Surgical treatment for apical vaginal prolapse

Summary

This chapter summarises the findings of the research described in this dissertation and highlights the most important findings.

Introduction

CHAPTER 1 provides a general introduction on pelvic organ prolapse (POP) and its treatment options. Pelvic organ prolapse (POP) refers to the downward displacement of a pelvic organ. It is a frequently occurring health issue, especially concerning elderly women. POP can cause bothersome symptoms that may include vaginal bulge, pelvic pressure, and symptoms related to bladder or bowel dysfunction. In addition to mechanical discomfort, POP may negatively affect sexuality, body image, and quality of life and it is one of the most common reasons for gynaecological surgery. Pelvic floor disorders are caused by complex pathophysiological mechanisms and have very different presentations, making them difficult to define. 'Anatomical prolapse with descent of at least one of the vaginal walls to or beyond the vaginal hymenal ring with maximal Valsalva effort, and second, the presence either of bothersome characteristic symptoms or of functional or medical compromise' has recently been adopted as the clinical definition of POP.

POP can occur in the anterior, posterior, or apical compartments of the vagina, but is not limited to one compartment at once. This thesis focusses on the apical compartment, thus uterine descent and post-hysterectomy vaginal vault prolapse.

The main goal of POP surgery is to restore normal pelvic anatomy and eliminate POP symptoms, which may subsequently restore bowel, bladder, and sexual function. Various treatment options exist in the treatment of apical prolapse, including sacrocolpopexy, sacrohysteropexy, and vaginal sacrospinous fixation. However, prospective comparative trials are rare. The aim of this thesis was to examine which treatment is the most optimal, in terms of effectiveness and safety, for women suffering from uterovaginal prolapse or post-hysterectomy vaginal vault prolapse.

What are the short-term and long-term outcomes of laparoscopic versus open abdominal sacrocolpopexy in the treatment of vaginal vault prolapse?

CHAPTER 2 describes the results of the multicentre randomised controlled SALTO trial, which compares laparoscopic sacrocolpopexy (LSC) to open abdominal sacrocolpopexy (ASC) in the treatment of post-hysterectomy vaginal vault prolapse. In this study, 74 patients with symptomatic vault prolapse, requiring surgical repair, were included and randomly assigned to LSC (n = 37) or ASC (n = 37). Follow-up after 12 months showed no significant differences in disease-specific quality of life, measured with the Urogenital Distress Inventory (UDI). The 'genital prolapse' domain on the UDI scored a median of 0.0 in both groups (IQR 0 – 0), p = 0.93. Patients had less blood loss and a shorter hospital stay after the laparoscopic procedure, compared with the abdominal technique. There was no substantial difference in the rate of complications between both groups. Moreover, we did not find a difference in anatomical outcome after one year, meaning that none of the patients had a POP-Q ≥ stage 2 prolapse of the apical compartment. In the LSC group, 7 surgical reinterventions were done, compared with 4 in the ASC group, of which none for the apical compartment. The number of surgical reinterventions was not statistically different. The composite outcome of success was 83.8% (n = 31) for the LSC group and 89.2% (n = 33) in the ASC group. Considering these results, we concluded that this trial provides evidence to support a laparoscopic approach when performing a sacrocolpopexy.

CHAPTER 3 presents the long-term follow-up of the SALTO trial. Patients were asked to participate in this observational follow-up study to examine disease-specific quality of life, anatomical outcome, retreatment, and long-term complications. We included 22 patients (61.1%) in the LSC group and 19 patients (54.3%) in the ASC group. There were 14 (38.9%) patients lost to follow-up in the LSC group versus 16 patients (45.7%) in the ASC group. The median duration of follow-up was 109 months (9.1 years). Disease-specific quality of life did not differ after long-term follow-up with median scores of 0.0 (LSC: IQR 0 – 17 versus ASC: IQR 0 – 0) on the 'genital prolapse' domain of the UDI in both groups (p = 0.175). Patient satisfaction, according to the PGI-I was also not statistically different (LSC: 57.9% versus ASC: 58.8%, p = 0.955). Anatomical outcomes were the same for both groups on all points of the POP-Q. The composite outcome of success for the apical compartment is 78.6% (n = 11) in the LSC group and 84.6% (n = 11) in the ASC group (p = 0.686). Mesh exposures occurred in two patients (12.5%) in the LSC group and one patient (7.7%) in the ASC group. There were five surgical reinterventions in both groups (LSC: 22.7%; ASC: 26.3%, p = 0.729). At long-term follow-up there was no substantial difference

in disease-specific quality of life, anatomic results on the POP-Q, complications as mesh or suture exposure, and reinterventions between the LSC and the ASC groups. Therefore, the laparoscopic approach of sacrocolpopexy is preferable, considering the previously discovered advantages on short-term.

Which treatment is the most optimal for patients with uterine prolapse, laparoscopic sacrohysteropexy or vaginal sacrospinous hysteropexy?

CHAPTER 4 shows the long-term outcomes of laparoscopic sacrohysteropexy (LSH) compared with vaginal sacrospinous hysteropexy (SSHP) as treatment for uterine descent. This is a retrospective study of patients who underwent a LSH between 2003 and 2013 or a SSHP between 2009 and 2011 for primary treatment of uterine prolapse. We included 105 patients, 53 in the LSH group and 52 in the SSHP group. Patients were asked to fill out several validated Dutch questionnaires to investigate disease-specific quality of life. Furthermore, they were asked to visit the outpatient clinic for a pelvic examination to examine anatomical outcomes. The median duration of follow-up was 4.5 years in the LSH group and 2.5 years in the SSHP group. There were no statistically differences between the study groups in composite outcome of success (POP-Q point C ≤ 0, no bulge symptoms, and / or no retreatment); 41.4% in the LSH group compared with 72.7% in the SSHP group (p = 0.073). Anatomical failure of the apical compartment (POP-Q point C > 1) occurred in one patient in each group (p = 0.711). Vaginal bulge symptoms for which patients consulted professionals happened in 34.6% of patients in the LSH group, compared with 21.2% in the SSHP group (p = 0.126). Last, no difference in patient satisfaction was found; 75% of patients in the LSH group were satisfied and 71.8% of patients in the SSHP group were satisfied (p = 0.741). The operative time was longer in the LSH group (117 minutes; IQR 110 – 123), compared with the SSHP group (67 minutes; IQR 60 – 73) (p < 0.001). The duration of hospital stay was also longer in the LSH group (4 days) than in the SSHP group (3 days) (p = 0.006). We concluded that LSH and SSHP are equally effective in the treatment of uterine prolapse, based on objective and subjective recurrence rates, after correction for confounding factors.

CHAPTER 5 provides the results of the LAVA trial, a multicentre randomised controlled non-blinded non-inferiority trial. In total, 126 women with uterine prolapse stage 2 or higher were randomly allocated between a laparoscopic sacrohysteropexy (LSH; n = 64) or a vaginal sacrospinous hysteropexy (SSHP; n = 62). LSH was non-inferior to vaginal SSHP regarding surgical failure at 12 months follow-up, in the intention to treat analysis. The failure rate was 1.6% (n = 1) in the LSH group, versus 3.3% in the SSHP group (n = 2);

difference -1.7%; 95% CI for difference -7.1 – 3.7. Non-inferiority of LSH was confirmed in the per protocol analysis. There were no differences in overall anatomical recurrences and quality of life. More bothersome symptoms of overactive bladder and faecal incontinence were reported after LSH. Dyspareunia was more frequently reported after SSHP. Based on the analysis at 1-year follow-up, we concluded that LSH was non-inferior to SSHP for surgical failure of the apical compartment.

Which treatment is the most optimal for patients with vaginal vault prolapse, laparoscopic sacrocolpopexy or vaginal sacrospinous fixation?

CHAPTER 6 shows the SALTO-2 research protocol, a randomised trial which compares laparoscopic sacrocolpopexy (LSC) to vaginal sacrospinous fixation (VSF) for the treatment of vaginal vault prolapse. Hysterectomy is one of the most performed gynaecological surgical procedures during lifetime. Many women who have had a hysterectomy because of prolapse symptoms will visit a gynaecologist for a surgical correction of a vaginal vault prolapse thereafter. Vaginal vault prolapse can be corrected by different surgical procedures. A Cochrane review comparing abdominal sacrocolpopexy (ASC) to VSF considered the abdominal procedure as the treatment of first choice for prolapse of the vaginal vault, although operation time and hospital stay is longer. Literature also shows that hospital stay and blood loss are less after a LSC compared with the abdominal technique. However, it is unclear which of these techniques leads to the best operative result and the highest patient satisfaction. Prospective trials comparing LSC and VSF are lacking. The aim of this randomised trial is to compare the disease-specific quality of life of the LSC versus the VSF as the treatment of vaginal vault prolapse. We will perform a multicentre prospective randomised controlled trial. Women with a post-hysterectomy symptomatic, POP-Q ≥ stage 2, vaginal vault prolapse will be included. Participants will be randomly allocated to either the LSC or the VSF group. The primary outcome will be disease-specific quality of life at 12 months follow-up. Secondary outcomes will be the effect of the surgical treatment on prolapse related symptoms, sexual functioning, procedure related morbidity, hospital stay, postoperative recovery, anatomical results using the POP-Q classification, and reinterventions. With a power of 90% and a level of 0.05, the calculated sample size necessary is 96 patients. Taking into account 10% attrition, a number of 106 patients (53 patients in each group) will be included.

CHAPTER 7 describes the outcome of the SALTO-2 trial, a multicentre randomised controlled trial and prospective cohort alongside, which compared laparoscopic

sacrocolpopexy with vaginal sacrospinous fixation in the treatment of vaginal vault prolapse POP-Q stage 2 or higher. Data from both studies was initially analysed separately, whereafter a meta-analysis was carried out to combine results for the primary outcome and principal secondary outcomes. In total, 179 women were included in the study, of whom 64 women were randomised and 115 women participated in a prospective cohort. The RCT was stopped prematurely, mainly because of strong patient preference hampering inclusion. Disease-specific quality of life did not differ after 12 months between the LSC and VSF group in the RCT and the cohort (RCT: p = 0.887; cohort: p = 0.704; meta-analysis: mean difference 1.57; 95% CI (-6.18 – 9.32), p = 0.692). The composite outcome of success for the apical compartment, in the RCT and prospective cohort, was 89.3% and 90.3% in the LSC group and 86.2% and 87.8% in the VSF group (RCT: p = 0.810; cohort: p = 0.905; meta-analysis: OR 0.86; 95% CI (0.26 – 2.80), p = 0.800). There were no statistically relevant differences in number of complications between the LSC and the VSF (RCT: p = 0.395; cohort: p = 0.129). Also, reinterventions did not differ statistically significantly differ between both groups (RCT: p = 0.934; cohort: p = 0.120), although there seems to be a clinically relevant difference in surgical reinterventions for the apical compartment in favour of the LSC. LSC and VSF are both effective treatments for vaginal vault prolapse, after a follow-up time of 12 months.

Which patient-related and physician-related factors are of importance for Dutch gynaecologists when treating patients with apical prolapse surgically?

CHAPTER 8 provides information on why Dutch gynaecologists prefer a certain surgical treatment for apical prolapse. These are the results of a qualitative study, in which we conducted semi-structured interviews. Ten Dutch urogynaecologists or gynaecologists with a special interest in urogynaecology participated. All gynaecologists performed vaginal surgeries for apical prolapse, seven gynaecologists perform sacrocolpopexy themselves or a colleague in their hospital does. Six gynaecologists would perform a VSF for a primary vaginal vault prolapse, in women who have never been operated for POP before; three gynaecologists preferred a sacrocolpopexy. All participants prefer a sacrocolpopexy for recurrent VVP, *i.e.,* after previous surgery for post-hysterectomy vault prolapse. All participants have stated that multiple comorbidities could be a reason to choose VSF, as this is considered less invasive than sacrocolpopexy. Most participants would choose a VSF in case of higher age (6/10) or higher body mass index (7/10). Gynaecologists who do not perform the sacrocolpopexy in their own clinic are more likely to perform a VSF and seem to find more reasons not to advise a sacrocolpopexy. In case

of a primary uterine prolapse, all participants prefer a vaginal, uterine-preserving approach in the surgical treatment of primary uterine prolapse.

Discussion & Impact Paragraph

CHAPTER 9 describes the general discussion, clinical implications of this research and future perspectives. According to this thesis, several conclusions can be made:

- Laparoscopic sacrocolpopexy is the preferred technique, compared to open abdominal sacrocolpopexy, based on short-term advantages. Results, in terms of recurrences and complication rates, are similar after long-term follow-up.
- Laparoscopic sacrohysteropexy and vaginal sacrospinous hysteropexy are comparable in their effectiveness for women with uterine prolapse, according to the results of a retrospective study and a randomised controlled trial with one year follow-up.
- Laparoscopic sacrocolpopexy and vaginal sacrospinous fixation are both effective surgical treatment options at twelve months follow-up, in the treatment of vaginal vault prolapse. Although, there seems to be a clinically relevant difference in surgical reinterventions for the apical compartment in favour of the LSC.
- Preferred treatment options for vaginal vault prolapse differ amongst Dutch gynaecologists. Most important factors on which their decisions are based are whether it is a recurrent vaginal vault prolapse, patient's health status, and patient's own preference.

The importance of this thesis and how it can contribute scientifically and societally is described in **CHAPTER 10**. The relevance of research on the treatment of POP is evident when considering factors as the high and increasing prevalence, the impact of the symptoms, and the need for treatment. The results of our studies are an addition to the existing literature because they show new information, which can be used for counselling and help patients making evidence-based decisions.