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Research Article

CLINICAL AUDIT OF LAPAROSCOPIC MYOMA MORCELLATION IN ATERTIARY CARE HOSPITAL OF SOUTH DELHI, INDIA

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A B S T R A C T

Uterine fibroids are the most common benign tumors occurring in 20 - 50% women in the reproductive age group. Laparoscopic myomectomy offers many advantages compared to open abdominal surgery. Two Most dreaded complication of Laparoscopic myoma morcellation are the risk of potential leiomyosarcoma (LMS) in a fibroid and Disseminated peritoneal leiomyomatosis (DPL). Our selection of cases was based on "Manchanda's Endoscopic Centre (MEC) Ultrasonographic leiomyosarcoma risk scoring system" and normal LDH 3 levels, that eliminated the risk of harbouring leiomyosarcoma in myomectomy specimen. Further, we performed "In bag" morcellation for all the cases that reduced the risk of DPL to zero. However we recommend delayed suture removal at morcellator port site, as multiple handling at this port may hamper blood supply and requires prolonged approximation.

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INTRODUCTION

Uterine leiomyoma are also referred to as myoma, fibromyoma or uterine fibroid, is the most common benign Gynecologic neoplasm that affects women of reproductive age.

Myomectomy is commonly performed surgery for the treatment of symptomatic fibroid uterus and the evolution of minimally invasive approaches have greatly decreased the postoperative hospital stay, intraoperative &postoperative morbidity and mortality. However, when specimens are large, minimally invasive myomectomy procedures require the fragmentation of tissue through morcellation, either with a laparoscopic power morcellator or with a scissors for removal from the abdominal cavity. Fragmentation of these tissues may lead to seeding and the development of parasitic fibroids[1.]

In-bag morcellation has been found to reduce the risk of possible tumorous spread. Food and Drug Administration (FDA) on 24 November 2014 advised against power morcellation, particularly in perimenopausal and postmenopausal women[2]. The risk of potential leiomyosarcoma (LMS), in a fibroid is less than 1 in 500 to 1:7400, But there is no single investigation that can warn of leiomyosarcoma[3]

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It was found that LMS in women having a myomectomy is lower than in those having a hysterectomy, probably because myomectomy is done in a younger group of women who want to preserve their fertility.

Literature search reveals that the complications associated with Laparoscopic myomectomy are following[3-5]

1. Overall complication rates vary between 0.1% and 1.3%.
2. Bowel Injury risk is 0.04%
3. Major vessels injury risk is 0.02%-0.04% (30%-50% of bowel injuries and 13%-50% of all vascular injuries are not detected immediately during the operation, resulting in correspondingly high morbidity and mortality rates)
4. Blood loss approximates 84 to 1200 ml
5. Conversion to laparotomy rate is between 0.34% and 2.7%
6. Hospital stay < 2 days
7. Incidence of parasitic fibroids after laparoscopic myomectomy with the use of morcellation is 0.9% to 0.12%
8. Morcellator technical problems were (0.12-0.3%), with transient stacking being the most frequent issue.
9. Late complications referred to as secondary lesions occur in 0.5% of cases,which includes secondary bowel lesions associated with peritonitis, intra-abdominal or wound infection.

Present audit was performed to explore the challenges and complication that occurred following myomectomy in our Institution.

Aim

1. To explore the Operative challenges and complications that occurred with myomectomy in our Institution, for past 3 years.
2. To compare the complication rates with other studies
3. To formulate certain practical recommendations to avoid associated complications, preoperative assessment of the risk of sarcoma morcellation in women planed for laparoscopic myomectomy.

MATERIAL AND METHODS

A Retrospective Cross sectional analysis of 3 years from September 2014 to August 2018 was done. Case records of women, who were considered low risk for leiomyosarcoma according to the inclusion criteria and underwent Laparoscopic myomectomy at our tertiary Centre (Pushpawati Singhania Research Institute, Delhi) were reviewed to obtain information about socio-demographic (age, gravidity, parity, menopausal status, and history of malignancy) characterstics, clinical profile, duration of surgery, blood loss, blood transfusion, postoperative morbidity, wound condition ,duration of Hospital stay, visceral injury, conversion to laparotomy, Tumor type according to the pathology reports etc.

Inclusion criteria

1. Women with score less than 8 according to Manchanda's Endoscopic Centre (MEC) ultrasonographic score [*based on Morphological Uterus Sonographic Assessment (MUSA)*[6] *and vascular score* [7]]
2. Normal levels of lactate dehydrogenase isoenzyme 3 (LDH3) 100-190 U/L

Table 1 Manchanda's Endoscopic Centre (MEC) Ultrasonographic leiomyosarcoma risk scoring system

S no.	Features	Score 0	Score 1	Score 2	Score 3	Score 4
1	Age	< 20 yrs	20 - 40 yrs	-	-	>40 yrs
2	Fibroid size	-	< 2cms	2-5 cms	5-8 cms	>8cms
3	Fertility status	infertile	fertile	-	-	-
4	No. of lesions	-	single		multiple	-
5	Cystic degeneration	-	absent	present		-
6	Echotexture	-	homogenous	inhomogenous	Varied echotexture	-
7	Echogenicity in relation to myometrium	-	hyperechogenic	isoechogenic	hypoechogenic	-
8	vascularity	-	Absent blood flow	Minimal flow	Moderate flow	Marked flow

Total score 24

- Low risk score (no risk of leiomyoscarcoma) < 8
- Moderate score (doubtful risk of leiomyoscarcoma) 8- 16
- High risk score (highly suggestive of malignancy) > 16

As per the protocol of our institution, anaemic patients were given GnRh agonist 3.75 mg IM for 3 doses preoperatively to build up Hb and also for tumor shrinkage. Intaoperatively inj Tranexamic acid 500 mg was routinely given and then continued, 6th hourly for 24 hours.

Essential instruments used for laparoscopic myomectomy included unipolar electrode, harmonic scalpel, bipolar forceps, and clawed grasping forceps ansd scissors. In addition dilute vasopressin (Pitressin: 1 Ampule of 20 IU in 300 mL normal saline) decreased the amount of blood loss.3-5 mL dilute Pitressin was injected into the base of the myoma stalk at its junction with the uterine fundus and also into multiple sites between the myometrium and fibroid capsule,until blanching was visualized. Bleeding areas were coagulated with bipolar forceps.

An incision is made on the serosa overlying the leiomyoma, using monopolar electrode, or harmonic scalpel and it was extended until it reaches the level of the fibroid capsule. Grasping, toothed forceps was used to hold the edges of the myometrium, and the suction-irrigator was used as a blunt probe to shell out the leiomyoma from its capsule. A myoma screw or laparoscopic single toothed tenaculum is inserted into the leiomyoma to apply traction while the suction-irrigator is used as a blunt dissector.

To remove myoma from the abdominal cavity through laparoscopic ports, Karl storz laparoscopic power morcellator and sterilised urobag was used for "contained" or "in bag " morcellation. This allows rapid spinning blades to fragment the tissues into smaller pieces and helps their removal through a small incision, thus preventing these fragments from getting implanted elsewhere.

After complete removal of the myoma, haemostasis was achieved and the edges of the uterine defect were approximated by suturing.

Patients were followed up until 6 weeks and suture removal was done on 7th postoperative day.

RESULT

Total 73 women fulfilled the inclusion criteria and were considered for the analysis. Majority belonged to 30 - 40 years of age group and 64.3% were nulliparous. Most common symptom at the presentation was abnormal uterine bleeding with infertility 42.4% (Table 2)

Table 2 Socio-demographic Profile

Age (years)	**N= 73 (%)**
< 20	2 (2.7%)
20 - 30	22(30%)
30 -40	37 (51%)
>40	12 (16.4%)
Parity :	
• Nulliparous	47 (64.3%)
• Primiparous	24 (33%)
• Multiparous	2
Complaint:	
• Abnormal uterine bleeding (AUB)	9 (12.3%)
• Infertility	29 (40%)
• AUB & Infertility	31(42.4%)
• Pressure symptoms	4 (5.5%)

60.2% were Intramural and 39.7% were subserosal fibroids. Majority 53.4% were more than 8 cm large and mean size & number of Fibroids removed were 8.66 ± 2.83 SD and 6 ± 4.62 SD respectively (Table 3)

Table 3 Fibroid characterstics

Type of Fibroid	**N (%)**
• Intramural	44 (60.2%)
• Suserosal	29 (39.7%)
Size of Fibroid	

• < 2cm	5 (6.8%)
• 2-5cm	12 (16.3%)
• 5-8cm	17 (23.2%)
• >8	39 (53.4%)
mean size of fibroids	8.66 ± 2.83 SD
Mean number of Fibroids removed	6 ± 4.62 SD

Duration of surgery was 2hours to 2 hrs & 30 min irrespective of size and number of the fibroids. However average time for myoma enucleation was 45 min and remaining time was spent in morcellation . 8.2 % women required blood transfusion and majority of them were anaemic preoperatively. Biggest challange was morcellator stacking and needed specimen cutting with scissors for specimen retrieval. None of the women required conversion to laparotomy or had bowel & bladder injury (Table 4)

Table 4 Intraoperative characterstics and complications

Intraoperative characterstics	
• Average blood loss	150.14 ± 221.10ml
• Duration of surgery	180±15.21 min
• Duration of morcellation	90±25.15 min
• Need for Blood transfusion	6/73 (8.2%)
Intraoperative complications	
• Morcellator stacking	8/73 (11%)
• Bowel injury	0
• Bladder or urinary injury	0
• Conversion to Laparotomy	0

Important complication noticed postoperatively was wound dehiscence in 2.73% women. None of the myoma specimen reported leiomyosarcoma on histopathology and none developed Disseminated peritoneal leiomyomatosis during their follow up (Table 5)

Table 5 Postoperative characterstics and complications

Need of Blood transfusion	**3/73 (4.1%)**
Wound dehiscence	2/73 (2.73%)
Bowel & Bladder morbidity	0
Leiomyosarcoma on histopathology	0
Disseminated peritoneal leiomyomatosis	0

DISCUSSION

Uterine fibroids are the most common benign tumors occurring in 20 - 50% women in the reproductive age group. Laparoscopic myomectomy (LM) offers many advantages compared to open abdominal surgery such as prompt recovery, short hospital stay, cosmetically improved scar and comparatively reduced adhesions from the procedure. Laparoscopic myomectomy was first time done in 1979 exclusively for subserous fibroids[8]

Current consensus regarding LM is individual choice based on radio- pathological findings and surgical skill. However excellent results are achieves if the fibroid is 8-10 cm and the total number should not exceed four or a single intramural or subserosal fibroid ≤15 cm or three or fewer fibroids of ≤5 cm. Differentiating leiomyoma from leiomyosarcoma is a difficult challenge. There is not any clinical sign or symptom, biochemical or imaging marker that may lead to precise preoperative distinction between these two and postoperative histological analysis is the only tool for the definitive diagnosis[9]

The Morphological Uterus Sonographic Assessment (MUSA) consensus paper, published in 2015, provides extensive sonographic features of myometrium and myometrial lesions. International Ovarian Tumor Analysis (IOTA) Consensus Group, reported that increased central and peripheral vascularity had a sensitivity, specificity, and positive predictive value (PPV) of 100%, 86%, and 19% in the diagnosis of LMS[6,7.]

The importance of biochemical or tumor markers to help in the diagnosis of LMS has been reported. Some studies observed the correlation between high levels of lactate dehydrogenase (LDH 3) and the pathological diagnosis of LMS

Goto *et al*. observed increased level of total LDH and LDH3 in all patients with LMS (LDH3, sensitivity and specificity 90% and 92.3%) [10]. Elevated serum cancer antigen 125 (CA125) has been occasionally observed in advanced LMS.

Seidman *et al*[11] observed that unexpected diagnoses of leiomyoma variants or atypical and malignant smooth muscle tumors had occurred in 1.2% of cases using power morcellation for uterine fibroids. Sizzi *et al* found 1 case out of 2050 procedures (0.04%) [12]. We did not observe any case of malignancy in myomectomy specimen on histopathological examinations.

The process of morcellation produces fragments of tissue which may be left behind and go on to seed the peritoneal cavity and produces parasitic myomas, masses, adenomyosis, and Disseminated peritoneal leiomyomatosis (DPL)[13]. DPL is a rare condition characterized by scattered smooth muscle nodules over the peritoneal surfaces that can mimic peritoneal carcinomatosis macroscopically. Approximately 100 cases of DPL has been documented and they are clinically benign with spontaneous regression partially or completely, but may also progress and undergo malignant transformation. We did not experience any complication due to morcellated fragments [14,15].

Uterine rupture following myomectomy is rare accounting for 2% of all pregnancy-related uterine ruptures, due to inadequate myometrial approximation and poor healing. Spontaneous improvement in abortion rate is 41% prior to surgery to 19% following myomectomy.

Major intraoperative and postoperative complications associated with laparoscopic myomectomy are rare in skilled surgeon's hands including bladder, bowel, and ureteral injury, intraoperative and postoperative hemorrhage requiring transfusion, and unintended conversion to hysterectomy, fistula, thrombosis, and embolism[17].

Author's Observations	Recommendations
None of the Laparoscopic myomectomy specimen harboured sarcoma	We recommend universal acceptance of "Manchanda's Endoscopic Centre (MEC) Ultrasonographic leiomyosarcoma risk scoring system"
None developed Disseminated peritoneal leiomyomatosis	For selection of the cases "contained" or "in bag " morcellation is recommended. Sterilised urobag can be utilized for this purpose
Minimal intraoperative blood loss	Injection Trenexamic acid 500 mg intraoperatively and continued 6th hourly for next 24 hours
%women had superficial wound dehiscence at morcellator port	Morcellator port site, delayed suture removal on 12 -14th day is recommended.

CONCLUSION

Meticulous patient evaluation should be performed before choosing the type and route of operation, and every effort

should be made to eliminate the likelihood of any complications including malignancy before surgery.

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