

A Study of Myomectomy and Post Myomectomy Sequelae

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ABSTRACT

Background: Leiomyoma is the most common benign tumor detected in 25-40% women of reproductive age group. Myomectomy is surgical procedure for women with leiomyoma who want to preserve their uterus. Post myomectomy sequelae is study of conception after myomectomy, recurrence rate, febrile morbidity, post op blood transfusion rate, adhesions rate at myomectomy scar and in adnexa

Objective: To study patients with infertility and leiomyoma and who have undergone myomectomy and their follow-up to find the outcome.

Materials and methods: A prospective observational study of 22 patients with infertility who underwent myomectomy for Leiomyoma at Gunasheela Surgical and Maternity Hospital from June 2007 to June 2009.

Results: In our study majority of the patients had open myomectomy. A second look laparoscopy was done to look for adhesions and tubal patency and was followed up. Total pregnancy rate was 54.54 %, febrile morbidity in 13%, hemorrhage requiring blood transfusion in 1 patient, wound infection in 1 patient and 2 (9%) had recurrence, 3 (15.79%) were free of adhesions, 4 (21.05%) had moderate adhesions and 7 (36.84%) had severe adhesions according to modified American fertility score classification.

Conclusion: Myomectomy increases the pregnancy rate when myoma was the only cause for infertility. Second look laparoscopy and adhesiolysis is recommended to all cases to evaluate the efficacy of the first surgery. Further larger studies and large sample size is required to confirm the results.

Keywords: Myomectomy, Pregnancy, Infertility, Adhesion

INTRODUCTION

Leiomyomas are benign smooth muscle neoplasm that typically originates from the myometrium. It is estimated that 2 to 3 percent of infertility cases are due solely to leiomyomas [1]. Leiomyomas may occur singly but often are multiple. According to the location leiomyoma can be interstitial, sub-serous, and sub-mucous.

Most are asymptomatic, less than 50% show symptoms of abnormal bleeding, pelvic pain, abdominal contour distortion, infertility, recurrent abortions, pressure symptoms and malignancy.

Myomectomy is advisable for women who wish to preserve their uterus and childbearing capabilities and is needed when myomas are either asymptomatic but growing rapidly and causing infertility or recurrent abortions or symptomatic causing abnormal uterine bleeding or pain.

Diagnosis is by Abdominal and trans-vaginal ultrasound with color flow Doppler, Saline-infusion sonography, hysteroscopy, hysterosalpingography and Magnetic

resonance imaging being accurate. In infertile patients, other investigations are also done.

Management options for leiomyoma are observation, medical treatment, Uterine Artery Embolization, MRI-Guided Focused Ultrasound Surgery for Uterine Fibroids. Surgical Management is Hysterectomy, myomectomy, myolysis and hysteroscopic resection of fibroid.

ASRM guidelines 2008 recommend that myomectomy is a relatively safe surgical procedure associated with few serious complications. In infertile women and those with recurrent pregnancy loss, myomectomy should be

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considered only after a thorough evaluation has been completed [2]. The possible risks of operation include adhesion formation, intrauterine synechia, blood transfusion and unexpected hysterectomy, should be balanced against the potential benefits.

Types of myomectomy are abdominal myomectomy, vaginal myomectomy, Laparoscopic myomectomy, Laparoscopic Assisted Myomectomy (LAM), Hysteroscopic myomectomy, Robotic myomectomy, Cesarean myomectomy.

A second-look laparoscopy should be proposed to patients desiring pregnancy.

Post myomectomy sequelae include febrile morbidity, postoperative blood transfusion, adhesions, Conception rate, miscarriages rate and recurrence rate.

In present study we analyzed infertile patients who underwent myomectomy and were followed up to know the fertility outcome and post myomectomy sequelae.

MATERIALS AND METHODS

The present study was carried out in Department of Obstetrics and Gynecology, Gunasheela Surgical and Maternity Hospital Bangalore India from June 2007 to June 2009.

It was a hospital based prospective observational study.

A total of 22 patients with infertility with proven myomas on ultrasound, who underwent myomectomy after fulfilling exclusion and inclusion criteria and after informed consent was chosen.

Inclusion criteria

- Woman in the age group between 18-40 years with proven Leiomyoma by clinically or ultrasound or laparoscopy
- Patients who have undergone myomectomy by any of the surgical methods mentioned above
- Patients with recurrent abortions

Exclusion criteria

- Myoma with associated other infertility factors
- Large myomata with severe degree of symptomatic adenomyosis
- Myomata with PID and tubo-ovarian masses
- Myomata with endometriosis
- Post-menopausal women.

After initial preoperative evaluation and consent, 19 patients underwent laparotomy and 3 Laparoscopic myomectomy and out of 22, 3 patients underwent hysteroscopic myomectomy also.

Myomectomy was performed through a Pfannenstiel incision under combined spinal and epidural anesthesia. A sterile aqueous solution of synthetic vasopressin about 20 units diluted in 20 mL of saline was injected along the planned serosal incision in order to reduce intra-operative bleeding. The myoma was exposed after a curvilinear incision over the capsule; in majority of cases a single anterior incision was done. Hemorrhage which developed during tumor e nucleation was controlled by grasping the bleeding vessel with hemostats. After e nucleation myoma bed was closed with interrupted sutures using vicryl 1-0 to obliterate the dead space, approximate the myometrium, and accomplish satisfactory hemostasis. The sutures were placed in such a way that the posterior flap of myometrium is folded over the anterior uterine wall and sutured in place, thus fashioning Bonney's hood and taking care not to compress the tubes.

In laparoscopic myomectomy extraction of the myoma was done through the mid-line supra-pubic incision.

Following myomectomy, postoperative care was given and complications if any like febrile morbidity, wound infection were managed. Patients were advised one cycle of OVRAL L and asked to review after one month for second look laparoscopy.

During second look laparoscopy detailed survey of pelvic viscera was done to look for any adhesion and quality of the myomectomy scar was also looked, as post-operative adhesions in myomectomy and infertility patients are of great importance. Chromotubation was done to check for tubal patency. Thin flimsy adhesions were released and dense adhesions were left alone.

Patients with sub mucosal fibroids with the greater portion inside the uterine cavity- underwent hysteroscopic resection of fibroid. Normal saline was used as distension media. The end point of fibroid coagulation is appearance of distinct craters with brown borders on all fibroid areas.

Patients were advised 3 cycles of OVRAL L and for a repeat hysteroscopy to look for any remnant fibroid.

Patients were followed up 3, 6, 12 months post second look laparoscopy or hysteroscopy to know fertility outcome and any recurrence. Younger woman with minimal adhesions and tubes patent were offered to try on their own or offered ovulation induction supported by intra uterine insemination (IUI). Elderly woman were counseled for assisted conception. Pregnancy arising as a result of IUI, *in vitro* fertilization (IVF) and spontaneous were documented and followed up. Recurrence of leiomyomata after myomectomy has been reported based on diagnosis by palpation and by systematic trans-vaginal ultrasonography.

STATISTICAL ANALYSIS

The statistical analysis was done by SPSS software.

All the results were plotted in a master chart. Descriptive frequencies, percentage and charts were used and data analysis was done.

RESULTS

An observational study consisting of 22 patients with proven myomas in infertility and underwent operative laparotomy in

19 and laparoscopy in 3 and 3 underwent hysteroscopic myomectomy also. They were followed up to know the fertility outcome and post myomectomy sequelae.

When age distribution of the patients was studied there were no patients less than 25 years of age and majority, i.e., 8 (36%) were above 36 years age (Table 1).

Table 1. Age distribution of patients studied.

Age in years	Number	%
21-25	0	0
26-30	8	36
31-35	6	28
>36	8	36
total	22	100

Out of 22 patients, 13 (60%) had primary infertility and 9 (40%) had secondary infertility. On follow up, the patients

with secondary infertility had better pregnancy rate, i.e., 6/9 (66%) (Table 2).

Table 2. Type of infertility and pregnancy rate after myomectomy.

Type of infertility	Number of patients	Pregnancy after myomectomy
Primary	13 (60%)	6/13 (46%)
secondary	9 (40%)	6/9 (66%)
total	22 (100%)	12 (54.54%)

Leiomyoma was assessed based on ultrasound finding, i.e., type and number of myomas. Majority had intramural myoma 10 (45.4%) and there were no patients with sub-

mucous myoma only but combination of sub-mucous with intramural and sub-serous was present (Table 3).

Table 3. USG finding of type of myoma and pregnancy after myomectomy.

USG finding (Type of myoma)	Number of patients	Pregnancy after myomectomy
Sub-serous	5 (22.7%)	3/5 (60%)
Intramural	10 (45.4%)	7/10 (70%)
Cervical pedunculated	3 (13.9%)	1/3 (33.33%)
Intramural + sub-serous	2 (9%)	0
Intramural + sub-mucous	1 (4.5%)	1 (100%)
Intramural + sub-serous + sub-mucous	1 (4.5%)	0
Total	22 (100%)	12 (54.54%)

Majority of the patients had single myoma 13 (60%) and pregnancy rate was also better in patients with single myoma

8/13 (61.5%) due to less adhesion chances post-operatively (Table 4).

Table 4. USG finding of number of myoma and pregnancy after myomectomy.

USG finding (number of myoma)	Number of patients	Pregnancy after myomectomy
Single	13 (60%)	8/13 (61.5%)
Multiple	9 (40%)	4 /9(44.44%)
Total	22 (100%)	12 (54.54%)

In our study febrile morbidity was in 13.64% (3/22) and had fever on first or second postoperative day, less percent attributed to good preoperative and postoperative care. The hemorrhage requiring blood transfusion was observed in

only 1 (4.55%) patient and wound infection in 1 (4.55%) patient. In our study, only 2 (9%) had recurrence during follow up of 2 years (Table 5).

Table 5. Immediate and remote complications - post myomectomy.

Complications	Number of patients	%
Immediate		
Febrile morbidity	3	13.64
Postoperative Hemorrhage requiring blood transfusion	1	4.55
Wound Infection	1	4.55
Unintended Hysterectomy	0	0
Remote		
Hernia	3	13.64
Recurrences	2	9.09
Total	22	100

Although all patients were counseled, only 19 patients came for second look laparoscopy. The presence of postoperative adhesions was observed in 16 out of 19 patients. The adhesions were thick, cordoning off the lower pelvis from the rest of the abdomen. Many of the adhesions were omental and some had carried small and large bowel with

them. But for the second look laparoscopy when done there would have been no hope to become pregnant by them. 3 (15.79%) patients were free of adhesions, 4 (21.05%) had moderate adhesions and 7 (36.84%) patients had severe adhesions according to modified American fertility score classification (Table 6).

Table 6. Incidence and severity of adhesions at second look laparoscopy after myomectomy.

	Number of Patients	%
Total no. of myomectomy Patients	22	--
Total no. of Patients for second look laparoscopy	19	100
Patient with adhesions	16/19	84.21
Patient with adhesion free	3/19	15.79
Bowel adhesions	9/19	47.37
Tubal adhesions	2/19	10.53
Adnexal adhesions	5/19	26.32

Out of 22 patients, two were lost for follow up. 12 patients conceived during the follow up period with a pregnancy of 54.54 % (Table 7).

Table 7. Pregnancy outcome.

Pregnancy	Number	%
Positive	12	54.55
Negative	8	36.36
Lost to follow up	2	9.09
Total	22	100

In study of type of pregnancy spontaneous conception was in 8 (66.67%), IUI in 1 (8.33%) and IVF in 3 (25%). IVF was done as a result of advanced age (Note- 36% were above 35 years age) (Table 8).

Table 8. Type of pregnancy.

Type of Pregnancy	Number	%
Spontaneous	8	66.67
IUI	1	8.33
IVF	3	25
Total	12	100

Among the patient who conceived abortion was noted only in 3 (25%) patients, 7 (58.34%) had singleton deliveries, 1 (8.33%) had twin delivery and 1 (8.33%) had term IUD due to cord accident. Among the delivered patients, i.e., 8, 4 patients had cesarean section and 4 patients had vaginal delivery. We did not observe any cases of myomectomy scar rupture or dehiscence in our study (Table 9).

Table 9. Pregnancy outcome.

Outcome	Number	%
Abortion	3	25
Single	7	58.34
Twins	1	8.33
Term IUD(cord accident)	1	8.33
Total	12	100

DISCUSSION

Myomectomy involves surgical removal of leiomyomas from their surrounding myometrium in an attempt to resolve abnormal uterine bleeding, pelvic pain, and infertility.

The possible risks of operation include adhesion formation, intrauterine synechiae, blood transfusion and unexpected hysterectomy should be balanced against the potential benefits.

The systematic use of second-look laparoscopy could reduce adhesions after myomectomy and consequently enhance fertility which is done 2 or 3 months after myomectomy.

Abdominal myomectomy has classically been viewed as a procedure associated with high intra operative and post-operative morbidity. The need for blood transfusion is believed to be higher with myomectomy than with hysterectomy [3].

Opinions vary widely in the literature, as no definitive demonstration of the causative role of leiomyomas in impeding conception is yet available. Leiomyomas reported as a sole cause of infertility in only a small percentage of patients. Whether leiomyomata are associated with a higher risk of first-trimester pregnancy loss, preterm labor or intrauterine growth restriction is much more controversial.

The goal of myomectomy is not only to resect all myomas, but also to improve fertility outcome and decrease menorrhagia, pelvic pain, dysmenorrhea.

Patients who came to infertility OPD of Gunasheela Surgical and Maternity Hospital, Bangalore were examined, had ultrasound evaluation and were included in the study after taking into consideration the inclusion and exclusion criteria and informed consent. About 22 patients who underwent myomectomy for leiomyoma were studied from June 2007 to June 2009 for a period of 2 years.

In this era laparoscopic myomectomy has become the order of the day but in our study most of the patient underwent open myomectomy.

In our study abortion was noted only in 3 (25%) patients. Buttram and Reiter [4] reported that 41% had spontaneous abortions. This rate was reduced to 19% after myomectomy.

Bulletti [5] found a significant difference in pregnancy rates between infertile women with and without myomas (11% fertility rate in women with myomas versus 25% in those without).

The impact of fibroids in individual patients is critically dependent on location, not simply size or number. If the leiomyomata are extremely large and intramural in location, preconceptional removal may be considered, but the potential benefit must be carefully weighed against the complications of the procedure. Campo et al. [6], analyzed that myomectomy significantly improves pregnancy outcome in patients with sub-serous or intramural fibroids, probably removing a plausible cause of altered uterine contractility or blood supply. In our study 12 patients

conceived, abortion was noted in 3 (25%), 7 (58.34%) had singleton deliveries, 1 (8.33%) had twin delivery and 1 (8.33%) had term IUD due to cord accident. Among the delivered patients, i.e., 8, 4 patients had cesarean section and 4 patients had vaginal delivery. We did not observe any cases of myomectomy scar rupture or dehiscence in our study. Dubuisson et al. [7] followed-up 145 pregnancies after laparoscopic myomectomy, 38 (26.2%) resulted in miscarriages, 58 in vaginal deliveries and 42 in cesarean sections. There were three uterine ruptures, all occurring before labor, one attributed to the laparoscopic myomectomy.

Dubuisson et al. [8] reported a mean intrauterine pregnancy rate following myomectomy via laparotomy of 53.9% and our study we had mean pregnancy rate of 54.54%.

In current series 3 patients underwent sub mucous fibroid resection out of which one patient conceived with a pregnancy rate of 33.3%. Only one uncontrolled series have evaluated reproductive outcome after hysteroscopic myomectomy reporting pregnancy rate of 31-77% by Donnez [9].

Since there is a genetic basis for the development of leiomyomata, even when all of the palpable leiomyomata have been surgically removed, there is recurrence and it depends on the number of tumors removed and the length of follow-up. In our study, only 2 (9%) had recurrence during follow up of 2 years. A well-known longitudinal study analyzing follow up of 622 women after abdominal myomectomy reported a 27% recurrence after 10 years by Candiani et al. [10].

In our study febrile morbidity was in 13.64% (3/22) and had fever on first or second postoperative day. The incidence of postoperative fever following myomectomy has been reported to be as high as 36% by Celik [11].

It has been observed that stitches taken during laparotomic myomectomy have thought to be responsible for producing large number of post-operative adhesions. It has been noticed that detailed ritual suturing of myoma bed in 2 or 3 layers after open myomectomy is counter predictive to the final outcome of the operation and also to the safety of patient particularly with regard to restoration of fertility. A major complication of any myomectomy is the development of postoperative adhesions involving viscera, adherent to the uterine incision sites as well as de novo adhesions at nonsurgical sites, generally attributable to the unavoidable peritoneal trauma. Adhesion was graded using modified American fertility society score that factored the presence, extent and tenacity of adhesion into a single score. The adhesion scoring system was extended to 24 anatomical sites to determine a total adhesion score. The extent of adhesion was classified as localized (i.e., <1/3 of the site covered with adhesions), moderate (i.e., 1/3 to 2/3 of the site covered) or extensive (i.e., >2/3 of the site covered with adhesions). The

severity of adhesions was classified as mild (i.e., flimsy, avascular) or severe (i.e., organized, cohesive, vascular and dense).

In our study 3 (15.79%) patients were free of adhesions, 4 (21.05%) had moderate adhesions and 7 (36.84%) patients had severe adhesions. Tulandi et al. [12] in their study in which no adhesion prevention interventions were undertaken, 93.7% of myomectomy incisions on the posterior uterine wall were associated with adnexal adhesions — i.e., only 6.3% of patients were adhesion-free at this site.

Medical therapy remains a short term measure of limited importance

The global pregnancy rates are the same after hysteroscopic, laparoscopic and abdominal myomectomy but there is no treatment for women who did not undergo surgery.

The good fertility outcome noted in our study can be attributed to good treatment protocol.

Also the study sample is small which can increase bias towards increased pregnancy rate.

CONCLUSION

Myomectomy plays an important role to treat fibroids in infertility. Management must be individualized, taking into consideration the age of the patient, duration of infertility, site and number of myomas and associated symptoms. The advantages and disadvantages of each route of myomectomy, i.e., open/laparoscopic/hysteroscopic myomectomy should also be considered. Myomectomy increases the pregnancy rate when myoma was the only cause for infertility. Adhesion formation is a common complication of myomectomy noted more and with increasing severity in abdominal myomectomy cases. Thus second look laparoscopy and adhesiolysis can be recommended to all myomectomy cases to evaluate the efficacy of the first surgery. Further larger studies and large sample size is required to confirm the results.

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CONFLICTS OF INTEREST

The author declares that there is no conflict of interests regarding the publication of this paper.

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