Introduction

Uterine myomas are the most common pelvic tumors over the age of thirty.1 The incidence of fibroids in pregnancy has been reported to be between 0.09% and 3.9%. Though the majority of gravid uteri with fibroids are asymptomatic, 10–40% can have complications in pregnancy.2

Performing myomectomy at the time of cesarean delivery in classical teaching has been discouraged because of the increased incidence of morbidity primarily from hemorrhage.3 The risk of excessive hemorrhage at the time of myomectomy is significantly greater than cesarean section alone. Myomectomy in the first trimester is associated with less blood loss than myomectomy at term.3 In the first trimester the uterus receives only 2%–3% of the cardiac output. At term, however, the uterus receives in excess of 17% of the cardiac output.4

In case series of twenty five myomectomy that was performed at the time of cesarean delivery, five patients (20%) received blood transfusion, although none patient required hysterectomy.5 For pedunculated fibroids the removal can be performed without difficulty since the bleeding is usually less and with minimum complications. Recently many case series of cesarean myomectomies have been published which reveals different results.

In this study our aim was to evaluate the outcome of myomectomy at time of cesarean delivery. All the cases performed at the Women's Hospital in Qatar during the study period were reviewed to assess our performance and the morbidity of this procedure.
Methods

A retrospective cohort study was used; forty six women with myomas who underwent myomectomy at time of cesarean delivery at Women's Hospital, Hamad Medical Corporation between January 2000 and December 2006 were included in this study.

The study group consisted of patients who underwent myomectomy at time of cesarean delivery. All the women fulfilled the following criteria: (1) documented fibroid uterus during the index pregnancy by antenatal ultrasound or by intraoperative findings; (2) delivery by cesarean delivery; (3) admission and post partum hematoctrits in the data base; (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, planned hysterectomy, or tubal ligation); (6) no co-morbid conditions with evidence of coagulopathy.

Characteristics abstracted include age, parity, gestational age at delivery, and number 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 notes or antenatal ultrasound during that pregnancy. When there was more than one myoma, the biggest and the smallest myoma diameter were documented.

Primary outcomes analyzed were change in hematocrit, hemoglobin, need for blood transfusion, intra- and post-operative complications, duration of hospital stay, and the necessity for admission in Intensive Care Unit. Hemorrhage was defined as a decrease of hematocrits of 10 points from the pre-operative to post-operative value or the need for intra- or post-operative blood transfusion. Operative time was calculated from skin incision to skin closure as indicated in nursing notes. Post operative fever was defined as a post operative temperature equals or greater to 38°C.

A linear incision was made over the myoma, myometrial closure was accomplished in one or two layers using interrupted absorbable sutures (1-0 vicryl), the serosa is sutured with a continuous absorbable suture (2-0 or 3-0 vicryl). Pelvic irrigation was done with saline.

All data were analyzed using Wilcoxon/Kruskal Wallis for non parametric variables, Chi square and Fisher Exact test for categorical variables, and Student's t-test for continuous parametric variables. The threshold of significance was defined as P <0.05.

Results

During the study period, forty six women with myomas who underwent myomectomy during cesarean section were included in this study. Our data have shown that myoma and pregnancy is found mainly in women after thirty years of age and prevalent in nulliparas.

The mean ±SD of age of patients who underwent cesarean myomectomy was 32.74±4.39 years. Around fifty two percents (52.2%) of them were nulliparas. The mean ± SD of the gestational age among the study group was 37.22±2.01 weeks. Of women who underwent cesarean myomectomy, the indication for the procedure in fifty percents (50%) of patients was either not noted or was identified as incidental and fifty percents (50%) of patients had specific indications documented including symptoms such as pain during pregnancy, obstructed lower uterine segment, unusual intra-operative appearance, and had a planned operation. Patients' characteristics are in Table 1.

The types of myoma removed are presented in Table 2. Most of the fibroids were subserosal (51.5%), 15.2% of them were located in multiple sites. Single myomas were found in 77.8% of cases, around sixty eight percents (67.6%) were located in the fundus, 10.8% were
Table 3. Outcomes of cesarean myomectomy patients

<table>
<thead>
<tr>
<th>Hemorrhage</th>
<th>N°</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Number and percentages of hemorrhage in relation to the size and location of myoma

<table>
<thead>
<tr>
<th>Size (diameter)</th>
<th>No</th>
<th>Yes</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤3 cm</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt;3 cm and ≤6 cm</td>
<td>8</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>&gt;6 cm</td>
<td>22</td>
<td>2</td>
<td>9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of fibroid</th>
<th>No</th>
<th>Yes</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intramural</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pedunculated</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Subserous</td>
<td>15</td>
<td>2</td>
<td>13%</td>
</tr>
<tr>
<td>Submucous</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Multiple</td>
<td>4</td>
<td>2</td>
<td>33.33%</td>
</tr>
<tr>
<td>Single fibroid</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Single fibroid</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
</tbody>
</table>

located in the lower segment, and around three percentages (2.7%) were located in the cervical region. The mean ±SD of size of fibroid removed was 7.11±5.99 cm (range, 1 cm – 34 cm).

The results of the primary outcome are shown in Table 3. Hemorrhage was encountered in four patients (8.7%), four patients in the study group required blood transfusion post operatively (8.7%), one of the four patients also required intra-operative blood transfusion (2.2%).

The mean change in hematocrit was 2.55±3.60 and one (2.2%) of the forty six patients in this group had change in hematocrits of more than 10 points. The mean ± SD of hemoglobin values were 11.63±1.28 preoperatively and 10.67±1.60 gm/dL postoperatively.

The mean operative time was 55.11±20.79 minutes. None of the patients required hysterectomy at the time of surgery or embolization within six weeks of delivery. No case of any organ injury was reported during the procedure. The mean length of hospital stay was 4.4±1.92 days. None required admission to the Intensive Care Unit. Three out of the forty six patients had post operative fever (6.5%).

The incidence of hemorrhage according to the size of the myoma is presented in Table 4. There was no statistical significance in the incidence of hemorrhage in relation to the large size group of fibroids (P=0.8) and also no statistical significance encountered in relation to the number of fibroids (P=0.16).

Nineteen (41.3%) of patients have subsequently become pregnant, four (21.05%) of whom had normal vaginal deliveries, while twelve (63.16%) had repeated elective cesarean section, and one patient had one normal vaginal delivery and one cesarean section (5.26%).

**Discussion**

Generally most obstetricians do not suggest myomectomy during cesarean delivery, unless the myoma is pedunculated, however some obstetricians agree in selected patients and in experienced hands myomectomy at time of cesarean section may be safe and effective procedure. Most authors found that the site of the myoma is more significant than any other factors. It seems that retro-placental myomas are associated with increased incidence of pre-term delivery, ante partum and post partum hemorrhage, fetal growth restriction and even intrauterine fetal death. Excavos established placental abruption when myoma volume was greater than 200 cm³ and more than 3 cm in diameter, with an incidence of 31% in this group of placenta with sub-mucosal myoma. More and more studies have been done worldwide on myomectomy during pregnancy and at cesarean section 13,14 where successful outcomes have been achieved without a significant increase in the complications.

In our study, hemorrhage encountered in patients who had large myoma was found to be not statistically significant (P=0.8); the P value of 0.16 was found when testing the null hypothesis of no difference between the mean value of number of fibroids for each of hemorrhage group. After stratifying the procedure by type of fibroid removed, operation done on multiple fibroids was found to be associated with a hemorrhage (33.33%), and subserosal cesarean myomectomy was associated with 13% of hemorrhage; on the contrary, no hemorrhage was encountered in the other types of fibroids.

In cases with persistent fibroids, myomectomy can be considered at cesarean section. Later myomectomy will involve more morbidity due to the fact that repeat abdominal surgeries are bound to be more difficult with adhesions and other peri-operative complications. Myomectomy at cesarean section gives another opportunity to do the same procedure without necessarily increasing the morbidity and is more cost-effective than an interval myomectomy. The major risk of undertaking myomectomy during cesarean section is the risk of bleeding and the possible difficulty of closing the defect in the cavity after myomectomy. With experienced surgeons who...
operate quickly and efficiently this surgery can be considered.

This study has several limitations, given its retrospective study design, it's subjected to several possible biases. Firstly, the study population was not large enough to make accurate conclusions. Secondly, the size, site, and type of fibroid were obtained from the operative notes and histopathology reports were not clearly documented. Finally, as a result of retrospective design, during the operations blood was measured together with amniotic liquor in milliliters so the hemorrhage was finally defined according to hematocrits values.

Conclusion

Despite these limitations, the message from this study is clear, myomectomy during cesarean section was not always a hazardous procedure and it can be performed without significant complications and should be pursued with caution and only in selected patients.2

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References


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