Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2025, 15(7), 1184-1197
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Laparoscopic Sacrocolpopexy with Mesh for Apical and Anterior Pelvic Organ Prolapse: A Report of 3 Cases in Yaoundé Gyneco-Obstetric and Pediatric Hospital, Cameroon

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How to cite this paper: Tompeen, I., Junie, N.Y., Esther, M., Sama, D. and Pascal, F. (2025) Laparoscopic Sacrocolpopexy with Mesh for Apical and Anterior Pelvic Organ Prolapse: Report of 3 Cases in Yaoundé Gyneco-Obstetric and Pediatric Hospital, Cameroon. *Open Journal of Obstetrics and Gynecology*, **15**, 1184-1197.
https://doi.org/10.4236/ojog.2025.157096

Received: June 15, 2025
Accepted: July 27, 2025
Published: July 30, 2025

Abstract

Introduction: Pelvic organ prolapse (POP) is a common disorder in the health care of women that negatively impact the quality of life when symptomatic. It affects about 30% to 40% of parous women and its incident increases with age. POP etiologies can be innate like connective tissues disorder or acquired like obstetrical complications. Its management can be surgical or not surgical. Laparoscopic sacrocolpopexy is the gold standard to treat POP but its practice requires lot of skills, making vaginal or laparotomic route to be preferred by many surgeons especially in low resource countries. The aim of the present study was to assess the safety and feasibility of laparoscopic sacrocolpopexy as treatment of POP in low resource countries like Cameroon. **Material and Methods:** We reported a series of three cases of pelvic organ prolapse managed by laparoscopy in gynecological department of Yaoundé Gyneco-Obstetric and Pediatric Hospital, between 2018 and 2023. All the following parameters were analyzed: age, parity, obstetrical history, type of pelvic organ prolapse, surgical techniques, duration of the surgery, complications, and outcomes. **Results:** Three patients (40 y/o, 37 y/o, and 34 y/o) presented with the following conditions, respectively: stage 1 cystocele and stage 3 hysterocele; stage 4 cystocele and stage 3 hysterocele; and stage 3 hysterocele. They underwent laparoscopic sacrocolpopexy. Two patients experienced macrosomia deliveries, prior to the unset of the prolapse, and the last had no obvious risk

factor for prolapse. The average duration of the surgery was approximately 149 minutes (135 minutes, 202 minutes and 110 minutes). There were no intraoperative complications and no recurrence after a period of 2 years follow-up. One of the patients gave birth by caesarean section, 1 year after the surgical procedure. **Conclusion:** POP is an increasing problem in the health care of women. Laparoscopic sacrocolpopexy is an effective technique for prolapse treatment, and it is feasible, and must be implemented in low resources countries. Learning curve can be reduced by standardization of the technique.

Keywords

Pelvic Organ Prolapse, Laparoscopy, Sacrocolpopexy, Mesh, HGOPY

1. Introduction

POP is a common problem among older female. Its prevalence varies depending on the study and definitions used by the authors [1], with increased prevalence in older age groups, particularly among parous women [2]. It is one of manifestation of pelvic floor disorders defined as the descent of the pelvic organs of anterior (bladder), middle (uterus, vaginal cuff) and posterior (rectum, small bowel) compartments into the vagina [3].

Its management has evolved considerably. Laparoscopic sacrocolpopexy (LSCP) has gained increasing acceptance as an effective treatment of POP, emerging as a gold standard for apical POP [4]. In the field of urogynecology, laparoscopy has gradually found its way, because it offers advantages such as better exposure and surgical detail, reduce blood loss, shorter hospital stays, and quicker recovery compared to open surgery [5]. Although mesh LSCP is the most widespread approach, other mesh fixation techniques like pectopexy [6] and lateral colposuspension [7] can be done by laparoscopy. However, this advanced approach requires specialized surgical skills and resources, which may not be readily available in all settings.

In Cameroon, very few data have been published by urologists [8], and none of them has reported laparoscopic management. While traditional vaginal approaches to POP repair are practiced, laparoscopic techniques remain underutilized due to several challenges. These include: limited access to laparoscopic equipment and expertise, financial constraints, healthcare system limitations, and cultural factors.

Therefore, this study aims to highlight the feasibility and safety of laparoscopic double promontofixation with mesh for apical and anterior POP in a tertiary referral hospital in Yaoundé, Cameroon. By presenting three cases successfully managed with this technique, we seek to contribute to the growing body of evidence supporting laparoscopic approaches to POP repair in resource-limited settings.

2. Material and Methods

2.1. Study Design and Period

We conducted a descriptive cross-sectional study with retrospective data collec-

tion at Yaoundé Gyneco-Obstetric and Pediatric Hospital (YGOPH), between 2018 and 2024.

2.2. Study Population

We selected patients who presented with urogenital prolapse and were managed surgically by laparoscopy in the gynecology department of the YGOPH. From the operating room registers, we identified these patients. Then, using their names, we searched for their files in the archives, and from their medical records, data were collected. Analysis was carried out for the following variables: age, parity, obstetrical history, presenting symptoms and duration, clinical presentation of the POP, intraoperative and post operative data, and outcome (which was obtained by telephone call).

2.3. Ethical Considerations

The Ethics Committee board of YGOPH approved the study and written informed consent was obtained from all patients for publication of this paper with accompanying image.

2.4. Operative Procedure

The cost of this procedure is around $1500 and requires conventional laparoscopic surgery equipment, as well as polypropylene prostheses, which are not always available in developing countries.

We performed laparoscopic sacrocolpopexy for all patients with uterine preservation. Two meshes were used for anterior and posterior vaginal wall in all cases.

Trocar positioning: Four trocars were used. One 10 mm in the umbilicus and suprapubic region, one 5 mm in the left and right iliac fossa.

Surgical dissection: During the LSCP, we dissected four areas: anterior vaginal wall for anterior mesh attachment, posterior vaginal wall for posterior mesh attachment, sacrum for sacral mesh attachment, and peritoneum for retroperitonealizing mesh. This dissection is improved by the mobilization of the left colon which can be transitorily fixed to the left anterior and lateral abdominal wall.

After the mobilization of the left colon and positioning patient in Trendelenburg position, promontory is dissected under direct visualization of the relevant anatomy of the presacral space. After dissection of sacrum, the peritoneal incision is extended inferiorly toward the medial edge of the right utero sacral ligament.

We then proceeded with posterior dissection between vagina and rectum. Posterior dissection needs and anterior retraction of the uterus by using a uterine manipulator. With tension placed on the rectum, the peritoneum opposite the torus uterinum was grasped and incised. Then, rectovaginal space was bluntly dissected between the two layers of Dennonvilliers fascia until reaching the levator ani muscles bilaterally (puborectalis muscle) and the perineal body. A polypropylene monofilament macroporous nonabsorbable mesh designed with two arms (caudal part), was attached to levator ani (each arm to each side of puborectalis).

A patch of the mesh was placed along the posterior vaginal wall, anchored to the uterosacral ligament, but not fixed at the promontory level in order to prevent excessive tension.

For anterior dissection, a horizontal incision of the peritoneum of the ventral cul-de-sac between bladder and uterus was made. The cleavage consists of anterior dissection of the vesicovaginal space in right plane, between endopelvic fascia and detrusor. A 4 cm dissection is enough, usually, but more may be required in case of anterior vaginal wall distended by large cystocele. A self-tailored double armed anterior mesh is fixed on the vagina and on the isthmus, and each arm is introduced throw the broad ligament. The two arms are then knotted together behind the posterior mesh, around the uterine isthmus. No big tension is needed. The posterior mesh is finally fixed on the sacral promontory on the anterior longitudinal ligament. The vesico uterine peritoneum and posterior dissection are closed.

3. Results

We recorded a series of 3 cases during the period of study. These cases are presented as follows:

3.1. Case 1

A 40-year-old woman gravida 6 para 3, presented to our department with a two-year history of vaginal mass with no associated symptoms. Her obstetrical history reported six uncomplicated pregnancy, three voluntary abortions, three vaginally delivery at term with a neonatal weight of 4100 g, 4000 g and 4150 g at delivery. Six months after giving birth, her husband began complaining of a sensation of vaginal mass during intercourse. This mass gradually became externalized, prompting a consultation to the gynecology outpatient department.

Clinical examination revealed a stage 3 uterine prolapse, associated with cystocele stage 1 (**Figure 1**). The maneuver of Ulmsten was normal, indicating the absence of associated stress urinary incontinence.

She underwent LSCP with anterior and posterior meshes, fixed to the promontory. Intraoperatively, there were no complications, the blood loss was 100 ml. The duration of surgery was 135 minutes. The post-operative period was unremarkable with good anatomical result. Clinical examination revealed no uterine nor bladder prolapse. The patient was discharged after 48 hours in hospital. she was regularly monitored for 1 year and follow-up was unremarkable.

3.2. Case 2

A 37-year-old woman gravida 4 para 4, with unremarkable medical condition, presented with vaginal mass that has gradually developed over the past 12 months after her last vaginal delivery, with no associated symptoms. She had 4 previous vaginal delivery, the last weighting 4200 g. Her physical examination revealed a stage 4 cystocele and stage 3 uterine prolapse without rectocele (**Figure 2A**) and

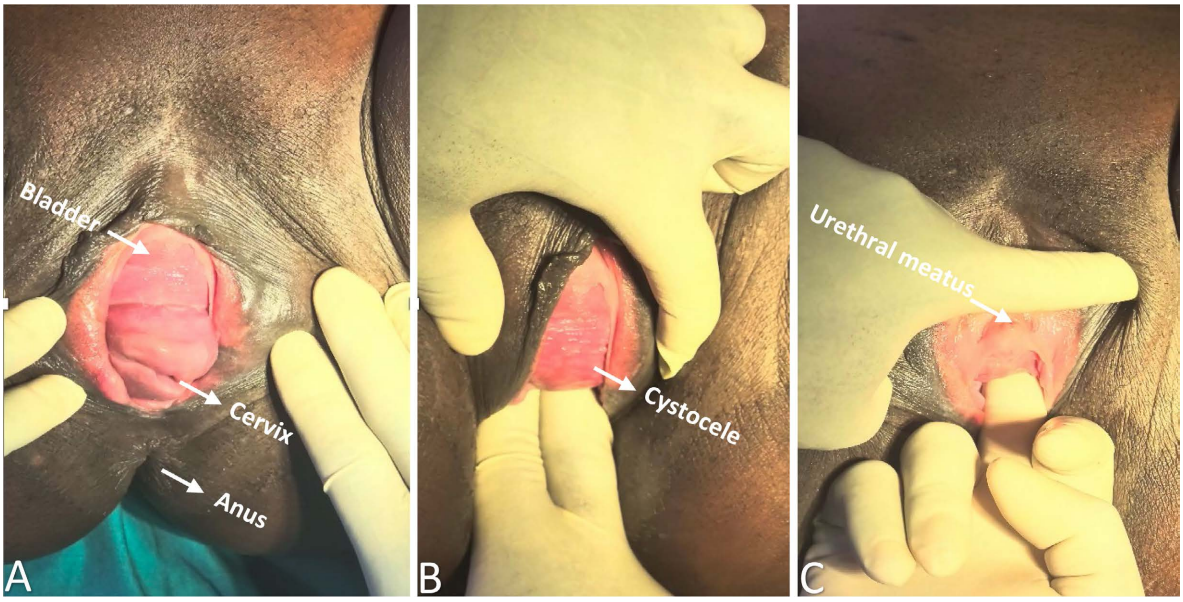


Figure 1. A. Uterine prolapse grade 3; B. Cystocele grade 1; C. Ulmsten Maneuver was normal, indicating the absence of stress urinary incontinence.

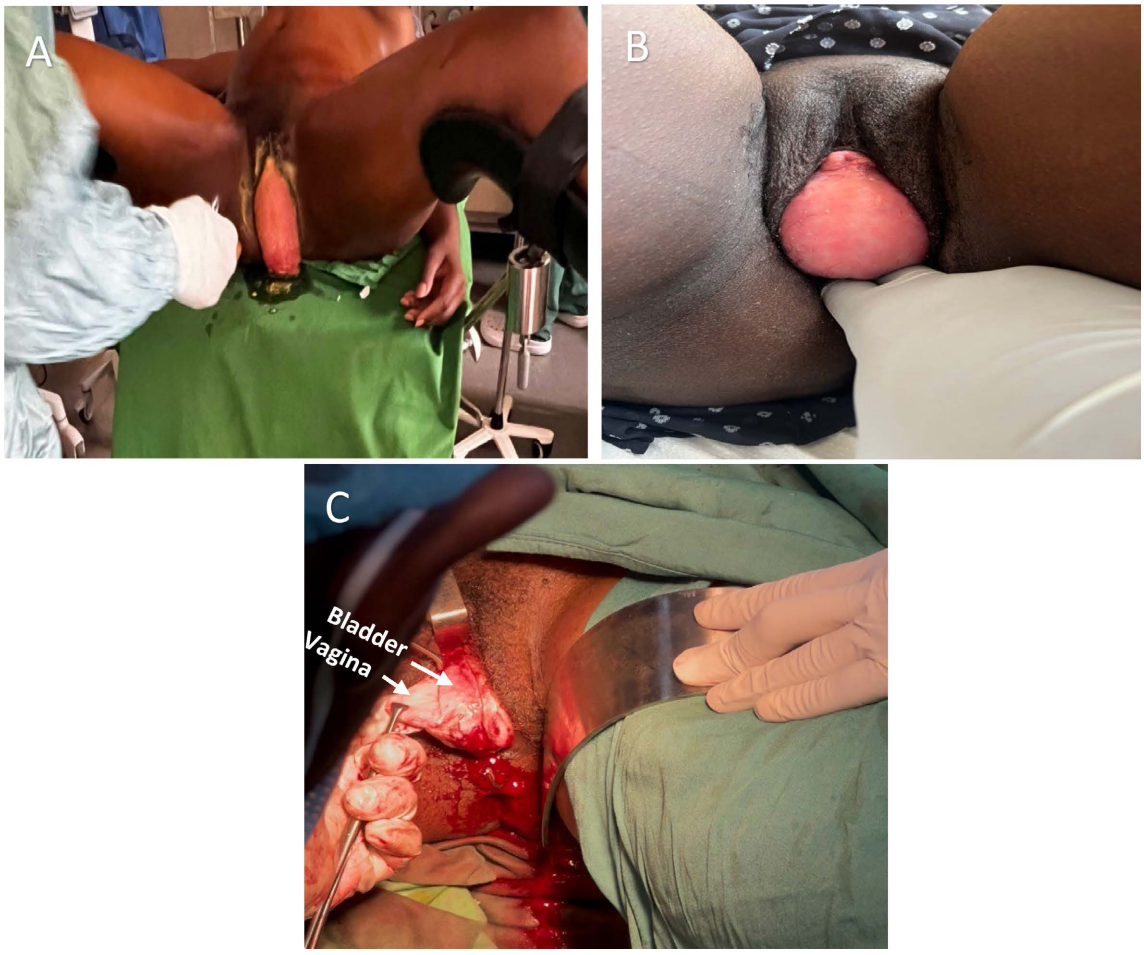


Figure 2. A. Stage 4 cystocele and stage 3 uterine prolapse; B. Cystocele after LSCP; C. anterior colporrhaphy with plication of the pubocervical fascia.

urinary stress incontinence. She underwent a LSCP lasting 202 minutes, which did not completely reduce the cystocele (Figure 2B). Therefore, 8 months later, she underwent a successful anterior colporrhaphy with plication of the pubocervical fascia (Figure 2C). The post-surgical course was uncomplicated, the follow up was regular and normal. Clinical examination revealed no uterine nor bladder prolapse. One year after the procedure, she became pregnant with no sign of recurrence during the pregnancy, apart from pelvic pain lateralized to the right that had persisted since the 2nd trimester. She gave birth at 38 weeks by caesarean section to a male newborn weighing 3500 g. The fibrosis associated with the prosthesis was intact with no sign of fracture.

3.3. Case 3

A 34-year-old woman gravida 2 para 1, with one uncomplicated vaginal delivery of a newborn weighting 3450 g, complained of vaginal mass in the past 2 years (from 3 months postpartum). The prolapse disappeared when lying flat, but gradually increased in size. Her medical history revealed a 5-year HIV infection, with normal follow up and negative viral load for 3 years. On clinical examination, the patient was in good general condition. There was a stage 3 uterine prolapse without cystocele and rectocele (Figure 3). We informed the patient of different treatments modalities. She opted for pessaries, but in view of her unavailability, she underwent LSCP, which was successful. The duration of surgery was 110 minutes. Postoperative period was uneventful. Clinical examination revealed no uterine prolapse. She was followed up for one year without signs of recurrence.

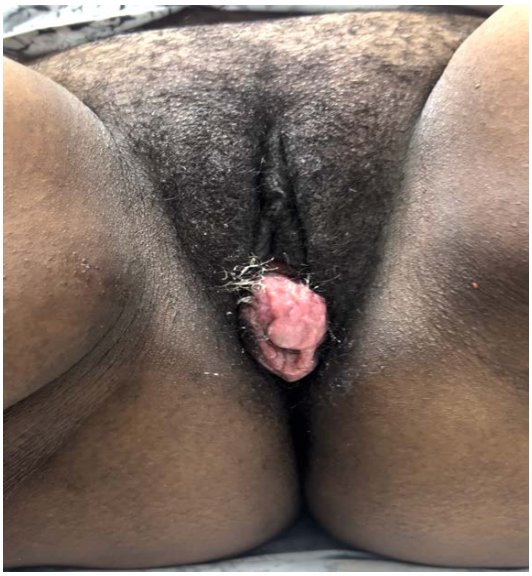
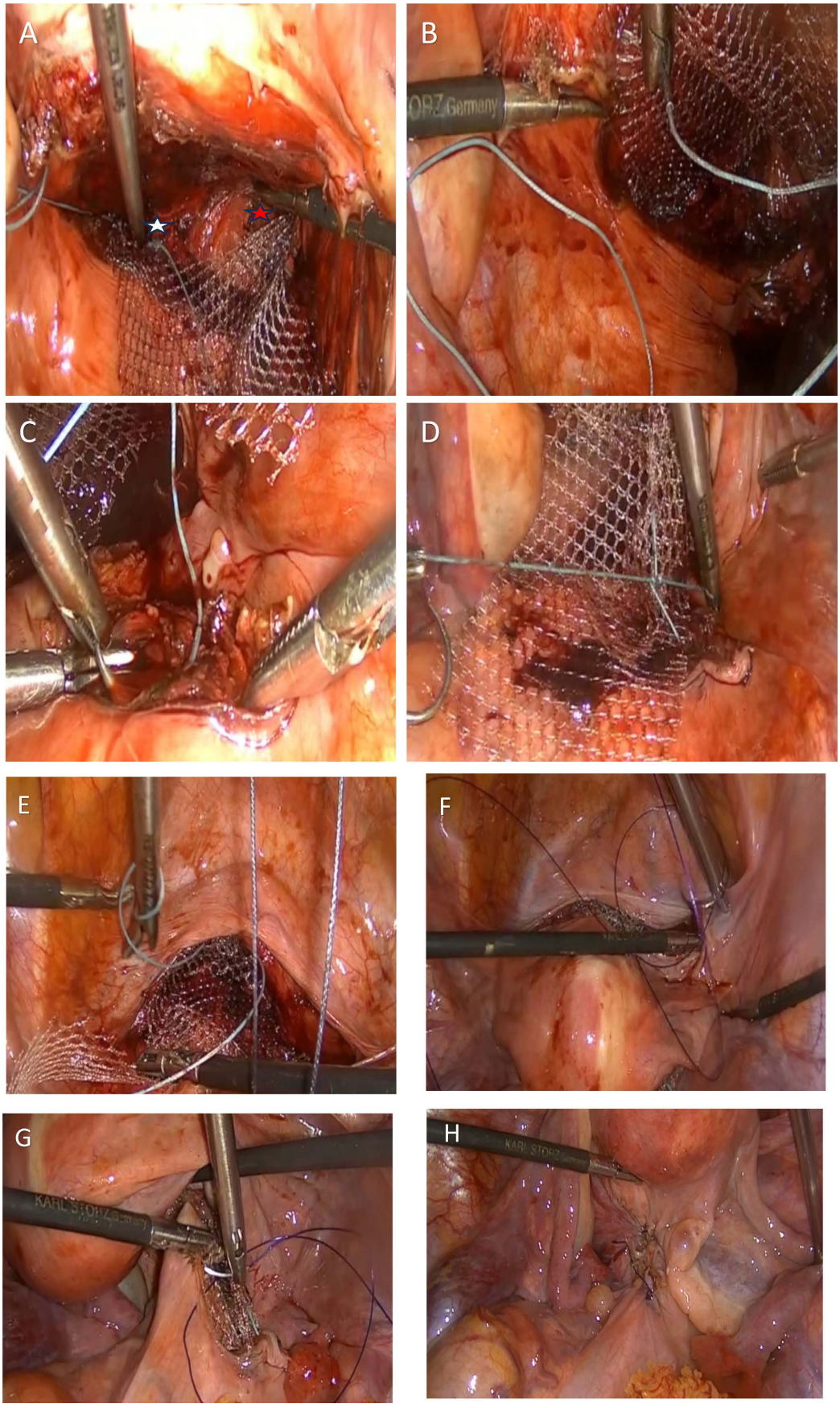


Figure 3. 3rd degree Uterine prolapse.

4. Discussion

According to the International Urogynecology Association, POP is defined as the descent of one or more of the anterior vaginal wall, posterior vaginal wall, the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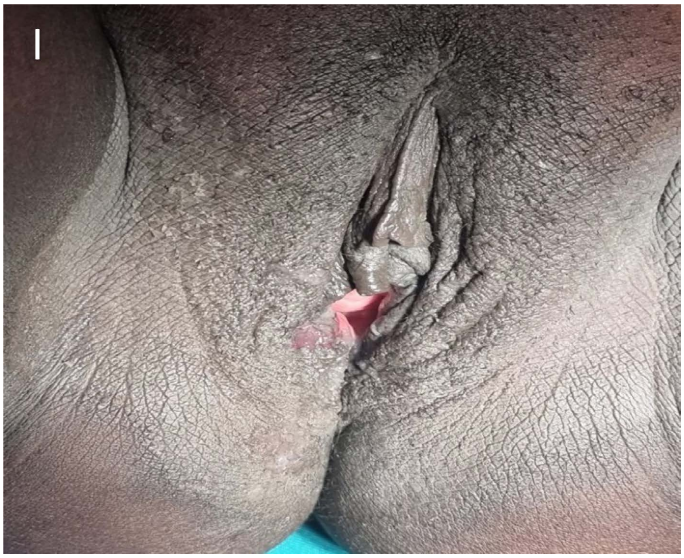

Figure 4. A. 2 arms of the mesh on right ( ) and left ( ) puborectalis; B. Anchoring mesh on uterosacral ligament; C-D. after dissection of sacral promontory, fixing mesh on anterior longitudinal ligament; E. anterior mesh is fixed on the anterior wall of vagina and on the isthmus, and arms are passing throw the broad ligament; F. Closure of vesicouterine peritoneum; G. posterior reperitonization; H. laparoscopic final view; I. Anatomical result.

uterus (cervix), or the apex of the vagina (vaginal vault or cuff scar after hysterectomy) [9]. It is not an uncommon condition, as 42.6% of women between the ages of 25 and 97 will have a pelvic floor disorder [10]. This incidence can reach 50% when POP is diagnosed during physical exercise [11]. In Cameroon, there are not many data on POP. One study showed that POP accounts for 0.8% of gynecological consultations [8].

POP is caused by combined failure of pelvic floor muscle and connective tissue [12]. Although this condition is frequent in postmenopausal women, young patient can also suffer from it as in our series (ranging from 34 to 40 years). Two of our patients (cases 1 and 2) were multiparous and had given birth to macrosomia. These obstetric conditions may explain the weakness of the pelvic floor muscles at the origin of the prolapse. The third patient had no obvious risk factors apart from a normal vaginal delivery. We have not formally ruled out a connective tissue or vaginal wall fascial tissues abnormalities in this case. However, it should be noted that because of heavy tasks and large amount of daily activity, African women are theoretically at risk of POP. Other risk factor or factor that influence the severity of POP over time, are obesity, conditions that increase intra-abdominal pressure such as chronic cough, soft tissue abnormalities such as Ehlers-Danlos syndrome, family history, and age [13].

Women with POP frequently report feeling heaviness in the vagina, as well as bladder and rectal symptoms. In our series, all patients presented with a mass protruding from the vagina. Some symptoms are sometimes nonspecific, and other like urinary and fecal incontinence are related to other pelvic floor disorders [14]. Although the Pelvic organ prolapse quantification system (POP-Q) [15] is the

most widely used assessment method in the world, it does not provide an adequate assessment of urogenital hiatus and perineal body [16]. According to the POP-Q, both anterior and apical compartments were damaged in two of our patients (case 1 and 2). None of them experienced stress urinary incontinence (SUI) after the Ulmsten maneuver. The association between POP and SUI has been reported [17]-[19], and 54% of patient with advanced stage reported subjective symptoms related to SUI [20]. It should be noted that the presence of anterior and apical POP can mask SUI symptoms that are revealed by POP repair, leading to de novo SUI after surgery [21].

Traditional abdominal surgery, vaginal surgery, laparoscopic and robotic surgery are various methods of treating POP surgically. According to recent research, the most effective treatment for apical prolapse is laparoscopic sacral colpopexy (LSCP), which has success rates between 78% to 100% [22], with potential benefits including shorter hospital stays, faster recovery periods, less blood loss, and less pain following surgery [23]. Our study has demonstrated the feasibility and safety of LSC in a developing country like Cameroon. To the best of our knowledge, this is the very first published study of this approach. However, this procedure which is technically challenging for urogynecologists, aims to relief symptoms and to restore the anatomical integrity of pelvic floor support. It requires high level laparoscopic operative skills to perform deep pelvic dissections and suturing, and to avoid associated intraoperative complications like vascular injuries, sacral nerve root damage [24]. For most authors, the reference technique is laparoscopic promontofixation with systematic anterior and posterior prostheses [25]. However, some publications have questioned the systematic use of the posterior prosthesis which is responsible for specific complications and side effects such as rectal injury, postoperative constipation and perianal pain [26]. In our series, the dissection was systematically performed anteriorly and posteriorly, with the insertion of two meshes. In our current practice, we have abandoned the systematic use of posterior prosthesis in the absence of a symptomatic rectocele. Each of our patients had apical prolapse (case 1, 2 and 3), two had anterior compartment prolapse (case 1 and 2), and none of them presented with rectocele. Our data corroborate those in the literature, which show that the anterior and apical compartments are generally those most affected [27] [28]. In our hands, mean operative time was 149 minutes ranging from 110 to 205 minutes. Similar variation was found in the literature [28]-[31], depending on the technique used. Duration of hospitalization was two days for all patients. Learning curve of LSCP surgery competency is achieved after 20 to 25 procedures, as well as reduced operating times being correlated with between 18 and 24 surgeries [32].

For all our patients, macroporous polypropylene mesh was used. Compared to native tissue, evidence suggests that it may be more effective to repair POP, even if it comes with higher risk of complications, with reoperation rate of 6%, and high risk of exposure [33]. In the literature, the LSCP technique differs according to many parameters, including number of meshes (anterior, posterior or both), the

level of fixation of the mesh, conservation of uterus or not, association with Burch colposuspension. Despite the absence of posterior compartment prolapse, we systematically placed an anterior and a posterior meshes, as POP is rarely confined to a single compartment, due to the weakness of pelvic connective tissue and collagen. All patients wished to have their uterus preserved. However, laparoscopic subtotal hysterectomy with LSCP by using mesh provides the strongest support for apical suspension, therefore, it has the highest anatomical success rate [34]. We opted for post-operative monitoring of stress urinary incontinence, which can be treated with a sub-urethral sling, a less time-consuming procedure than the Burch procedure, of which we have no experience. In case 2, we were unable to reduce the cystocele completely, as it was large stage 4 (**Figure 2**). Anterior dissection in this case often needs to be deeper, which was not the case in this patient. She presented a residual cystocele at the end of the operation. She underwent successful anterior colporrhaphy with plication of the pubocervical ligament (**Figure 2C**). With a mean follow-up of 24 months, none of them experienced complications or recurrence. Some complications, such as spondylodiscitis, may arise at a distance from the surgical procedure. It includes a spectrum of spinal infections such as discitis, osteomyelitis, epidural abscess, meningitis, subdural empyema, and spinal cord abscess [35].

Some complications are specific to LSCP intraoperatively. Due to the dissection of promontory, there is a risk of fatal hemorrhage, sacral nerve and ureteral injury, spondylodiscitis and sacral osteomyelitis, especially in patients with anatomical variations and obesity [24] [36]. Kotani *et al.* have proposed procedures for a secure LSCP surgery by conducting preoperative computed CT scans and perioperative ultrasounds of the promontory to avert separation of an extensive presacral region [37]. Therefore, laparoscopic lateral suspension [38] and laparoscopic pectopexy [6], which are less complex techniques with same anatomical and functional results, were developed. Other therapeutic modalities involve a non-surgical approach. if a symptomatic patient requires non-surgical treatment, a pessary can be offered. The most common pessaries for POP are the ring pessary and the Gellhorn pessary [39]. Although pelvic floor muscle training can reduce the symptoms associated with POP by improving muscle strength, it cannot restore the anatomy like the surgical approach [40].

Uterine-sparing surgeries for pelvic organ prolapse are currently increasing in popularity. Numerous variables affect this decision, including the wish to preserve fertility, the conviction that the uterus contributes to sexual function, and its importance in a woman's sense of identity [41]. One of our patients (case 2) became pregnant after LSCP, and gave birth to a healthy child by cesarean section. Throughout her pregnancy, we did not record a recurrence. Most data on pregnancy after prolapse surgery are case report or case series. Therefore, care must be taken in analyzing and interpreting these data, which require more robust studies. One systematic review on this topic demonstrated that LSCP enables an uneventful, full-term pregnancy without influencing the support of the apical compartment

[42].

The limitations of our study are the small size of our study population and the absence of comparison with other therapeutic means used in our department.

5. Conclusion

LSCP with mesh is a safe and viable approach of surgical management of pelvic organ prolapse. It aims to relief symptoms and to restore the anatomical integrity of pelvic floor support. Its advantages are related to those of laparoscopy, including shorter hospital stays, faster recovery periods, less blood loss, and less pain following surgery. However, this procedure is technically challenging for inexperienced urogynecologists. Our study has demonstrated the feasibility and safety of LSCP in a developing country like Cameroon.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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