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ORIGINAL ARTICLE

Evaluation of Myomectomy During Cesarean Section: A Tertiary Center Experience

Sezaryen Sırasında Miyomektominin Değerlendirilmesi: Üçüncü Basamak Bir Merkez Deneyimi

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ABSTRACT

Aim: The study aims to investigate the outcomes of patients who underwent myomectomy during cesarean section in our tertiary center.
Material and method: This study was conducted between January 1, 2015 and May 31, 2022. The patients included in the study were divided into three groups: patients with myoma uteri and pregnancy who underwent cesarean section and simultaneous myomectomy (Group 1), patients with myoma uteri and pregnancy who underwent cesarean section only (Group 2), and pregnant patients without myoma who underwent cesarean section only (Group 3). The groups were compared in terms of preoperative and postoperative results.
Results: A total of 138 patients, 56 40.6% (Group 1), 31 22.5% (Group 2), 51 37% (Group 3) were included in the study. When compared according to demographic characteristics, Group 1 and Group 2 had significantly higher age and significantly lower gravida and parity (p: <0.001, p: 0.048, p: 0.005, respectively). There was no significant difference between Group 1 and Group 2 in terms of myoma size and number (p: 0.162, p: 0.228, respectively). Operative time, laboratory results, and blood transfusion requirements were similar between the groups.
Conclusion: Performing a myomectomy during a cesarean section, considering the potential risks based on our data, is a feasible procedure when carried out by experienced surgeons at tertiary hospitals. Precautions should also be taken regarding complications. We believe that the decision to include or exclude a myomectomy during a cesarean section should be discussed with the patient, considering the risk-benefit ratio and the factors mentioned above, and should be made on a case-by-case basis.

Keywords: Pregnancy, Myoma, Cesarean myomectomy, Tertiary center

ÖZ

Amaç: Çalışmanın amacı, üçüncü basamak merkezimizde sezaryen sırasında miyomektomi geçiren hastaların sonuçlarını araştırmaktır.
Gereç ve yöntem: Bu çalışma 1 Ocak 2015 ile 31 Mayıs 2022 tarihleri arasında yürütülmüştür. Çalışmaya dahil edilen hastalar üç gruba ayrıldı: miyoma uteri ve gebeliği olan ve sezaryen ve eş zamanlı miyomektomi geçiren hastalar (Grup 1), miyoma uteri ve gebeliği olan ve sadece sezaryen geçiren hastalar (Grup 2) ve miyomu olmayan ve sadece sezaryen geçiren gebe hastalar (Grup 3). Gruplar ameliyat öncesi ve sonrası sonuçlar açısından karşılaştırıldı.
Bulgular: Çalışmaya toplam 138 hasta, 56 40,6% (Grup 1), 31 22,5% (Grup 2), 51 37% (Grup 3) dahil edildi. Demografik özelliklere göre karşılaştırıldığında, Grup 1 ve Grup 2'de anlamlı derecede daha yüksek yaş ve anlamlı derecede daha düşük gravida ve parite vardı (sırasıyla p: <0,001, p: 0,048, p: 0,005). Miyom boyutu ve sayısı açısından Grup 1 ve Grup 2 arasında anlamlı bir fark yoktu (sırasıyla p: 0,162, p: 0,228). Ameliyat süresi, laboratuvar sonuçları ve kan transfüzyonu gereksinimleri gruplar arasında benzerdi.
Sonuç: Verilerimize göre olası riskleri göz önünde bulundurarak sezaryen sırasında miyomektomi yapmak, üçüncü basamak hastanelerde deneyimli cerrahlar tarafından gerçekleştirildiğinde uygulanabilir bir işlemdir. Komplikasyonlar konusunda da önlemler alınmalıdır. Sezaryen sırasında miyomektomi yapma veya yapmama kararının, risk-fayda oranı ve yukarıda belirtilen faktörler göz önünde bulundurularak hasta ile görüşülmesi ve vaka bazında verilmesi gerektiğine inanıyoruz.

Anahtar Kelimeler: Gebelik, Miyom, Sezaryen miyomektomi, Üçüncül merkez

Introduction

Uterine myomas are the most common benign tumors of the female genital tract. Their prevalence ranges from approximately 30-50% (1). The exact incidence of pregnancy is difficult to estimate. However, the literature reports a prevalence of 2-4% (2). Since myomas are hormone-sensitive, they may enlarge during pregnancy and cause complications. Uterine leiomyomas (fibroids) are benign (non-cancerous) gynecological tumors that have been linked to risk of fetal malpresentation, preterm birth, and Cesarean delivery although most pregnancies with fibroids are uncomplicated (3). Occasionally, cervical myomas causing heavy and persistent vaginal bleeding can be observed (4). Rarely, pedunculated or subserosal myomas cause acute abdomen or obstruction, and antepartum myomectomy can be performed (5).

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The prevalence increases with maternal age and varies by race. In a prospective cohort study including nearly 2800 patients at 12 clinical sites in the United States, the prevalence of fibroids at any time during pregnancy was 12 percent in patients 19 to 25 years of age, increasing to 32 percent in patients 35 to 42 years of age (6). There are studies advocating myomectomy during cesarean section because it accelerates postpartum involution and reduces the incidence of postpartum myoma-related complications such as menorrhagia, anemia, and pain (7). There are also studies suggesting that myomectomy during cesarean section should be avoided due to the risk of excessive bleeding and the potential need for a hysterectomy to control the bleeding, and that sometimes, depending on the location of the fibroid, surgical intervention should be postponed until after the cesarean section (8, 9).

In this study, we aimed to investigate the outcomes of pregnant patients in our clinic who underwent simultaneous myomectomy during a cesarean section.

Material and Method:

Patient selection

This study was conducted in the Department of Obstetrics and Gynecology at Dicle University Faculty of Medicine between January 1, 2015, and May 31, 2022. Patient information was retrospectively obtained from file archives and electronic records. The study was planned in accordance with the principles of the Helsinki Declaration, and approval was obtained from the local ethics committee of Dicle University Faculty of Medicine (Ethics Committee number: 2022/64) before starting the study.

The patients included in the study were divided into three groups: Group 1 consisted of patients who underwent cesarean section and simultaneous myomectomy; Group 2 included patients with uterine fibroids who underwent only a cesarean section; and Group 3 comprised patients without fibroids who underwent only a cesarean section. Group 3 patients were randomly selected from other patients. The groups were evaluated in terms of preoperative and postoperative hemogram values, demographic characteristics, operation duration, hospital stay duration, need for blood transfusion, need for intraoperative or postoperative hysterectomy, and need for additional surgical interventions

The patients included in the study were divided into three groups: patients with myoma uteri and pregnancy who underwent cesarean section and simultaneous myomectomy (Group 1), patients with myoma uteri and pregnancy who underwent cesarean section only (Group 2), and pregnant patients without myoma who underwent cesarean section only (Group 3). Group 3 patients were randomly selected. The groups were evaluated in terms of preoperative and postoperative hemogram values, demographic characteristics and surgical characteristics

Inclusion Criteria

All patients included in the study were diagnosed with uterine fibroids via ultrasound during the current pregnancy. Patient information was obtained from the hospital's electronic records and file archives, including surgical notes and pathology results after cesarean delivery. The ultrasound evaluation was performed using a GE Voluson730 Expert ultrasound device. Patients with placental localization and invasion anomalies, bleeding diathesis, known maternal diseases (such as heart disease, preeclampsia, diabetes), fetal anomalies, and twin pregnancies were excluded from the study. Similarly, patients whose delivery took place outside our hospital and whose information could not be accessed from file archives and electronic records were not included in the study.

Statistical analysis

The analyses were evaluated in SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22 package program. Descriptive data were presented as n, % values for categorical data and mean±standard deviation (Mean±SD) and median interquartile range (25-75 percentile values) for continuous data. Chi-square analysis (Pearson Chi-square) was used to compare categorical variables between groups. Compliance of continuous variables with normal distribution was evaluated by the Kolmogorov-Smirnov test. Mann-Whitney U-test was used to compare paired groups. In the comparison of more than two variables, One-way ANOVA analysis was performed for those that fit the normal distribution, and the Kruskal Wallis test was performed for those that did not show normal distribution. In examining the relationship between continuous variables, the Pearson correlation test was used for those with normal distribution and the Spearman correlation test for those without normal distribution. The statistical significance level was accepted as $p<0.05$ in the analysis.

Results

A total of 138 pregnant women who had myomectomy simultaneously with cesarean section (n:56 Group 1), who had myoma of pregnancy but not myomectomy simultaneously with cesarean section (n:31 Group 2), and who had normal cesarean section but not myoma (n:51 Group 3) were included in the study. The average age of Group 3 was found to be significantly lower than that of the other two groups (p<0.001). A significant difference was observed between the groups in terms of gravida (p=0.048) and parity (p=0.005), and this difference was due to the difference between Group 1 and Group 3, and Group 1 had lower gravida and parity. There was a significant difference between the groups in terms of the number of cesarean sections, and this difference was due to the difference between Group 3 and the other two groups, and the number of cesarean sections in Group 3 was higher (p=0.002). No significant difference was found between the groups in terms of gestational week (p=0.062) (Table 1).

Table 1. Demographic characteristics of the patients

	Group 1	Group 2	Group 3	Effect size	p
	Mean±SD	Mean±SD	Mean±SD		
Age	34.4±4.9[a]	35.5±4.6[a]	30.0±5.9[b]	0,143	<0.001*
Gravida, Median (IQR)	2.0 (1.0-5.0)[a]	3.0 (2.0-5.0)[a,b]	4.0 (2.0-5.0)[b]	0,037	0.048**
Parity, Median (IQR)	1.0 (.0-3.0)[a]	2.0 (1.0-3.0)[a,b]	2.5 (1.0-4.0)[b]	0,070	0.005**
Number of cesarean sections, Median (IQR)	.0 (.0-1.0)[a]	.0 (.0-2.0)[a]	1.0 (.0-3.0)[b]	0,085	0.002**
Gestational week, Median (IQR)	37.5 (35.0-38.0)	37.6 (34.0-38.0)	38.0 (36.0-39.0)	0,048	0.062**
Discharge time, Median (IQR)	2.0 (2.0-3.0)	2.0 (2.0-3.0)	2.0 (2.0-2.0)	0,012	0.258**

*One Way ANOVA analysis, **Kruskal Wallis analysis, ***Mann Whitney U test was applied [a,b]Group where the difference originated

When comparing the groups in terms of myoma size and number, the average myoma size for Group 1 and Group 2 was 6.8 (2.0-7.5) cm and 6.0 (4.0-8.0) cm, respectively. The average number of myomas in Group 1 and Group 2 was 1.0 (1.0-2.0) and 1.0 (1.0-1.0) respectively. In Group 1, the average number of myomas removed was 1.0 (1.0-2.0) Group 2 did not undergo myomectomy, and Group 3 was the group without myomas. The groups were compared in terms of fibroid size, number and duration of surgery in Table 2, and no significant differences were found (p=0.162, p=0.228, p=0.839, respectively).

Table 2. Surgical characteristics of the patients

	Group 1	Group 2	Group 3	Effect size	p
	Mean±SD	Mean±SD	Mean±SD		
Myoma size, Median (IQR)	6.8 (2.0-7.5)	6.0 (4.0-8.0)	-	0,534	0.162***
Number of myomas, Median (IQR)	1.0 (1.0-2.0)	1.0 (1.0-1.0)	-	0,155	0.228***
Retrieved myoma, Median (IQR)	1.0 (1.0-2.0)	-	-	-	-
Operation duration, Median (IQR)	45.0 (45.0-60.0)	45.0 (45.0-60.0)	50.0 (40.0-55.0)	0,004	0.839**

*One Way ANOVA analysis, **Kruskal Wallis analysis, ***Mann Whitney U test was applied [a,b]Group where the difference originated

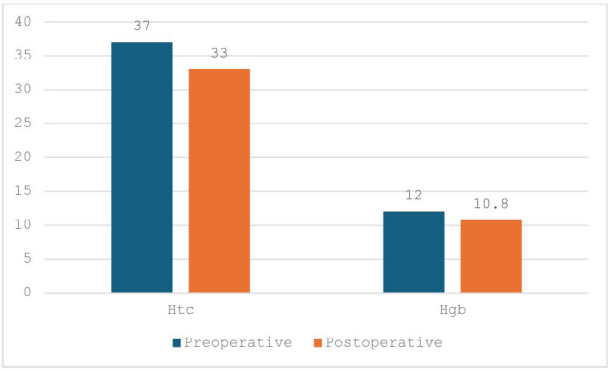
Comparison of the groups based on laboratory characteristics is given in Table 3. (p: 0.833, p: 0.311, p: 0.467, p: 0.999, respectively)

Table 3. Laboratory characteristics of the groups

	Group 1	Group 2	Group 3	Effect size	p
	Mean±SD	Mean±SD	Mean±SD		
Pre HTC (%)	37.1±3.5	37.2±3.9	36.8±3.1	0,001	0.833*
Pre HGB mg/dL	11.9±1.4	12.3±1.2	11.7±1.2	0,014	0.311*
Post HTC (%)	32.6±4.0	33.0±3.6	33.5±3.7	0,001	0.467*
Post HGB mg/dL	10.8±1.4	10.8±1.2	10.8±1.4	0,006	0.999*

*One Way ANOVA analysis, **Kruskal Wallis analysis, ***Mann Whitney U test was applied [a,b] Group where the difference originated, Pre: preoperativ, Post: postoperative, HGB:hemoglobin , HTC: hematocrit

Preoperative and postoperative laboratory values decreased significantly in all groups (p<0.001) (Figure 1).



HGB:hemoglobin , HTC: hematocrit

Figure 1. Preoperative and postoperative laboratory values of the groups

For Group 1, there was a significant positive correlation between myoma size and operation time and discharge time and a significant negative correlation between myoma size and gravida and parity. For Group 1, there was a significant negative correlation between the number of myomas and gravida and parity. For group 1, there was a significant negative correlation between the number of myomas removed and gravida and parity. For group 2, a significant

positive correlation was observed between the number of myomas and gestational week (Table 4).

Table 4. Correlation of myoma characteristics with variables

		Group 1			Group 2	
		Myoma size	Number of myomas	Removed myoma	Myoma size	Number of myomas
Age	r	.046	.126	.125	.021	.326
	p	.735	.355	.360	.912	.074
Gravida	r	-.428	-.432	**-.432**	-.226	.185
	p	.001	.001	**.001**	.221	.318
Parity	r	-.383	-.391	**-.391**	-.104	-.082
	p	.004	.003	**.003**	.578	.660
Number of cesarean sections	r	-.223	-.223	-.223	-.070	.200
	p	.099	.099	.099	.709	.282
Gestational week	r	.190	.101	.099	-.030	.426
	p	.160	.459	.469	.875	.017
Operation duration	r	.503	.222	.223	.151	.259
	p	.000	.100	.099	.419	.160
Pre HTC (%)	r	-.070	.043	.041	.038	.112
	p	.608	.751	.766	.840	.550
Pre HGB mg/dL	r	-.159	-.053	-.054	.013	-.081
	p	.242	.699	.694	.945	.664
Post HTC (%)	r	-.178	-.160	-.161	.194	.198
	p	.188	.238	.236	.297	.286
Post HGB mg/dL	r	-.145	-.190	-.190	.175	.115
	p	.287	.160	.160	.345	.538
Discharge time	r	.351	.029	.030	-.105	.070
	p	.008	.834	.827	.574	.707

Pre: preoperativ, Post: postoperative, HGB:hemoglobin , HTC: hematocrit

The blood transfusion rates of the groups are given in Figure 2, and no significant difference was observed (p=0.107)

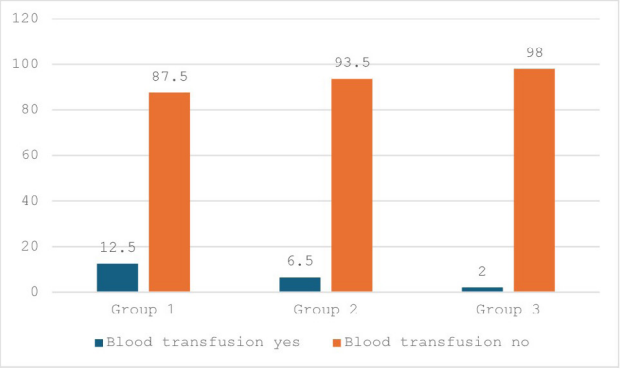


Figure 2. Blood transfusion rate by groups

Discussion

Because of the major complications of myomectomy during cesarean section, such as severe bleeding, morbidity, and mortality, most obstetricians avoid intervening in myomas during cesarean section. However, some studies have also argued that operations performed in full-fledged centers and by an experienced obstetrician do not cause complications and protect patients from a second operation, anesthesia risks, and complications of a new operation (10-12). We believe that the differences in opinions among surgeons are due to factors such as the surgeon's experience, the suitability of the center, and the availability of adequate equipment.

It is known that uterine myoma increases with age. Today, the rate of myoma uteri detection in pregnant patients is increasing due to the advancement of the gestational age for social reasons (career, etc.) in many societies. With advancing gestational age, easy access to hospitals, and innovations in diagnostic methods, the rate of patients being diagnosed with myoma is also increasing. The increase in the presence of myoma in pregnant women complicates the management of patients and causes anxiety in clinicians and patients. Therefore, we investigated the clinical outcomes of our tertiary center to guide the management of patients undergoing concomitant myomectomy with cesarean section.

It has been suggested that cesarean myomectomy has a lower complication rate than gynecologic cases. This is because the uterus can grow 1000-fold in volume and 20-fold in weight during pregnancy, but myomas can only grow a quarter as large. Therefore, they argued that myomectomy during cesarean section results in less tissue damage compared to the removal of myomas in a symptomatic case without pregnancy (13). Since the proportion of uterine myomas is larger in pregnant women than in non-pregnant women, uterine incisions are smaller, and cleavage is more easily achieved. Thus, myomectomy is technically easier (14). The elasticity of the pregnant uterus facilitates suture placement, while uterine contractions and physiologic involution further reduce bleeding. Hemorrhage and hematoma formation at the myomectomy site can also be prevented due to the addition of uterotonic drugs and the very good uterine response to uterotonic agents in the postpartum period (15).

Studies have shown that fibroids are more common in nulliparous and nulligravid women and that their incidence increases with age (16, 17). It is also known that myomas cause preterm delivery, and pregnant women with myoma at birth have a significantly lower gestational week (18). Similarly, in our study, parity and gravida were significantly lower, and age was significantly higher in patients with myoma than in

those without myoma.

A meta-analysis of 19 studies compared 2301 patients who underwent cesarean section myomectomy with patients who underwent cesarean section only. As a result of the evaluation, it was found that hemoglobin decline was higher, and more transfusions were needed in the group that underwent cesarean myomectomy (19). Another meta-analysis and a retrospective cohort study found no increase in complication rate and hysterectomy rate after cesarean myomectomy (18, 20). In our study, there was no difference between preoperative and postoperative laboratory results, operative time, and operative results in all groups. In addition, no major complications or hysterectomy occurred in any patient. We think the reason for this is that it is being performed at a tertiary center by experienced surgeons.

We think that the number of patients with uterus myoma who become pregnant will gradually increase in our society due to the advancement of the gestational age for social reasons (career, etc.). Therefore, we presented retrospective cesarean myomectomy data from our clinic, a tertiary center, in comparison with the literature. Our study supports the existing literature, and we found that the rate of nulliparity and nulligravid pregnancies and the mean age were higher in pregnant patients with myoma uteri compared to the control group. In addition, we think that the decision for cesarean section may have been made earlier because of the complaints of myoma-related pain, preterm labor, and EMR in pregnant patients.

In our retrospective study, no significant difference was found in the duration of surgery, hemoglobin drop, mean discharge time, and blood transfusion requirement between the groups. However, in pregnant women with myoma, we found a positive correlation in operative time, postoperative discharge time, and erythrocyte transfusion as the size and number of myomas increased.

Limitations

In addition to contributing to the literature, our study also has some limitations, such as being retrospective, single-centered, and lacking long-term postoperative outcomes of patients. We believe that the study should be supported by larger case series.

Conclusion

Whether myomectomy should be performed during cesarean section in patients with myoma is still a controversial issue in the literature. Although the addition of myomectomy operation during cesarean section is an operation that can be performed by experienced surgeons in a tertiary center by evaluating the possible risks, precautions should be taken in terms of complications. If the surgeon is not experienced and does not have adequate equipment, cesarean section alone may be preferred. In summary, cesarean myomectomy remains a relevant topic today. Therefore, we believe that surgeons need to continuously update their knowledge and experience in this area.

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No

Type of Contribution Authors

Özlem Polat Bozbay; Conception, Design, Materials, Data Collection and/or Processing, Writer

Dorşin Sancar Aslan; Resource, Literature Review

Reyhan Gündüz; Supervision, Critical Review

Nizamettin Bozbay; Analysis and/or Interpretation, Critical Review

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