http://www.ijwhr.net
doi 10.15296/ijwhr.2022.04
Open Access Original Article
IJWHR
International Journal of Women's Health and Reproduction Sciences
Vol. 10, No. 1, January 2022, 16–18
ISSN 2330-4456

Comparison of Laparoscopic Myomectomy Outcomes Based on Myoma Weight: A Cross-sectional Study

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Abstract

Objectives: Objectives: Myomas are the most common non-malignant pelvic neoplasm in women's reproductive life. The aim of present study was to compare the outcome of large myoma Laparoscopy in Iranian reproductive-age women.

Materials and Methods: This cross-sectional study was conducted on 86 women with symptomatic uterine myoma who underwent laparoscopic myomectomy between December 2013 and October 2018. Participants were divided into two groups based on the myoma weight (<80 (n=15) and ≥80 g (n=71)). Finally, age, body mass index, number of myomas removed, duration of surgery, postoperative hospitalization, amount of blood transfusion, and hemoglobin reduction were compared between the two groups. Data were analyzed by SPSS software version 22.

Results: The mean age of participants were similar in both groups ($P=0.48$). There were no significant differences between the two groups regarding body mass index ($P=0.56$) and indications for laparoscopic myomectomy ($P=0.46$). The mean weight of myoma and duration of surgery were significantly different between the two groups ($P<0.001$ and $P<0.007$, respectively). Changes in hemoglobin and days of hospitalization after surgery were not significantly different between the two groups.

Conclusions: The length of hospital stay and blood loss in laparoscopic myomectomy did not differ significantly based on myoma weight. So, laparoscopic myomectomy could be considered a minimally invasive alternative for managing symptomatic large myoma.

Keywords: Laparoscopy, Myomectomy, Myoma, Outcome

Introduction

Uterine myomas are the most common non-malignant pelvic and genital tract tumors in females during reproductive age (1-5). Some studies reported incidence of myoma about 5.4%-77% worldwide (4-7). Furthermore, incidences of myoma are estimated to be about 20%-50% of reproductive-age women (3,8). Some studies have shown the causes of 40%-60% of hysterectomies in women are myomas (9,10). Myomas most occur and are frequent during the last decade of women's reproductive activity (10, 11). Uterine myomas have a significant burden on reproductive-age women's health (11). Also, based on some studies, about 29% of gynecological hospitalization included myoma (12,13). This benign tumor is often asymptomatic (30-50%), and only about 30% of patients referred with infertility, abnormal uterine bleeding, metrorrhagia, and pelvic pain (2,9,14).

Myomectomy is a conservative and alternative approach in symptomatic myoma (especially rapidly growing) in reproductive age (14,15). Some literature reported after myomectomy, the percentage of pregnancy increased, and abortion rates decreased (about 19% to 41%) (10,15). Laparoscopic surgery in the case of large myoma is complicated (2,8) because large myoma may affect the surgeon's visual field, operation field, limited laparoscopic instrument approaching angle, and increased operation time (2,10).

As a result, prolonged manipulation may increase surgical complications after laparoscopy in large myoma (2,10). Few investigations reported outcomes after laparoscopic myomectomy in large myoma (2,16,17). In this investigation considered cut-off value to detect the large myoma was 80 g (2).

Contrary to previous studies, this study compared the outcomes of laparoscopic surgery based on the myoma weight (not diameter). Also, no study was found comparing the results of laparoscopic myomectomy for large myomas in women of reproductive age.

Materials and Methods

Setting and Participants

In this cross-sectional study, all women referred to the Obstetrics and Gynecology Department of Farmaniyeh hospital, Tehran, Iran, for conventional laparoscopic myomectomy between December 2013 and October 2018, were enrolled. The inclusion criteria were women aged 18 to 49 years with myoma size ≥5 cm, complete medical records, and desire to preserve fertility. The diagnosis method was a pelvic examination and abdominal and transvaginal ultrasound without contrast magnetic resonance imaging. Uterine myoma was diagnosed based on International Classification Disease codes (ICD 10).

Received 17 May 2020, **Accepted** 22 December 2020, **Available online** 10 January 2021

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Key Messages

- Laparoscopic myomectomy offers a minimally invasive alternative for the management of symptomatic myoma.

Women with a suspicious adnexal mass, menopause, history of Tamoxifen consumption, pelvic irradiation, and women with risk factors or evidence for uterine sarcoma were excluded.

Participants were divided into two groups based on myoma's weight: group A; uterine myoma weight <80 g and group B; uterine myoma weight ≥80 g. Finally, age, body mass index, number of myomas removed, duration of surgery, postoperative hospitalization, amount of blood transfusion, and hemoglobin (Hb) reduction were compared between the two groups. Also, women were followed up for 2 years after surgery, and the risk of tumor cell seeding and dissemination in morcellator was explained and informed written consent was obtained.

Data Analysis

Data were analyzed by using the Statistical Package for the Social Sciences software (SPSS, version 22.0 for Windows; SPSS Inc., Chicago, IL), Fisher exact test, and Student's *t* test. *P* value less than 0.05 were considered significant.

Results

The data of 86 women who had a main myoma, 15 (17.4%) in group A (had a myoma weighing <80 g), and 71 (82.6%) in group B (had a myoma weighing ≥80 g) was analyzed and compared.

There were no significant differences between the two groups regarding age, body mass index, and indications for laparoscopic myomectomy (Table 1).

The minimum and maximum weights of myomas were 29.1 g and 916.5 gr, respectively. The mean weight of myomas was significantly different between the two groups ($P<0.001$). The mean number of myomas removed was 2.13 ± 1.7 in group A and 2.15 ± 1.6 in group B. The duration of surgery was significantly lower in group A than in group B. Changes in Hb and days of hospitalization after surgery were not significantly different between the two groups. A total of six women required blood transfusion. There were no statistically significant differences in the mean number of myoma between the two groups. In addition, most participants in the two groups had myomas larger than 5cm in size. Two study groups were similar in terms of myoma size ($P=0.311$) (Table 2).

Discussion

Myoma treatment has developed in past decades (1-3). The approach of new and novel surgical treatment is minimally invasive techniques (11,15). Laparoscopic myomectomy has fewer complications after surgery, but this surgery was complicated in large myomas. Laparoscopic myomectomy of large myoma is difficult because of poor visual field and restricted and limited space for laparoscopic instruments actions (2,7).

In our study, the mean age of participants was older than other studies (37.07 ± 7.85 and 38.54 ± 7.21 years in groups A and B, respectively). In one study, the mean age of the participants was 30.0 years (range: 23-56 years) (15) and in the study of Yoon and colleagues was 34.9 ± 5.6 years (11).

The mean of duration of surgery in the present study was obtained 46.00 ±14.041 in group A and 57.86 ± 15.312 min in group B, while other studies have reported from 84 to 112 minutes (9-11,15).

The mean of postoperative hospitalization in some studies reported 23 hours (one day) (10-13), and in our study was about 24 hours. Some literature reported that laparoscopic myomectomy is unsuitable for very large myoma, and the number of myomas is more than two (10-13). But our study showed there were no significant differences between the number of myomas and outcomes.

In our study, six women with myoma's weight ≥80 g required blood transfusion, similar to Yoon et al study (11). In addition some studies showed that blood transfusion during laparoscopic myomectomy in large myoma does not correlate with the number of myomas (10,12,15). The mean size (diameter) of myoma in this investigation was similar to other studies (2). In one study mean change in serum Hb concentration after surgery was 2.1 ± 1.2 (g/dL) (11).

Also, duration of surgery in our study was shorter than other studies (2,10). Serum Hb change of this study lower than the prior studies (10). It seems that if the surgeon is highly skilled in performing this procedure, the duration of surgery will be significantly reduced, which in turn will help reduce blood loss.

Tinelli and colleagues presented that metrorrhagia

Table 1. Comparison of Participants' Demographic Characteristics in Two Study Groups

Characteristics	Group A (n=15)	Group B (n=71)	*P* Value
Age (mean±SD)	37.07±7.85	38.54±7.21	0.48 [a]
Body mass index (mean ± SD)	25.40±4.37	24.69±4.29	0.58 [a]
Laparoscopic myomectomy indications, No. (%)			
Menorrhagia	12 (80)	62 (87.31)	0.46 [b]
Previous myoma symptoms	11 (73.31)	63 (88.70)	0.12 [b]
History of Infertility	1 (6.62)	9 (12.64)	0.51 [b]

[a] Student's t test; [b] Fisher exact test.

Table 2. Comparison of Laparoscopic Myomectomy Outcomes in Two Study Groups

Variables	Group A (n=15)	Group B (n=71)	*P* Value
Number of myomas, mean ± SD	3.81±1.42 (1-7)	4.90 ± 1.60 (1-8)	0.24[a]
Weight of myomas, mean ± SD (g)	52.37 ± 21.64	228.99 ± 140.17	<0.001[a]
Number of myomas removed, mean±SD	2.13 ± 1.73	2.15 ± 1.61	0.98 [a]
Duration of surgery, mean ± SD (min)	46.00 ± 14.04	57.86 ± 15.31	0.007 [a]
Hemoglobin changes, mean ± SD (mg/dL)	0.90 ± 0.39	1.11 ± 0.55	0.17 [a]
Post-operative hospitalization, mean ± SD (days)	0.00	1.17± 0.38	0.08 [a]
Needs to blood transfusion, No. (%)	0 (0)	6 (8.40%)	0.30 [b]

[a] Student's *t* test; [b] Fisher exact test.

happened in 21%, and infertility occurred in 42% of participants (10). In our study, no laparoscopic surgery was converted to laparotomic abdominal surgery, a similar to Tinelli et al study (10)

For future studies, the evolution of outcomes in large sample size and long time follow-up suggested.

Study Limitation

In the present study, recurrence of myoma, pregnancy outcomes, and blood loss were not evaluated.

Conclusions

Based on this study, the length of hospital stay and blood loss in laparoscopic myomectomy did not differ significantly based on myoma weight. So, laparoscopic myomectomy could be considered a minimally invasive alternative for managing large symptomatic myoma.

Authors' Contribution

All authors had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Concept and design: FS, EA and BN. Acquisition, analysis, or interpretation of data: EA, AK, and FS. Drafting of the manuscript: FS, EA and BN and SNA. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: EA, AK and SNA. Supervision: FS.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

This study proposal was approved by the ethics committee of Farmanieh hospital, Tehran, Iran (Code: FH-02005) and was done in accordance with the Helsinki Declaration.

Financial Support

The authors received no financial support for the research, authorship, and/or publication of this article.

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