

Impact of Laparoscopic Myomectomy on Pregnancy Outcomes: A Retrospective Review

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ABSTRACT

Background: Uterine fibroids are the most common benign tumors of the female reproductive tract, affecting fertility and pregnancy outcomes. Laparoscopic myomectomy has emerged as a minimally invasive treatment option for women with symptomatic fibroids who wish to preserve fertility. This study aimed to evaluate the impact of laparoscopic myomectomy on pregnancy outcomes in women with a history of uterine fibroids.

Methods: This retrospective study reviewed 35 patients who underwent laparoscopic myomectomy at the Department of Obstetrics and Gynecology, KVG Medical College and Hospital, Sullia between June 2023 and May 2024. Women of reproductive age (18-45 years) with confirmed diagnoses of uterine fibroids who underwent laparoscopic myomectomy and desired fertility were included. Demographic data, surgical outcomes, and pregnancy outcomes (conception rates, miscarriage rates, preterm delivery rates, and mode of delivery) were collected for a minimum follow-up period of 12 months post-surgery.

Results: The mean age of participants was 34.6 ± 5.2 years with a BMI of 26.4 ± 4.1 kg/m². The average number of fibroids removed was 2.3 ± 1.5 , with the largest fibroid measuring 6.8 ± 2.4 cm. Most fibroids were intramural (51.4%), followed by subserosal (34.3%) and submucosal (14.3%). Mean operative time was 92.5 minutes with an estimated blood loss of 150.3 mL and hospital stay of 1.8 days. The conception rate was 11.4% (4/35) with a mean time to conception of 8.2 months. The miscarriage rate was 25% (1/4) and preterm delivery rate was 33.3% (1/3). Among deliveries, 66.7% (2/3) were vaginal and 33.3% (1/3) were cesarean sections. The mean gestational age at delivery was 36.7 weeks. Subgroup analysis based on fibroid location showed no statistically significant differences in pregnancy outcomes.

Conclusion: Laparoscopic myomectomy appears to have a positive impact on pregnancy outcomes in women with uterine fibroids. While our findings show conception rates, successful vaginal delivery rates, and pregnancy complication rates comparable to previous studies, the retrospective design, small sample size, and lack of a control group necessitate larger prospective studies to confirm these findings and assess long-term outcomes.

Keywords: Laparoscopic myomectomy, uterine fibroids, pregnancy outcomes, conception rate, miscarriage, preterm delivery

INTRODUCTION

Uterine fibroids are the most common benign tumors of the female reproductive tract, affecting up to 70% of women by age 50 [1]. These benign monoclonal tumors of the smooth muscle cells of the myometrium can vary widely in size, number, and location. Symptomatic fibroids can cause heavy menstrual bleeding, pelvic pain, and infertility, significantly impacting women's quality of life and reproductive health [2].

For women with symptomatic fibroids who wish to preserve fertility, myomectomy is the preferred surgical approach. Laparoscopic myomectomy has emerged as a minimally invasive alternative to traditional open myomectomy, involving the removal of uterine fibroids through small incisions in the abdomen [3]. This approach offers several advantages including shorter hospital stays, less postoperative pain, faster recovery times, and potentially better reproductive outcomes compared to open myomectomy [4].

The impact of laparoscopic myomectomy on fertility and pregnancy outcomes has been an area of growing interest. Studies suggest that pregnancy rates after laparoscopic myomectomy range from 33% to 77%, with a lower risk of uterine rupture compared to open myomectomy [5]. However, data on long-term pregnancy outcomes following laparoscopic myomectomy remain limited, especially regarding factors such as miscarriage rates, preterm delivery rates, and mode of delivery.

The recurrence rate of uterine fibroids after laparoscopic myomectomy is estimated to be 4.9% to 28.3% over a period of 1 to 5 years, which may impact long-term fertility and pregnancy outcomes [6]. Therefore, understanding the effectiveness of laparoscopic myomectomy in improving pregnancy outcomes is essential for optimizing the management of women with uterine fibroids who desire future fertility.

This retrospective study aims to evaluate the impact of laparoscopic myomectomy on pregnancy outcomes in women with a history of uterine fibroids, focusing on conception rates, miscarriage rates, preterm delivery rates, and mode of delivery. The findings of this study will contribute to the existing body of evidence and help inform clinical decision-making for women with uterine fibroids who wish to conceive.

MATERIALS AND METHODS

Study Design and Population

This retrospective study was conducted at the Department of Obstetrics and Gynecology, KVG Medical College and Hospital, Sullia. We reviewed the medical records of 35 patients who underwent laparoscopic myomectomy between June 2023 and May 2024.

Selection Criteria

Inclusion Criteria:

1. Women with confirmed diagnoses of uterine fibroids
2. Patients who underwent laparoscopic myomectomy as the primary treatment for uterine fibroids
3. Women of reproductive age (18-45 years) with a desire to conceive post-surgery
4. Patients with no prior history of uterine surgery

Exclusion Criteria:

1. Women with other significant gynecological conditions (e.g., endometriosis, adenomyosis) that may impact fertility
2. Patients with a history of multiple (>3) miscarriages or recurrent pregnancy loss
3. Women with known chromosomal abnormalities or genetic disorders that may affect fertility
4. Patients with severe comorbidities (e.g., uncontrolled diabetes, hypertension) that may complicate pregnancy
5. Women who underwent additional fertility treatments (e.g., IVF) during the follow-up period, as this may confound the results

Data Collection

Medical records were reviewed to identify patients who met the inclusion criteria. The following data were extracted:

1. Demographic information: age, body mass index (BMI)
2. Fibroid characteristics: number, size, and location (subserosal, intramural, or submucosal)
3. Surgical outcomes: operative time, estimated blood loss, length of hospital stay, and complications
4. Pregnancy outcomes: conception rate, time to conception, miscarriage rate, preterm delivery rate, gestational age at delivery, and mode of delivery

Follow-up data on pregnancy outcomes were collected for a minimum of 12 months post-surgery.

Data Analysis

Descriptive statistics were used to summarize patient characteristics, surgical outcomes, and pregnancy outcomes. Continuous variables were presented as mean $\pm$ standard deviation, and categorical variables were presented as frequencies and percentages. Conception rates, miscarriage rates, preterm delivery rates, and mode of delivery were calculated as percentages of the total study population or relevant subgroups. Subgroup analysis based on fibroid location was performed to assess differences in pregnancy outcomes. Statistical significance was set at $p < 0.05$.

RESULTS

Participant Demographics and Baseline Characteristics

A total of 35 patients who underwent laparoscopic myomectomy were included in this study. The mean age of participants was 34.6 ± 5.2 years with a mean BMI of 26.4 ± 4.1 kg/m². The average number of fibroids removed per patient was 2.3 ± 1.5 , with the largest fibroid measuring 6.8 ± 2.4 cm.

Regarding fibroid location, 18 patients (51.4%) had intramural fibroids, 12 (34.3%) had subserosal fibroids, and 5 (14.3%) had submucosal fibroids (Table 1).

Table 1: Participant Demographics and Baseline Characteristics

Characteristic	Value
Age (years)	34.6 ± 5.2
BMI (kg/m ²)	26.4 ± 4.1
Number of fibroids	2.3 ± 1.5
Largest fibroid size (cm)	6.8 ± 2.4
Fibroid location [n (%)]	
- Subserosal	12 (34.3%)
- Intramural	18 (51.4%)
- Submucosal	5 (14.3%)

Surgical Outcomes

The mean operative time was 92.5 minutes, with an estimated blood loss of 150.3 mL. The average length of hospital stay was 1.8 days. Complications were observed in 2 patients (5.7%), which included minor intraoperative bleeding requiring transfusion in one patient and postoperative fever in another patient. No major complications such as conversion to laparotomy or readmission were reported.

Pregnancy Outcomes

Of the 35 patients who underwent laparoscopic myomectomy, 4 (11.4%) conceived during the follow-up period. The mean time to conception was 8.2 months post-surgery. Among those who conceived, 1 (25%) experienced a miscarriage, and 3 (75%) had ongoing pregnancies that progressed to delivery.

Of the 3 deliveries, 1 (33.3%) was preterm (defined as delivery before 37 weeks of gestation), and 2 (66.7%) were term deliveries. The mean gestational age at delivery was 36.7 weeks. Regarding mode of delivery, 2 (66.7%) patients had vaginal deliveries, and 1 (33.3%) underwent cesarean section.

Subgroup Analysis: Pregnancy Outcomes by Fibroid Location

Pregnancy outcomes were analyzed based on fibroid location. Among patients with subserosal fibroids (n=12), 2 (16.7%) conceived, and none experienced miscarriage. In the intramural fibroid group (n=18), 1 (5.6%) patient conceived but experienced a miscarriage. Among patients with submucosal fibroids (n=5), 1 (20%) conceived with no miscarriage.

While these findings suggest potential differences in conception rates based on fibroid location, the small sample size limits the ability to draw statistically significant conclusions.

DISCUSSION

This retrospective study examined the impact of laparoscopic myomectomy on pregnancy outcomes in women with uterine fibroids. Our findings suggest that laparoscopic myomectomy may have a positive influence on fertility and pregnancy outcomes, albeit with some limitations that warrant consideration.

The conception rate of 11.4% observed in our study is lower than previously reported rates in the literature. Bernardi et al. (2014) reported a conception rate of 16.7% after laparoscopic myomectomy in a 6-year follow-up study [7], while Pitter et al. (2015) observed a higher rate of 25.0% (p=0.04) [8]. The lower conception rate in our study may be attributed to various factors including the shorter follow-up period, differences in patient characteristics, or potential technical aspects of the surgical procedure.

Our study demonstrated a successful vaginal delivery rate of 66.7%, which is comparable to the 70.8% reported by Bernardi et al. (2014) [7]. This relatively high rate of vaginal deliveries suggests that laparoscopic myomectomy may not significantly compromise the structural integrity of the uterus, allowing for vaginal delivery in most cases.

The miscarriage rate of 25% in our study was similar to the 23.1% reported by Bernardi et al. (2014) [7] but higher than the 10.5% reported by Pitter et al. (2015) (p=0.29) [8]. While this difference did not reach statistical significance, it highlights the need for larger studies to better understand the impact of laparoscopic myomectomy on early pregnancy outcomes.

The preterm delivery rate of 33.3% in our study was higher than the 14.6% reported by Bernardi et al. (2014) (p=0.27) [7] and the 18.2% reported by Pitter et al. (2015) (p=0.41) [8]. Although these differences were not statistically significant, they raise questions about the potential impact of laparoscopic myomectomy on uterine function during pregnancy. Factors such as the extent of myometrial disruption, healing process, and scar formation may influence the risk of preterm delivery.

Our subgroup analysis based on fibroid location did not reveal statistically significant differences in pregnancy outcomes. However, the numerical trends suggest that subserosal fibroids may be associated with better conception rates compared

to intramural or submucosal fibroids. This observation aligns with the understanding that subserosal fibroids, which do not distort the uterine cavity, may have less impact on fertility compared to intramural or submucosal fibroids.

Several limitations of our study deserve mention. First, the retrospective design introduces potential selection bias and limits the standardization of data collection. Second, the small sample size, particularly for pregnancy outcomes, reduces statistical power and the ability to detect significant differences between subgroups. Third, the lack of a control group (e.g., women with fibroids who did not undergo surgery or those who underwent open myomectomy) limits our ability to make comparative conclusions about the effectiveness of laparoscopic myomectomy. Finally, the relatively short follow-up period may not capture the full impact of laparoscopic myomectomy on long-term fertility and pregnancy outcomes.

CONCLUSION

In conclusion, this retrospective study suggests that laparoscopic myomectomy may have a positive impact on pregnancy outcomes in women with uterine fibroids. The observed conception rate, successful vaginal delivery rate, and pregnancy complication rates are comparable to those reported in previous studies.

However, the study's limitations, including its retrospective design, small sample size, and lack of a control group, warrant larger prospective studies to confirm these findings and assess long-term outcomes. Despite these limitations, the results of this study provide valuable insights into the potential benefits of laparoscopic myomectomy for women with uterine fibroids who desire to conceive.

Further research is needed to optimize patient selection, surgical techniques, and postoperative management to improve pregnancy outcomes in this population. Additionally, studies comparing laparoscopic myomectomy with alternative treatments for uterine fibroids, such as open myomectomy or uterine artery embolization, would provide more comprehensive evidence to guide clinical decision-making.

Ultimately, individualized treatment plans that consider factors such as fibroid characteristics, patient preferences, and reproductive goals are essential for optimizing outcomes in women with uterine fibroids who wish to preserve fertility.

REFERENCES

1. Stewart, E. A. (2015). Uterine fibroids. *New England Journal of Medicine*, 372(17), 1646-1655.
2. Marsh, E. E., & Bulun, S. E. (2006). Steroid hormones and leiomyomas. *Obstetrics and Gynecology Clinics of North America*, 33(1), 59-67.
3. Bhawe Chittawar, P., Franik, S., Pouwer, A. W., & Farquhar, C. (2014). Minimally invasive surgical techniques versus open myomectomy for uterine fibroids. *Cochrane Database of Systematic Reviews*, (10).
4. Jin, C., Hu, Y., Chen, X. C., Zheng, F. Y., Lin, F., Zhou, K., & Gu, H. F. (2009). Laparoscopic versus open myomectomy—a meta-analysis of randomized controlled trials. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 145(1), 14-21.
5. Mallick, R., & Odejinmi, F. (2017). Laparoscopic myomectomy: a review of current practice and future direction. *Journal of Obstetrics and Gynaecology*, 37(8), 1014-1020.
6. Radosa, M. P., Owsianowski, Z., Mothes, A., Weisheit, J., Vorwergk, J., Asskaryar, F. A., ... & Runnebaum, I. B. (2014). Long-term risk of fibroid recurrence after laparoscopic myomectomy. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 180, 35-39.
7. Bernardi TS, Radosa MP, Weisheit A, Diebolder H, Schneider U, Schleussner E, et al. Laparoscopic myomectomy: a 6-year follow-up single-center cohort analysis of fertility and obstetric outcome measures. *Arch Gynecol Obstet*. 2014;290(1):87-91.
8. Pitter MC, Simmonds C, Seshadri-Kreaden U, Hubert HB. The impact of different surgical modalities for hysteroscopic myomectomy on pregnancy outcomes. *J Minim Invasive Gynecol*. 2015;22(6S):S239.