Implications of Adhesiolysis during Repeat Cesarean Section in Low Socioeconomic Countries: A pilot study

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ABSTRACT

Objectives: Adhesions developed after cesarean sections (CS) vary according to the number of repeat section. Delivery times were reported to increase with increased number of CS.

Materials and Methods: This is a prospective cohort study done in Assiut Women Health Hospital from August 2012 to August 2015 to evaluate the implications of doing adhesiolysis at CS either before delivery of the fetus or after that on maternal morbidity during current CS and recurrence rate in next sections. Adhesiolysis during CS avoids the use of anti-adhesion substances which is costly and not available in our low-income society.

Results: Fifty patients were included in the study. The dominant type of adhesion was omental, bladder and uterine adhesions forming bands with the anterior abdominal wall. The uterovesical adhesion was present in all cases. No maternal morbidity occurred during adhesiolysis. Follow up of those patients were continued for 3 years. The percentage of adhesions in the next CS after this adhesiolysis was only 2 cases (4%) and both cases were omental adhesions.

Conclusion: The use of adhesiolysis in repeat CS adhesions with an ascending curve of experience is essential in our low socioeconomic countries and associated with no maternal or neonatal complications.

Keywords: adhesiolysis, repeat cesarean section, adhesions, maternal morbidity

Introduction

Adhesions are defined as an abnormal fibrous connection between 2 anatomically different surfaces area. They often occur as a result of surgery and formed between internal organs and tissues, joining them together. Postoperative adhesions frequently occur following abdominal surgery and are linked with a large economic burden due to economic costs of the length of hospital stay resulting from adhesiolysis. Adhesions developed after CS varies according the number of repeat section. Rates of adhesion development recorded at a second CS (24-46%) are lower than third (43-75%) and fourth CS (up to 83%) and Adhesions after CS or any laparotomy is associated with increased rates of chronic pelvic pain, infertility, bowel obstruction and ectopic pregnancy.
Pelvic adhesion can influence the maternal morbidity which can occur in women with repeat CS, and can change the decision from total hysterectomy to subtotal hysterectomy. Also, little can influence the incidence of bowel and bladder injury during hysterectomy\(^6\).

Adhesiolysis during current CS is of great value in preventing adhesions in next CS especially with the unavailability of anti-adhesion barriers which may be used extensively in developed countries to prevent future adhesion\(^7\). Adhesiolysis can be done by scissors dissection and ligation of fibrous bands or using monopolar diathermy coagulation. Electrocoagulation produces severe trauma with subsequent acute and prolonged inflammatory reactions\(^8\) increasing postsurgical adhesion formation.

The aim of our study was to evaluate the implications of doing adhesiolysis at CS either before delivery of the fetus or after that on maternal morbidity during current CS and recurrence rate in next sections. Recurrence means a presence of bands between two pelvic organs or between one pelvic organ and abdominal wall in next CS whether surgical adhesiolysis will be needed or not.

**Materials and Methods**

This is a prospective cohort study done in Assiut Women Health Hospital from August 2012 to August 2015. The Assiut University Medical Ethical Review Board approved the study. All eligible participants signed a written informed consent before participation after explaining the purpose of the study.

Fifty pregnant women at term (37-40 weeks) gestation with uncomplicated singleton pregnancy scheduled for elective repeated lower segment cesarean section under spinal anesthesia were included in the study.

We didn’t calculate the sample size as we assumed that 50 patients will be sufficient enough to test our hypothesis as a pilot trial, and then we can calculate, based on the study results, the actual sample size of our next study. Pregnant women with medical disorders, placenta previa, any contraindication to spinal anesthesia, and those who refused to participate in the study were excluded.

Patients’ age, parity, gestational age and the number of previous CS were registered before the start of surgery. All cesarean deliveries were conducted by a staff member (the two authors) with an assistant senior resident.

Starting CS after good disinfection of the skin from xiphisternum to the suprapubic area, skin Pfannenstiel transverse incision, dissection of the anterior rectus sheath transversely and opening the parietal peritoneum longitudinally. Starting adhesiolysis accords the site of adhesion using scissor dissection and ligation or coagulation diathermy. The choice between coagulation and ligation depend upon characters of adhesions as coagulation was used in the presence of visible thin and a vascular adhesion but ligation was used in presence of incomplete visible band, thick and vascular one.

The suture material used in all cases through the whole operation was vicryl No.0 and the diathermy used was unipolar adjusted at 80 watts.

Adhesiolysis can be completed after delivery of the fetus to avoid delay in delivery of the fetus and the remaining adhesions were dissected after exteriorization of the uterus which allowed easy dissection. After the closure of the uterus in 2 layers and good homeostasis, leaving the visceral peritoneum without closure but with meticulous coagulation of its edge, closure of the parietal peritoneum and closure of anterior rectus sheath was done.

Closure of the skin by a subcuticular method using vicryl No.2-0. Two grams of cefotaxime as prophylactic dose before cord cutting were given to every patient.

The following data were recorded intraoperatively for all patients; duration of CS, occurrence of morbidity, amount of blood loss, need for blood transfusion, types and criteria of adhesions. Maternal morbidity included all those related directly to adhesiolysis like bladder injury or bladder injury or indirectly like delay of management of severe atonic postpartum hemorrhage due to obscuring adhesion. Neonatal condition at delivery, Apgar score and the need for admission to
pediatric care unit (PCU) were also recorded.

Postoperative follow-up was done with a recording of the time of passing flatus, duration of hospital stay, need for postoperative analgesia and occurrence of any wound infections. The patients starting diet after 6 hours from CS

All fifty cases were followed up till the next CS for assessment of the site and types of formed adhesions in the next cesarean section. Adhesions are defined as the presence of bands between two pelvic organs or between any pelvic organ and the abdominal wall. The duration was ranged between 18 - 24 months in all cases. All cases were performed by the same 2 obstetricians

The data were collected and entered into Microsoft access database to be analyzed using the Statistical Package for Social Science (SPSS Inc., Chicago, version 18). Qualitative data were expressed as frequency and percentage. Quantitative data were presented in terms of mean and standard deviation.

Results

Fifty patients with repeated CS were included in the study were classified as follows: 13 had previous two CS, 28 had previous three CS, 8 had previous four CS and 1 had previous five CS. The mean age of study participants was 32.3±4.75 years and the mean parity was 2.94±0.71 (Table 1).

Table 1. Sociodemographic and clinical data of the study participants.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>23</td>
<td>42</td>
<td>32.30</td>
<td>4.75</td>
</tr>
<tr>
<td>Parity</td>
<td>2</td>
<td>5</td>
<td>2.94</td>
<td>0.71</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>37</td>
<td>39</td>
<td>38.82</td>
<td>0.44</td>
</tr>
<tr>
<td>Duration of CS (min)</td>
<td>40</td>
<td>75</td>
<td>58.60</td>
<td>10.975</td>
</tr>
<tr>
<td>Amount of blood loss (ml)</td>
<td>350</td>
<td>700</td>
<td>512.00</td>
<td>113.64</td>
</tr>
<tr>
<td>Passage of flatus (days)</td>
<td>1</td>
<td>3</td>
<td>1.70</td>
<td>0.65</td>
</tr>
<tr>
<td>Hospital stay (hours)</td>
<td>6</td>
<td>8</td>
<td>6.78</td>
<td>0.86</td>
</tr>
</tbody>
</table>

No cases with maternal morbidity occurred during adhesiolysis. The mean blood loss was not significantly increased (512±113.64) without and need for blood transfusion in all cases. No cases with neonatal morbidity or admission to PCU. The mean Apgar score at 1 minute was 9.12±0.56) The intraoperative adhesions found were variable in sites and types. The most common site of adhesions was uterovesical found in all cases (100%). Omental adhesions with the anterior uterine wall came next in 47 cases (94%). Other sites of adhesions were rare. As regard type of adhesions, they were dense (60%), thick (62%), avascular (70%) and did not distort the anatomical relations (78%) of cases (Table 2).

The percentage of adhesions in the next repeat CS after this adhesiolysis which was done within three years after this adhesiolysis was only 2 cases (4%). Both of them were omental adhesions. Operative interference was easy in all cases in the repeat CS.

Table 2. Sites and types of intraoperative adhesions.

<table>
<thead>
<tr>
<th>Sites</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterovesical</td>
<td>50 (100%)</td>
</tr>
<tr>
<td>Omental with the uterus</td>
<td>47 (94%)</td>
</tr>
<tr>
<td>Uterosigmoid</td>
<td>8 (16%)</td>
</tr>
</tbody>
</table>
Table 2. Sites and types of intraoperative adhesions. (Cont.)

<table>
<thead>
<tr>
<th>Sites</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intestinal with the uterus</td>
<td>4 (8%)</td>
</tr>
</tbody>
</table>

Types

<table>
<thead>
<tr>
<th>Types</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine</td>
<td>20 (40%)</td>
</tr>
<tr>
<td>Dense</td>
<td>30 (60%)</td>
</tr>
<tr>
<td>Thin</td>
<td>19 (38%)</td>
</tr>
<tr>
<td>Thick</td>
<td>31 (62%)</td>
</tr>
<tr>
<td>Avascular</td>
<td>35 (70%)</td>
</tr>
<tr>
<td>Vascular</td>
<td>15 (30%)</td>
</tr>
<tr>
<td>Distort anatomy</td>
<td>11 (22%)</td>
</tr>
</tbody>
</table>

Discussion

The current study proves that adhesiolysis during CS decreases the recurrence rate in next cesarean sections without adding morbidities to the patients or to the neonates during current CS.

Poole, 2013 also found that adhesions occur frequently after CS and the incidence increases with each subsequent CS. Repeat CSs are complicated by adhesions, which increase operating time, time to delivery and risk of bladder injury. Clinical data on the efficacy of adhesion prevention strategies related to the setting of CS are limited; also, there is a significant need for well-controlled, randomized clinical studies investigating adhesion prevention in the labor and delivery setting.

Gedikbasi et al, 2010 found that there was an increase in the risks for operative complications and poor perinatal outcomes in multiple repeat CS. Patients must be informed about the related risks of multiple repeated CSs and tubal ligation needs to be encouraged. In our study no recorded cases of bladder or intestinal injury related to adhesiolysis, no cases of delayed management of any obstetrics complication related to adhesiolysis.

Adhesiolysis before delivery increase the blood loss and need for transfusion during CS was debatable. Although some have suggested that significant blood loss is associated with higher number CSs. Other studies were not associated with significant blood loss. While some have found that the risk of blood transfusion increased significantly with increase in the number of prior CSs others have either found no difference overall. In our study, no significant blood loss was recorded in all cases and no need for a blood transfusion at all.

Sikirica et al, 2012 found that adhesiolysis rates were higher in repeat compared with primary CS. In repeat CS patients, costs and complications were higher in the adhesiolysis group. Reducing adhesion formation after primary CS could reduce cost and complications at the time of repeat CS.

Regarding perinatal morbidity, some studies reported that the mean incision to delivery time in women with high score adhesions was significantly higher, compared to those with low score adhesions (19.8 minutes vs 15.6 minutes, respectively; p=0.04). Also in the same study analysis, it was found by 30 minutes after skin incision, 17.9% of women with high score adhesions remained undelivered, versus 5.1% of those with low score adhesions (p=0.04). Delivery times have also been reported to increase with increase in the number of previous CSs in the same study.

All the previous studies found that adhesion increase of maternal injuries during adhesiolysis and also delay interference in case of any complications like doing subtotal hysterectomy instead of total hysterectomy as adhesion distort anatomy. In addition to the increase of operative time due to adhesiolysis, the cost of any complication that occurs due to
adhesion and cost of use of anti-adhesion substances(7).

Therefore, all are recommending measures to prevent further adhesion formation as adding anti-adhesion barrier which is costly and not available in our low economic and low facilities societies. But in both situation adhesiolysis is recommended, therefore, our study aimed to see the implication of adhesiolysis by doing it with an ascending curve of experience in addition to doing it in a perfect way and completely and re-evaluation was done in next CS.

In the same sitting, the evaluation of adhesiolysis as an acute event also done. Operative time was not prolonged with gaining experience of perfect adhesiolysis; also, blood loss was within normal range and no maternal morbidity nor mortality at all. Also, one of the advantages is early discharge within hours without complications

Although there are many factors that have an influence on the postoperative adhesion formation and doing adhesiolysis might not be the factor on recurrent adhesions, we tried to choose a homogenous group of patients with the same pattern of postoperative follow-up to minimize other factors affecting adhesion formation

The limitations of the current study include an absence of a control group, but currently, we are working in a large case-control study based on our preliminary results to confirm our hypothesis. Second, the small sample size was taken that makes our result cannot be generalizable to the population.

The most important point gained is the very low incidence of adhesion in next CS and the operation was simple and easy in comparison to past one. This technique can be encouraged in our community as the cost and availability of anti-adhesion barrier could be difficult. Further large sample sized studies are needed to confirm our results.

Potential conflicts of interest

The authors declare no conflict of interest.

References