Research article

Laparoscopic myomectomy: A retrospective analysis of 432 cases

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Abstract

Overview: Laparoscopic myomectomy has become increasingly popular in Sri Lanka due to its favorable long term outcome. Purpose of this study is to evaluate not only laparoscopic myomectomy technique but also operative time, blood loss depending on site, size and number of fibroid.

Method: In this retrospective study we have analyzed data from 432 women who had undergone laparoscopic myomectomy at Colombo South Teaching Hospital, Sri Lanka during the period from 2011 January to 2021 January. Data were collected from patient database, hospital records and histopathology data base. Data were collected according to demographical details including age, BMI, parity and past surgical histories, myoma details including size, type, site and number, intraoperative details and postoperative data.

Results: Mean age of patients undergone laparoscopic myomectomy are 35.5 years (SD 6.083) Majority of the population (67%) were nulliparous. Indication wise 192 patients (44.4%) had pressure symptoms,137 patients (31.7%) presented with heavy menstrual bleeding and 103 patients (23.8%) had subfertility history. Regarding fibroids characteristics, single fibroid found in 168 patients (38.9%), fibroids between 2-4 found in 199 patients (46.1%) and fibroids 5-10 found in 65 patients (15%). Considering the location of fibroid, 192 patients (44.4%) had anterior wall, posterior wall in 125 (28.9%), fundal in 87 (20.1%), broad ligament in 21 (4.1%) and other locations in 7 patients (1.6%). Regard to type of the fibroids intramural fibroids identified in 196 patients (45.4%), sub serosal in 136 (31.5%), submucosal in 75 (17.4%) and pedunculated in 22 patients (5.1%).

Mean blood loss was 159.4 +/- 68.03 ml while mean operative time was 124 +/- 49.6 minutes. But those differs with number and size and site of the fibroids. Mean blood loss and operative time increased when fibroids number and size increased. Mean operative time is 92.23 minute for fibroid size less than 8cm vs 178.9 minute for fibroid more than 12cm. Mean blood loss is 115.25ml for fibroid less than 8cm vs 238.27ml for fibroid size more than 12cm. Mean operative time for single fibroid is 90.8 minute vs 179.5 minute for fibroids 5-10. Mean operative time and blood loss are increased with posterior wall and broad ligament fibroids. However, it is not statistically significant (P Value 0.006 and 0.008 respectively). Prolonged operative time did not impact on surgical outcomes in terms of hospital stay and blood transfusion.

Conclusion: In experienced and expert hand, laparoscopic myomectomy is a safe procedure with good surgical outcomes and low complication rate. Operative time and blood loss are mainly associated with the size of largest fibroid and number of fibroids. Open myomectomy may be of benefit for number of fibroids > 10 when considering completeness of surgery. Hand morcellation through suprapubic port is a safe and effective method of specimen retrieval in laparoscopic myomectomy.

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Introduction

Laparoscopic myomectomy is a challenging yet rewarding gynaecological surgery conducted world-wide by skilled laparoscopic surgeons. Colombo-South Teaching Hospital (CSTH) is the centre of excellence in gynaecology laparoscopic surgeries in Sri Lanka and lead by an experienced surgeon who has got more than 15 years of hands-on advanced gynaecological laparoscopic surgeries in Sri Lanka. Fibroids are benign hormone sensitive monoclonal tumours that could grow into a range of a few millimetres to a massive mass in 20 to 30% of women in reproductive age group[1,2]. Uterine leiomyomas can be debilitating to women not only in fertile age group but also in peri and post-menopausal age groups in many aspects. Fibroids can significantly affect their quality of lives due to abnormal uterine bleeding, pelvic pain, pressure symptoms leading to bladder and bowel symptoms, and subfertility. The symptoms and effects of fibroids on a woman depends on the size or the volume, number, and the location of the of leiomyomas. Paul et al, in his case series of uterine myomectomy has illustrated, pressure symptoms that negatively affect patient's quality of life, heavy uterine bleeding with failed medical therapy, infertility, rapid growth, and suspected sarcomas as indications for surgical management of fibroids[3]. Although there are several approaches of myomectomy including laparotomy, hysteroscopy, and MyoSure, laparoscopic approach remains the commonly proposed mode of myomectomy with quicker recovery time, minimal post-operative pain, minimal blood loss and minimal post-operative intra-abdominal adhesions[4,5]. Minimal access surgery remains the gold standard in many countries where the expertise is available. Even though there were many limitations for laparoscopic myomectomy in the past including the limitations caused by size and location of the fibroid, vascularity, and risk of intra-operative bleeding[6,7], with advancing technology and skilled surgeons there are virtually nil boundaries for the scope of laparoscopic approach in the contemporary.

Aims of our study were to analyze demographical, intraoperative and postoperative outcomes of 432 cases of laparoscopic myomectomy by a single surgeon in a tertiary center in Sri Lanka.

Material and methods

This is a retrospective analysis of laparoscopic myomectomies which were carried out by a single surgeon at professorial unit, Colombo South Teaching Hospital, University of Sri Jayewardenepura Sri Lanka. Data was collected in a 10 years period between 2011 January to 2020 January from all patients who underwent laparoscopic myomectomy. Pre operatively all women were assessed by abdominal examination with or without bimanual examination and fibroids mapping was done by ultrasound scan. Patients with fibroids more than ten and fibroid size more than 32 weeks size were not selected for laparoscopic surgery due to technical difficulties. Findings suggestive of uterine malignancies were referred to gyaneoncological unit and excluded from the research. All patients were preoperatively assessed for fitness for major surgery and general anesthesia. Informed written consent was taken from all patients prior to surgery.

Surgical technique: All cases were done under general anesthesia, patient was positioned to modified Lloyd-Davies position and bladder was empty using foley catheter. All patients were given intraoperative antibiotic prophylaxis and appropriate thromboprophylaxis. Laparoscopic entry was made through suprapubic or Palmers point using Veress needle. Another two ipsilateral and one contralateral ancillary ports were used. All cases were performed using 10mm telescope with Olympus laparoscopic stag. Intra-abdominal pressure of 15mmhg was maintain during the surgery. Vasopressin 20 IU diluted in 200ml of normal saline were injected to myometrium to reduce intraoperative blood loss and laparoscopic myoma screw was used to manipulate uterus by the assistant. Monopolar diathermy was used for initial incision and bipolar diathermy was used for subsequent dissection and achieving haemotasis at the setting of 45 watts cutting and 45 watts coagulation. Additionally, laparoscopy scissor and grasper were used and no other advanced energy devices were used for entire population. Myometrial defect was repaired using polyglactin layer by layer according to thickness of defect. However, practice changed to use of barb sutures since 2015 from its introductions. Specimens were retrieved by electro-mechanical morcellation through lateral port. With the evidence of electro-mechanical fibroid morcellation complications, practice is changed to hand morcellation through 4cm size suprapubic port with wound protector/retractor.

Data were collected from patient database, hospital records and histopathology data base. All data were cross checked by name and hospital register number to avoid duplication. Data were collected according to demographical details including age, BMI, parity and

past surgical histories, myoma details including size, type, site and number, intraoperative details and postoperative details. Data were entered in Microsoft Exel spread sheet and adhered to best clinical practice to ensure confidentiality. Ethical approval was taken from local ethics committee. However full ethical approval was not required as this was evaluation of an ongoing practice. SPSS version 28 was used for data analysis. Descriptive analysis was performed in all data and relationships between myoma characteristics and surgical outcomes were assessed using t test. P value <.05 was considered as significant.

Results

Four hundred and thirty-two patients underwent laparoscopic myomectomy during period of year 2010 to year 2020. Mean age of the population is 35.5 years (SD 6.083) Majority of the population (67%) were nulliparous. 13.4% had history of past laparoscopic surgery, 15.7% and 2.1% had history of past transverse suprapubic laparotomy and midline laparotomy respectively. Regarding indication for surgery, 192 patients (44.4%) had pressure symptoms, 137 patients (31.7%) presented with heavy menstrual bleeding and 103 patients (23.8%) had infertility. Number of surgeries per year has been gradually increased over period and there was 3-fold increment over last 5 years compared with initial five years.

Regarding fibroids characteristics, single fibroid found in 168 patients (38.9%), fibroids between 2-4 found in 199 patients (46.1%) and fibroids 5-10 found in 65 patients (15%). In 159 (36.8%) patients largest size of fibroid removed is < 8cm, in 169 patients (39.1%) its was between 8cm-12cm and in 104 patients (24.1%) it is more than 12cm. Considering the location of fibroid, 192 patients (44.4%) had anterior wall, posterior wall in 125 (28.9%), fundal in 87 (20.1%), broad ligament in 21 (4.1%) and other locations in 7 patients (1.6%). With regard to location intramural fibroids identified in 196 patients (45.4%), subserosal in 136 (31.5%), submucosal in 75 (17.4%) and pedunculated in 22 patients (5.1%).

With regards to intraoperative findings, intraoperative blood loss was 159.4 +/- 68.03 ml, mean operative time was 124 +/- 49.6 minutes. However, blood loss and operative time varies according to size, number and location of fibroids.

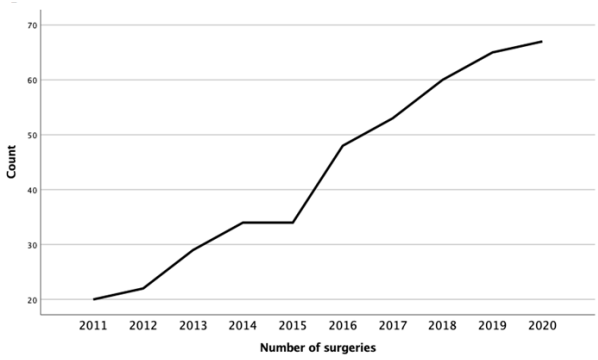


Figure 1.

Table 1. Comparison of fibroids number and size with surgical outcomes

	<8cm	**8cm - 12 cm**	**>12cm**	**P value**
Mean blood loss (ml)	115.25	152.4	238.27	<0.001
Operative time (min)	92.23	122.1	178.9	<0.001
	1 fibroid	**2-4 fibroids**	**5-10 fibroids**	**P value**
Mean blood loss (ml)	122	166.5	234	<0.001
Operative time (min)	90.8	135.1	179.5	<0.001

Table 2. Comparison between fibroid type and location with surgical outcomes

	Anterior	Posterior	Fundal	Broad ligament	Other	P value
Mean blood loss (ml)	163	170	145	127	117	.006
Operative time (min)	125.9	133.6	115.8	113.5	80	.008
	Sub mucosal	**Intra mural**	**Sub serosal**	**other**		**P value**
Mean blood loss (ml)	139	163.1	162.3	95		.008
Operative time (min)	90.8	135.1	179.5	60		.210

There were no intraoperative complications in 99.5% cases. There was a one bladder injury in a patient with past laparotomy and one intraoperative blood transfusion. 358 patients (82.9%) were discharged within first 24 hours of post-op period. 16.4% were discharged within first 48 hours and only 3 patients (0.7%) kept up to 72 hours. There were no major postoperative complications. However, two patients received blood transfusions, 8 patients developed febrile morbidity and 13 patients stayed in ward for additional 24 hours due to pain. There were no cases that required conversion to laparotomy. All specimen histology was reported as benign. Disseminated leiomyomatosis or parasitic myomas were not reported in any case during follow up.

Not only total number but also number of complicated surgeries have been increased over the past 10 years period of time. Majority of surgeries with fibroid size >12cm were performed during last 5 years (Figure 2). Despite the complexity of surgeries and change of specimen retrieval method, operative time, blood loss, intraoperative and postoperative complications were not changed.

Discussion

Myomectomy is the most common procedure for symptomatic fibroids in reproductive age women. It can be done as open surgery, laparoscopically or hysteroscopically. Laparoscopic approach has many advantages including minimal blood loss, reduced requirement of post op analgesia, short hospital stay, minimal adhesion formation, early return to activities and better cosmetic outcome[8-10]. However, there are limitations associated with laparoscopic approach such as prolonged operative time, risk of convertion to laparotomy, risk of reopening and complications related to specimen retrieval[11-14]. Mais et al[15] shows that there is no significant difference in between open myomectomy and laparoscopic myomectomy in terms of bleeding and operative time. Hysteroscopic myomectomy is the choice of surgery for FIGO type 0,1 and 2 myo-mata[16,17].

This is the largest study of laparoscopic myomectomy reported in Sri Lanka. All surgeries were performed by experienced consultant gynaecologist and assisted by a senior trainee. Our population mean age is 35.5 years and majority are nulliparous which are similar findings when compared with other case series. In our study, total 1285 fibroids were removed and the largest one was 30cm (range 4cm-30cm). However, when the total number of fibroids were more than 10 in a single patient, it was not selected for laparoscopy as it is associated with risk of incomplete removal of all fibroids and prolonged operative time. Historically, fibroid size less than 8cm and two or less total fibroids were selected for laparoscopy surgery[18]. But with advancement of technology and with more surgical skills, these boundaries have been overcome. When reviewing literature, average number of fibroids were removed range from 1-4 and largest size of fibroid removed range from 5cm-20cm.

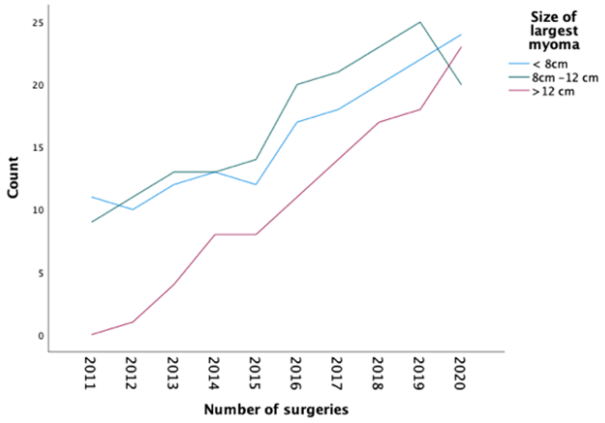


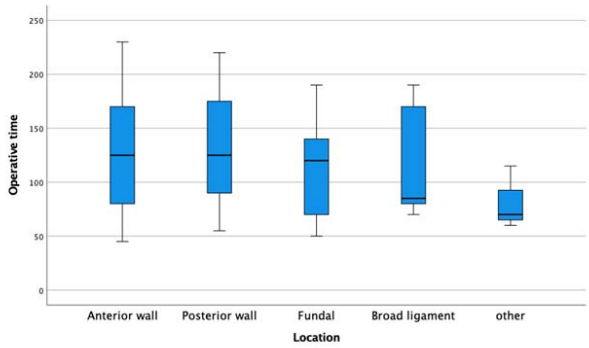
Figure 2.

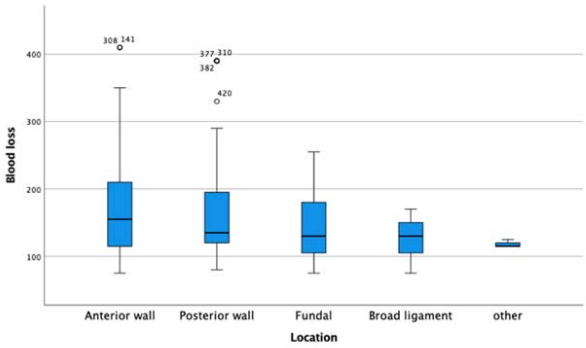
Average operative time in our sample is 124.8 minute. Main factors that determine the operative time were the size of fibroid and number of fibroids (Table 1). These findings are compatible with literature[11,19,20]. When compared with the location of fibroids, posterior wall fibroids and broad ligament fibroids consumed more operative time than others. However, it is not statistically significant when logistic regression done for size and number of fibroids (p-0.172). prolonged operative time did not impact on surgical out comes in terms of hospital stay and blood transfusion. However, there is a statistical significant association with post-operative pain (p<.001) and febrile morbidity (p<.001). Change of the practice of specimen retrieval technique from electro-mechanical morcellation to hand morcellation through suprapubic port with wound protector/ retractor did not affect surgical outcomes in terms of operative time, hospital stay, and additional requirement of analgesia.

Mean estimated blood loss in our population was 159.4 ml (SD 68.03) which is comparable with literature 11,19-21 Three patients required blood transfusion. Size of the largest fibroid and number of fibroids are main determinant factors for intraoperative blood loss. Use of intraoperative vasopressin and achieving proper surgical plane are important factors to reduce blood loss. However there was no relationship between blood loss and location of fibroids.

Overall complication rate in our population is 5.4% which include blood transfusion (0.5%), febrile morbidity (1.9%) and postoperative pain which required additional analgesia (3%). These findings are compatible with previous studies. According to literature, conversion rate of laparoscopy to laparotomy range from 0.1% to 29%. Main contributing factors are size of the fibroid, location and number[3,22,23]. Good case selection and increasing experience with expertise contributed to bring down the conversion rate to zero in our study despite of tackling larger size of fibroids and greater number of fibroids. Majority of patients were discharged within first 24 hours following surgery which is compatible with other studies [11,20,21,24]. Operative time and duration of hospital stay has significant association (p<.001). However, location of fibroid or type of fibroid did not have any impact on duration of hospital stay.

With the new evidence, FDA discourages use of electro-mechanical morcellation from 2014[25]. Our new technique of hand morcellation through suprapubic port with wound protector has better outcomes without compromising operative time, additional need of postoperative analgesia, wound infection or hospital stay. There wasn't a single case of dissemination of fibroids reported.





Conclusion

In experienced and expert hand, laparoscopic myomectomy is a safe procedure with good surgical outcomes and low complication rate. Operative time and blood loss are mainly associated with size of largest fibroid and number of fibroids. Open myomectomy may benefit for number of fibroids >10 when considering completeness of surgery. Hand morcellation through suprapubic port is a safe and effective method of specimen retrieval.

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