ABSTRACT

Introduction: Surgical routes used to correct complex pelvic floor disorders (CPFDs) may have a negative impact on women’s sexual function. Currently, there is no evidence concerning the impact of a specific surgical procedure on postoperative sexual function in women.

Aim: The aim of this study was to compare an abdominal approach with rectopexy and sacrocolpopexy to a perineal procedure with abdominal rectopexy, regarding female sexual function in cases of CPFDs.

Methods: Women who were operated for CPFDs between January 2003 and June 2010 were retrospectively asked to answer the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12, the Miller Score of Incontinence, and a urinary incontinence frequency score. We also questioned them about their sexual function and satisfaction before and after the operation using visual analogic scores.

Main Outcome Measure: We compared the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12 before and after the surgery in both groups, and we made an intragroup comparison.

Results: There were 334 women identified, but only 51 could be included. Globally, we found no statistically significant differences in terms of sexual function before and after surgery between the 25 groups. Intragroup comparison demonstrated that, within the perineal approach group, patients experienced a decrease in their sexual arousal after the procedure. The choice of surgical route for pelvic floor disorders does not seem to have an impact on the results of postoperative sexual function in women. This study adds to the limited literature on sexual outcomes of surgery for CPFD. It is limited principally due to its retrospective design and the small number of patients included.

Conclusion: Both surgical routes have very similar outcomes on most sexual questions. A perineal approach combined with abdominal rectopexy did, however, demonstrate a slight decrease in sexual arousal of the patients after the intervention.

INTRODUCTION

Complex pelvic floor disorders (CPFDs) encompass rectal, vaginal, and/or uterine prolapse as well as rectocele, cystocele, or enterocele. CPFD affect mostly elderly and multiparous women. Other CPFD described risks factors are obesity, chronic constipation, use of neuroleptics, and white ethnicity.

CPFD induces anatomic modifications, which can cause discomfort or even pain. In addition, several patients complain of urinary and/or fecal incontinence, which represents an important social impairment for them. Moreover, CPFD is a major public health concern, as the economic burden of fecal and urinary incontinence can reach annually up to US $13 and $32 billion, respectively.

Several surgical techniques using different approaches have been proposed to correct CPFD. The main approaches to CPFD...
are perineal (vaginal approach) and/or abdominal (rectopexy and sacrocolpopexy). There are no specific guidelines for the surgical treatment of CPFD and the surgeon selects a technique according to his skills and his global assessment of the anatomic disorder in each individual patient. Complications and recurrences after these various procedures are well-documented, however, the functional results concerning fecal incontinence are encouraging. The effects of such interventions on women’s sexual function have rarely been assessed. It is known that pelvic organ prolapse can cause a feeling of shame and can also make sexual intercourse painful or impossible. Indeed, surgery through the vagina can leave scar tissue that could modify the sexual function of patients. On the other hand, dissection near the hypogastric plexus (abdominal approach (AA)) can also have an impact on sexual function.

We hypothesized that for CPFD, perineal surgery is more deleterious for sexual function than an isolated AA due to the fact that dissection near the hypogastric plexus can be very well controlled. The main purpose of this study was to retrospectively assess women’s sexual function after surgery for CPFD, comparing an AA to a combined abdominal and perineal approach (APA; see “Patients and Methods”). As a secondary aim, we evaluated pelvic floor incontinence (anal and urinary), female subjective health status, and satisfaction with surgery.

Patients and Methods

We conducted a bicentric retrospective study. This study has been approved by the ethical committee for publication. According to the ethical principles of the Helsinki Declaration, patients gave their informed consent to participate in this study. Anonymous questionnaires were then sent to eligible women who underwent surgery for a CPFD, meaning rectocele and/or rectal prolapse. Some patients also had prolapse of another organ, but this was not the indication for the operation. No other specific surgery was performed during the procedure. Patients were eligible if they were sexually active, capable of discernment, and had a minimum follow-up of 3 months after surgery. Due to the retrospective study design, all questionnaires were sent after surgery. Surgical interventions were performed by 2 surgeons either at Geneva University Hospital or at Nyon Hospital (Western Lemanic Hospitals Group) between January 2003 and June 2010. Both AA and the APA were performed. The APA procedure includes an abdominal and a perineal route during the same intervention. The surgeon selects the surgical technique according to the diagnosis and clinical findings. The AA and APA are standardized and both operators performed identical procedures.

The AA procedure begins with a posterior rectopexy (ie, a retro-rectal dissection of the Waldayer space), associated with a fixation of the rectum to the promontory. We combine this procedure with a sacrocolpopexy only if a vaginal or uterine prolapse is associated with the rectal prolapse. During sacrocolpopexy, there is a dissection of the rectovaginal septum up to the perineal body. A biologic mesh is then inserted and attached to the perineal body and to the vaginal dome with 2 stitches of nonresorbable suture (Ethibond 2.0; J&J, Nanterre, France). The mesh is then fixed to the promontory using Protack (Covidien, Elancourt, France). Both the rectopexy and the sacrocolpopexy are performed by laparoscopy or laparotomy if a laparoscopy was contraindicated.

The APA consists of a posterior rectopexy through an AA, as previously described, followed by the closure of the perineal hiatus through a colpectomy, which we call the “Marti-Zacharin suture.” This is associated with a posterior colpomyorrhapsy of the levator ani muscles. We perform an arcuate incision on the posterior hymen, without mucosal resection. There is no colpopexy during this procedure. For both AA and APA, there was no associated hysterectomy or other concurrent surgery performed during these procedures.

We included only sexually active women (ie, patients who report having sexual intercourse at least 5 times a month both before and after the operation).

To assess women’s sexual function after these surgical interventions, we used the validated French translation of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12 (PISQ-12), which assesses the sexual function of women with genital prolapse and/or urinary incontinence. This questionnaire assesses 3 aspects of the patient’s sexuality: behavior and emotions, aspects related to the partner, and physical and bodily dimensions. The PISQ-12 does not differentiate between sexual intercourse and masturbation and does not assess anal intercourse. 2 questionnaires were sent to the patients to assess their sexual function retrospectively before and after the intervention.

Additional questionnaires were sent along with the PISQ-12. We investigated whether patients had changed their sexual activity after surgery using a visual analog scale (VAS). Patients rated their sexual activity before and after the intervention from 0 (poor) to 10 (excellent). The Miller score was used to assess postsurgical anal incontinence to gas, liquid, or solid and quantifies it with a score from 0 (completely continent) to 18 (major incontinence). This score does not evaluate the social embarrassment nor the subjective perception of the patient. Patients were also qualitatively evaluated (using VAS) for the development of urinary incontinence after the intervention.

Finally, a VAS was also used to assess the overall subjective health status of the patients (a score of 0 means they consider themselves in poor health, whereas 10 indicates they consider themselves in excellent health). A VAS score was also used to assess their satisfaction with the intervention (a score of 0 means that they are unsatisfied, whereas a score of 10 means they are fully satisfied.).

For quantitative variables, Mann–Whitney or unpaired Student’s t-tests, according to variable distributions, were performed to compare patient’s demographic characteristics. Pearson chi-square or Fisher’s exact tests were used for categorical variables.
Paired Student’s t-tests were performed to compare intragroup patients before and after the surgical intervention. Unpaired Student’s t-tests were used to compare the 2 groups of patients (AA vs APA). The statistically significant threshold for the P value was fixed below .05. Missing data were ignored.

RESULTS

During the aforementioned period, 334 patients were identified and contacted (Figure 1). Among the 334 patients, 73 refused to participate in the study, 57 were unattainable, and 38 were unable to answer because of mental impairment or death. After these exclusions, we arrived at 166 patients. Among those 166 patients, 54 were still sexually active. We considered that if the patients had been sexually inactive because of pain or discomfort before the procedure they could have intercourse after the intervention. We, therefore, excluded sexually inactive patients after the intervention.

Among the 54 questionnaires, 3 of them were not correctly filled out and were excluded from our study. 51 patients were finally included for assessment of sexual function. Among those 51 patients, 24 patients underwent an APA and 27 patients underwent an AA.

The median age was 57.5 years (34–80 years) in the APA group, and 63 years (43–82 years) in the AA group.

Regarding overall sexual activity, 18 of these 51 patients noted a modification in their sexuality; 7 as an improvement and 11 as an impairment. Among the 7 patients who noticed an improvement in their sexual function, 4 patients had an APA and 3 had an AA. However, of the 11 patients who complained about impairment, 8 had an APA, and 3 patients underwent an AA. Among the 33 patients who did not notice any change in their sexual function, 12 patients had an APA; the other 21 had an AA (Table 1). These differences were, however, not statistically significant.

No sexually active patient stopped sexual activity because of the surgical intervention.

The PISQ-12 explored sexual function using different parameters (Tables 2 and 3). We observed a decrease in the frequency of sexual arousal after APA: patients scored 3.23 before surgery (95% CI = 2.92–3.53) and 2.73 (95% CI = 2.23–3.23) after APA with a P value at .038. A higher score indicates a high frequency of sexual arousal. However, there were no statistically significant differences when both techniques were compared.

Regarding pain during sexual intercourse, women operated with AA scored 2.68 (95% CI = 2.18–3.18) preoperatively vs 2.72 (95% CI = 2.25–3.19) after the intervention. A higher score indicates less pain, but these results were not statistically significant. On the other hand, patients who had an APA scored 3.00 (95% CI = 2.42–3.58) before surgery vs 2.44 (95% CI = 1.97–2.90) postoperatively. Dyspareunia tends to increase after this operation, but these results were also not statistically significant (P = .056). Finally, when comparing the 2 procedures, there were no statistically significant differences either (P = .092).

Table 1. Modification of sexual activity after surgery

| Modification of sexual activity | APA (24) | AA (27) | P value |
|--------------------------------|----------|---------|---------|
| No change in sexual activity n (%) | 12 (50) | 21 (77.8) | 0.038 |
| Degradation n/total (%) | 8/12 (66.7) | 3/6 (50) | 0.627 |
| Improvement n/total (%) | 4/12 (33.3) | 3/6 (50) | 0.627 |

AA = abdominal approach; APA = abdominal and perineal approach.
Table 2. Comparison of PISQ-12 scores before and after surgery according to the procedure (intragroup comparison)

| PISQ-12 questions                                      | AA before surgery | AA after surgery | AA vs APA | APA before surgery | APA after surgery | APA vs APA |
|--------------------------------------------------------|-------------------|------------------|-----------|--------------------|-------------------|------------|
| Frequency of sexual desire mean (95% CI [4–0])         | 2.68 (2.31–3.1)   | 2.56 (2.24–2.88) | .265      | 2.82 (2.47–3.17)   | 2.55 (2.22–2.87) | .229       |
| Frequency of orgasms (95% CI [4–0])                   | 3.04 (2.71–3.37)  | 2.72 (2.19–3.25) | .119      | 2.87 (2.45–3.29)   | 2.61 (2.02–3.21) | .283       |
| Frequency of sexual arousal (95% CI [4–0])             | 3.22 (2.93–3.51)  | 3.22 (2.85–3.59) | 1         | 3.23 (2.92–3.53)   | 2.73 (2.23–3.23) | .038       |
| Satisfaction in sexual variety (95% CI [4–0])          | 3.24 (2.92–3.56)  | 3.19 (2.88–3.50) | .715      | 3.04 (2.66–3.42)   | 2.65 (2.15–3.15) | .142       |
| Frequency of pain (95% CI [0–4])                       | 2.68 (2.18–3.18)  | 2.72 (2.25–3.19) | .852      | 3.00 (2.42–3.58)   | 2.44 (1.97–2.90) | .056       |
| Frequency of UI during intercourse (95% CI [0–4])      | 3.56 (3.22–3.89)  | 3.76 (3.54–3.98) | .096      | 3.48 (3.01–3.95)   | 3.17 (2.66–3.69) | .2587      |
| Fear of UI during intercourse (95% CI [0–4])           | 3.60 (3.22–3.98)  | 3.84 (3.65–4.0)  | .185      | 3.61 (3.22–3.99)   | 3.44 (2.92–3.95) | .567       |
| Avoiding sex because of bulging (95% CI [0–4])        | 3.17 (2.66–3.68)  | 3.75 (3.44–4.06) | .065      | 3.18 (2.66–3.71)   | 3.23 (2.66–3.79) | .888       |
| Negative emotions (95% CI [0–4])                       | 3.40 (3.02–3.78)  | 3.64 (3.33–3.95) | .110      | 3.35 (2.82–3.88)   | 3.09 (2.41–3.76) | .458       |
| Partner erectile dysfunction (95% CI [0–4])            | 3.44 (3.06–3.82)  | 3.24 (2.8–3.66)  | .096      | 3.39 (2.96–3.82)   | 3.48 (3.07–3.89) | .539       |
| Partner ejaculation disorders (95% CI [0–4])           | 3.72 (3.42–4.02)  | 3.64 (3.31–3.98) | .327      | 3.59 (3.24–3.94)   | 3.63 (3.29–3.99) | .715       |

Table 3. Comparison of PISQ-12 scores difference, before and after surgery and after surgery for item 12, between AA and APA, (intergroup comparison)

| PISQ-12 questions                             | AA | APA | AA vs APA |
|-----------------------------------------------|----|-----|-----------|
| Frequency of sexual desire mean (95% CI [4–0]) | 0.12 (-0.97 to 0.34) | 0.27 (-0.19 to 0.73) | .536       |
| Frequency of orgasms (95% CI [4–0])           | 0.32 (-0.09 to 0.73) | 0.26 (-0.23 to 0.75) | .849       |
| Frequency of sexual arousal (95% CI [4–0])     | 0 (-0.32 to 0.32)    | 0.5 (0.03–0.97)     | .075       |
| Satisfaction in sexual variety (95% CI [4–0])  | 0.05 (0.22–0.32)     | 0.39 (-0.14 to 0.93) | .241       |
| Frequency of pain (95% CI [0–4])               | -0.04 (-0.48 to 0.40) | 0.57 (-0.02 to -1.15) | .092       |
| Frequency of UI during intercourse (95% CI [0–4]) | -0.2 (-0.44 to 0.04) | 0.30 (-0.24 to 0.85) | .089       |
| Fear of UI during intercourse (95% CI [0–4])   | -0.24 (-0.60 to 0.12) | 0.17 (-0.45 to 0.8)  | .241       |
| Avoiding sex because of bulging (95% CI [0–4]) | -0.58 (-1.20 to -0.04) | -0.05 (-0.71 to -0.62) | .226       |
| Negative emotions (95% CI [0–4])              | -0.24 (-0.54 to 0.06) | 0.26 (-0.455519 to 0.98) | .191       |
| Partner erectile dysfunction (95% CI [0–4])    | 0.2 (0.04–0.44)      | 0.09 (-0.20 to 0.38) | .535       |
| Partner ejaculation disorders (95% CI [0–4])   | 0.08 (-0.09 to 0.25) | 0.05 (-0.20 to 0.30) | .815       |

Statistics

AA = abdominal approach; APA = abdominal and perineal approach; PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire 12; UI = urinary incontinence.
Concerning the other PISQ-12 items, we also found no statistically significant differences.

The overall satisfaction of sexual function was assessed with a VAS. Patients scored 6.41 (95% CI = 5.44–7.38) before surgery and 5.91 (95% CI = 4.66–7.16) after surgery for APA and 6.73 (95% CI = 5.77–7.69) before surgery and 6.46 (95% CI = 5.61–7.29) after surgery for AA (Table 4). These differences were not statistically significant. Moreover, intergroup analysis did not show statistically significant differences between APA and AA before and after surgery. Quality of life and global satisfaction of the operation were also assessed with a VAS (Table 5) but there were no statistically significant differences.

Regarding anal incontinence, the median Miller score for patients operated by an APA (21 patients responded to this question) was 5.5 (ranging from 3–12) vs 4.5 (ranging from 3–11) for patients operated with an AA (27 patients answered this question; Table 6). This difference was not statistically significant ($P = .308$). The results regarding urinary incontinence after the operation did not show any statistically significant difference between APA and AA (Table 7).

**DISCUSSION**

**Principal Findings**

In this study, we could assess whether the surgical treatment of CPFD by a perineal approach with abdominal rectopexy has an impact on sexual function compared to an AA with sacrocolpopexy and rectopexy. No statistically significant differences were found between the 2 groups and this allows us to propose both approaches to the patients without inducing sexual impairment.

**RESULTS**

Only 18 patients noticed a subjective change in their sexual function after surgery (Table 1). There are no statistically significant differences between the AA and APA groups.

We detected only 1 difference with the PISQ-12 questionnaire. Sexual arousal was decreased after surgery in the APA group. This could be simply explained by the vaginal scar, but local inflammation resolved over time. This finding was consistent with that of Bouchet et al who also compared perineal approach to AA for CPFD. In the Bouchet study, they also found an increase in dyspareunia in the APA group vs the AA group. Concerning dyspareunia, we thought the APA procedure would cause more pain than the AA, but our findings did not demonstrate a difference. However, the $P$ value for this item was close to being significant. Bouchet et al also pointed out that those women in both groups avoided sexual intercourse due to a vaginal bulk, predominantly in the AA group. We also found no difference for this parameter in the present study.

In the literature, the few articles devoted to women’s sexuality after rectocele surgery can hardly be compared to our study. Indeed, the operative technique performed was most often an anterior rectopexy, whereas we performed a posterior one. In our center, this is the first time we have studied this subject.

In one of the first studies conducted on this subject, patients complained of postoperative dyspareunia. Their sexual activity

### Table 4. VAS of sexual satisfaction

|                        | APA Before surgery | APA After surgery | $P$ value | AA Before surgery | AA After surgery | $P$ value |
|------------------------|--------------------|-------------------|-----------|-------------------|-----------------|-----------|
| VAS (95% CI [0–10])    | 6.41 (5.44–7.38)   | 5.91 (4.66–7.16)  | .429      | 6.73 (5.77–7.69)  | 6.46 (5.61–7.29)| .378      |

**Table 5. VAS of patients with sexual activity**

| Patient with sexual activity | APA | AA | $P$ value |
|-----------------------------|-----|----|-----------|
| VAS quality of life after surgery (95% CI [0–10]) | 7.29 (6.38–8.2) | 7.44 (6.63–8.25) | .802 |
| VAS global satisfaction score after the intervention (95% CI [0–10]) | 6.54 (5.16–7.92) | 7.68 (6.46–8.90) | .208 |

$AA$ = abdominal approach; $APA$ = abdominal and perineal approach; $VAS$ = visual analogue scale.
was significantly decreased. In our study, women who were sexually active before the surgery still had intercourse afterward.17

The assessment of anal incontinence with the Miller score showed that both interventions had similar results, as well as for urinary incontinence. These results are difficult to compare with other existing studies because of the difference in the scores used to assess anal incontinence and the difference in surgical procedures performed. Although some studies seem to show better results for the abdominal route in terms of continence, others do not find any difference.18–20 We cannot draw parallels with our study. Heterogeneity of the available literature is significant and level of evidence low, however, it is necessary to have well-designed prospective trials to answer this question.

Finally, patients were satisfied identically in both procedures, which encourages us to propose them in an equivalent way.

Clinical Implications
During a lifetime, the probability of women to undergo surgery for pelvic organ prolapse and/or urinary incontinence is 11–19%.21 Before any surgical procedure, every patient must be informed of the different surgical techniques available and their potential complications. It has been shown that receiving this information before the procedure increases patient satisfaction.22 While taking the medical history, physicians should assess if the patient is still sexually active and if her sexual function has been affected by CPFD.

The impact of perineal surgery on female patients’ sexual function is becoming increasingly studied. There exists very little literature that measures postoperative CPFD repair of sexual function in women. In fact, the majority of publications are focused on ventral rectopexy and the results are not unanimous regarding the influence of these interventions on the sexual function of patients.23,24

According to our point of view, most patients with CPFD are no longer sexually active. However, for those still having sexual intercourse, both surgical routes can be proposed without implications on their sexual function.

Strengths and Limitations
Sexual function after pelvic floor surgery is a very important outcome related to quality of life. We believe this should be taken into account when a woman needs surgery for a CPFD, and this study adds to the limited literature on sexual outcomes after this type of surgery.

On the other hand, this study is limited due to its retrospective design. We asked patients to remember details of their sexual function before the surgical intervention, which could be influenced by what they experienced during the postoperative course and their satisfaction of surgery. More simply, women could also have just forgotten how it was before surgery. Indeed, the median time elapsed between the surgery and the transmission of the questionnaire was approximately 30 months. However, we believe that if a woman has noted a change in her sexual activity, she would openly report this when completing the questionnaire.

Another potential bias in this study is the possible misunderstanding of some questions by the patients because of their advanced age. Although some of the patients could speak French properly, there were also non-native French speakers and they might have had difficulty reading and understanding our questionnaire.

It was also difficult for us to convince patients to participate to this study. Indeed, more than a third of patients refused to answer the questionnaire. They refuse to talk about their sexuality, which still remains taboo for many elderly women in Switzerland. Finally, results must be interpreted cautiously as the final sample of patients retained for analysis was small (51 women). This can be explained by the fact that older patients are usually less sexually active, and we were looking for women having sexual intercourse at least 5 times a month.25 Absence of statistically significant differences may be induced by a lack of statistical power.

CONCLUSION
Our results show that both surgical routes, APA or AA, can be proposed to female patients with CPFD with regard to the potential impact on their future sexual function. However, if
patients have an APA procedure, they may have a slight decrease in sexual arousal compared to before the operation.

Although some studies find dyspareunia after surgical procedures for CPFD, our experience does not confirm it. Patients should not refuse surgery because of fear of being compromised in their sexual activity.

Further studies are needed to confirm if a vaginal incision has more negative impact on women’s sexual function, especially concerning dyspareunia. An AA should be considered as the first approach of choice, in case of rectal prolapse alone or associated with vaginal or uterine prolapse. However, it is possible to have a simultaneous perineal approach, in case of a necessary sphincter repair, without impairing the patient’s sexual function.

**ACKNOWLEDGMENT**

The authors thank Dr Alexis Zawodnik for his statistical support while proofreading of the article.

**Corresponding Author:** Astrid Zawodnik, MD, Division of Digestive Surgery, Geneva University Hospitals, Rue Gabrielle-Astrid Zawodnik, MD, Division of Corresponding Author: to support while proofreading of the article.

**Funding:** No outside financial support has been provided for this study.

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