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Laparoscopic Myomectomy in a Tertiary Care Centre in Douala, Cameroon

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Authors' contributions

This work was carried out in collaboration between all authors. Author TOE did all the surgical operations, wrote the protocol and wrote the first draft of the manuscript. Author GEEO managed the literature searches and pathologic analyses. Authors GEHE and CNT assisted in the surgical operations and managed the patients after surgery. Author EBP supervised and proofread the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To assess the feasibility and outcome of laparoscopic myomectomy with single or double-layer closure of myoma bed for management of myomas at a tertiary care centre in Douala, Cameroon.
Materials and Methods: Thirty patients with large or moderate-size myomas were managed

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laparoscopically from September 1996 to September 2008. The indications for surgery included subfertility, heavy menstrual bleeding, abdominal mass and lower abdominal pain. Pre-operative evaluation included history, clinical examination and sonographic mapping. Myomas were enucleated and retrieved laparoscopically by morcellation. Myoma beds were sutured in a single or double layer by endoscopic intra-corporeal suturing depending on the depth of the fibroids.

Results: Among our patients, 14 (46.7%) presented with subfertility, 8 (26.7%) with heavy menstrual flow and 6 (20%) with abdominal mass. Two (6.7%) presented with lower abdominal pain. The average maximum diameter of myoma was about 8.5 cm. The mean duration of surgery was 123.2±90 min and blood loss was minimal. The mean post-operative stay in hospital was averagely 3.03 days. There were no intra-operative complications recorded among our series and hospital stay was uneventful.

Conclusion: With proper single layer closure of the myoma bed, laparoscopic myomectomy is feasible for moderate and even large myomas not more than three fibroids, and has excellent outcomes.

Keywords: Laparoscopy; myomectomy; leiomyomas; single or double layer closure.

1. INTRODUCTION

Uterine leiomyomas or fibroids are the most common pelvic tumours in women, with a reported incidence of 20-25% [1,2]. Women who have had a liveborn child are at 20-50% reduced risk of uterine leiomyomata [3]. This reduction in risk increases with increasing number of liveborn children [4] with several studies showing that women who have had four or more births are at 70-80% lower risk than nulliparous women to develop uterine fibroids [5,6]. Age- adjusted uterine leiomyomata rates among black women are two to three times greater than the corresponding rates among white women [7,8]. Leiomyomas are clinically important because they are a major cause of abnormal uterine bleeding and are the most commonly cited reasons for hysterectomy [1,3,5]. Traditional treatment for leiomyomas has been surgical removal through either hysterectomy or myomectomy by laparotomy. Over the years, techniques and instrumentation have greatly improved, leading to newer surgical techniques such as hysteroscopic myomectomy/endometrial ablation, laparoscopic myomectomy/hysterectomy and robotic surgery [9–13].

The introduction of laparoscopic surgery in Cameroon has been since the early 1990s [14,15]. Since then, there has been improvement in the skills of those surgeons who practice the technique.

The aim of this study is to report our experience in advanced laparoscopic surgery and to show that this novel technique is also feasible and safe in low income economies.

2. MATERIALS AND METHODS

2.1 Study Design

The results of this study are based on the analysis of a prospectively recorded database including sociodemographic characteristics of women treated by laparoscopy at our institution during the period 1996-2008.

2.2 Study Procedure

The sociodemographic characteristics included age, marital status, education, social class, previous pregnancies, HIV, and serologic status. Most of the women seen at this specialty clinic are clinician-referred patients. The following information was recorded prospectively in a database during surgery: number of fibroids, largest diameter of fibroids, location (sub-serous, intra-mural, sessile or pediculated), and analysis was done according to the FIGO classification 2011 [16], and focused on the number of hysterotomies, type of suture used, position of uterine cavity (closed or open), and associated operative procedures. Enrolement into study was by convenient and consecutive sampling. We did not calculate the sample size needed for the study since patients treated laparoscopically during the study period were all included. The inclusion criteria into study were:

- Patients being treated for subfertility with leiomyomata causing endometrial distortion or tubal occlusion with normal ovulation and normal male factor.
- Patients with not more than three large leiomyomas between 3-10 cm each and

producing pressure symptoms, excessive menstrual bleeding or pain.
- Asymptomatic large leiomyomatas producing palpable abdominal mass up to mid-way between the umbilicus and symphysis pubis.

During the follow-up of these women, a detailed anamnesis and physical examination was obtained from each patient. All the patients underwent ultrasound scanning for mapping of leiomyomata: number, size, location and most importantly differentiating it from adenomyosis [17], hysterosalpingography (HSG) [18] and sonohysterography [19,20] to evaluate the uterine cavity and tubal patency. Some authors recommend Magnetic Resonance Imaging (MRI) [21,22] for the accurate mapping of fibroids. This modality was not used because of lack of equipment. Basic pre-anesthetic investigations included: Full blood count, coagulation studies, fasting blood sugar, HIV serology, and liver and kidney function tests. Any patient who was found to be anemic prior to booking for surgery was deferred and given iron supplementation for at least one month and rechecked before surgery. Bowel preparation was with X-Prep® one sachet taken the night before surgery. No patient received GnRH analog prior to surgery because of loss of cleavage plane associated with this medication and likely to render surgery difficult. All operations were performed under general anesthesia [23].

2.3 Operation Technique

The main steps in performing laparoscopic myomectomy were:

1) Hysterotomy (Fig. 1)
2) Enucleation of fibroid (Fig. 2)
3) Hysterorrhaphy in one or two layers
4) Morcellation with a steiner electric morcellator (Fig. 3)

Our technique for port placement involved sub-umbilical veress needle insertion with a point incision and a 10 mm sub umbilical primary Trocar for the telescope, and subsequently two lateral suprapubic 5 mm trocars and one median suprapubic 10 mm trocar all by trans-illumination (direct vision). All ancillary ports were also made so that they remain above and outside the biggest leiomyoma. The median 10 mm port was for the 10 mm toothed grasping forceps for big fibroids. On peritoneal entry all pelvic and abdominal structures were inspected and other pathologies, if present, noted. In most of the cases, we preferred to make a longitudinal incision over the most bulging part of the myoma with the monopolar hook. In case of multiple leiomyomas, we preferred to give single anterior or posterior incision in such a manner that most leiomyomas could be enucleated by a single incision from superficial to deepest locations. The leiomyomas were grasped with the 10 mm toothed grasping forceps and pulled towards the anterior abdominal wall and sharp dissection was carried out in the plane between myoma and the pseudo capsule with monopolar hook and hemostasis was assured with the bipolar forceps to minimize blood loss. The myomas were finally enucleated by traction on the myoma and counter traction on the uterus. After enucleation, there was usually no bleeding, but if at all there was, then bipolar coagulation was carried out. After achieving adequate hemostasis, myoma bed was sutured in a single or double layer with interrupted laparoscopic intra-corporeal stitches using polyglactin 910 No. 2 (Vicryl® Ethicon). We repaired the uterus in one or two layers depending on the depth of the hysterotomy.

Copious irrigation with normal saline 9‰ solution was carried out. Myomas were retrieved by the Steiner electric morcellator (Karl Storz, Germany) via a 15 mm sleeve. The operations were carried out by one surgeon with the same surgical team and with the same technique. It is noteworthy that during the study period there was only one Gynecologist performing laparoscopic surgery at the Department of Obstetrics and Gynecology of the Douala General Hospital, Cameroon. All patients were conscious and could sit up and walk in their rooms within 6 hrs of surgery. They were allowed to take fluids and semi-solid foods, started ambulation and deep breathing and leg raising exercise the next day and were discharged from hospital averagely after 3.03 days.

2.4 Data Management and Statistical Analysis

Thirty records of laparoscopic myomectomy were found out of 832 laparoscopies. We entered and analysed data with Microsoft Excel. In computing the socio-demographic characteristics of study participants, average number of fibroids measures of central tendencies (mean and standard deviation) was used while frequencies were used to compute level of education, religion, marital status, occupation, location and number of fibroids and outcome of laparoscopic myomectomy.

Fig. 1. Vertical posterior fundal incision with a monopolar hook

Fig. 2. Complete enucleation of fibroid

Fig. 3. Morcellation with a Steiner electric morcellator

2.5 Ethical Consideration

Authorization was obtained from the director of the Douala General Hospital to carry-out this study. Approval was also obtained from the ethics committee of the Douala General Hospital.

3. RESULTS

A total of 832 laparoscopies were performed at our service during the study period, out of which 0.4% (30/832) women underwent laparoscopic myomectomy.

Table 1: The average age of our patients was 35 (range 25-41). Most of the patients (63%) were married and 73.3% had undergone tertiary education. Majority of the patients were either in business (43.3%) or were private sector employees (36.7%). Most of them (76.7%) had health insurance coverage.

Table 1. Socio-demographic characteristics of patients

Variable	Number	Frequency (%)
Age (years)		
25-29	2	06.7
30-34	16	53.3
35-39	08	26.7
>40	04	13.3
Total	30	100
Average age	**35±31.9**	
Marital status		
Married	19	63.3
Single	08	26.7
Divorced	03	10.0
Total	30	100
Level of education		
Primary	00	00
Secondary	08	26.7
Tertiary	22	73.3
Total	30	100
Employment status		
Housewife	00	00
Business	13	43.3
Civil servant	06	20.0
Private Sector employee	11	36.7
Total	30	100
Payment modality		
Insurance coverage	23	76.7
Cash prepaid	07	23.3
Total	30	100

Table 2: Majority (46.7%) of the patients were subfertile and 26.7% had abnormal uterine bleeding. A total of 55 fibroids were diagnosed before surgery and were removed; but during surgery a total of 68 fibroids were found. Most of the fibroids were FIGO stage 4 (18%), stage 5 (32.7%) and stage 6 (25.5%). The average operation time was 123.2±90 minutes and the average number of fibroids removed per patient was 1.83. The complications encountered during surgery include conversion to laparotomy in 6 (20%) patients. Four (13.3%) patients had a blood loss of 500-750 ml that necessitated blood transfusion. Furthermore, twenty-six (86.7) patients had blood loss was <500 ml. The average hospital stay was 3.03 days.

All patients had an uneventful recovery. None of the patients had reactionary or late secondary hemorrhage. We did not perform a second look laparoscopy because of increased cost.

Table 3: Amongst the subgroup of patients who presented with subfertility, 64,3% (9/14) conceived after the surgery and had an uneventful antenatal course. They were all delivered by cesarean section during which minimal adhesions were noticed. No patient had rupture of myomectomy scar. All who had heavy menstrual bleeding had improvement of their symptoms. The two who had pelvic pain became symptom free.

4. DISCUSSION

Our study, set in the General Hospital in Douala, an urban town in Cameroon, aimed at reporting our experience in advanced laparoscopic surgery and showing that this novel technique is also feasible and safe in low income economies.

4.1 Prevalence of Laparoscopic Myomectomy

A total of 832 laparoscopies were performed at our service during the study period, out of which 0.4% (30/832) women underwent laparoscopic myomectomy.

In this era of minimal assess surgery, laparoscopic myomectomy has gained more grounds in the developed countries than in low income countries. The advantages of this technique over traditional laparotomy include less operative trauma and blood loss, reduced post-operative morbidity, shorter hospital stay and recovery time, earlier return to normal activity, fewer post-operative adhesions, better

cosmesis, improved patient compliance and better pregnancy outcomes [2,24]. Furthermore, the magnification provided by the telescope allows careful micro surgical dissection, development of avascular planes and perfect hemostasis [25]. Most of the patients in our series had tertiary level of education and insurance coverage.

Laparoscopic surgery has not been widely known or accepted by patients in Douala, Cameroon. The reason for this trend is that the DGH is a tertiary care centre offering specialized care and not accessible to all.

Furthermore, many gynecologists in Cameroon are not trained in laparoscopic surgery. Even those who are trained lack the skills in advanced laparoscopic surgery. Most of gynecologists still prefer open Myomectomy because of the technical difficulties in laparoscopic surgery or lack on their part of endoscopic intracorporeal suturing skills.

Most of our patients were FIGO stage 3-6 and the number of fibroids diagnosed before surgery was less than what was seen during surgery. This fact emphasizes the importance of a good preoperative transvaginal sonography or

Table 2. Clinical characteristics of patients

Variable	Number	Frequency (%)
Indication for Surgery		
Subfertility	14	46.7
Abnormal uterine bleeding	08	26.7
Abdominal mass	06	20
Lower Abdominal mass	02	06.6
Total	30	100
Operation time (minutes)		
150-180	9	30
100-150	21	70
Total	30	100
Average	123.2±90.3	
Number of Fibroid (FIGO stage) before surgery	**N=55**	**100**
Stage 3-100%im, touching endometrium	8	14.5
Stage 4-im	10	18.2
Stage 5-s/s-im≥50%	18	32.7
Stage 6-s/s –im<50%	14	25.5
Stage 7-pediculated	05	09.1
Total N°removed	**55**	**100**
Total N°found	68	
Average n°removed/patient	**1.83**	
Conversion to laparotomy		
Yes	06	20
No	24	80
Total	100	100
Average Blood loss (ml)		
<500	26	86.7
500-750	04	13.3
Blood transfusion		
Yes	04	13.3
No	26	86.7
Total	30	100
Post operative admission (days)		
2	09	30
3	15	50
4-5	06	20
Total	30	100
Average	**3.03±3.07**	

sonohysterography by a competent sonographer [16]. This fact emphasizes the importances of MRI for accurate mapping of fibroids. Besides, studies have shown its superiority over the other modalites [21,22]. The average number of fibroids removed was 1.83. This corroborates other studies. We had to convert to open surgery (laparotomy) in 20% cases because of multiple fibroids, greater than 3, [26] diagnosed during surgery, and because of excessive bleeding, greater than 500 ml, that required blood transfusion. The cases with excessive bleeding were those we handled when we just started performing laparoscopic myomectomy. At that stage we had some technical difficulties in assuring adequate hemostasis given that some cases were poorly selected.

Table 3. Outcome of laparoscopic myomectomy

Variable	Outcome	Number (%)
Sub-fertility	Pregnancy	
	Yes	9 (64.3%)
	No	5 (35.7%)
	Total	14 (100%)
Abnormal uterine bleeding	Reduced bleeding	
	Yes	8 (100%)
	No	0
	Total	8 (100%)
Abdominal mass	Present	0
	Absent	6 (100%)
	Total	6 (100%)
Lower abdominal pain	Present	0
	Absent	2 (100%)
	Total	2 (100%)

Some of the major concerns in laparoscopic surgery are the risk of hemorrhage and uterine rupture in subsequent pregnancies [27,28]. It has been reported that rupture can occur during the course of pregnancy or during delivery after removal of myomas. However, in experienced surgeon's hands, with superior skill of endo suturing, laparoscopic myomectomy is a very safe procedure and such complications are rare. Dubuisson et al. [29] found three cases of spontaneous uterine rupture in 100 pregnancies after laparoscopic myomectomy. Amongst these, only one rupture occurred at the laparoscopic myomectomy site. The strength of scar largely depends on proper meticulous closure of the incision site. That is why multiple layer closure gives much better results than single layer closure. It also gives much better approximation of the defect and a neat finish in the end of procedure. Based on the clinical trials and case series, it would appear that the risk of uterine rupture during pregnancy is no higher than 1% when the myomectomy incision is appropriately repaired [29]. We had no scar rupture during pregnancy even in very big leiomyomas and we performed prophylactic cesarean delivery in all our patients who conceived. However, elective cesarean births after laparoscopic myomectomy may have been an over-treatment because patients with subserous or pediculated fibroids may have given birth vaginally without risk. Nonetheless, we did not always have the detailed post-operative notes to help us make the appropriate delivery choice; nor the means of evaluating the strength of the uterine scar. Another complication causing much concern is the subsequent adhesion formation. This sometimes depends on the number of knots and blood debris left in-situ. The fewer the number of bulky knots, the lower the adhesion scores. However, this requires advanced suturing skills. Retrieval of large myoma still poses technical difficulties to a good number of surgeons. Morcellators have made this task much simpler [11,30]. The 12 or 15 mm claw forceps of the morcellator offers better grip and steadier traction. This reduces the operating time and the technical difficulty of the procedure considerably. The average operation time in our series was 123 minutes. This was longer than that reported by other studies [31]. We took extreme care to remove myomas in longer chips to reduce the morcellation time. Exact count of myomas and location of their parking in the abdomen was kept to avoid misplacing any myoma. Such misplaced myomas are a common cause of iatrogenic myomas as reported by Nezhat et al. [32], Huang PS et al. [33] and Cucinella et al. [34]. The average post-operative stay in hospital after surgery in our series was 3.03 days. This was similar to that reported in other studies [35].

Furthermore, recent studies have reported dissemination of occult sarcoma after laparoscopic morcellation of uterine fibroids [11] and there is already a shift in attitude after the food and drug administration (FDA) statement to that effect [36].

One of the major problems of laparoscopic myomectomy in Cameroon is that patients with fewer than five fibroids are hard to find. Most patients have more than 10 leiomyomatas and are therefore not suitable for laparoscopic myomectomy. This explains why we had only 0.4% laparoscopic myomectomies in our hospital during the study period. The place of

laparoscopic surgery in Cameroon would be in the lysis of adhesions after myomectomy by open surgery (laparotomy) [28,37,38].

5. STUDY LIMITATIONS

This is a monocentric study and results could not be generalized to other centres performing laparoscopic surgery. The number of patients who underwent laparoscopic myomectomy was also small.

6. CONCLUSIONS

Laparoscopic myomectomy has gained increasing popularity in the developed world since the early nineties. This technique is still to be mastered by gynecologists in most Sub-Saharan African countries.

The instruments are sometimes not accessible to most hospitals and not many gynecologic surgeons are familiar with this technique.

One of the most promising areas of laparoscopic surgery in Sub-Saharan Africa is laparoscopic adhesiolysis after myomectomy by laparotomy for multiple uterine fibroids because myomectomy is very adhesiogenic.

CONSENT

Written informed consent was obtained from all the participants before the surgery that led to this study.

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COMPETING INTERESTS

We declare that we have no any competing interests.

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