Re-laparotomy After Cesarean Section: Risk, Indications and Management Options

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ABSTRACT

Aim: To identify risks, indications and outcomes for relaparotomy after cesarean delivery. **Methods:** A prospective case-controlled study conducted at Mansoura University Hospital, Egypt from 2009 to 2012. Each case was matched randomly to 2 cases that had delivered by cesarean section during the same period and did not undergo repeated surgical intervention. Information's on indications were obtained to gather information's on risks factors. **Results:** relaparotomy complicated 1.04 % (n= 26) of the total number of the cesarean section (CS) (n=2500). The principal indications for relaparotomy were internal bleeding (Intra-abdominal bleeding in 41.7% (n=10); rectus sheath hematoma in 29.2% (n=7) and uncontrolled postpartum hemorrhage (PPH) in 29.2 % (n=7) of cases, followed by infections in 7.7% (n=2) of cases. Resulting in 11.5 % (n=3) maternal death. Predictors for relaparotomy after cesarean delivery from univariate logistic model, placenta previa (OR=6.898, 95% CI=1.867- 25.4, P=.004), fetal weight greater than 4 kg (OR=6.409, 95% CI=1.444-28.44, .015). Previous cesarean section and parity were not a risk for re-laparotomy. **Conclusion:** In this study, the incidence of relaparotomy after cesarean delivery was very high (1.04%). Associated with high maternal mortality (11.5%).The main predictors were placenta previa and fetal macrosomia.

Key words: Cesarean section, Re-laparotomy, risk, management options.

1. INTRODUCTION

The frequency of cesarean section (CS) is persistently increasing all over the world. The expanding rate of CS is due to many factors including pregnancy after the age of 35 years and maternal requests. In addition, changes in maternal characteristics such as increase obesity and diabetes. The obstetric practices such as labor induction and epidural anesthesia all have contributed to the rise in the rate of CS rate (1). Studies have shown that the rate of complications associated with CS is several-fold that of vaginal delivery (2, 3). One of the rarest complications of CS is re-laparotomy after CS. Although, it occurs but reports of the rates, causes, and risk factors are lacking. Gedikbasi et al. in 2008 reported that there are only three descriptive studies documenting re-laparotomy after CS in the obstetrics literature (4). In view of this scant literature and lack of comparative studies examining the risk and outcome of relaparotomy, the aim of the current study was to investigate risks, treatment options and outcome for relaparotomy after cesarean in a case-controlled study

2. MATERIALS AND METHODS

Methods and subjects

In this prospective study, 2500 cesarean deliveries were performed at Mansoura University Hospital, Egypt from January 1. 2009 through December 31, 2012. The hospital

of the study is a tertiary hospital, with 15,000 annual deliveries. The labor ward was supervised by consultants and senior registers. The decision of relaparotomy and the surgical procedure were conducted by the consultant on duty.

In this study, patients were included if they had undergone relaparotomy after CS for any event which is related to the primary procedure. Of the 2500 CS, 26 patients had undergone relaparotomy after the primary procedure. Each patient of the study group was randomly matched to 2 cases that had undergone cesarean delivery during the same period. Accordingly, 52 patients were needed to serve as a control.

The demographic data we recorded included, maternal age; parity; number of previous abortions; antenatal care converge, numbers of previous scars and gestational age. Our variables of interest were indications for cesarean section; indications for relaparotomy; the type of CS; admission to the ICU; blood transfusion; length of hospital stay as well as fetal and maternal morbidity and mortality. For clarity, macrosomia is defined as birth weight 4kg or greater, the diagnosis of fetal distress was on the CTG findings. PIH included both pre-existing and pre-eclampsia. This study was approved by the Ethics Committee of the College of Medicine of Mansoura University.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS 17

Characteristics	Study group (n=26)	Control group (n=52)	P value
Maternal age	32.5385±3.97221	35.5385±4.08256	.575
Gestational age	36.7692±2.30318	38.4064±1.80694	.648
parity	1.9231±1.05539	5.2436±1.50485	.052
No. of previous CS	1.8077±1.13205	1.6667±1.95180	.007
ANC	10(38.5)	66(84.6)	P<0.001
Fetal weight	3.6231±.41695	3.2090±.49836	.195

Data was presented as mean±SD. Student t test was used for analysis, p value was set to significant in <.05.

Table 1. Demographic and obstetrical characteristics of the study and the control cases

for Windows) was used for recording and statistical analyses of data. The descriptive statistics used included the mean, the frequency distribution and the standard deviation. A chi-square test was used to compare the means of qualitative data, whereas a Student's t-test was used to compare the means of quantitative data. In multivariate analysis, all independent variables were added to the model at the same time. The results of the analysis are presented as odds ratio (OR) and 95% confident interval (95% CI). The test of significant was set at a $p < .05$.

3. RESULTS

The total number of CS during the study period was 2500. Of these; 26 patients had undergone re-laparotomy. Thus, the frequency of re-laparotomy in this study was 1.04%. The majority 21(80.8%) were delivered by emergency CS and few 10 (38.5%) of them had antenatal coverage. Relaparotomy was done on average time of 5.5769 ± 1.94264 hours after the primary surgical procedure, but cases with sepsis were re-opened on an average of 3-8 days.

All patients received blood transfusion on an average of 4.8077 ± 2.31550 units of blood. The leading indication for re-laparotomy was hemorrhage in 24(92.3%) of patients (indicated by hemodynamic instability). Intra-operative findings were intra-abdominal bleeding 41.7% (n=10), and hematoma (broad ligament and rectus sheath hematoma) 29.2% (n=7). Uncontrolled postpartum hemorrhage was reported in 29.2% (n=7). The second indication for relaparotomy was pelvic infections accounted for 7.7% (n=2). Seven (26.9%) patients required admission to the intensive care units and the average length of hospital stay was 4.0 ± 2.87054 days. The majority of patients 53.8% (n=14) were treated by uterine arteries ligation, while 46.2% (n=12) were treated by subtotal hysterectomy. Maternal death was reported in 3(11.5%) cases, there was no fetal death. The common complications were DIC (3 cases,

Indication	Number	Percentage
Placenta previa	9	34.6
Fetal weight > 4kg	7	26.9
Multiple pregnancy	3	11.5
Eclampsia	2	7.7
Fetal distress	2	7.7
Failure to progress	2	7.7
Tender scar	1	3.8

Table 2. Indications for cesarean section

11.5%), cardiac arrest (2 cases 7.7%) and bladder injury (1 case, 3.8%)

Demographic and obstetrical characteristics of the study and the control cases are shown in Table 1. The study subjects had increased frequency of the number of previous Cesarean delivery ($p = .007$) compared to the control group.

The principal indication for CS were, complete placenta previa (9 cases, 34.6%), macrosomia (7 cases, 26.9%), multiple pregnancy (3 cases, 11.5%), eclampsia (2 cases 7.7%), fetal distress (2 cases 7.7%), failure to progress in labor (2 cases 7.7%) and scar dehiscence (1 case, 3.8) as shown in Table 2.

Binary logistic regression was used to examine how well some selected obstetrics characteristics can predict relaparotomy by using the control group as a reference category as shown in table 3. Stronger predictors of relaparotomy were placenta previa (OR=6.898, 95% CI=1.867- 25.4, $p = .004$), fetal macrosomia (OR=6.409, 95% CI=1.444- 28.44, $P = .015$). There was no association with the number of previous cesarean delivery, and parity, p value > .05 as shown in Table 3.

4. DISCUSSION

In the current study, the incidence of relaparotomy after CS was found to be 1.04%. This incidence is very high and inconsistent with previous reports. The majority of previous studies reported a rate of relaparotomy ranging between 0.2%-7% (5, 6, 7). The high rate of re-laparotomy in our study, could be explained by poor antenatal care coverage (indicated by 61.5% non-user), consequently high rate of emergency CS which has a 4-folds increase in the rate of relaparotomy ($p = .005$). Seal et al. (6) reported that, of these 66 cases requiring relaparotomy following cesarean delivery, 63 (95.5%) had an emergency cesarean delivery. Perhaps, low rates reported by some authors indicate availability of health services, good conduction of the antenatal care, selection of patients at risks for elective CS and early intervention.

Variables	Control group (n=52)	Study group (n=26)					
		Univariate			Multivariate		
		OR	95% CI	P value	OR	95% CI	P value
PP	1.00*	4.976	1.461-16.956	0.010	6.898	1.867- 25.4	.004
macrosomia	1.00*	0.226	0.059-.862	0.030	6.409	1.444-28.44	.015
PCS	1.00*	0.794	0.246-2.555	0.698	.705	.188-2.645	.605
parity	1.00*	0.837	0.486-1.440	0.520	.899	.485-1.666	.735

1* reference category Abbreviations: OR, odds ratio; CI confident interval; PP, placenta previa; PCS, previous cesarean section;

Table 3. Univariate and multivariate analysis of cesarean section and some selected risk factors

The principal indication for relaparotomy after CS in the current study, was hemorrhage, both intra-abdominal bleeding and uncontrolled PPH accounted for 24 (92.3%). All previous studies have reported that intra-abdominal bleeding was the leading cause for relaparotomy after CS, but with different rates. A figure of 70.9% is reported in the current study after excluding uncontrolled post partum hemorrhage. Comparable rates were reported by some authors (7, 8). Recently, Kessous et al. (9) reported that bleeding accounted for 70% of indications for relaparotomy. Bleeding secondary to uterine atony is preventable by adopting active management of the third stage of labor in women with identifiable risk factors for uterine atony by either rectal misoprostol or oxytocin infusion (10). Intra-abdominal bleeding after CS depends on the skill and the experience of the operator and the surgical technique used, such factors would be difficult to discern in the current study, because this essential parameter was not evaluated. Sometimes we faced difficulties in identifying the source of bleeding, especially with huge hematoma.

In this study, relaparotomy was performed within 5.5 hours after the primary procedure, agreed with previous reports (11). On the other, relaparotomy performed for sepsis required an average of 6-11 days after primary surgical operation. Sepsis in our report accounted for 7.7% (n=2) of all cases. It was found that the important risks factors for infection after CS were the duration of the surgical procedure especially when exceeding 38 min and body mass index of greater than 30 and the commonest site for infection is the surgical site (12). In our series both cases had pelvic abscess which was treated successfully with evacuation, drainage and antibiotics. In our study, surgical treatment received for intraabdominal bleeding were either hysterectomy in 46.2% (n=12) and uterine artery ligation in 53.8% (n=14).

Literature evaluating the indications for CS leading to re-laparotomy is scant and insufficient to make a valid comparison about this important issue. In the current study, the most important indications for cesarean delivery leading to relaparotomy were complete placenta previa with an odds ratio of 6.898 and fetal weight greater than 4kg with an odds ratio of 6.409. This finding agreed with Hasegawa et al. (13) who concluded that placenta previa poses a high risk of morbidity and mortality for both fetal and mother among subjects underwent relaparotomy after CS. Kessous et al reported additional risks for re-laparotomy after CS including previous CS, severe preeclampsia, uterine rupture, placental abruption, cervical tear and PPH (9). This was supported by more recent report by Levin et al. (5) who reported that, placental abruption, duration of primary surgery, and the experience of the chief surgeon were significant risks for relaparotomy after CS. Sak et al (14) in analysis of 113 cases that underwent re-laparotomy concluded that, placental abruption, HELLP Syndrome and previous cesarean section were the most important risks for relaparotomy.

We have had high number of cesarean hysterectomies (46.2%). This can be explained by high rate of placenta previa which accounted for 34.6% of the indications for re-laparotomy in our study. Alchalabi et al. (15) reported

that the risk for hysterectomy increased by a 14-fold in patients who had 3 and more previous CS and the risk after placenta abruption and multiple pregnancy were 15.28 and 1.85 respectively.

Unfortunately, there were 3 maternal deaths in our report accounted for 11.5%, which is very high. Gedikbasi et al. (16) reported 1 case fatality after relaparotomy of the 35 studied cases. In two cases the indication for CS was placenta previa complicating previous scar resulted in intra-operative bleeding. In the third case CS was done on account of triplets' gestation following IVF

5. CONCLUSION

In the current study, the incidence of relaparotomy after CS was 1.04%. The most common indications for CS were hemorrhage and infections. Placenta previa, fetal macrosomia and emergency cesarean delivery were the best predictor of relaparotomy after CS.

CONFLICT OF INTEREST: NONE DECLARED

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