

# AN EXPERIENCE WITH A SINGLE LAYER UTERINE CLOSURE AND JOEL-COHEN ABDOMINAL APPROACH FOR CAESAREAN SECTION

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## ABSTRACT

*Objective* To evaluate the effect of opening the abdomen by Joel-Cohen incision and single layer locked closure of uterus during caesarean section in terms of intraoperative and postoperative complications.

*Study design* Descriptive study.

*Place & Duration of study* Private hospitals, Baqai Medical University and Hamdard University Hospitals, from April 2007 to April 2010.

*Methodology* In this study women scheduled for lower segment caesarean section through Joel-Cohen incision and single layer closure of uterine incision were enrolled. The outcome measures studied were operating time, intra operative blood loss, febrile morbidity, wound infection, number of additional haemostatic sutures needed, post operative pain, analgesic requirement and hospitalization period.

*Results* A total of 100 women were recruited. There was significant reduction in operative time (10 minutes, range 7-11minutes). The blood loss was approximately 100 ml (range 70-110ml). Febrile morbidity was observed in five cases. There were three additional sutures required in five cases and two stitches in another five patients. The hospital stay was 36 hours in 97 cases while five days in three cases.

*Conclusions* Joel-Cohen incision is associated with less blood loss, shorter operating time, less post operative pain, shorter time from skin incision to birth of the baby, similarly single layer closure was associated with less blood loss, short duration of operative procedure, less post operative pain and short hospital stay.

*Key words* Joel –Cohen incision, Single layer uterine closure, Caesarean section.

## INTRODUCTION:

Joel-Cohen incision is a transverse incision made 3cm below the level of straight line joining the anterosuperior iliac spines.<sup>1</sup> This incision is associated with less blood loss, short operating time, shorter time from skin incision to birth of baby and lower analgesic requirements. The single layer locked closure of uterus is associated with reduced

operating time, less tissue disruption and less introduction of foreign material to the wound. It has additional theoretical advantage of less tissue damage, which may result in a stronger wound and thus a reduced risk of rupture with subsequent labour.<sup>2</sup>

The lower segment transverse uterine incision has stood the test of time over a period of 75 years and remains the best way to enter the uterus.<sup>3</sup> Closure of the uterus in single layer appears to be acceptable whenever technically possible. The purpose of this study was to evaluate the effect of opening the abdomen by Joel-Cohen incision, single layer

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closure of uterus, intraoperative and postoperative complications.

#### **METHODOLOGY:**

This study was carried out on patients who underwent LSCS due to various indications at private hospital where author practice, Baqai Medical University and Hamdard Medical University Hospitals, between April 2007 and April 2010. Informed consent was taken from all the women who were eligible for the study. Inclusion criteria were caesarean section due to any indication or high risk factors. Those with previous caesarean section, obstructed labour and low lying placenta were excluded. General physical and systemic examinations were done. Routine investigations including complete blood picture, urine examination, blood sugar levels and ultrasound were performed. All women received prophylactic antibiotics unless already receiving.

Abdomen was opened by straight transverse incision (Joel-cohen).The skin incision was carried down to the anterior rectus sheet. Fascia was opened bluntly after a 3-4 cm incision and stretched in craniocaudal fashion. Rectus muscle retracted laterally and parietal peritoneum was bluntly opened by digital dissection. Visceral peritoneum was then grasped with forceps and incised as usual. The uterus was opened by a nick in lower segment and stretched digitally transversely as usual. After the delivery of baby by vaccum extractor the the placenta was removed by controlled cord traction. The uterus was closed in single layer with continuous locking polyglycolic sutures. Additional sutures were applied whenever required in order to secure haemostasis. The visceral and parietal peritoneum were not closed. Rectus was approximated with number 1 polypropylene sutures and skin was approximated with sub-cuticle closure.

Time from skin incision to skin closure was noted. Number of additional sutures taken were also noted. Intra-operative blood loss was calculated by measuring blood in the suction apparatus and on sterile drapes. All patients were kept admitted for 36 hours calculated from completion of procedure till discharge. During the post operative period analgesics was prescribed twelve hourly in all patients. Rest of the postoperative care was as usual fo any caesarean section. The outcome measures noted were operating time, intra-operative blood loss, number of additional haemostatic sutures, febrile morbidity (cystitis, wound infection), analgesia required postoperatively and hospital stay.

#### **RESULTS:**

There was significant reduction in operating time by Joel-Cohen incision and single layer locking suture closure of uterus(10minutes, range 7-11minutes). The blood loss was 100 ml (range 70-110ml). There were 3 additional haemostatic sutures taken in five (10%) cases, while in another five (10%) patients only 2 stitches were applied each on the either corner. Febrile morbidity was observed in five cases, out of which one case was of wound infection, one case of endomyometritis and three case of cystitis probably due to catheterization. Maximum hospital stay after surgery was 36 hours in 97 cases. Post operative recovery of all patients was smooth. Only three cases needed stay for five days. Number of analgesic doses required were two in 24 hours.

#### **DISCUSSION:**

The main purpose of wound suture is to assist haemostasis, resist stress and strain on wound till healing gives it intrinsic strength. It also assists haemostasis. In post-partum period the uterus goes through rapid involution so that any type of suture become loose.<sup>2,4</sup> Haemostasis which also depends on uterine contraction and retraction. Additional suture material may result in more tissue ischaemia and necrosis and more foreign tissue in the body, which may be a nidus for infection. Recent experimental studies in animals have shown that non-closure of uterine incision has no adverse effect on operative or post-operative morbidity and shows histological evidence of lesser muscular necrosis, scar fibrosis and endometritis.<sup>4,5</sup> The decreased operating time observed in our study (10 minutes) is closer to that reported in studies conducted by Tully L et al and Tischendorf D.<sup>6,7</sup> Second layer suturing prolongs operating time and increases the number of needle punctures in the uterine wall.<sup>8,9</sup>

Lower febrile morbidity found in the present study with single layer closure is similar to that reported by Tischendorf D.<sup>7,9</sup> This lower febrile morbidity is probably due to decreased operating time. The decreased endomyometritis in our study is similar to the study by Iankov M and Durn Wald C.<sup>10,11</sup> Due to low rates of febrile morbidity and wound infection, shorter hospitalization time and better involution of uterus occurs. There was no dehiscence and secondary bleeding, in this study. Thus single layer closure is recommended for wider application.<sup>11</sup>

In a study conducted by Sivasuriya M and Colleagues, single layer closure of uterus was used in 100 patients. In all there was also a valid indication for sterilization. A noteworthy feature was

that, the incidence of post-operative complications was no higher as compared with the standard 2-layer suture of the uterus.<sup>12</sup> A Cochrane data base systemic review states that single layer closure of uterus compared with double layer closure was associated with a statistically significant reduction in mean blood loss (three studies, 527 women, MD-70.11, 95% CI-101.61 to 38.60); duration of operative procedure (four studies, 645 women, MD-7.43, 95% CI-8.41 to 6.46) and less post operative pain. The result of 10 randomised trial (2531 women) reports that single layer closure of uterine incision was associated with reduction in blood loss (by some 70 ml, range 39-102 ml; from three studies), duration of procedure (some 7 minutes, range 6.5 to 8 minutes; four studies).<sup>13</sup> Another Cochrane review has concluded that there appears to be no advantage or disadvantages for routine use of single layer closure compared to two layer closure, except perhaps a shorter operation time.<sup>14</sup>

There is a study comparing the pregnancy outcomes subsequent to single-versus two layer closure of a prior uterine incision and there was no difference in the rate of uterine scar separation after single versus two layer closure. Data was also collected regarding maternal and foetal morbidity in both the procedures and in the indexed pregnancies the incidence of uterine window or rupture did not differ from that in control patients so the conclusion was that pregnancy outcome is indistinguishable from those in patients having a standard two layered closure.<sup>15,14</sup>

In contrast to the above studies there are studies which conclude that during a trial of labour in women who had a single layer of uterine closure, 3.3 % rate of uterine rupture noted as compared to those with a previous 2-layer closure where rate of uterine rupture was 0.6%. On the other hand study by Jelsema RD and Durn Wald C reported that single layer closure had advantage of less tissue damage which may result in a stronger wound and thus a reduced risk of rupture with subsequent labour.<sup>16,17</sup>

Similarly a study was conducted in 1995 with 125 caesarean sections using 2-layer closure in 62 patients and a one layer suture in 63 patients. They compared intra-operative and post operative courses of two groups of patients post-operatively between the 8<sup>th</sup> and 10<sup>th</sup> day. An ultrasonic examination of the scar was also performed. The data showed that the scar in the single layer group was thinner so they concluded that the result did not support an advantage of the one layer suture as compared to the two layered technique.<sup>18</sup>

There was a comparative study based on a Joel-Cohen incision with the traditional Pfannenstiel technique in terms of operative data and post-operative recovery. Out of 158 randomized patients, 83 underwent the innovative caesarean section (Joel-Cohen incision, one layer locked uterine suture, no peritonization) and 75 had traditional operative approach (Pfannenstiel incision, double layered closure of the uterus, visceral and parietal peritonization). Results conclude that total operating time was shorter with the innovative technique and few sutures were used. Patient operated by the new technique began moving sooner and intestinal function restarted earlier. A study on 1006 women based on single layer closure was associated with reduced operating time (5.6 minutes). Based on trial, radiographic scar appearance showed fewer scar defects at three months in single layer closure group. There was no significant difference in terms use of extra haemostatic sutures, incidence of endometritis, decrease in post-operative haematocrit or use of blood transfusion.<sup>19</sup>

#### CONCLUSION :

Opening the abdomen by Joel-Cohen incision and closing the uterus in single layer not only reduces intraoperative and postoperative complications but also saves time and cost of the procedure.

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