

Comparative Study of Cesarean Myomectomy with Abdominal Myomectomy in Terms of Blood Loss in Single Fibroid

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Abstract

Objective In this study, we evaluate the safety and feasibility of cesarean myomectomy and compare this

procedure with abdominal myomectomy in single fibroid, in terms of blood loss and postoperative complications.

Methods Thirty-three patients who underwent cesarean myomectomy from June 2006 to 2012 in Amrita Institute of Medical Sciences, were included in the study. Almost an equal number of patients who underwent abdominal myomectomy (32) in the same period were included. Women are divided into two groups: group 1—cesarean myomectomy, group 2—abdominal myomectomy.

Results Mean age of the women was comparable; mean gestational age in group 1 was 37.97 \pm 1.57 weeks; and 60 % were primiparous. Hemoglobin (Hb) drop postoperatively was compared between the groups, and there was no significant difference. Though there was statistically significant difference among the groups regarding the size of fibroids, the main outcome measure of the study, the Hb drop was comparable between group 1 and 2. There is statistically significant difference in the Hb difference with increasing mean diameter of the fibroids. As the size increases, Hb drop also increases indicating the increasing blood loss. The

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measures used to reduce blood loss such as vasopressin instillation and stepwise devascularization influence the blood loss, and *P* value shows borderline significance. There was no difference in Hb drop among the groups according to the type of fibroids. But more subserous fibroids were removed in group 1, whereas more intramural fibroids were removed in group 2.

Conclusion Cesarean myomectomy can be safely done in single fibroids and is comparable to abdominal myomectomy in terms of blood loss.

Keywords Cesarean myomectomy · Abdominal myomectomy · Blood loss · Mean diameter of fibroid

Introduction

Traditionally myomectomy along with cesarean section was not advised due to the increased chance of hemorrhage and the risk of hysterectomy. But now the incidence of myomas in the child-bearing period is increasing due to postponement of pregnancy. We encounter many fibroids complicating pregnancy forcing us to think about the option of cesarean myomectomy. Conservative thinking advises not to interfere with the myomas which are likely to regress after delivery. Evidence from literature shows that only 22–32 % myomas grow during pregnancy. After delivery, the maximum reduction in the size of fibroid is 50 %. After puerperal regression, myomas keep growing under the effect of hormones. In the recent era, with the availability of various methods to reduce the blood loss during cesarean myomectomy, the procedure can be undertaken safely. Should we remove whatever the size of myomas we encounter during the cesarean section? Is myomectomy in the pregnant state as safe as myomectomy in nonpregnant state? Through this study, we attempt to find the answers for these questions. In this study, we evaluate the safety and feasibility of cesarean myomectomy and compare this procedure with cesarean alone and abdominal myomectomy, in terms of blood loss and postoperative complications.

Aim

To compare the procedures of cesarean myomectomy of single fibroid and abdominal myomectomy of single fibroid with respect to blood loss and postoperative complications.

Materials and Methods

Thirty-three patients who underwent cesarean myomectomy from June 2006 to 2012 in Amrita Institute of Medical

Sciences, were included in the study. Almost an equal number of patients who underwent abdominal myomectomy (32) in the same period were included. Among 33 patients, 24 were antenatally detected to have myomas, and in the rest, it was an incidental finding intraoperatively. Decision for myomectomy depended on the patient's choice, location, size, and number of uterine myomas and the surgeon's experience. Women with single myoma only were included in the study. Informed consent was taken prior to the planned procedure.

During cesarean section, after uterine closure, myomas were localized. Twenty-three among 48 women had vasopressin instillation prior to myomectomy, to reduce the intraoperative blood loss. Vasopressin 20 units diluted in 200 ml of normal saline was instilled in the serosa and in between serosa and myoma. Depending on the surgeon's preference and the size of the myoma, various methods were used to reduce the blood loss. Along with vasopressin and stepwise devascularization (three women) uterine artery ligation [1] had been done prior to myomectomy. Another patient who had a huge fundal subserous myoma underwent uterine artery embolization after delivery of the fetus. Myomectomy was done by making an incision using electrocautery over the myoma. Myoma was enucleated followed by closure of the myoma bed with vicryl 1-0 sutures. For serosa, 2-0 vicryl suture was used. In abdominal myomectomy group, myomectomy was preceded by vasopressin instillation in 20 patients. After enucleation of the myoma, myoma bed was sutured in the same way.

Data including age, parity, indication for the procedure, comorbidities, mean diameter of the myoma, intraoperative finding, hemoglobin drop between preoperative and postoperative levels, blood transfusion, postoperative complications, and histopathology report were collected, and statistical analysis was done using SPSS Software-Independent samples *t* test, modified *t* test, Mann–Whitney test, and Chi-square test wherever applicable.

Results

Women are divided into two groups: group 1—cesarean myomectomy and group 2—abdominal myomectomy (Fig. 1). Mean age of the women, mean diameter of the fibroid, types of the fibroid, Hb drop postoperatively, and usage of methods to reduce blood loss are compared among the groups (Table 1). There is no significant age difference among the groups. Three cesarean sections were done in late preterm period. 60 % of women were primiparous.

Only four women underwent cesarean section due to fibroid complicating pregnancy in group 1. Pfannenstiel incision was used for all women except two who had midline vertical incision. Three women had general anesthesia for the procedure.

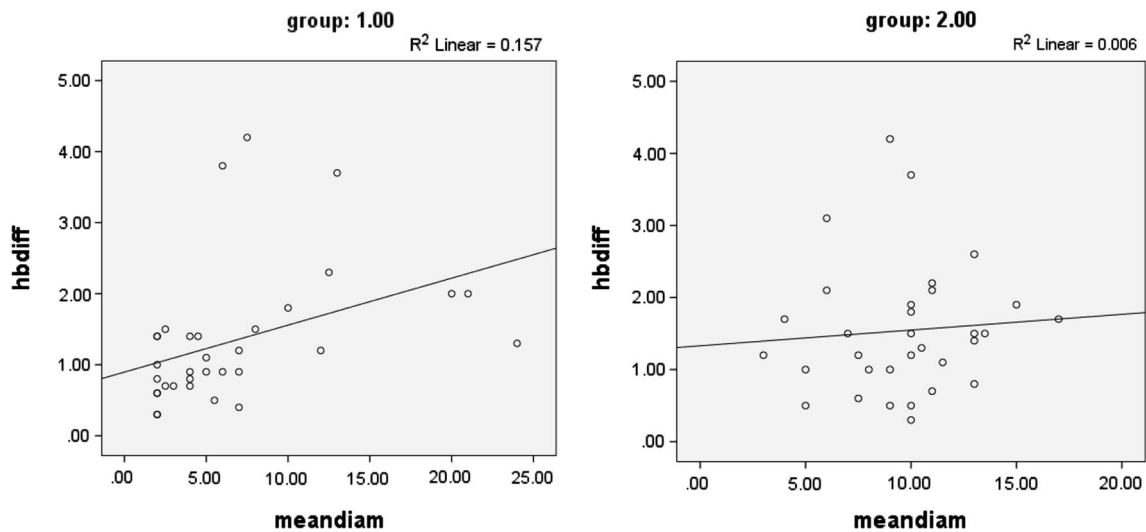


Fig. 1 Correlation between Hb drop and mean diameter of the fibroids

Table 1 Comparison between groups of mean age and mean diameter of the fibroid

	Group 1 (33)	Group 2 (32)	P value
Mean age (years)	32.39 ± 4.42	33.34 ± 3.66	0.350
Mean gestational age (weeks)	37.97 ± 1.57		
Parity primi	20 (60.1 %)	–	
Multi	13 (39 %)		
Mean diameter of the fibroid (cm)	6.69 ± 5.76	9.64 ± 3.20	0.014
Need for blood transfusion	12 %	12.5 %	

Mean diameter of fibroids removed in abdominal myomectomy group was greater than cesarean myomectomy group (Table 1). Size of the fibroids ranged from 2 to 21 cm. Though there is statistically significant difference among the groups regarding the size of fibroids, the main outcome measure of the study, the Hb drop is comparable between these two groups. A larger number of subserous fibroids were removed during cesarean section, whereas the fibroids removed were intramural in majority in abdominal myomectomy group which is statistically significant. In both the groups, the methods such as vasopressin instillation and stepwise devascularization were almost equally used.

Blood loss is measured as hemoglobin (Hb) difference between pre- and postoperative hemoglobin values. Mean Hb difference was compared between the groups, and there was no statistically significant difference (Table 2). Hb drop was also studied according to the type of the fibroids, size of the myomas, and methods used to reduce blood loss (Tables 3, 4). Though subserous fibroids were more in number in group 1, none was pedunculated. The Hb drop was not significant between the groups in both the types. The methods to reduce blood loss have made borderline significant difference in blood loss in group 1, whereas in group 2, the same was not observed in our study. While

Table 2 Type of fibroid and methods used to reduce blood loss comparison between the groups

	Group 1 (33) (%)	Group 2 (32) (%)	P value
Type of fibroids			
Subserous	24 (73)	9 (28)	<0.001
Intramural	9 (27)	23 (72)	
Methods used			
No	10 (30)	12 (37.5)	0.726
Yes	23 (70)	20 (62.5)	

considering the mean diameter of the fibroid and Hb drop, there exists a positive correlation between them. The model is significant, and P value is 0.022. The regression equation of Hb drop on mean diameter in group 1 is as follows— $Hb\ drop = 0.066 \times \text{mean diameter of the fibroid} + 0.899$. But in group 2, there is no correlation between size and Hb drop, and the equation is $Hb\ drop = 0.022 \times \text{mean diameter} + 1.330$.

In both the groups, there was no postoperative febrile morbidity, i.e., temperature of 100 °F and above within 48 h of procedure. In each group, four women needed blood transfusion.

Table 3 Blood loss difference between the groups

Group	No.	Hb difference mean (median)	SD (min, max)	<i>P</i> value
1	33	1.34 (1.10)	0.96 (0.30, 4.20)	0.160
2	32	1.54 (1.45)	0.90 (0.30, 4.20)	

Table 4 Blood loss difference according to the type of fibroids and methods used

Group	Types	Hb difference mean (median)	SD (min, max)	<i>P</i> value
1 (33)	Subserous (24)	1.33 (1.15)	0.89 (0.30, 3.80)	0.746
	Intramural (9)	1.36 (0.90)	1.19 (0.30,4.20)	
2 (32)	Subserous (9)	1.34 (1.10)	0.98 (0.30, 3.70)	0.223
	Intramural (23)	1.62 (1.50)	0.80 (0.50, 4.20)	
Methods used				
1 (33)	No (10)	1.58 (1.40)	0.85 (0.70, 3.80)	0.054
	Yes (23)	1.23 (0.90)	1.00 (0.30, 4.20)	
2 (32)	No (12)	1.33 (1.15)	0.83 (0.30, 3.10)	0.283
	Yes (20)	1.67 (1.50)	0.93 (0.50, 4.20)	

Red degeneration is common in pregnancy. Eight women out of 33 in group 1 had red degeneration, and eight other women had either of hyaline or cystic degeneration. In group 2, eight women had cystic or hyaline degeneration. Rest of the specimen showed benign leiomyoma without any degenerative changes.

Discussion

Performing myomectomy during cesarean section was considered a dangerous procedure due to the risk of severe hemorrhage. Compared to the nonpregnant state uterus receives in excess of 17 % of cardiac output. So the chance of hemorrhage is also high. Theoretically speaking, myomectomy ventured in this hyperdynamic environment may lead to increased blood loss. But many retrospective studies showed that the reverse is true.

Commonly held belief is that myoma grows during pregnancy. But the literature review says that 30–40 % myomas grow during pregnancy [1]. Rest of the myomas do not grow or even decrease in size during pregnancy. Maximum growth occurs in first trimester. Fibroids of size more than 5 cm tend to grow rather than the smaller myomas [2, 3]. So the myomas of less than 5 cm in size, we often encounter during cesarean section will not undergo change in size postpartum. Such myomas may become symptomatic later. In that case, dealing with that during cesarean section is a reasonable option.

In our study, we compared the myomectomy done in pregnant as well as in nonpregnant state. Blood loss depicted by the hemoglobin drop is not statistically

significant between cesarean and abdominal myomectomy groups. Till date, the largest study by Li et al. [4] comprising 1242 women who underwent cesarean myomectomy, found no significant difference in mean Hb change, incidence of postoperative fever, and length of hospital stay between study group and cesarean section with or without fibroids. In another retrospective study by Roman [5], there was no significant difference in hematocrit between cesarean myomectomy and cesarean done in women with fibroids. In contrast to our study, he found no difference in blood loss with the increase in size of the fibroids, though the mean diameter of the fibroid removed was 3.5 cm. In our study, the mean diameter of fibroid removed during cesarean section was 6.7 cm, and the largest was almost equal to 28-week size gravid uterus.

Among 33 women in cesarean myomectomy group, only four patients received blood transfusion. Two of them had myomas more than 10 cm in size. Among them, one mother who had the biggest myoma 22 × 23 cm, received 2 units of packed RBC transfusion. In other woman, though the size was less than 10 cm, it was submucous myoma and the cavity was entered. Hence submucous myoma has to be handled with caution. In abdominal myomectomy group, among 32 women, four women had to be transfused, and they had single unit of PRBC. This can be explained by the low baseline Hb (8–10 g %) in these women as majority of them presented with menorrhagia, and in our institute, the cut-off Hb is 8 g % and PCV 23 % for blood transfusion. Though single unit transfusion is not preferred nowadays, it is according to individual decision.

Vasopressin instillation and stepwise devascularization were practiced in most of the cesarean myomectomy cases.

Only vasopressin was used in open myomectomy cases. In spite of these measures, there was no difference in the blood loss found in group 2, but group 1 showed borderline difference in blood loss. A study by Owolabi et al. [6] showed reduction in the incidence of hemorrhage by the use of tourniquet and postdelivery oxytocin infusion. In another study by Kwawukume [7], mean Hb drop was 1.83 with the use of tourniquet during myomectomy and the average myoma size was 6 cm.

There is no difference in hemoglobin drop in terms of the types of myomas also between the groups. In group 2, 72 % myomas were intramural, whereas in group 1, subserous myomas were common (73 %). In the study by Kwawukume [7], 85 % of the fibroids removed were intramural and still there was no significant blood loss compared to cesarean section alone. Submucous fibroids are not tackled routinely as it may involve the full thickness of myometrium which in future pregnancy will need a repeat elective cesarean section. In the study by Adesiyun et al. [8], a maximum number of 6 of submucous fibroids were removed. Only one submucous fibroid was removed in our study. 9.1 % mothers received blood transfusion in his study, whereas 12 % mothers received blood transfusion in our study. Till date, only one prospective study by Adesiyun et al. [9] showed the scar integrity, and 44 % had successful vaginal birth out of 29 women. To know the integrity of cesarean myomectomy scars apart from lower segment incisions, further studies are needed.

Contractile power of the pregnant uterus can reduce the blood loss compared to nonpregnant uterus. Our study shows that the blood loss is comparable between cesarean myomectomy and abdominal myomectomy. The limitations are small sample size, and the fibroids removed during cesarean were more of subserous type, though suturing was needed for them.

Conclusion

Cesarean myomectomy in case of single fibroid can be safely done in selected patients with proper methods to

reduce the blood loss. It is a reasonable option rather than opting for myomectomy after pregnancy as both the procedures are comparable in terms of blood loss. However, the integrity of a scar after removal of a large submucous myoma, which may involve the full thickness of the myometrium, has to be studied in future studies.

Compliance with Ethical Requirements and Conflict of Interest The study was approved by the Institute ethical committee, and informed consent has been taken from all the patients who were included in the study. Mangala Kanthi Janu, Sudha Sumathy, Sreedhar Sarala, B. Rajammal, M. G. Usha, and V. S. Sheejamol declare that they have no conflict of interest.

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