ORIGINAL ARTICLE

IS MYOMA SIZE IMPORTANT IN CAESAREAN MYOMECTOMY OPERATION?

Sezaryen Myomektomi Operasyonunda Myom Boyutu Önemli midir?

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ABSTRACT

Objective: The purpose of this study was to examine the impact of myoma size on intraoperative and postoperative clinical results among caesarean section (CS) patients who underwent myomectomy.

Material and Methods: The results of 34 cases who had caesarean myomectomy were analysed retrospectively. Patients' demographic, clinical, and pathological data was analysed in two categories based on the size of their myomas: those less than 5 cm, those 5 cm and greater than 5 cm. The study analysed many factors including maternal age, gravida, parity, history of abortions, gestational age at delivery, birth weight of the infant, duration of the operation, features of the myoma, pre- and post-operative haemoglobin levels, requirement for blood transfusion, and pathology results.

Results: Our study involved performing myomectomy operation concurrently with caesarean delivery in 17 pregnant patients with myomas measuring less than 5 cm and in 17 pregnant patients with myomas measuring greater than 5 cm. The most prevalent kind was corpus localised (79.4%), the most pathologically normal leiomyoma nodule (82.4%), and the most uncommon one was cellular leiomyoma (2.99%). Subserosal myoma was the most common kind, accounting for 64.7% of cases. There were no statistical differences seen between the two groups in terms of age, gestational age, infant weight at delivery, pre- and post-operative haemorrhage, requirement for blood transfusion, myoma location, myoma type, and pathological examination. Upon analysing all clinical data, a statistically significant difference was detected between the two groups when evaluating the operation duration of individuals with myomas measuring under 5 cm and those with myomas measuring 5 cm or greater (45.47±9.94 vs 52.88±11.09) (p=0.048).

Conclusion: In proficient medical facilities, the practice of conducting myomectomy during caesarean delivery, irrespective of the size of the myoma, may be regarded as a secure and efficient method in selected patients. It is important to acknowledge that the duration of the operation may be extended as the size of the myoma grows.

Keywords: *Caesarean Section; Caesarean Myomectomy; Myoma Uteri; Myoma Size; Operation Time*

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ÖZET

Amaç: Sezaryen operasyonu sırasında myomektomi yapılan olgularda myom boyutlarının intraoperatif ve postoperatif klinik sonuçlar üzerine etkisinin araştırılması amaçlandı.

Gereç ve Yöntemler: Sezaryen myomektomi yapılan 34 olgunun sonuçları retrospektif olarak incelendi. Hastaların demografik, klinik ve patolojik verileri olgular myom boyutuna göre 5 cm altı ve 5 cm ve üstü olarak iki grup olarak incelendi. Anne yaşı, gravida, parite, abortus, doğumdaki gebelik haftası, bebek doğum kilosu, operasyon süresi, myom özellikleri, operasyon öncesi ve sonrası hemoglobin değerleri, transfüzyon ihtiyacı, patoloji sonuçları karşılaştırıldı.

Bulgular: Çalışmamızda myom boyutları 5 cm altı 17 gebe hastaya ve 5 cm ve üstü olarak 17 gebe hastaya sezaryen esnasında myomektomi operasyonu aynı anda uygulandı. En sık korpus yerleşimli (%79,4), patolojik olarak en sık normal leiomyoma nodülü (%82,4) en az ise sellüler leiomyoma (%2,99) izlendi. En sık myoma çeşidi ise %64,7 oranında subserozal yerleşimli olarak görüldü. iki grup arasında yaş, gebelik haftası, doğumda bebek kilosu, operasyon öncesi ve sonrası kanama, transfüzyon ihtiyacı, myom yerleşimi, myom çeşidi ve patolojik inceleme açısından istatistiksel olarak farklılık saptanmadı. Tüm klinik veriler incelendiğinde ise 5 cm altı ve 5 cm ve üstü iki grup operasyon süresi açısından değerlendirildiğinde iki grup arasında istatistiksel olarak anlamlı farklılık izlendi (45,47±9,94 vs 52,88±11,09) (p=0,048).

Sonuç: Tecrübeli kliniklerde, sezaryen sırasında myom boyutundan bağımsız olarak myomektomi yapılması seçilmiş hastalarda güvenli ve etkin bir yöntem olarak kabul edilebilir. Operasyon süresinin myom boyutu arttıkça uzayabileceği unutulmamalıdır. Uygun yerleşimli myomlarda sezaryen sırasında myomektomi yapılması maternal morbidite ve mortaliye artırmamaktadır.

Anahtar Kelimeler: *Sezaryen Doğum; Sezaryen Myomektomi; Myoma Uteri; Myom Boyutu; Operasyon Süresi*

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INTRODUCTION

Leiomyomas, which are also diagnosed as fibroids, are the most prevalent benign gynaecological tumours among women of reproductive age (1). Leiomyomas are smooth muscle cell-derived monoclonal tumoral formations (2). Typically, they manifest without apparent symptoms and are identified through routine gynaecological examinations (3).

Myoma incidence during pregnancy ranges from 3 to 10% (3). During pregnancy, hormonal changes and increased blood flow to the uterus cause these hormone-sensitive benign tumours to become larger. These lesions, which are typically asymptomatic, result in pelvic pain as a consequence of degeneration induced by estrogenic alterations in the body during pregnancy. Additionally, they may result in complications during pregnancy. Specifically, they can induce complications such as threatening miscarriage, preterm delivery, ectopic pregnancy, premature membrane rupture, placental abruption, placental location abnormalities, antenatal haemorrhage, and, in rare cases, high blood pressure during pregnancy (4).

Pregnancies at an advanced age are on the rise at present. Furthermore, concerning birth, it is regrettable to report that the incidence of operative births (caesarean sections) continues to rise on a daily basis. In underdeveloped countries, the caesarean section (CS) rates are around 6%, in developed countries 27.2%, and when looking at the world average, it is approximately 18.6%; however, these rates continue to increase (5).

As the incidence of myoma rises with age and the number of pregnancies in older women grows, there is a corresponding increase in the number of pregnancies identified with myoma and associated problems. Hence, it is important to diagnose and treat complications that may arise as a result of myoma during a caesarean birth (5, 6). The incidence of complications associated with myomas is rising as a result of an increasing number of births at advanced maternal age and the higher rates of caesarean deliveries. Clinicians continue to be concerned about performing myomectomy, particularly after caesarean birth, due to the increased problems that may ensue. Myomectomy, particularly when done during caesarean birth, can lead to serious complications including heightened bleeding, uterine atony, and infertility due to the need for a hysterectomy. Due to these many factors, it is not advisable to do a myomectomy as routine procedure during a caesarean delivery. Myomectomy is not suggested during caesarean birth if it is suspected to create serious complications, particularly if it is located in the lower portion of the uterus or the posterior wall (7, 8, 9).

We know that there is 3-4 times increase in uterine blood flow due to physiological changes that occur during pregnancy. Consequently, it is established that there is a physiological enhancement in the blood supply to the fetus and placenta within the uterus, as well as an increase in blood flow to the myoma. During caesarean sections and myomectomy surgeries, a lack of clinical knowledge and ineffective control of bleeding might lead to a higher demand for blood and blood product transfusions in around 20-25% of cases. This might result in an increase in serious complications, and which might lead to severe problems such as infertility due to hysterectomy. It is important to remember that including myomectomy during caesarean delivery has serious potential complications owing to physiological and pathological alterations. Therefore, it is advisable to only do this procedure in carefully chosen patients, after acquiring the required expertise and taking appropriate precautions (10, 11).

Recent literature indicates that myomectomy performed during caesarean section is a secure surgical procedure for specific patient populations in medical facilities with clinical expertise. This procedure has been found to yield positive results in subsequent pregnancies by reducing complications, the need for additional surgeries, and associated risks. Based on the findings of these studies, it is concluded that myomectomy operation can be performed during caesarean delivery, particularly for patients who meet the acceptable criteria (12-15).

Our study examined the clinical and pathological characteristics of patients who had a myomectomy during caesarean delivery. We identified and discussed the potential complications that can occur during or after the procedure, based on existing literature. Additionally, we aimed to analyse the impact of myoma sizes on the clinical results.

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MATERIAL AND METHOD

The scope of our study encompasses pregnant women who have been diagnosed with myoma uteri and have applied to the same clinic from November 2017 to 2023. After obtaining authorization from the local ethics council (dated 18.04.2025 and numbered 4/10), a retrospective examination was conducted on the files of pregnant patients who were above 34 weeks and underwent caesarean section for various reasons, as well as those who received myomectomy simultaneously. The study comprised 34 cases, which were categorised into two groups based on the size of the myoma: cases with a size below 5 cm and cases with a size of 5 cm and greater. The study comprised cases that had myomectomy during caesarean section. Myomas detected incidentally were operated on during planned cesarean section under normal elective conditions and in cases with appropriate emergency cesarean section indications. Patients who experienced bleeding during pregnancy, patients who were diagnosed with placenta adhesion and placement problems, patients who had previously undergone myomectomy, patients with a history of gynaecological surgery in the pelvic region, patients who declined to participate in the study, patients with pre-eclampsia or eclampsia, patients with Hellp syndrome, patients with acute fatty liver disorder during pregnancy, cases of immune thrombocytopenic purpura, patients who had serious comorbidities, cases of premature delivery before 28 weeks' gestation, and cases with coagulation problems or the use of anti-coagulant medication were not included in the study. The patient files were reviewed to evaluate various factors including maternal age, previous pregnancy history, gestational week, preoperative and postoperative haemoglobin levels, baby weight at birth, operation time, location of the myoma nodule, pathological diagnosis, type according to location, whether blood transfusion was performed, history of postoperative complications, and the sizes and locations of the removed myomas during caesarean section.

The caesarean section and simultaneous myomectomy procedure were carried out by the same proficient surgical team. All caesarean section surgeries were conducted through a lower uterine segment incision at a single centre with expertise with postpartum haemorrhage and access to blood and blood supplies. If the myomectomy was performed simultaneously, the serosal incision and/or caesarean section was operated on and removed from the incision line if it was close to the incision line. All patients received an oxytocin infusion and a methylergonovine injection as part of their routine care to promote uterine contractions during and after a normal caesarean birth.

The excised myoma nodules were assessed by proficient pathologists within the same clinic. The largest diameter measured in the pathological examination was analysed as the myoma size. All pathology reports evaluated yielded no indication of cancer.

The statistical analysis of the study's findings was conducted using the SPSS v22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) programme. During the evaluation of the study data, descriptive statistical methods such as the Mean and Standard deviation were employed. Additionally, the Mann Whitney U test was utilised to compare quantitative data and assess the differences in normally distributed parameters between two groups. The Wilcoxon test was employed to compare variables within the same group. The Chi-Square test and Fisher's Exact test were employed to compare qualitative data. The significance was assessed at a level of $p<0.05$.

RESULTS

Our study included 34 cases who had myomectomy during caesarean birth. In 17 cases, the diameter of the excised myoma was a smaller than 5cm, whereas in the remaining 17, it was 5cm or greater. The patients' ages varied from 25 to 45 years, with an average of 33.62±4.80. Pregnancy weeks range from 28 to 40 weeks, with an average of 37.50 ± 2.15 weeks. Preoperative Hgb values range from 11 to 14.9, with an average of 11.64 ± 2.97. Postoperative Hgb levels range from 10 to 13.6, with an average of 10.51±3.21. Baby weights range from 1330 to 4000 grams, with an average of 2983.5 ± 665.01 grams. Operation times range from 35 to 70 minutes, with an average of 49.18 ± 11.03 minutes. Myoma locations were corpus in 27 (79.4%) cases, fundus in 6 (17.6%) cases, and cellular leiomyoma in 1 (2.9%) case. When the pathological distribution is analysed, it is shown that Degenerate Leiomyoma is

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found in 5 (14.7%) cases, Leiomyoma in 28 (82.4%) cases, and Cellular Leiomyoma in 1 (2.9%) case. No blood transfusions were administered in any of the cases, and no postoperative fever was detected. Myoma type was intramural in 10 (29.4%) of the cases, intramural/subserous in 1 (2.9%), pedular in 1 (2.9%), and subserous in 22 (Table 1).

There is no statistically significant difference in gravida, parity, and abortion rates based on myoma diameter (p>0.05). There is no statistically significant difference in myoma locations based on myoma diameter, pathological diagnostic type, or myoma uteri kinds (p>0.05) (Table 2).

There is no statistically significant difference in average age, weeks of pregnancy, or weight of the baby at birth based on myoma diameter (p>0.05). There is a statistically significant difference between operation times based on myoma diameter (p <0.05). The group with larger myoma diameters had a longer operation time. There is no statistically significant difference between preoperative and postoperative Hgb levels based on myoma diameter (p>0.05). In the group with a myoma diameter smaller than 5 cm, the reduction in postoperative Hgb levels compared to preoperative Hgb levels was not statistically significant (p>0.05). In the group with a myoma diameter of 5 or greater, the reduction in postoperative Hgb levels compared to preoperative Hgb levels was not statistically significant (p>0.05) (Table 3).

Table 1. Clinical and demographic characteristics of the cases.

		Min-Max	Mean±SD
Age		25-45	33.62±4.80
Week of Pregnancy		28-40	37.50±2.15
Preop Hgb		11-14.9	11.64±2.97
Postop Hgb		10-13.6	10.51±3.21
Baby Weight (gr)		1330-4000	2983.5±665.01
Operation time (min)		35-70	49.18±11.03
		n	%
Gravida	1	14	41.2
	2	4	11.8
	≥3	16	47
Parity	0	14	41.2
	1	6	17.6
	≥2	14	41.2
Abortion	0	13	65
	≥1	7	35
Myoma Location	Corpus	27	79.4
	Fundus	6	17.6
	Isthmus	1	2.9
Pathology	Degenerate Leiomyoma	5	14.7
	Leiomyoma	28	82.4
	Cellular Leiomyoma	1	2.9
Blood Transfusion	Not	34	100
Postoperative fever	Not	34	100
Myoma Type	Intramural	10	29.4
	Intramural/Subserous	1	2.9
	Pedunculated	1	2.9
	Subserous	22	64.7

Preop: preoperative, Postop: postoperative, Hgb: hemoglobin, gr: gram, min: minimum, max: maximum, SD: standard deviation, min: minute

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Table 2. Evaluation of clinical characteristics of cases according to myoma diameter.

		Myoma Size< 5cm	Myoma Size≥ 5cm	P-value
		n; %	n; %	
Gravida	1	8;47.1	6;35.1	[3] 0.515
	2	3;17.6	1;5.9	
	3	3;17.6	5;29.4	
	≥4	3;17.6	5;29.4	
Parity	0	8;47.1	6;25.3	[2]0.751
	1	3;17.6	3;17.6	
	≥2	6;35.3	8;47.1	
Abortion	Not	6;66.7	7;63.6	[2]0.156
	Yes	3;33.3	4;36.4	
Myoma location	Corpus	13; 76.5	15; 88.2	[2]0.656
	Fundus	4; 23.5	2; 11.8	
Pathology	Degenerate Leiomyoma	3; 17.6	3; 27.6	[2]1.000
	Leiomyoma	14; 82.4	14; 82.4	
Myoma type	Intramural	4; 23.5	6; 35.3	[3]0.452
	Subserous	13; 76.5	11; 64.7	

[2]Fisher's Exact test, [3]Ki-Kare-test

Table 3. Characteristics of myomas in pregnant women who underwent cesarean section.

	Myoma size< 5cm	Myoma size≥ 5cm	P-value
	Mean±SD	Mean±SD	
Age	33.53±4.66	33.71±5.07	[1]0.917
Week of pregnancy	37.47±1.51	37.53±2.69	[1]0.938
Baby weight (gr)	2872.06±612.05	3095.0±715.04	[1]0.336
Operation time (min)	45.47±9.94	52.88±11.09	[1]0.048*
Pre-op Hgb	11.70±3.08	11.59±2.95	[1] 0.915
Post-op Hgb	10.94±2.91	10.07±3.52	[1] 0.441
Pre-op/ Post-op Hgb	[4] 0.404	[4] 0.179	

[1]Mann Whitney U test, [4] Wilcoxon test, *p<$^{0.05}$, Preop: preoperative, Postop: postoperative, Hgb: hemoglobin, gr: gram, min: minimum, max: maximum, SD: standard deviation

DISCUSSION

Our study analysed clinical, pathological, preoperative, and postoperative data from patients who received myomectomy during caesarean section. The cases who had myomectomy during caesarean section were divided into two groups based on myoma size: less than 5 cm and 5 cm or above. There was no statistically significant difference between the two groups when comparing age, gestational week, infant birth weight, uterine location of myomas, myoma kinds, pathological examination results, and preoperative and postoperative haemoglobin levels. However, it was discovered that the operation time in cases with myomas greater than 5 cm was statistically significant longer than in cases with myomas smaller than 5 cm (p=0.048). It demonstrates that the increases in myoma size between the two groups is unrelated to the increase in morbidity; the only difference is the increased operating time.

Gynaecological pathologies, particularly myoma, have become more common after surgical delivery in recent years as the number of advanced-age pregnancies and caesarean deliveries has increased worldwide. For all of these reasons, it is stated that performing a myomectomy operation during caesarean delivery has a positive effect on subsequent pregnancies and the

patient's quality of life, the possibility of myoma re-developing is very low, and the risk of complications related to the operation is low (16, 17). However, it should be noted that myomectomy performed during caesarean delivery can result in serious morbidities such as postpartum bleeding and hysterectomy, including loss of fertility, so it is best to perform this procedure in effective centres with clinical experience and adequate blood and blood product replacement services. During our study, we did not administer any blood or blood products to 34 patients who underwent myomectomy during caesarean section. Furthermore, we did not observe any pathological findings that would lead to increased morbidity in the postoperative period, such as high fever or similar, in any of our patients' clinical vital signs.

Recently, it has been revealed that caesarean myomectomy is safe. Caesarean myomectomy is now widely regarded as an effective and safe procedure, particularly when performed by expert gynaecologists. Thus, the chance of repeat myomectomy surgery, the risks associated with repeat anaesthesia, and the expense are all decreased. Furthermore, the increased risk of pregnancy complications caused by mucosal-located myomas is reduced, and women's quality of life improves as a result of increased fertility after myomectomy and a decrease in clinical symptoms such as myoma-related pelvic pain and vaginal bleeding (18).

A study of 111 cases in which myomectomy was performed during caesarean section found that hysterectomy was never performed. Furthermore, there were no significant differences observed in terms of operation time, hospital stay, amount of bleeding, and rates of serious complications between the two groups (Those with myomectomy and those without). Caution is advised specifically while removing intramural deep-seated myomas, however it has been confirmed that myomectomy is generally safe regardless of the size and location of the myoma (12). None of the cases in our analysis required hysterectomy or any other surgical intervention to prevent bleeding, which is consistent with the results of all the cases that received myomectomy during caesarean delivery. There were no complications during or after the operation. Furthermore, it is worth noting that the majority of our cases exhibited myoma sizes of 5 cm or smaller and were located subserosally within the uterine corpus. As a result, the level of bleeding experienced was minimal, obviating the necessity for blood transfusion. Consequently, our incidence rates of fever and similar complications were lower in comparison to the existing body of literature (19).

When examining the literature, it is evident that myoma sizes play a crucial role in determining clinical and pathological results, as well as potential complications, in cases where caesarean myomectomy is performed. This highlights the significance of myoma sizes in all obstetric or gynaecological scenarios requiring myomectomy. However, we may conclude that there is no obvious cut-off value for myoma sizes. Upon reviewing the conducted studies, it was found that performing myomectomy during caesarean section is safe, regardless of the number, size, and location of myomas. This conclusion was based on a study that included cases with myoma sizes of 5 cm and above, where no complications were observed. Another study found no significant variation in the reduction of haemoglobin levels, length of hospital stays, and duration of surgery among patients with myomas larger than 5 cm who underwent caesarean myomectomy. The size and location of the myoma did not affect the feasibility of performing myomectomy (20).

A meta-analysis of 2301 cases was conducted, comparing cases with and without myomectomy after caesarean delivery. The average haemoglobin reduction in the caesarean myomectomy group was 0.25 mg/dL greater (95% [CI]: 0.06-0.45), and the requirement for blood transfusion was increased [OR]: 1.41; 95% [CI]: 0.96-2.07 (21). However, another retrospective cohort study published in 2019 reported no difference in average Hb decrease or blood transfusion rate between patients who received CS myomectomy and those who underwent CS alone (19). In our study, when we examined the cases who underwent myomectomy during caesarean section as below 5 cm and 5 cm and above, there was no difference between the two groups in terms of myoma location, pathological examination, myoma types, and amount of bleeding, and the operation time was only statistically significantly longer in cases with myomas

of 5 cm and above. However, no increased bleeding, blood and blood product replacement, wound infection, or similar complication rates were found in any case related to the longer duration.

It is believed that myomectomy conducted after a caesarean delivery takes longer, regardless of the size of the myoma. It is stated that the difference in average operation times is statistically significant (22-24). Another study indicated that when myomectomy was performed during a caesarean section, the operation time was statistically significantly longer in the groups who had intramural and subserosal myomectomy than in the groups who did not (25).

A comparative analysis was conducted between 21 pregnant patients diagnosed with myoma uteri measuring above 5 cm and 68 pregnant patients with myoma uteri measuring under 5 cm. The analysis focused on evaluating the clinical, pathological, and complications following myomectomy performed during caesarean section. The operation time was found to be 13.1 minutes longer in the over 5 cm group, but it was stated that there was no statistically significant difference in terms of operation time between the two groups. In addition, the study reported that the duration of hospitalisation was 0.6 days longer in the group with myomectomy greater than 5 cm, but this was not statistically significant (26). Our study reveals that the average operation time was 7.41 minutes longer on average (52.88±11.09 compared to 45.47±9.94) in the group where myomectomy was performed over 5 cm, and this difference was statistically significant (p=0.048).

When myoma uteri is identified, particularly in gynaecology, despite the progress made in medical and surgical treatments, hysterectomy is still the preferred option over fertility-sparing surgery. Upon reviewing the literature, particularly regarding abdominal myomectomy operations, it has been reported that there is a transition to hysterectomy in % 2cases due to bleeding and similar serious complications, especially due to inadequate haemostasis. Despite retrospective studies indicating a 0% rate of serious complications, such as loss of fertility or hysterectomy, after caesarean myomectomy, clinicians continue to avoid this procedure due to concerns about potential risks (19, 27, 28). In this study, we did not develop any potentially serious complications in all myomectomy cases in which 5 cm below or above 5 cm were removed in the CS. Furthermore, we did not have any cases in which a hysterectomy was conducted in a manner that would result in a loss of fertility.

When examining the studies overall, a comparison was made between the operation times in cases with and without myomectomy during caesarean section. It was noted that the operation times were generally longer, ranging from 5 to 15 minutes, in the myomectomy group. It is stated that this difference in operation times is of no importance, because it has been stated that the group without myomectomy may need a second operation later, which causes an increase in surgical and anaesthesia complications and an increase in cost (10, 29). In our study, myomectomy was conducted in all cases. In our study, myomectomy was conducted in all cases, and when these cases were reviewed in terms of myoma size, we can conclude that it is important since it is the first clinical study to indicate that the operation duration may rise as the myoma size grows.

The primary concern during a myomectomy operation performed during a caesarean section is the occurrence of post-myomectomy haemorrhage. Consequently, healthcare professionals universally refrain from doing myomectomy operations during caesarean sections. In reality, the contractility of the uterus is the most important predictor of the risk of bleeding in myomectomy surgery during caesarean section, both in gynaecological and especially in obstetric cases. Furthermore, it is important to acknowledge the physiological thrombogenic condition that occurs during pregnancy. This condition involves an elevation in coagulation factors that promote clotting, as well as an increase in the contractile capacity of the pregnant uterus. These physiological changes effectively prevent bleeding, despite the increased blood flow in the pregnant uterus. Upon completion of data analysis, a caesarean myomectomy operation may be advised in specific cases, conducted by skilled medical facilities and an experienced surgical team, while considering all protective and risky variables associated with pregnancy.

Our study has some limitations. The most important limitations of our study include its retrospective

nature, limited number of participants, absence of a control group comprising individuals diagnosed with myoma during caesarean section but not subjected to myomectomy, and the absence of long-term clinical monitoring and data on subsequent pregnancies. Furthermore, a relative decrease in morbidity may have been detected due to myoma location, size, and number, as well as clinical heterogeneity, and each case could not be examined individually in terms of potential complications. The fact that all our cases underwent myomectomy during caesarean section and the absence of a control group that did not do so may actually reduce the risk of bias, because in selected cases, the removal of single, millimetrically small and pedunculated or serosal myomas could have resulted in similar selection bias, as well as reducing morbidity. Moreover, the expertise of our centre in this field may have reduced the risk of complications.

Nevertheless, However, after the caesarean myomectomy operation performed in a single experienced centre by the same surgical team experienced in terms of postpartum bleeding, the fact that our clinical results support myomectomy during caesarean section, in line with the literature, can be seen as the most important strength. Furthermore, our study's strength is underscored when we consider the possibility that all myomas identified during caesarean section were removed without differentiation of their localised area, type, and size, and that if not eliminated, a subsequent operation may be necessary.

CONCLUSION

Performing a myomectomy during a caesarean section does not result in serious morbidity or mortality. There is a lengthening of the surgical procedure's duration, particularly in cases with large-sized myomas. However, this does not result in serious postoperative complications. Myomectomy operations can be successfully carried out during caesarean sections in skilled medical facilities.

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REFERENCES

1. Kashani BN, Centini G, Morelli SS, Weiss G, Petraglia F. Role of Medical Management for Uterine Leiomyomas. Best Pract Res Clin Obstet Gynaecol. 2016;34:85-103.

2. Li Z, Maeda D, Kudo-Asabe Y, Tamura D, Nanjo H, Hayashi A, et al. MED12 is frequently mutated in ovarian and other adnexal leiomyomas. Hum Pathol. 2018;81:89-95.

3. Stewart EA, Laughlin-Tommaso SK, Catherino WH, Lalitkumar S, Gupta D, Vollenhoven B. Uterine fibroids. Nat Rev Dis Primers. 2016;2:16043.

4. Ciavattini A, Clemente N, Delli Carpini G, Di Giuseppe J, Giannubilo SR, Tranquilli AL. Number and size of uterine fibroids and obstetric outcomes. J Matern Neonatal Med. 2015; 28(4):484–8.

5. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. PLoS One. 2016;11(2):e0148343.

6. Coronado GD, Marshall LM, Schwartz SM. Complications in pregnancy, labor, and delivery with uterine leiomyomas: a population-based study. Obstet Gynecol 2000;95:764–9.

7. Neiger R, Sonek JD, Croom CS, Ventolini G. Pregnancyrelated changes in the size of uterine leiomyomas. J Reprod Med 2006;51:671–4.

8. Vitale S G, Padula F, Gulino F A. Management of uterine fibroids in pregnancy: recent trends. Curr Opin Obstet Gynecol 2015;27:432–7.

9. Kwawukume EY. Caesarean myomectomy. Afr J Reprod Health 2002;6(3):38–43.

10. Samy A, Raslan AN, Talaat B, El Lithy A, El Sharkawy M, Sharaf MF, et al. Perioperative nonhormonal pharmacological interventions for bleeding reduction during open and minimally invasive myomectomy: a systematic review and network meta-analysis. Fertil Steril. 2020;113(1):224-33.e6.

11. Thaler I, Manor D, Itskovitz J, Rottem S, Levit N, Timor-Tritsch I, et al. Changes in uterine blood flow during human pregnancy. Am J Obstet Gynecol. 1990;162(1):121-5.

12. Roman AS, Tabsh KM. Myomectomy at time of cesarean delivery: a retrospective cohort study. BMC Pregnancy Childbirth 2004;4(1):14.

13. Song D, Zhang W, Chames MC, Guo J. Myomectomy during cesarean delivery. Int J Gynaecol Obstet 2013;121:208–13.

14. Hatırnaz Ş, Güler O, Başaranoğlu S, Tokgöz C, Kılıç GS. Endometrial myomectomy: a novel surgical method during cesarean section. J Matern Fetal Neonatal Med 2018;31:433–8.

15. Akbas M, Mihmanli V, Bulut B, Temel I, Karahisar G, Demirayak G. Myomectomy for intramural fibroids during caesarean section: A therapeutic dilemma. J Obstet Gynaecol. 2017;37(2):141-5.

16. Akkurt MO, Yavuz A, Eris Yalcin S, Akkurt I, Turan OT, Yalcin Y, et al.

Can we consider cesarean myomectomy as a safe procedure without long-term outcome? J Matern Fetal Neonatal Med 2016;9:1–6.

17. İncebiyik A, Hilali NG, Camuzcuoglu A, Vural M, Camuzcuoglu H. Myomectomy during cesarean: a retrospective evaluation of 16 cases. Arch Gynecol Obstet 2014;289: 569–73.

18. Goyal M, Dawood AS, Elbohoty SB, Abbas AM, Singh P, Melana N, et al. Cesarean myomectomy in the last ten years; A true shift from contraindication to indication: A syste-matic review and meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2021;256:145-57.

19. Zhao R, Wang X, Zou L, Zhang W. Outcomes of myomectomy at the time of cesarean section among pregnant women with uterine fibroids: A retrospective cohort study. Biomed Res Int. 2019;2019:7576934.

20. Kwon DH, Song JE, Yoon KR, Lee KY. The safety of cesarean myomectomy in women with large myomas. Obstet Gynecol Sci. 2014;57(5):367-72.

21. Pergialiotis V, Sinanidis I, Louloudis IE, Vichos T, Perrea DN, Doumouchtsis SK. Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis. Obstet Gynecol. 2017;130(6):1295-303.

22. Sakinci M, Turan G, Sanhal CY, Yıldız Y, Hamidova A, Guner FC, et. al. Analysis of myomectomy during cesarean section: A terti-ary center experience. J Invest Surg. 2022;35(1):23-9.

23. Kaymak O, Ustunyurt E, Okyay RE, Kalyoncu S, Mollamahmutoglu L. Myomectomy during cesa-rean section. Int J Gynaecol Obstet. 2005;89(2):90-3.

24. Özcan A, Kopuz A, Turan V, Sahin C, Töz E, Aksoy S et al. Cesarean myomectomy for solitary uterine fibroids: Is it a safe procedure?. Ginekol Pol. 2016;87(1):54-8.

25. Guler AE, Guler ZD, Kinci MF, Mungan MT. Myomectomy during cesarean section: Why do we abstain from?. J Obstet Gynaecol India. 2020;70(2):133-7.

26. Bayram F, Aslan MM. The Effect of Myoma Size on Cesarean Myomectomy Results. OTJHS. 2022;7(3):371-5.

27. Giuliani E, As-Sanie S, Marsh EE. Epidemiology and management of uterine fibroids. Int J Gynaecol Obstet. 2020;149(1):3-9.

28. Sawin SW, Pilevsky ND, Berlin JA, Barnhart KT. Comparability of perioperative morbidity between abdominal myomectomy and hysterectomy for women with uterine leiomyomas. Am J Obstet Gynecol. 2000;183(6):1448-55.

29. Miller C, Laparoscopic myomectomy. In: O'Donovan P, Miller C (eds). Modern management of abnormal uterine bleeding. Boca Raton, Fla.: CRC Press; 2008: 232–9.