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Myomectomy at time of cesarean delivery: a retrospective cohort study

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Abstract

Background: Myomectomy at time of cesarean delivery is traditionally discouraged because of the risk of hemorrhage. A retrospective cohort study was performed to determine whether myomectomy at time of cesarean delivery leads to an increased incidence of intrapartum and short-term postpartum complications.

Methods: A computer search of medical records from May 1991 to April 2001 identified a total of 111 women who underwent myomectomy at time of cesarean delivery and 257 women with documented fibroids during the index pregnancy who underwent cesarean delivery alone. Charts were reviewed for the following outcome variables: change in hematocrit from preoperative to postoperative period, length of operation, length of postpartum stay, incidence of postpartum fever, and incidence of hemorrhage. Hemorrhage was defined as a change in hematocrit of 10 points or the need for intraoperative blood transfusion.

Results: The incidence of hemorrhage in the study group was 12.6% as compared with 12.8% in the control group ($p = 0.95$). There was also no statistically significant increase in the incidence of postpartum fever, operating time, and length of postpartum stay. No patient in either group required hysterectomy or embolization. Size of fibroid did not appear to affect the incidence of hemorrhage. After stratifying the procedures by type of fibroid removed, intramural myomectomy was found to be associated with a 21.2% incidence of hemorrhage compared with 12.8% in the control group, but this difference was not statistically significant ($p = 0.08$). This study had 80% power to detect a two-fold increase in the overall incidence of hemorrhage.

Conclusion: In selected patients, myomectomy during cesarean delivery does not appear to result in an increased risk of intrapartum or short-term postpartum morbidity.

Background

Myomectomy at time of cesarean delivery has traditionally been discouraged. With the exception of small, pedunculated fibroids, most of the leading obstetrics textbooks advise against myomectomy during cesarean delivery due to theoretical risks of intractable hemorrhage and increased postoperative morbidity. [1,2] In the medical literature, however, there are few studies which directly address this controversy. In fact, this recommendation relies entirely on a body of evidence consisting of case series and anecdotes which give conflicting results. [3-8]

In an attempt to define the risks of myomectomy during cesarean delivery, we looked at our ten year experience at

our institution with the procedure. Our objectives were two-fold: to determine whether myomectomy at time of cesarean delivery leads to an increased incidence of hemorrhage and perioperative morbidity; and to identify subgroups which may be at higher risk of developing intrapartum hemorrhage.

Methods

A retrospective cohort design was used. A computer search of hospital records at UCLA Medical Center and UCLA-Santa Monica Medical Center was performed using the diagnosis code for fibroids and procedure code for cesarean delivery. This process identified 368 women with documented fibroids who underwent cesarean delivery with or without myomectomy between May 1991 and April 2001. These women fulfilled the following criteria: (1) documented fibroid uterus during the index pregnancy by antepartum ultrasound or by intraoperative findings; (2) delivery by cesarean delivery; (3) admission and postpartum hematocrits in the database; (4) no evidence of antenatal bleeding (e.g., from placenta previa or abruption); (5) no other procedures at the time of cesarean delivery besides myomectomy (e.g., cystectomy, myolysis, or planned hysterectomy); (5) no co-morbid conditions with evidence of coagulopathy. The study group consisted of patients who underwent myomectomy at time of cesarean delivery; the control group consisted of patients with documented fibroids during the index pregnancy who underwent cesarean delivery alone.

Characteristics abstracted include age, parity, gestational age at delivery, type of cesarean performed, and size and location of fibroid. For the patients who underwent myomectomy, the size of the excised fibroid was obtained from the pathology report or, if no pathology report was available, the surgeon's findings in the operative note. For the control group, the size of fibroid was obtained from the operative note or, if not indicated in the operative note, from an antenatal ultrasound performed during that pregnancy.

Primary outcomes analyzed were change in hematocrit, postpartum fever, operative time, and length of postoperative hospital stay. Hemorrhage was defined as a decrease in hematocrit of 10 points from the preoperative value to the postoperative value or the need for intraoperative transfusion. Operative time was calculated from skin incision to skin closure as indicated in nursing notes. Fever was defined as postoperative temperature greater than or equal to 38.0°C.

All data was analyzed using Pearson's X^2 or Fisher Exact test for categorical variables and Student t-test for continuous variables. The threshold of significance was defined as $p < 0.05$.

Results

During the study period, 111 women underwent myomectomy/cesarean delivery and 257 women with documented fibroids during the index pregnancy underwent cesarean delivery alone. Demographic characteristics of the control group and the study group are shown in Table 1. They were similar with respect to median age, median parity, median gestational age, and median size of fibroid. Most patients in both groups underwent low transverse cesarean delivery.

The types of fibroid removed from the patients who underwent myomectomy during cesarean delivery are shown in Table 2. Of the women who underwent myomectomy, the indication for the procedure in 86% of patients was either not noted or was identified as incidental. Fourteen percent of patients had specific indications documented including symptoms such as pain during pregnancy, obstructed lower uterine segment, and unusual intraoperative appearance.

The results of the primary outcomes are shown in Table 3. The incidence of hemorrhage was 12.6% in the myomectomy group and 12.8% in the control group ($p = 0.95$). One patient in the study group required postpartum blood transfusion (0.9%) due to symptomatic anemia and three patients in control group required blood transfusion (1.2%), one intraoperatively and two postpartum. In the myomectomy group, the mean change in hematocrit was 5.5%, and 13 of 111 patients in this group had a change in hematocrit of more than 10%. In the control group, the mean change in hematocrit was 6.1%, and 30 of 257 patients in this group had a change in hematocrit of more than 10%. No patient in either group required hysterectomy or embolization within 6 weeks of delivery. There was also no significant difference in the incidence of fever, mean operative time, or mean length of hospital stay. A power analysis reveals that, with this sample size, this study had the power to detect a two-fold increase in incidence of hemorrhage from the control group to the myomectomy group.

Results stratified by the size of fibroid removed is shown in Table 4. No significant difference in the incidence of hemorrhage for each size group. When stratifying results by type of cesarean delivery performed, type of fibroid removed (i.e., subserosal, intramural, submucosal, or pedunculated), and location of fibroid removed, there was no statistically significant difference in the incidence of hemorrhage and other outcomes. But, of the 33 patients who underwent intramural myomectomy, 21.2% of these patients met the criteria for hemorrhage compared with 12.8% of control patients with documented intramural fibroids, an increase that did not reach statistical significance ($p = 0.08$).

Table 1: Population Characteristics

	All Myomectomies	All Controls
Number of patients	111	257
Median age in years (range)	37 (23–48)	35 (17–48)
Median parity (range)	0 (0–4)	0 (0–4)
Median gestational age in weeks (range)	38.0 (27.3–41.6)	39.1 (24–42.6)
Median size of fibroid in cm (range)	3.5 (0.9–30)	3 (1–20)
Type of cesarean section in number of patients:		
Low transverse	105	250
Classical	6	7
Number of different primary surgeons	22	58

Table 2: Type of fibroid removed

	Number of procedures (N = 111)
Submucosal	6 (5%)
Intramural	27 (24%)
Subserosal	27 (24%)
Pedunculated	25 (23%)
Multiple sites	20 (18%)
Not recorded	6 (5%)

Table 3: Outcomes of all cesarean myomectomy patients compared with controls

	Myomectomy (N = 111)	Controls (N = 257)	p-value
Mean change in Hct, (range)	5.5 (-1.1 – 15)	6.1 (-3.3 – 18.3)	NS
Incidence of hemorrhage	12.6%	12.8%	NS
Frequency of blood transfusion	0.9%	1.2%	NS
Incidence of postoperative fever	4.5%	4.7%	NS
Mean OR time in minutes (range)	55 (25 – 161)	51 (20 – 107)	NS
Mean postpartum stay in days (range)	3.6 (2 – 7)	3.4 (2 – 12)	NS

Table 4: Incidence of hemorrhage stratified by size of fibroid removed, compared with controls

Size of fibroid (diameter)	Myomectomy	Control	p-value
< 3 cm	4/40 (10%)	7/71 (9.9%)	NS
≥ 3 cm and < 6 cm	5/46 (10.9%)	14/97 (14.4%)	NS
≥ 6 cm	5/22 (22.7%)	6/45 (13.3%)	NS

* Patients were excluded from analysis if the size of the fibroid was not indicated in the operative report, pathology report, or antenatal ultrasound report.

Discussion

The management of fibroids encountered during cesarean delivery poses a therapeutic dilemma. Myomectomy has traditionally been discouraged during cesarean delivery. In fact, many surgeons perform classical cesarean instead of a low transverse cesarean as a means to avoid lower uterine segment myomas, a procedure which carries a risk of increased blood loss in and of itself. The largest series to date to evaluate this debate, this study helps to allay some of the fears of increased short-term morbidity with cesarean myomectomy. In this study, we have demonstrated that myomectomy performed at time of cesarean delivery does not increase the risk of hemorrhage, postoperative fever, or prolong hospital stay. These results indicate that in selected patients and in experienced hands, myomectomy during cesarean delivery can be a safe procedure.

But, in which patients? Clearly, large fundal, intramural fibroids intuitively should be avoided. Although no statistically significant difference was found between the patients who underwent intramural myomectomy or myomectomy of a fibroid greater than 6 cm in diameter and the control group, this lack of a difference may be attributed to a small sample size and therefore insufficient power to detect such a difference. Thus, intramural myomectomy should be performed with caution. But, in the setting of the symptomatic patient with an accessible subserosal or pedunculated fibroid or the patient with fibroids obstructing the lower uterine segment, our findings indicate that this procedure can be safely accomplished. Several recent studies have described techniques which can minimize blood loss at cesarean myomectomy, including uterine tourniquet, [8,9] bilateral uterine artery ligation, [9] and electrocautery. [10] Although none of these techniques were used in our study, they may further reduce blood loss during cesarean myomectomy.

This study has several limitations. Given its retrospective study design, it is subject to several possible biases, namely reporting bias and selection bias. When myomectomy was performed, the operative note clearly stated where the fibroids were located and how the procedure was performed. It is possible that in patients undergoing cesarean delivery alone, the incidence of fibroids was under-reported. Furthermore, as 86% of patients who underwent myomectomy had no clear indication for the procedure documented in the operative report, there may be some degree of selection bias.

Conclusions

Despite these limitations, the message from this study is clear: what was once thought to be taboo should now be reconsidered. Myomectomy during cesarean delivery can be a safe, effective procedure in experienced hands.

Competing interests

None declared.

Authors' contributions

ASR reviewed all patient charts, abstracted data, performed statistical analysis, and drafted the manuscript. KMT conceived of the study, participated in study design, and participated in revising the manuscript. Both authors read and approved the final manuscript.

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