

COMPARISON BETWEEN COHEN'S INCISION AND PFANNENSTIEL'S INCISION IN CESAREAN SECTION ACCORDING TO BENEFITS AND COMPLICATIONS

*¹Dabdoub Tariq, ²Naisa Thawra and ³Yousef Ahmed

¹M.D, Department of Obstetrics and Gynaecology, Tishreen University Hospital, Lattakia, Syria.

²Associate Prof, Department of Obstetrics and Gynaecology, Tishreen University Hospital, Lattakia, Syria.

³Prof, Department of Obstetrics and Gynaecology, Tishreen University Hospital, Lattakia, Syria.

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*Corresponding Author: Dabdoub Tariq

M.D, Department of Obstetrics and Gynaecology, Tishreen University Hospital, Lattakia, Syria.

ABSTRACT

Background: Cesarean Section is delivery of fetus through incision in uterus after laparotomy. There are many types for abdominal incision during cesarean section such as Cohen incision and Pfannenstiel incision. Cohen's incision is straight line made under the line between anterior superior iliac spine by 3 cm. Pfannenstiel incision is curvilinear incision made above pubic symphysis by 2-3 cm. **Objective:** Main objective: This study was designed to compare the Joel-Cohen and Pfannenstiel incisions during cesarean deliveries according to operating time and intraoperative blood loss. Second objective: Evaluate effect of Cohen incision and Pfannenstiel incision on maternal recovery. **Methods:** One hundred pregnant women scheduled for delivery by cesarean section were randomised to either Cohen incision (n=50) or Pfannenstiel incision (=50). **Design:** Randomised controlled trial. **Results:** Median operative time was shorter in Cohen incision than Pfannenstiel incision and median intraoperative blood loss was less in Cohen incision than Pfannenstiel incision (p<0.005). Postoperative hospital stay and pain degree were similar between the two techniques. **Conclusion:** We concluded that Cohen incision in cesarean section reduce operating time and intraoperative blood loss compared to Pfannenstiel incision .

KEYWORD: Cesarean section Abdominal incision, Cohen incision, Pfannenstiel incision operative time blood loss.

INTRODUCTION

Cesarean Section is delivery of fetus through incision in uterus after laparotomy. Cesarean Section is one of the most common operation in obstetrics worldwide.^[1] There are many abdominal incision in cesarean section such as classical incision or longitudinal incision that is made at midline from umbilicus to pubic symphysis and transverse incision that is made above pubic symphysis in different techniques. Cohen's incision is straight line made under the line between anterior superior iliac spines by 3 cm.^[2] Pfannenstiel incision is curvilinear incision made above pubic symphysis by 2-3 cm.^[3] There are many studies worldwide compare different transverse incisions in cesarean section according to benefits and complications. There are few studies compared Cohen incision and Pfannenstiel incision and thus we made this study.

MATERIAL AND METHODS

The study was conducted at the labor ward of Tishreen University Hospital in Lattakia-Syria for one year(2021-2022).

Study design

It was randomized control trial.

Inclusion criteria

- 1-age: 18-38 years
- 2-gestational age 37-42 weeks
- 3-singleton pregnancy

Exclusion criteria

1. Previous abdominal incisions
2. Obstetric complications that need another specific incision
3. Medical illnesses that affect postoperative recovery
4. Uterine tears that need longer operative interventions.

Methods

One hundred pregnant women, who were to undergo elective caesarean delivery and who had no history of lower abdominal surgery, were randomly assigned to Joel-Cohen incision (n=50) and Pfannenstiel incision (n=50). The randomisation was by computer-generated, sealed envelopes that were opened by the physician just before surgery, and the results of the randomisation were known only to the single obstetrician (O. F.) who performed all surgery. The envelopes were balanced in four blocks of 18 operations in each block. Using such large blocks diminished the risk that the operator could guess the next treatment allocation. Neither the physicians at the department, the nursing staff nor the women themselves were aware of the randomisation results.

The wound was dressed pre-operatively in plastic drapes in which drainage pockets were incorporated for collecting all fluids. By the end of the operation, the operating sponges were wrung out before the pockets were evacuated into the suction bottle. The blood fraction of the blood-amniotic fluid mixture in the suction bottle was estimated, comparing the haemoglobin concentration with the haemoglobin concentration in the patient's blood. The blood-amniotic fluid mixture was heparinised to prevent clotting. The individual providing anaesthesia recorded the duration of surgery, as well as the volume of fluids given intravenously and blood transfusion, if given. The women scored their post-operative pain every three hours, when awake, on a ten centimetre visual analogue scale. The post-operative hospital stay was defined as the duration from the day of surgery to the day of discharge.

Written informed consent, as approved by the ethics committee at Latakia University, was obtained from each participant.

Women in both groups scrubbed their abdomens the evening before surgery with a 4% chlorhexidine sponge for at least two minutes just before showering. The same procedure was repeated the next morning. Before surgery the pubic hair was removed from the operative field using a disposable razor and the abdomen was scrubbed with a solution of 0.5% chlorhexidine in alcohol. A urinary catheter was introduced before surgery and removed the same evening. The women received five units of oxytocin intravenously as the cord was clamped. No patient received prophylactic antibiotics. The incision was dressed with a sterile bandage that was removed on the second postoperative day.

The Pfannenstiel technique was performed as the standard procedure in our department (curvilinear incision 2-3 cm above pubic symphysis and sharp dissection of the next layers of abdomen). In the Joel-Cohen technique the skin incision was placed 3 cm below the line between anterior superior iliac spines. The subcutaneous tissue was incised only in the three most

medial centimetres, while the lateral tissue was separated manually. From this point, the abdomen was opened as described 3 cm transverse incision was performed in the uterine isthmus, intended to penetrate most of the myometrial layer sharply, sparing the deepest fibres closest to the cavity which were subsequently opened with the blunt end of the scalpel to avoid fetal injury^[1,3]. The incision was then extended laterally by two fingers. After the baby was extracted the placenta was delivered spontaneously, if necessary with gentle external compression of the uterus. The hysterotomy was closed by five to seven single stitches in one layer using 0 suture. The visceral and parietal layers of the peritoneum were left open while the fascia was closed by single 0 stitches. The subcutaneous tissue was left unsutured and the skin was sewn with a 3-0 intracutaneous continuous suture. All suture material, in both the Pfannenstiel and study group, was resorbable braided polyglycolic acid.

Data analysis

Before beginning the study, a power analysis was performed, indicating that 31 women would be required in each study arm to demonstrate an intra-operative blood loss reduction from 500 to 375 mL with a standard deviation of 125 mL. This yields a level of statistical significance of < 0.01 with a power of 80%. The estimated reduction of intra-operative blood loss was based on a minor pilot study. Continuous data were analysed with a nonparametric test (Mann-Whitney U test), and data were presented as median [25th, 75th centiles]. Categorical data were analysed with Fisher's exact test (two-tailed). P values < 0.05 indicated a significant difference. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated for categorical data.

RESULTS

A total of 100 women were recruited for this study. Of these, 50 women underwent Cohen incision group and 50 women underwent Pfannenstiel incision. The mean age of women that underwent Cohen incision was 30.4 ± 3.9 years, while the mean age for those that underwent Pfannenstiel incision was 31.2 ± 4.8 years. There was no statistically significant difference between the mean age of the two groups ($P > 0.05$). The mean gestational age was 39.4 ± 1.4 weeks in Cohen incision and was 38.1 ± 1.6 weeks, thus selection of patients in both groups were similar [Table 1].

Median operating time was 21.3 ± 1.43 in Cohen incision and 27.6 ± 1.52 in Pfannenstiel incision and this difference was statistically significant ($P < 0.05$). Median intraoperative blood loss was 235.2 ± 22.3 in Cohen incision and 439.4 ± 20.8 in Pfannenstiel incision and this difference was statistically significant ($P < 0.05$).

Median post operation hospital stay was 4.5 ± 1.1 day in Cohen incision and 4.3 ± 1.4 in Pfannenstiel incision with no statistically significant difference between the mean

age of the two groups ($P > 0.05$). Mean post operation pain and burning sensation was similar in both groups with no statistically significant difference.

Table (1): Patient's characteristics.

Patient group characteristics	Cohen incision	Pfannenstiel incision	P-value
Age (years)	30.4±3.9	31.2±4.8	0.8
Gestational age (weeks)	39.4±1.4	38.1±1.6	0.5

Table (2) median operating times.

Operating time	Cohen incision	Pfannenstiel incision	P-value
Mean ± SD	21.3±1.43	27.6±1.52	0.0001
≥25m	2(4%)	47(94%)	0.0001
<25m	48(96%)	3(6%)	

Table (3) Median intraoperative blood loss during Cesarean section.

Blood Loss	Cohen incision	Pfannenstiel incision	P-value
Mean ± SD	235.2±22.3	439.4±20.8	0.0001
≥300ml	21(42%)	42(84%)	0.0001
<300ml	29(58%)	8(16%)	

Table (4) Hospital Stay after Cesarean Section.

Hospital Stay	Cohen incision	Pfannenstiel incision	P-value
Mean ± SD	4.5±1.1	4.3±1.4	0.2
≥2	15(30%)	22(44%)	0.5
<2	35(70%)	28(56%)	

Table (5) Self-assessment on a ten visual analogue scale.

Self-assessment	Cohen incision	Pfannenstiel incision	P-value
Pain	21(42%)	26(52%)	0.5
Burning sensation	9(18%)	17(34%)	0.09

DISCUSSION

The present study is a controlled prospective study involving only one surgeon. This design guarantees a highly standardised operating technique. The randomized prospective design lowers the risk of bias regarding background factors. One major finding of the present study was that the new surgical technique resulted in lower blood loss during surgery compared with Pfannenstiel technique. The intra-operative blood loss was measured using a sensitive sampling method. One other major finding of the present study was that the new surgical technique resulted in reduced operating time. Stark and Finkel.^[14] in a retrospective study, also found an operating time reduction when the abdomen was opened by Joel-Cohen incision. Pietrantonio *et al.*^[15] used a standard Pfannenstiel technique in a quasi-randomised study but left the peritoneal layers open to spontaneous healing. This also resulted in somewhat shorter operating times without other differences in outcome. In a recent prospective study, Irion *et al.*^[16] presented a reduction in operating time as well as a shorter time for return of bowel sounds when the visceral and parietal peritoneum were left unsutured compared with when they were sutured.

In the present study, as in clinical practice, we have chosen an incision level between the original low Pfannenstiel incision and the Joel-Cohen incision. We found no technical disadvantage of incising at a lower level than that described by Joel-Cohen.

In the present study only women scheduled for elective cesarean sections were included. The objective, as well as of having only one obstetrician performing the surgery and only one other obstetrician performing all the follow up, was to standardise the study conditions. In order to control study conditions, only women with no former lower abdominal surgery were included. When performing caesarean section the second or third time, adhesions in different layers will increase the operating time somewhat.^[9] In some cases it is necessary to use scissors to enlarge the fasciae opening.

The primary outcome of the present study is that caesarean delivery performed with the Joel-Cohen technique reduces operating time and blood loss during surgery. The operations in this study were performed by a very experienced senior obstetrician which makes the operating times short in both groups. In clinical practice many caesarean sections are performed not by senior

obstetricians, but by residents. The operating time might then be considerably longer and blood loss during surgery might be greater.^[19] and it remains to be seen whether the advantages found in this study are sustained.

A study of this size does not have enough power to show a difference in the frequency of wound infections or other maternal morbidity during caesarean delivery using the described technique, as the rate of maternal morbidity was low in both groups.

CONCLUSION

We conclude that the modified Joel-Cohen technique of caesarean delivery reduced intra-operative blood loss and operating time compared with the Pfannenstiel technique.

RECOMMENDATION

1-It is recommended that cohen incision to be used in cesarean section because it has shorter operation time and less intraoperation blood loss

2-Further studies should be conducted to compare the benefits and complications of these incisions.

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