

Reproductive Outcome after Laparoscopic Myomectomy for Intramural Fibroids in Infertility Women

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Abstract: *Background:* Myomectomy is the recommended treatment for symptomatic uterine fibroids when women wish to preserve their fertility. The role of infertility and intramural fibroids are controversial. The aim of the present study was to assess the infertility results and pregnancy outcome in infertile patients with or without associated infertility factors who underwent laparoscopic myomectomy of large intramural myoma and to assess the safety of laparoscopic myomectomy in infertility patients. *Methods:* 35 infertile patients who underwent laparoscopic myomectomy for intramural fibroid measuring more than 30 mm in diameter were studied from January 2017 to December 2017. Their fertility and pregnancy outcome were studied for 24 months post laparoscopic myomectomy. *Results:* 23 patients became pregnant (65.5%). The mean delay in conception was 7±2.9 months. Nearly 34.7% of the women conceived spontaneously, 34.7% conceived by IUI and the remaining 30.43% by IVF. Among 23 pregnancies 17 live newborns were delivered. No dehiscence of uterine scar occurred. No difference was noted in pregnancy rates according to patient and fibroid characteristics. *Conclusion:* Woman whose infertility is probably attributable to intramural fibroids had 65% chance of conceiving within one year post myomectomy and the pregnancy rate was found to be 76% for women who had no other associated infertility factors. Patient and fibroid characteristics had no significant role in infertility post myomectomy. Laparoscopic myomectomy hence is a feasible procedure with less morbidity, rapid recovery, and potentially less risk.

1. Introduction

Uterine fibroids are the most common solid pelvic tumours in females. Fibroids have a reported incidence ranging from 30% to 70% in women of reproductive age and increasing with age¹. Myomas can be identified in 20-40% of all reproductive aged women and in 5-10% of infertile women.^{2,3,4}

Myomectomy is the recommended treatment for symptomatic uterine fibroids when women wish to preserve their fertility^{5,6}. Traditionally, this procedure has been performed by laparotomy or mini-laparotomy. Using a laparoscopic technique provides a shorter hospital stay and a faster recovery.^{7,8}

The role of uterine fibroids in infertility was evaluated indirectly by assessment of fertility after myomectomy in women with unexplained infertility. The pregnancy rate ranged from 45% to 65% within 1 year of surgery.^{2,9,10} The relationship between infertility and uterine fibroids is well known. However, the characteristics of infertile patients suitable for myomectomy and of the fibroids, which should be removed, are still controversial. It has been proved that the removal of submucosal fibroids improves fertility, but removal of subserosal fibroids has no impact on fertility^{11,12}. Great uncertainties exist about the effect of intramural fibroids on fertility.

Only few studies have evaluated the safety of and fertility rates associated with laparoscopic myomectomy for the treatment of intramural fibroids alone.¹⁴

The aim of the present study was to assess the infertility results and pregnancy outcome in infertile patients with or without associated infertility factors who underwent laparoscopic myomectomy for large intramural myomas.

In this retrospective study, we compared reproductive performance before and after myomectomy performed. Our aim was to evaluate the safety of laparoscopic myomectomy of intramural fibroids and the impact on subsequent fertility.

2. Material and Method

It was a Retrospective study, which was carried out at an advanced laparoscopic hospital, in which 35 infertile patients who underwent laparoscopic myomectomy for intramural fibroid were studied from January 2017 to December 2017. Their fertility and pregnancy outcome were studied for 24 months post laparoscopic myomectomy. The study population included infertility patients with intramural fibroids with or without other associated factors..

Infertility is defined as one year of unprotected intercourse without conception. All laparoscopic procedures were carried out by the same surgeon with the same team. Indications for laparoscopic myomectomy were infertility causes with myoma measuring more than 30 mms.

For all women a complete infertility work-up was done, including Endocrine blood studies, USG, ovulation studies, a spermocytogram and hysterosalpingography. Hysteroscopy was performed prior laparoscopic myomectomy to confirm uterine cavity distortion.

Laparoscopy was carried out under general anesthesia with

endotracheal intubation. First, a 10-mm port was placed through the umbilicus and a video laparoscope was introduced. Under direct laparoscopic vision two 5-mm ports were placed laterally on either side of the upper abdomen. After intra-abdominal observation confirmed the position and size of the uterine myomas, vasopressin diluted in physiologic saline was injected between the myometrium and the capsule of the myomas. The myomas were removed by making a horizontal incision directly above the lesions with the coagulation system (Harmonic Scalpel). Myoma was enucleated. Base cauterized with bipolar cautery. Hemostasis at the myomectomy site was achieved with bipolar cautery. Wound sutured in three layers with V loc sutures. Specimen morcellated using morcellator, removed in pieces and sent for histopathology report.

3. Results

For the 35 infertile patients who underwent laparoscopic myomectomy, the range of age was 24 to 42 years with mean age 32.83 ± 3.899 years. In the present study, 27 cases (77.1%) were primary infertility and 8 cases (22.9%) were secondary infertility. Majority of primary infertility and secondary infertility patients were in the age group of 31-35 years. The mean duration of infertility was 6.29 ± 3.61 years. The duration of infertility ranged from 1 to 16 years. In our study, majority of patients of primary infertility (44.4%) had duration of infertility of 1-5 and 6-10 years and that of secondary infertility, majority (62.5%) had duration of infertility of 1-5 years. 23 women (65.7%) had one fibroid, 10 (28.6%) had two fibroids and 2 (5.7%) had three fibroids. Thus 12 patients had multiple fibroid. The mean number of fibroids per patient was 1.4 ± 0.6 .

23 (65.7%) women had largest myoma size less than 5 cms and 12 (34.3%) women had largest myoma size more than or equal to 5 cms. The mean size of largest myoma is 4.4 ± 1.19 cms. The distribution of the locations of the largest fibroid in the uterus was 13 (37.1%) in the posterior wall, 16 (45.7%) in an anterior location, and 6 (17.1%) in fundal locations. 14 patients (40%) had multifactorial infertility. Most of the patients with multifactorial infertility presented with more than one additional factor; 5 (14.3%) had mild endometriosis, 8 (22.9%) had reduced ovarian failure and 1 (2.9%) had tubo ovarian pathology. Hysteroscopy revealed distortion of the uterine cavity in 13 (37.1%) of patients. Uterine cavity was opened in 7 (20%) patients.

In our study, 23 (65.5%) of 35 patients who underwent laparoscopic myomectomy conceived. The mean time for conception following laparoscopic myomectomy was 7.26 ± 2.96 months. The overall pregnancy rate after myomectomy was 23/35 (65.7%). Of the 23 patients who became pregnant, 8/23 (34.7%) conceived spontaneously. The remaining 8/23 (34.7%) conceived by IUI and 7/23 (30.43%) by IVF. Among the 23 pregnancies, 17 live newborns were delivered. Among the live births, 11 (64.7%) delivered at term and 6 (35.2%) were preterm. No dehiscence of uterine scar was observed.

In the present study there was no significant effect on reproductive outcome of patient by patient's age, duration of infertility and cause of infertility. There was no significant

effect on reproductive outcome of patient by number and size of fibroid and distortion of uterine cavity by fibroid.

Patient Characteristics and Fertility Outcome

Characteristic	Patients who conceived (n=23)	Patients who did not conceive (n=12)	p value
Patients age			
<40 yrs	22 (71)	9 (29)	0.106
≥40 yrs	1 (25)	3 (75)	
<35 yrs	19 (70.4)	8 (29.6)	0.402
≥35 yrs	4 (50)	4 (50)	
Duration of infertility			
<3 yrs	3 (60)	2 (40)	0.999
≥3 yrs	20 (66.7)	10 (33.3)	
Causes of infertility			
Multifactorial	7 (50)	7 (50)	0.153
Unexplained	16 (76.2)	5 (23.8)	

Fibroid Characteristics and Fertility Outcome

Characteristic	Patients who conceived (n=23)	Patients who did not conceive (n=12)	p value
No. of fibroids			
1	14 (60.9)	9 (39.1)	0.476
≥2	9 (75)	3 (25)	
Distortion of uterine cavity			
Yes	9 (69.2)	4 (30.8)	0.999
No	14 (63.6)	8 (36.4)	
Size of myoma			
<5	13 (56.5)	10 (43.5)	0.149
≥5	10 (83.3)	2 (16.7)	

4. Discussion

Physicians who have female patients with uterine fibroids who want to become pregnant, face a clinical quandary regarding the best management of fibroids. The main argument against conservative myomectomy is the lack of definite evidence of a causal association between uterine fibroids and infertility. Concerns remain about potential adverse consequences, such as morbidity, complications, adhesion formation, and increased risk for uterine scar dehiscence.

The results compare favourably with reports in the literature which suggest that the surgical removal of myomas has beneficial effect on enhancing fertility and improving pregnancy outcome. The 65.7% successful pregnancy rate following myomectomy strongly indicates that such treatment may be standard of care in myoma complicating infertility women. The findings of our study are not consistent regarding the nature of leiomyoma because the size, number, or location of fibroids did not affect the pregnancy rate following myomectomy with insignificant p values.

There were similarities in distribution of patient's characteristics in all case series for age, type of infertility and duration of infertility.

With regard to the surgical procedures, in the present studies all patients underwent laparoscopic myomectomy. There were no conversions to laparotomy. Uterine cavity was opened in 7 (20%) patients. No major complications occurred. No patient needed a blood transfusion during or after surgery. In our study, post operatively no major complications were noted. Few patients had mild to moderate abdo-

minal discomfort. However severe abdominal pain and shoulder pain were noted in one case each. Overall the complication rate was 4%.

Myomectomy is a challenging procedure because it involves the reconstruction of an organ that can undergo remarkable structural changes, as it does during pregnancy. The literature documents the normal reproductive performance of uterus after laparotomic myomectomy. The degree of involvement of myomas in the infertility of certain patients is the subject of considerable debate and a number of theories have been proposed. Fibroids may affect sperm migration by reducing uterine contractility and increasing the distance that the spermatozoa have to travel. Fibroids may be responsible for vascular changes, which would have repercussions on the endometrium and may hinder implantation.

Literature states that the pregnancy rate ranged from 45% to 65% within 1 year of myomectomy. This value is higher than that observed in couples with untreated unexplained infertility. Dessolle et al¹⁴, Morito et al¹⁷ and Vidya et al arrived at similar conclusion regarding laparoscopic myomectomy.

In the present studies, the overall pregnancy rate after myomectomy was 65.7%, which agrees with the other studies. Moreover, the pregnancy rate was found to be 76.2% for women who had no other associated infertility factors.

Of the 23 patients who became pregnant 34.7% conceived spontaneously. The remaining 34.7% conceived by IUI and 30.43% by IVF. The conception rate was found better (65.7%) in our study than the other studies because of the use of assisted reproductive techniques for indicated patients in the subsequent cycles post myomectomy. In Morito et al, the patients were not treated using assisted reproduction technology before or after the operation and the overall pregnancy rate was 50%.

The mean time for conception following laparoscopic myomectomy was 7.26 ± 2.96 months. Pregnancies were achieved after a relatively short delay in conception.

The live birth was 73.8% in our studies with similar findings observed by Dessolle and Morito in thier studies. Increased rate of ectopic and missed abortion were due to the ART procedures done.

The percentage of patients who got pregnant post myomectomy was about 70% when the age was less than 35 and when no other associated factor was involved. While the percent decreased to about 25% with age more than 35 and with associated infertility factors. Therefore, if women with unexplained infertility have a better chance of conception after myomectomy and if the patient age is more than 35, this conservative operation should not be postponed for too long.

However, in the present study there was no significant effect of patient characteristics on reproductive outcome post myomectomy. This may be because the present sample is too small. In any event, patient characteristics may be the most important factor. Our finding agrees with those of Mo-

rito et al but they stated pregnancy rates were affected by the presence of other infertility factors associated with uterine myomas. In contrast, Dessolle observed adverse prognostic factors for infertility after laparotomic myomectomy, which included increased patient age, long duration of infertility and associated infertility factor.

In the present study fibroid characteristics such us size, number of the fibroid nor did distortion of the uterine cavity play a significant role in infertility post myomectomy. Similar finding was seen in Morito et al and Dessolle et al which stated that fibroid characteristics were not decisive. A possible explanation for these results is that the effect of the fibroid is not only mechanical. In our study, myomectomy was performed exclusively by laparoscopy. Laparoscopic myomectomy, as well as other laparoscopic procedures, has less morbidity, rapid recovery, and potentially less risk for adhesion formation. In the present study, there were no adhesions seen at the myomectomy scar.

Some of the main concerns after laparoscopic myomectomy are obstetric complications, including uterine rupture during pregnancy and the need for elective cesarean delivery^{15,16}. The few published case reports of this complication occurred during the second trimester. The indication for pregnancy termination either at term or preterm were based on obstetric indications (pregnancy induced hypertension, fetal distress, bad obstetric history) and not due to scar tenderness. We observed no scar dehiscence or uterine rupture. Similarly intact myomectomy scar was observed by Dessolle and Morito in their studies, contradicting the previous studies stating increased scar rupture at second trimester (Dubuisson et al and friedman et al). However, our sample is too small to permit definitive conclusions about this complication.

From these audit data we suggest that a woman whose infertility is probably attributable to intramural fibroids will have 45-65% chance of conceiving within one year post myomectomy. Laparoscopic myomectomy hence is a feasible procedure with less morbidity, rapid recovery, and potentially less risk. Thus, due to varied results on reproductive outcome after laparoscopic myomectomy in infertility patients, furthermore studies are required to evaluate its efficacy.

5. Limitations of the Study

- It was a retrospective study.
- The sample size was considerably small.

6. Conclusion

Woman whose infertility is probably attributable to intramural fibroids had 65% chance of conceiving within one year post myomectomy and the pregnancy rate was found to be 76% for women who had no other associated infertility factors. Patient and fibroid characteristics had no significant role in infertility post myomectomy. Laparoscopic myomectomy hence is a feasible procedure with less morbidity, rapid recovery, and potentially less risk.

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