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Analysis of clinical, biological and obstetric factors influencing the decision to perform cesarean myomectomy

Analiza czynników klinicznych, biologicznych i położniczych wpływających na decyzję o usunięciu mięśniaka macicy w trakcie cięcia cesarskiego

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Abstract

Objectives: *Myomas in pregnancy are associated with a significantly higher risk for cesarean section (CS). Cesarean myomectomy (CM), i.e. myomectomy during cesarean section, has been the source of much debate and was considered relatively contraindicated for many years. However, some authors advise to perform routine myomectomy during CS. The aim of our study was to determine factors influencing the intraoperative decision to perform CM.*

Material and methods: *A total of 185 patients with uterine myomas, who delivered by caesarean section during a 5-year period, were included in the study - 102 patients underwent CM (study group) and 83 women underwent CS without myomectomy (control group). Clinical and obstetric data were recorded and processed for analysis. Using non-parametric correlation methods, we investigated the influence of different variables on the decision to perform CM.*

Results: *No differences were recorded between the two groups in terms of parity, fetal presentation, gestational age, number of previous laparotomies, and previous myomectomy, presence of diabetes and hypertension, indications and type of CS. Significant differences were detected in type and location of the myomas, contrary to their number and size, where no significant differences were registered.*

Conclusions: *The most significant predictors of CM included age, surgical experience and type of myomas. CM is generally performed by experienced surgeons and in younger women. Also, it is more often performed in patients affected by pedunculated and subserosal myomas, and less frequent in case of intramural and multiple myomas.*

Key words: **cesarean myomectomy** / **cesarean section** / **myoma** / **myomectomy** /

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Streszczenie

Cel pracy: *Mięśniaki macicy w ciąży są związane z istotnie wyższym ryzykiem cięcia cesarskiego (CS). Miomektomia podczas cięcia cesarskiego (CM) jest źródłem wielu debat a przez wiele lat była uznana za przeciwwskazaną. Aczkolwiek niektórzy autorzy zalecają rutynową miomektomię podczas cięcia cesarskiego. Celem naszego badania jest określenie czynników wpływających na decyzję o miomektomii podczas cięcia cesarskiego.*

Materiał i metoda: *Do badania włączono 185 pacjentek z mięśniakami macicy, które miały wykonane cięcie cesarskie w czasie 5 letniej obserwacji – 102 pacjentki przeszły miomektomię podczas cięcia cesarskiego (grupa badana) a 83 miały wykonane cięcie cesarskie bez miomektomii (grupa kontrolna). Analizie poddano dane kliniczne i położnicze. Przy pomocy testów nieparametrycznych zbadano wpływ różnych zmiennych na decyzję o cięciu cesarskim.*

Wyniki: *Nie znaleziono różnic pomiędzy dwiema grupami pod względem rodności, położenia płodu, wieku ciążowego, liczby uprzednio wykonanych laparotomii oraz miomektomii, obecności cukrzycy lub nadciśnienia, wskazań do cięcia cesarskiego oraz rodzaju wykonanego cięcia cesarskiego. Istotne różnice dotyczyły typu i lokalizacji mięśniaków, w przeciwieństwie do liczby i rozmiaru, które nie miały znaczenia.*

Wnioski: *Na wykonanie miomektomii podczas cięcia cesarskiego największy wpływ miały wiek, doświadczenie operatora i rodzaj mięśniaka. CM jest wykonywana przez doświadczonych chirurgów i u młodszych kobiet. Również miomektomia podczas cięcia cesarskiego częściej jest przeprowadzana na uszypułowanych i podsurowicówkowych mięśniakach a rzadziej w przypadku śródściennych i mnogich mięśniaków.*

Słowa kluczowe: **miomektomia podczas cięcia cesarskiego** / **cięcie cesarskie** / / **mięśniak, miomektomia** /

Introduction

Myomas are the most common benign tumors of the genital organs in women of reproductive age. Myomas in pregnancy, irrespective of their size, are associated with a significantly elevated risk for cesarean section (CS) [1, 2]. In the older literature, cesarean myomectomy (CM) was considered a high-risk intervention due to high incidence of perioperative complications, which may become an indication for postpartum hysterectomy [1, 3]. CM was advised only if it was necessary for the safe extraction of the fetus and the suture of the uterus [4]. In contrast, some authors recommend routine myomectomy during CS in every case [5].

Objectives

The aim of the study was to determine factors influencing the intraoperative decision to perform CM.

Material and methods

This retrospective study included 185 patients with uterine myomas, who delivered by CS during a 5-year period. The study group included 102 women who underwent CM and the control group comprised 83 women who received CS without myomectomy. The study was approved by the Local Institutional Review Board and Local Ethics Committee. The inclusion criterion was the existence of uterine myomas confirmed during CS. The exclusion criteria were the possible confounding factors, i.e. placenta previa or placental abruption, congenital or acquired coagulopathy, multiple pregnancies, and additional surgical procedure during cesarean section (except myomectomy).

We recorded the following parameters: patient age, parity, fetal presentation, gestational age at delivery, history of previous myomectomies and/or laparotomy, hypertension and/or diabetes, indications and type of CS, experience of the surgeon, type, location, size and number of the myomas, number of uterine incisions, and histopathological findings of the removed myomas. The indications for CS were defined based on the primary indication for surgery. Experience of the surgeon was evaluated on the basis of the length of post-residency professional activity (in years) in the University Hospital.

Type, location and number of myomas were determined on the basis of the operative notes in medical records. By type, myomas were divided into four categories: pedunculated, subserosal, intramural and multiple. Location of myomas was defined based on anatomical location, as follows: uterine fundus, anterior and posterior wall, cornual or isthmic-cervical fibroid. In cases of multiple myomas, the diameter of the largest myoma was taken into account. In the study group, the size of the myoma was defined on the basis of the measurements made by the pathologist.

In the control group, the size of the myoma was defined on the basis of preoperative ultrasound findings or surgeon's estimates listed in the surgical report. Statistical comparisons were made between the control and the study groups. After controlling normal distribution, a Student's t-test for numerical data and Pearson's chi-square test for comparing ordinal variables were used. Also, non-parametric correlation method (ρ coefficient) was used for identifying predictors of myomectomy. Data were analyzed using SPSS statistical software (version 17.0). The unique level of significance throughout the study was 0.05.

Results

Mean patient age was 34.5±4.6 years and 36.1±4.5 years in the study and the control groups, respectively. Women in the study group were significantly younger than controls (t=2.358, p=0.019), as shown in Figure 1.

The groups did not differ in terms of parity, fetal presentation, gestational age at delivery, number of previous laparotomies, history of previous myomectomies, the presence of diabetes and hypertension, indications and type of cesarean section.

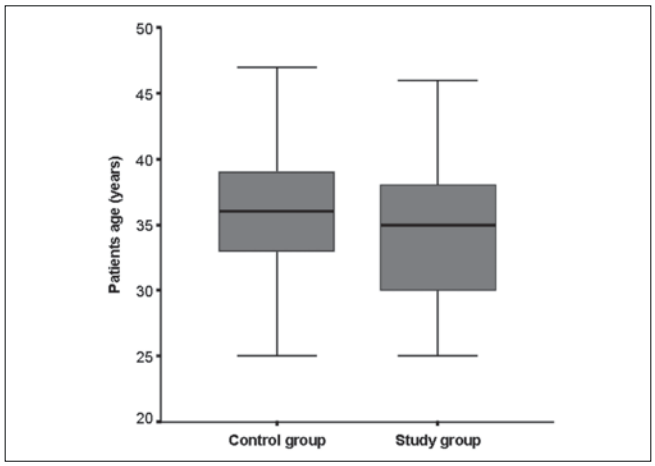

Figure 1. Patient age in the study and the control groups.

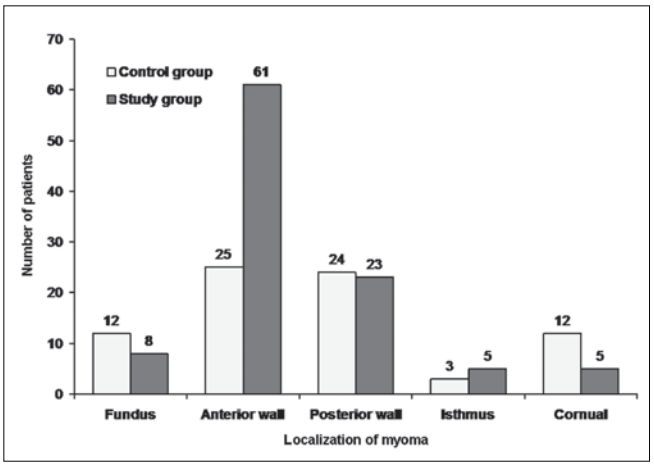

Figure 4. Myoma location in both groups.

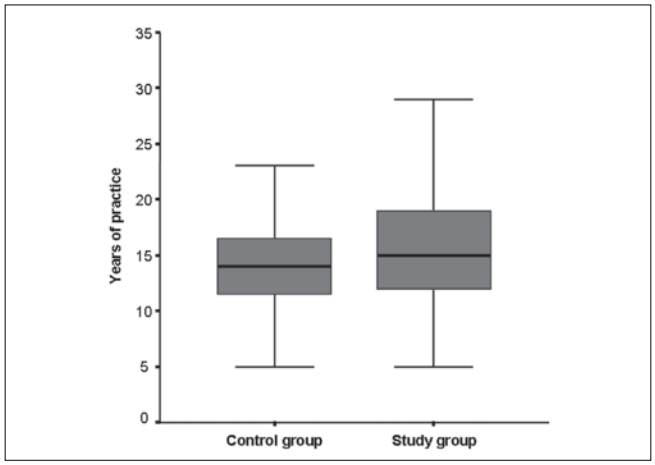

Figure 2. Surgeon's practice (in years).

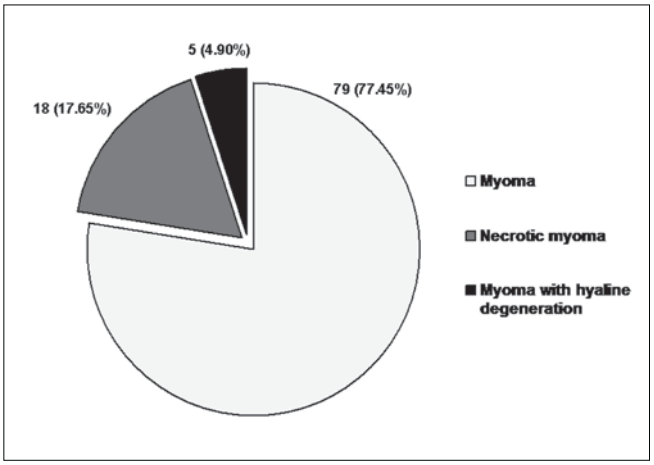

Figure 5. Pathological diagnoses of the myomas in the study group.

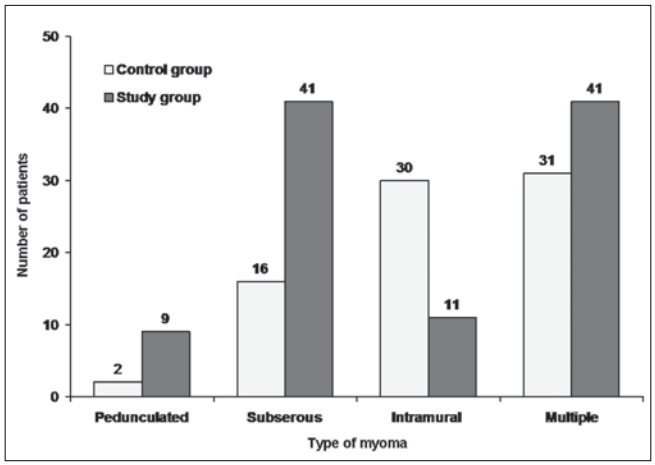

Figure 3. Myoma types in both groups.

Mean number of years of practice for the surgeon who operated on the women from the study group was significantly higher (t=2.076, p=0.039), and was 16.78±6.59 years, as compared to 14.80±6.25 years for the surgeon who operated on controls (Figure 2). The groups statistically significantly differed with regard to the type of fibroid ($\chi 2$=23.063, p=0.000). In the study group, multiple (40.20%) and subserosal (40.20%) myomas were the most frequent, followed by intramural (10.78%), and pedunculated (8.82%) fibroids as the least common. Also in the control group, multiple myomas (39.24%) were the most and pedunculated fibroids (2.53%) were the least common, but intramural myomas were significantly more (37.97%) and subserosal myomas were significantly less (7.59%) frequent than in the study group (Figure 3). Myomectomy is usually performed in women with pedunculated fibroids (9 patients, 81.82%) than subserosal myomas (41 patients, 71.93%). Myomectomy is least frequently performed in cases of intramural myomas (26.83%), and multiple myomas (56.94%). Statistically significant difference in the location of myomas was observed between the groups ($\chi 2$=15.813; p=0.000).

In the study group, myomas of the anterior wall (59.80%), rather than the posterior wall (22.55%) or the fundus (7.84%), were the most common, while isthmic-cervical and cornual myomas (4.90%) were the rarest. In the control group, anterior wall (32.89%) and posterior wall (31.58%) myomas were the most common, while isthmic-cervical myomas (3.94%) were the least frequent. Myomas of the uterine fundus and those of the cornual location were significantly more frequent in the control group (15.79%) than in the study group (Figure 4). The number of performed myomectomies (myomectomy was performed in 70.93% of the cases) was the highest in women with anterior wall myomas. A minimal number of myomectomies was performed in women with cornual myomas (29.41%). Mean size of myomas in women from the study group was 55.60±33.84 mm (min. 10 mm, max. 210 mm), and in controls 57.63±35.71 mm (min. 10 mm, max. 200 mm), but the difference was statistically insignificant. Also, the groups were not statistically significantly different with regard to the number of myomas. Myomectomy was performed via the low uterine segment incision in 8 (7.84%) patients from the study group. The vast majority of subjects (78 patients; 76.47%) had two uterine incisions (CS and myomectomy), while in 16 women (15.69%) three or more incisions were performed. With regard to histopathologic findings of the myomas, the difference was highly statistically significant (χ^2=11.178, p=0.001), as a result of a rare finding of myomas with signs of hyaline degeneration (4.90%) and the dominant finding of myomas without any secondary changes (77.45%), as shown in Figure 5.

We investigated the influence of various factors on the decision to perform CM using non-parametric correlation. The most important predictor of myomectomy was maternal age (ρ=-0.164, p=0.006), followed by surgical experience (ρ=0.156; p=0.008), and ultimately the type of fibroid (ρ=-0.145, p=0.009). Myomectomy was performed more often in younger women and by experienced obstetricians. Also, it was more frequently performed in patients with pedunculated and subserosal myomas rather than intramural and, particularly, multiple myomas. The decision to perform myomectomy was not affected by the number of previous pregnancies and births, size, location and number of fibroids, or weeks of gestation at delivery. Myomectomy was not significantly associated with fetal presentation, the presence of hypertension and diabetes, indications and type of cesarean delivery, as well as previous myomectomy and laparotomy, although the procedure was not performed in patients with three previous laparotomies.

Discussion

In recent years, a growing number of studies have indicated that CM in selected groups of patients is not necessarily linked to an increased risk of complications, but the literature does not clearly define the exact indications and contraindications for CM [6-10]. CM is a potentially complex obstetric operation, combining CS and myomectomy into one procedure, which could lead to serious life-threatening situations and complications in the puerperium [11, 12]. Sometimes, however, it is not so obvious because there are situations when it may be advisable to perform CM to actually prevent complications [12].

In our study, CM was performed more frequently in younger women, in whom the risk of complications caused by fibroids in the next pregnancy is higher and the need for myomectomy before the next pregnancy more likely. Our attitude was also supported by the fact that in many other reports the age of the operated patients was even younger than in our study [6, 7].

The results of our research are consistent with the expectations about the type of myomas and surgical experience of the obstetricians. CM was performed by more experienced surgeons, in accordance with the current recommendations [8, 9, 13]. Although most surgeons agree about the importance of surgical experience to perform CM safely, our search of the relevant literature did not identify any reports on a necessary degree of surgical experience for CM [9, 14]. To the best of our knowledge, there is just one study reporting that the surgeons were resident doctors and that CM was performed by specialists, which was not the case in our study [7].

As far as the type of myomas was concerned, the largest number of patients in our study had multiple myomas, while pedunculated myomas were rare. Multiple myomas often obstruct the birth canal and can lead to irregular uterine contractions. Therefore, they can be found more often in women who delivered by CS. The largest number of patients in the study group had subserosal and multiple myomas, while in the control group the incidence of subserosal myomas was significantly lower, and intramural myomas were significantly more often observed. Pedunculated myomas were rare in both groups, but significantly more so in controls than in the study group (2.53% vs. 8.82%). Pregnant women with pedunculated myomas, if they are not large and do not constitute an obstruction of the birth canal, may deliver vaginally in the absence of other indications for CS. Although the total number of patients with pedunculated myomas was small, they were detected in the study group 3.5 times more frequently than among controls. This is expected, given the recommendations from the literature that pedunculated myomas during CS should be removed whenever possible [7, 11, 14]. The same is true for subserosal myomas, which were about five times less frequent in controls. Most authors agree that, apart from pedunculated fibroids, subserosal myomas are those in which enucleation can be done relatively safely during CS [11, 15]. Intramural myomas, for which the literature data suggest to avoid CM, were 3.5 times more common in controls than in the study group [7, 15]. In contrast, some authors are of the opinion that in selected cases enucleation of intramural myomas from the uterine body can be safely performed without complications, using methods to reduce intraoperative bleeding [16-19].

No statistically significant correlation between the decisions to preform myomectomy and location of the myomas was found, although CM was performed most often in women with myomas on the anterior wall of the uterus, in accordance with the published recommendations [9, 14].

A higher incidence of anterior myomas in the study group was an expected result, given that these myomas can interfere with making and/or suturing the low transverse uterine incision and the extraction of the fetus, and in some cases their enucleation is inevitable [16, 20, 21]. Olamijulo et al. [22], recommended CM in cases of anterior myomas in the isthmic region as an alternative to corporal CS, in order to extract the fetus. Routine CM in cases of anterior myomas was advised by Ehigiegba et al. [23]. Most authors agree that myomas located near the lower uterine segment (LUS) should be removed, particularly if it is possible without an additional incision on the uterus, as was the

case in 8 patients in the study group [11, 16, 20]. A small number of patients in whom CM was performed through the LUS incision could be linked to the small number of isthmic-cervical myomas in the study group.

Lack of statistically significant correlation between the decision to perform myomectomy and myoma location in our study does not indicate the absence of a significant correlation and mutual influence of these factors. Fundal and cornual myomas were two and three times more common, respectively, in our controls than in the study group. The difference between the groups can be explained by the general belief that cornual myomas should not be operated because of the risk of postoperative obstruction of the Fallopian tubes. As a consequence, it may impair the reproductive function, as reported by various authors [7, 14]. Moreover, CM is traditionally not recommended in cases of fundal and cornual myomas [7, 14]. Some authors reported CM to be safe even in cases of fundal fibroids, by intraoperative application of a tourniquet around the ovarian and uterine blood vessels [24]. Thus, Li et al. [16], using a tourniquet around the uterine and ovarian blood vessels and high-dose oxytocin infusion, performed routine CM even in such cases.

In our study, the size of the myoma did not affect the decision to perform myomectomy, what could be explained by the fact that even relatively small fundal and cornual myomas may cause more intensive bleeding than larger isthmic-cervical myomas. Thus, the decision to perform CM was more dependent on the type of myoma rather than its size. One limitation of our study was the inaccurate measurement of fibroid size in a small number of patients, who were intraoperatively defined by a subjective judgment of the surgeon. Except in the case of posterior wall myomas, Ehigiegba et al. [23], suggest routine CM in all cases of symptomatic myomas larger than 20-30 mm, including fundal myomas. The cited authors also noted that in some cases it is even safe to delivery vaginally after such a surgery [23]. Similar observations regarding size of the myomas were presented by Kwawukume et al. [24], who advise not to remove small myomas but only larger fibroids. An opposite view was presented by Ande et al. [25], who recommend all macroscopic myomas to be removed during CS in order to prevent myoma recurrence.

The lack of impact of the number of myomas on the decision to perform myomectomy can be explained by the fact that the majority of women had a single myoma. The absence of significant correlation between the number of previous laparotomies and the decision about CM can be explained by a relatively low incidence of relaparotomies in our study. However, we observed that the number of performed myomectomies decreases with an increasing number of previous laparotomies.

Myoma location in relation to the large blood vessels constitutes a very important factor while deciding to perform CM [7, 10]. The literature offers only one absolute contraindication to CM, i.e. the intra-surgical uterine hypotony/atony following the delivery of a fetus [7, 10, 11, 13, 23].

Unfortunately, in our study, no data on some of these factors, such as the distance from the large uterine blood vessels, contractility of the uterus during the operation, and intensity of bleeding at the site of the cesarean incision, were recorded in the operative notes. This is another bias in our investigation.

According to most authors, a suspicion of secondary changes and degeneration of the fibroid is an important factor affecting the decision to perform CM, in addition to its anatomical location, the number and size of the fibroids, and the experience of the surgeon [7, 10, 15, 17, 24].

The primary finding of myomas without secondary degenerative changes in our research (77.45%) is an unexpected result, since the macroscopically changed myomas are one of the reasons for CM described in the literature [15]. Another literature drawback on CM is that many studies did not report the histopathological findings of the removed myomas [26, 27]. Agrawal et al. [28], reported that in a sample of 14 patients there were no cases with histologically proven malignant changes, but the incidence of secondary degeneration is not stated. Mu et al. [13], analyzed fibroids after CM: out of 43 fibroids, red degeneration was diagnosed in 81.4%, hyaline in 9.3% and mucinous degeneration in 2.3% of the cases. Similar results were documented by Lin et al. [18], in whose research hyaline degeneration was present in 52.8% of the cases. We do not have a satisfactory explanation for the difference in the frequency of secondarily altered myomas between the literature and our results.

Our analysis investigated factors influencing the intraoperative decision to perform CM, an obstetric operation with high-risk of surgical complications, including life-threatening situations. Based on the values of correlation coefficients, we realized that the most important predictor of myomectomy was maternal age, followed by the experience of the surgeon and, ultimately, the type of fibroid.

According to Ortac et al. [29], CM is recommended in the following cases: patient request, symptomatic uterine myoma, myoma previa with obstruction of the birth canal, myoma causing fetal malpresentation, myomas that may lead to postoperative complications and/or adverse perinatal outcomes in the next pregnancies. Similar comments are cited in the study by Owolabi et al. [30].

Conclusions

Despite recent papers discussing favorable outcomes of CM, the topic remains a controversial issue and requires prospective randomized studies to accurately define the criteria for indications and contraindications for this procedure.

Authors' contributions:

1. Radmila Sparić – concept and design of the study, acquisition, analysis and interpretation of data, drafting the article, revising the article critically for important intellectual content, corresponding author, prepare the final version of the manuscript, both text and figures.
2. Antonio Malvasi – concept and design of the study, nalysis and interpretation of data, drafting the article, revising the article critically for important intellectual content, prepare the figures, final version of the manuscript.
3. Andrea Tinelli – concept and design of the study, acquisition, interpretation of data, drafting the article, revising the article critically for important intellectual content, prepare the final version of the manuscript.

Conflict of interests statement

The authors certify that there is no actual or potential conflict of interest in relation to this article and they have no financial interests or connections to reveal, direct or indirect or other situations that might raise the question of bias in the work reported or the conclusions, implications or opinions stated-including pertinent commercial or other sources of funding for the authors or for the associated departments or organizations, personal relationships or direct academic competition.

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References

1. Sparic R. Myomas in pregnancy, childbirth and the puerperium. *Srp Arh Celok Lek.* 2014, 142, 118-124.
2. Qidwai GI, Caughey AB, Jacoby AF. Obstetric oucomes in women with sonographically detected uterine leiomyomata. *Obstet Gynecol.* 2006, 107, 376-382.
3. Exacoustos C, Rosati P. Ultrasound diagnosis of uterine myomas and complications in pregnancy. *Obstet Gynecol.* 1993, 82, 97-101.
4. Lee HJ, Norwitz ER, Shaw J. Contemporary management of fibroids in pregnancy. *Rev Obstet Gynecol.* 2010, 3, 20-27.
5. Dimitrov A, Nikolov A, Stamenov G. Myomectomy during cesarean section. *Akush Ginekol* (Sofia). 1999, 38, 7-9.
6. Hassiakos D, Christopoulos P, Vitoratos N, [et al.]. Myomectomy during cesarean section: a safe procedure? *Ann NY Acad Sci.* 2006, 1092, 408-413.
7. Celal K, Hulya C. The evaluation of myomectomies performed during cesarean section in our clinic. *Niger Med J.* 2011, 52, 186-188.
8. Park BJ, Kim YW. Safety of cesarean myomectomy. *J Obstet Gynecol Res.* 2009, 35, 906-911.
9. Machado LS, Gowri V, Al-Riyami N, Al-Kharusi L. Caesarean Myomectomy: Feasibility and safety. *Sultan Qaboos Univ Med J.* 2012, 12, 190-196.
10. Kim YS, Choi SD, Bae DH. Risk factors for complications in patients undergoing myomectomy at the time of cesarean section. *J Obstet Gynaecol Res.* 2010, 36, 550-554.
11. Yellamareddygari S, Chakrabarti M, Ravuri S, Ahluwalia A. Leaving fibroids at caesarean section, is it safe? *Gynecol Surg.* 2010, 7, 173-175.
12. Koide K, Sekizawa A, Nakamura M, [et al.]. Hypovolemic shock due to massive edema of a pedunculated uterine myoma after delivery. *J Obstet Gynaecol Res.* 2009, 35, 794-796.
13. Mu YL, Wang S, Hao J, [et al.]. Successful pregnancies with uterine leiomyomas and myomectomy at the time of caesarean section. *Postgrad Med J.* 2011, 87, 601-604.
14. Song D, Zhang W, Chames MC, Guo J. Myomectomy during cesarean delivery. *Int J Gynaecol Obstet.* 2013, 121, 208-213.
15. Roman AS, Tabsh KM. Myomectomy at time of cesarean delivery: a retrospective cohort study. *BMC Pregn Childbirth.* 2004, 4, 14.
16. Li H, Du J, Jin L, [et al.]. Myomectomy during caesarean section. *Acta Obstet Gynecol Scand.* 2009, 88, 183-186.
17. Ma PC, Juan YC, Wang ID, [et al.]. A huge leiomyoma subjected to a myomectomy during a cesarean section. *Taiwan J Obstet Gynecol.* 2010, 49, 220-222.
18. Lin JY, Lee WL, Wang PH, [et al.]. Uterine artery occlusion and myomectomy for treatment of pregnant women with uterine leiomyomas who are undergoing cesarean section. *J Obstet Gynaecol Res.* 2010, 36, 284-290.
19. Sapmaz E, Celik H, Altungul A. Bilateral ascending uterine arteries vs. tourniquet use for hemostasis in cesarean myomectomy. A comparison. *J Reprod Med.* 2003, 48, 950-954.
20. Mahendru R, Sekhon PK, Gaba G, Jadav S. At times, myomectomy is mandatory to effect delivery. *Ann Surg Innov Res.* 2011, 5, 9.
21. Sparić R, Berisavac M, Buzadžić S, Mirkovic L. Complications during cesarean delivery in a patient with two previous myomectomies. *Acta Chir Iugosl.* 2013, 60, 99-100.
22. Olamijulo JA. Unplanned lower segment caesarean myomectomy. *J Obstet Gynecol.* 2009, 29, 553.
23. Ehigiegba AE, Ande AB, Ojobo SI. Myomectomy during cesarean section. *Int J Gynecol Obstet.* 2001, 75, 21-25.
24. Kwawukume EY. Caesarean myomectomy. *Afr J Reprod Health.* 2002, 6, 38-43.
25. Ande AB, Ehigiegba AE, Umeora OU. Repeat myomectomy at caesarean section. *Arch Gynecol Obstet.* 2004, 270, 296-298.
26. Kaymak O, Ustunyurt E, Okyay RE, [et al.]. Myomectomy during cesarean section. *Int J Gynecol Obstet.* 2005, 89, 90-93.
27. Tinelli A, Malvasi A. Mynbaev OA, [et al.]. The surgical outcome of intracapsular cesarean myomectomy. A match control study. *J Matern Fetal Neonatal Med.* 2014, 27, 66-71.
28. Agarwal K, Agarwal L, Agrawal A, [et al.]. Caesarean myomectomy: prospective study. *NJIRM.* 2011, 2,11-14.
29. Ortac F, Gungor M, Sonmezer M. Myomectomy during section. *Int J Gynecol Obstet.* 1999, 67, 189-190.
30. Owolabi AT, Oluwafemi K, Loto OM, [et al.]. Caesarean myomectomy – a safe procedure: A retrospective case controlled study. *Nepal J Obstet Gynaecol.* 2007, 2, 59-62.