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Re-laparotomy after caesarean section

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Abstract
Relaparotomy after caesarean section is a serious complication and is associated with maternal morbidity and mortality. The data of re-laparotomy after caesarean section is limited. So in the present study, we will evaluate the risk factors and outcome of relaparotomy after cesarean section in our study population.

Keywords: Caesarian section, relaparotomy, indications

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 relaparotmy, the aim of the current study was to investigate risks, treatment options and outcome for relaparotomy after caesarean.

Material and Methods
Study design
It is a cross-sectional study conducted in the department of gynecology and obstetrics, a tertiary health care hospital. Out of 2,998 c-section cases, 16 cases had relaparotomy during the period of 5 years from January 2015 to November 2019. Inclusion criteria for the study are cases who are subjected to relaparotomy that is done within 60 days of C-section from our hospital or referred from another center for the sake of complications after C-section. Cases with relaparotomy after 60 days of the C-section and indication for the primary surgery selected was related to obstetrics were excluded from the study.
Data such as age, parity, period of gestation, comorbidities, indication for C-section and relaparotomy, the procedure used during relaparotomy, the interval between C-section and relaparotomy, and outcome after second surgery were noted and filled in excel and calculated the frequency and percentage.

Results

Table 1: Clinical presentation of cases

	Frequency	Percent
Parity		
Primigravide	6	37.5
G2p1l1	5	31.3
P1l1	2	12.5
G3p2l2	1	6.3
P2l2	2	12.5
Period of gestation		
>37 weeks	7	43.8
<37 weeks	9	56.3
Comorbidities		
Without any comorbiditis	9	56.3
Fibroid utreus	1	6.3
Severe pre-eclampsia	3	18.7
Anaemia	3	18.7
Indication for C-section		
Dystocia	3	18.75
Malpresentation	1	6.25
Fetal distress	1	6.25
Biophysical profile (BPP)↓	1	6.25
Antepartum haemorrhage (APH)	3	18.75
Premature rupture of membrane(PROM)	1	6.25
Placenta previa	6	37.5

Table 2: Indication, procedure and outcome of Relaparotomy

	Frequency	Percentage
Indications of relaparotomy		
Burst abdomen	5	31.25
Rectus sheath hematoma	2	12.5
Hemoperitoneum	6	37.5
Intestinal obstruction	1	6.25
Pelvic /peritoneal abscess	2	12.5
Procedure during relaparotomy		
Tension suture	5	31.25
Evacuation of rectus sheath hematoma	2	12.5
Drainage of pus and peritoneal lavage	2	12.5
Internal iliac artery ligation	2	12.5
Hysterectomy	1	6.25
Rent closure and bilateral uterine artery ligation	2	12.5
Omental tear (partial omentectomy)	1	6.25
Intestinal obstruction	1	6.25
Maternal output		
Recovered and discharged	15	93.8
Death	1	6.3

Discussion

In the present study, we evaluate the risk factors, indications, and outcomes of C-section patients requiring relaparotomy. During 2 years of study, there were a total number of 16,901 deliveries among 10,478 cases by normal vaginal and 6423 cases by C-section delivery. Among 6423 cases 16 cases required relaparotomy and the incidence was found to be 0.25% which is similar to the other studies [1-8].

Placenta previa, Antepartum hemorrhage (APH), Dystocia, Malpresentation, Fetal distress, altered biophysical profile (BPP), and Premature rupture of membrane (PROM) were major indications for C-section with comorbidities such as fibroid uterus, severe pre-eclampsia, and anemia were associated with our study population. The major indication for c-section in our study population was placenta previa indication (37.5) as in Raagab *et al*., where the percentage of placenta previa was found to be 34.6 [9]. The percentage of emergency C-sections was found to be above 95% and 5% had elective C-sections [9, 10], whereas, in our study, all cases had emergency C-sections as in Debdulal *et al*. study [14].

In our study, hemoperitoneum (37.5%) was the major indication of relaparotomy followed by burst abdomen, rectus sheath hematoma, pelvic/peritoneal abscess, and intestinal obstruction. Many studies reported that hemorrhage was the leading indication for Relaparotomy after C-section. Hemoperitoneum was a major indication of relaparotomy in Raagab *et al.*, Ahmed *et al.*, and Levin *et al*. studies [12, 3, 8]. Burst abdomen (31.25%) was the second most indication of relaparotomy in our study. whereas the studies reported that the percentage of Burst abdomen was observed in 4%, 10.7%, and 22.7% of C-section cases [7, 11, 6]. To reduce postoperative complications, proper care, and safe procedure should follow to minimize further complications. The standard procedure was not available for Relaparotomy due to various indications and complications of cases. Rectus sheath hematoma and pelvic /peritoneal abscess were found to be 12.5% in our study, whereas Debdulal *et al*. and Ahmed *et al*. reported that the percentage of rectus sheath hematoma was 29.72% and 7.4% in their studies [14, 3]. Abscess/sepsis was another major indication of relaparotomy, an abscess is a collection of pus due to bacterial infection and leads to sepsis condition. Studies reported that the percentage of the time interval between C-sections to Relaparotomy was higher within 24 hrs followed by 1-7 days 3 6, in our study the mean time interval between primary and secondary surgery was found to be 6.8 ± 1.2 days in the study population. In our study, the percentage of tension suture procedure during relaparotomy was noted to be 31.5% and followed by evacuation of rectus sheath hematoma, drainage of pus and peritoneal lavage, internal iliac artery ligation, Rent closure, and bilateral uterine artery ligation, hysterectomy, omental tear (partial omentectomy) and intestinal obstruction.

The procedure during the relaparotomy will be various according to the cases and complications of primary surgery. In our study, in case of 6.25%, hysterectomy was required, whereas in Ahmed *et al*. and Lurie *et al*. studies they reported that the percentage of hysterectomy was 77.78% and 5.55% [3].

The percentage of maternal recovery and death was found to be 93.8% and 6.3% (due to severe anemia and heart disease) in our study. Studies reported that maternal mortality is high in emergency C-section when compared to elective C-section, according to Ahmed *et al*., Raagab *et al*., and Shyamal *et al*. studies reported the fatality rate of 18.5%, 11.5%, and 15.38% after Relaparotomy [6, 13].

Conclusion

Due to the age of motherhood, the lifestyle of women, and advanced medical facilities, the normal vaginal delivery rate is decreasing and the C-section delivery rate is increasing worldwide. After successful C-section obstetricians find different clinical complications after primary surgery then the relaparotomy procedure will be used by experts to save the maternal life. The risk of secondary surgery and rate of morbidity and mortality will be minimized by selecting proper procedure of Relaparotomy, diagnosis with efficient facilities in the center with a good efficient team.

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