, unique quality assessment tool to reflect upon individual surgical performance with case-mix correction.

