Original Research Article

Risk Factors, Indications and Outcome among Relaparotomy following Caesarean Section cases in BSMC & H, Bankura, WB

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Abstract

Objectives: The objective of the present study was to study about the risk factors, indications and outcome among relaparotomy following the caesarian section.**Methods:**A retrospective observational study was conducted in a Bankura Sammilani Medical College and Hospital in Bankura, West Bengal, India from September 1, 2018 to August 31, 2020 of the thirty seven cases that required relaparotomy following caesarean section.**Result:** During this two year time frame, a total of 22,192 cesarean deliveries was performed out of 46,214 live birth, among which total of 37 cases had relaparotomy. All the relaparatomy cases were following emergency caesarian section. The most dominant indication of caesarian section was non-progress of labour (21.62%) and post CS scar tenderness (35.13%). Regarding the indication of relaparatomy, most of the cases due to rectus sheathe hematoma (RSH) (29.72%) and intra-peritoneal hemorrhage (27.02%). Ligation of bleeding point (64.86%) and hysterectomy (18.91%) were done in most of the cases.In postoperative complications, out of 37 relaparatomy cases, maternal death occur in 2 cases (5.40%) and in 91.89% cases, patient was discharged at stable condition.**Conclusion:** Relaparatomy after caesarian section is life saving process. It is the main challenge to take decision to go for early reoperation following caesarian section. The interval between initial operation and relaparotomy, indications of caesarian section, post-operative condition and intra-operative findings are the utmost important parameters that determine the outcome. Proper diagnosis, emergency condition of patient, use of meticulous surgery techniques can minimize the risk of relaparatomy.

Keywords: Relaparotomy, Caesarian section, Rectus sheathe hematoma, Intra-peritoneal hemorrhage.

Introduction

The practice of cesarean section (CS) has become one of the most common methods in obstetrics [1]. Primary rates of caesarean section are increasing day by day may be because of changes in maternal characteristics (e.g. obesity and extremes of age) and obstetric practices (e.g. labor induction and epidural anesthesia) [2]. Due to patient requests, the obstetric and medical indications for performing CSs, with or without legitimacy, are increasing worldwide [3]. Cesarean delivery rates increased 25% of all deliveries in the United States and has exceeded from 20.7% to 31.1% in 10 years(1996-2006) with more than 1.3 million CS performed per annual [4,5]. In the United Kingdom, CS rate was 9% of all deliveries in 1981 and increased to 21% in 2001 [6, 7]. Rate of caesarean section is 19.7% in Israel [8]. With the improving surgical techniques, anesthesia, aseptic techniques, and facilities for blood transfusion, the safety of caesarean delivery has increased many folds. The large number of caesarean section may be explained by the improved fetal monitoring techniques and better surgical facilities. The complications associated with cesarean delivery is known to be higher that of vaginal delivery[9, 10]. This may be due to the pathology underlying the indication or the quality of the surgery. According to WHO, etiological study in 2015, CS can cause permanent complications, disability or death particularly in settings that lack the facilities to properly conduct safe surgery and treat surgical complications [11]. In India, a high morbidity rate of 45% was reported [12]. The procedures required for relaparotomy after CS should be decided according to the indication of exploration. There are various indications of relaparatomy such as rectus sheathes hematoma, uterine necrosis, intra-peritoneal hemorrhage, intra peritoneal abscess, bowel ischemia etc [13]. There is no standard procedure for all cases. Procedures include hysterectomy, Internal iliac artery ligation, uterine artery ligation, ligation of tubal sterilization side bleeder, drainage of blood clots and parietal hematoma, securing angles of uterine incision, removal of a foreign body or drainage of pus, adhesiolysis, resection of gut with temporary colostomy and repair of urinary bladder or bowel injuries [14,15]. Decreasing rate of CS in developing countries like India can be helpful in lowering the risks and morbidities because not all safety measures and facilities are available in rural areas [16]. Quick recognition and proper treatment of post-operative complications are mandatory to achieve a safe and successful outcome [17]. Studies on relaparotomy following caesarean section are very rare [18].Relaparotomy after CS is rare. Literature is scanty and insufficient to make a valid comparison

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about this important issue [19, 20]. Hence our study aims to find out the risk factors, maternal morbidity and mortality associated with relaparotomy after caesarean section.

Material and Methods

This study was done in the department of gynecology and obstetrics over a 2-year period from September 1, 2018 to August 31, 2020. The study was conducted after institutional ethical committee approval is obtained. During this time a total of 16644 cesarean deliveries were performed. A total of 37 cases had relaparotomy.

Selection criteria

Inclusion criteria: Patients who are subjected to relaparotomy after caesarian section.

Exclusion criteria:Skin bleeding, secondary suturing, any complication that does not require opening of the peritoneum, Rectus sheathe hematoma which has no additional complications like intra-peritoneal collection or others.

Study Variable: Age, parity, gestational period at the time of CS, indication of CS, time interval between the CS and relaparotomy, clinical features at the timer of presentation, duration of relaparotomy to be completed, outcome of the operation.

Data collection will be done by the following technique:

1. Interview 2. Clinical examination 3. Review of the Bed Head Ticket 4. Observation of operative procedures and findings.

Interpretion: The Collected data will be analyzed and the following things will be searched.

1.Proportion of patients underwent relaparotomy with each of the indication.

2. Mean time interval of performing relaparotomy after immediate CS among study participants.

3. Proportion of patients showing different intra-operative procedures andfindings.

4.Proportion of patients experiencing various post operative complications and different short term outcomes.

Ethical clearance: The study will be done after obtaining Ethical Clearance from the Institutional Ethics Committee of Bankura Sammilani Medical College and informed consent of each participant.

Results

Over a period of 2 years from September 1, 2018 to August 31, 2020, total 46,214 live birth occur of which there was a total of 22,192 caesarean deliveries in the study centre and 37 (0.16%) of which were followed by exploratory relaparotomy. The study includes following characteristics:percentage of emergency and elective cesarean deliveries; rate of operations performed during the day or night shift, types of patients (In house and referred) and duration of Caesarian section (CS) [Table 1]. As the study was retrospective in nature, the weight and height of patients was not available that is why body mass index could not be calculated.

Table 1: Different study parameters

Risk factors		No. of cases	Percentage (%)
Types of caesarian section	Emergency	37	100
	Elective	0	0
Types of patient	In house	29	78.37
	Referred	8	21.62
Time of performing CS	10pm to 6am	28	75.67
	6am to 10pm	9	24.32
Duration of CS	> 1 hour	21	56.75
	< 1 hour	16	43.24

In case of primary caesarian section, non-progess of labour was the most common indication of LUCS (21.62%). Other dominant indications include CPD (5.40%), MSL with Bradycardia (10.81%) and PROM (10.81%). In case of repeat CS, the most common indication was post CS scar tenderness [Figure 1]. Among the 37 cases, regarding the indication of relaparotomy, 29.72% cases due to Rectus sheathe hematoma, 27.02% due to intra peritoneal hemorrhage, 5.40% cases due to uterian necrosis, 10.81% due to primary PPH. 6 cases of intra peritoneal abscess (16.21%) and 2 cases of bowel ischemia (5.40%) were present. Other 4 cases due to abdominal distention with tachycardia (10.81%) [Table 2].

Table 2: Indications of relaparotomy

Indication		No. of cases	Percentage (%)
Rectus sheathe hematoma		11	29.72
Intra-peritoneal hemorrhage		10	27.02
Uterine necrosis		2	5.40
PPH	Primary	2	5.40
	Secondary	2	5.40
Abdominal distention + trachycardia + positive USG findings i.e., free fluid in abdomen		4	10.81
Intra-peritoneal abscess		6	16.21
Bowel ischemia and/or necrosis		2	5.40

*One case may have multiple findings, so some of the numbers of tables is not equal to the total number of cases.

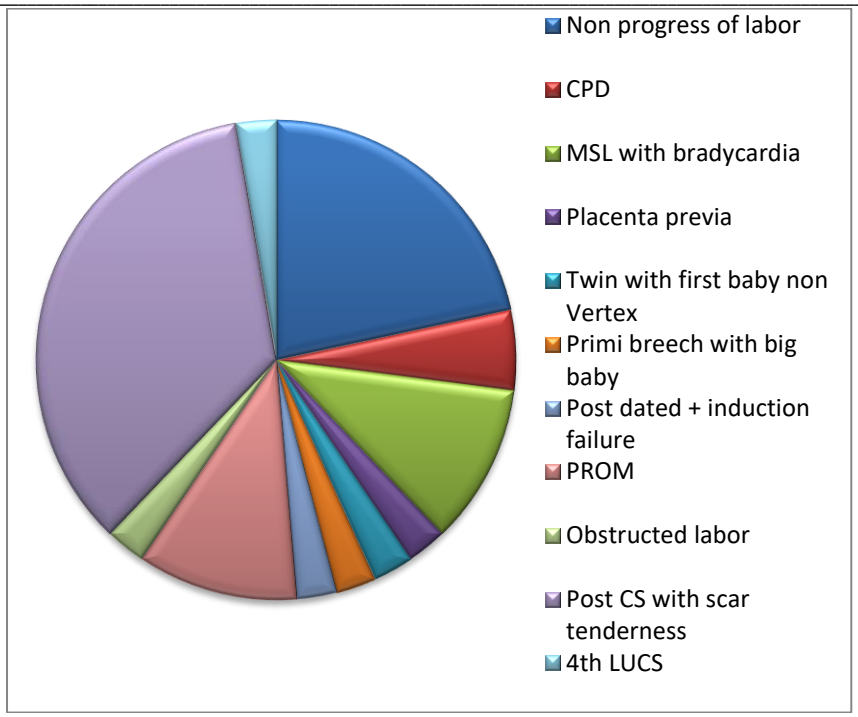

Fig 1: Indications of LUCS in 37 relaparotomy cases

Intra-operative findings at relaparotomy were as follows: Rectus sheathe hematoma(29.72%),PPH (10.81%), Bowel ischemia (5.40%), Uterine necrosis, Intraperitoneal hemorrhage was seen associated with ligation stump bleeding (2.70%), with bleeding from uterine angles (10.81%), bleeding from inferior epigastric artery (10.81%), bleeding from the bladder of plexus (2.70%), rectus sheath haematoma (10.81%) and ruptured bladder (2.70%). Intraperitoneal abscess was present in 6 cases [pelvic abscess- 5.40%, para colic abscess- 2.70%, abscess in between gut loop- 2.70% and abscess in the uterine and abdominal cavity- 5.40%]. 1 case was due to bladder based hematoma (2.70%), other 8 cases were negative laparotomy [Table 3].

Table 3: Intra-operative findings

Intra-operative findings		No. in cases	Percentage
Rectus sheathe hematoma		11	29.72
PPH	Primary (atonic)	2	5.40
	Secondary	2	5.40
Intra-peritoneal hemorrhage	Bleeding from ligation stump	1	2.70
	Bleeding from uterine angle	4	10.81
	Rectus sheathe hematoma	4	10.81
	Bleeding from inferior epigastric artery	1	2.70
	Bleeding from bladder based plexus	1	2.70
	Ruptured bladder	1	2.70
Intra-peritoneal abscess	Pelvic abscess	2	5.40
	Para colic abscess	1	2.70
	Abscess in between gut loop	1	2.70
	Abscess in the uterine and abdominal cavity	2	5.40
Bowel ischemia and/or necrosis		2	5.40
Uterine necrosis and/or scar dehiscence		2	5.40
Bladder based hematoma		1	2.70
Negative relaparotomy		8	21.62

*One case may have multiple findings, so some of the numbers of tables is not equal to the total number of cases.

Alone ligation of bleeding point was required in 24 cases (64.86%). Among which drainage of hematoma and hemostasis in bladder based hematoma was done in 2 cases (5.40%), ligation of rectus muscle was done in 9 cases (24.32%), ligation of inferior epigastric artery and ligation of tubal sterlization site bleeder were done in 8 case (21.62%) and 1 case (2.70%) respectively. Other 4 case (10.81%) were done by securing uterine angle bleeding. Hysterectomy was done in total 7 cases (18.91%) of relaparotomy. 6 cases (16.21%) required drainage of pus with adhesiolysis. Compression suture with ligation of vessel was done in 2 cases (5.40%), resection of gut and temporary colostomy was done in 2 cases (5.40%). In 8 cases (21.62%), peritoneal washing was done and intra peritoneal drain given. Repaired of ruptured bladder was done in 1 case (2.70%) only [Table 4].

Table 4: Procedure performed at relaparotomy

Procedure		Number	Percentage
Ligation of the bleeding point	Drainage of hematoma and hemostasis in bladder based hematoma	2	5.40
	Ligation of rectus muscle	9	24.32
	Ligation of inferior epigastric artery	8	21.62
	Ligation of tubal sterlization site bleeder	1	2.70
	Uterine angle bleeding secured	4	10.81
Hysterectomy		7	18.91
Drainage of the pus and adhesiolysis		6	16.21
Compression suture + ligation of vessel in a stepwise manner		2	5.40
Resection of gut and temporary colostomy		2	5.40
Peritoneal washing and intra peritoneal drain given		8	21.62
Repair of ruptured bladder		1	2.70

*One case may have multiple findings, so some of the numbers of tables is not equal to the total number of cases.

Regarding post operative outcome,34 patients (91.89%) of relaparotomy were discharged at stable condition and 1 patient (2.70%) was referred to other centre. Out of 37 patients, death occurs in other 2 cases(5.40%), 1 maternal death occurred due to hypervolumic shock and MODS (2.70%), other was due to DIC (2.70%).

Discussion

In this study, indications, risk factors and outcome of caesarian cases requiring relaparotomy were analyzed. During the 2 year time frame of our study, there were a total of 22,192 caesarean deliveries among which 37 cases required relaparotomy following caesarean section (0.16%) which was very close to the report of Levin et al [21]. In the study of Ahmed Khan and Kolasseri [13], 0.13% cases required relaparotomy after caesarian section. According to the study of Raagab AE [22] and Gedikbasi [19], the percentage of cases required relaparotomy after caesarian section were 1.04% and 0.12% respectively. Emergency caesarian section increases the risk of relaparotomy. All the cases of our study had emergency caesarian section (100%). In the study of Seal SL [23], 95.5% cases had emergency caesarian section and 4.55% had elective caesarian section. The percentage of emergency caesarian cases was 95.5% and 85.18% in the study of Raagab AE [22] and Ahmed Khan [13] respectively.

In our study, in case of primary caesarian section, non-progress of labour was the most common indication of LUCS (21.62%). Similarly, in the study by Ahmed Khan [13], the most common indication of caesarean section was failure to progress in labour (29.6%). Other dominant indications include CPD (5.40%), MSL with Bradycardia (10.81%) and PROM (10.81%).

The principal two indications of relaparotomy after caesarian sections were Rectus sheathe hematoma (29.72%) and intra peritoneal hemorrhage (27.02%). In the study of Raagab AE [22], the main indication was hemorrhage (92.3%). Ahmed Khan reported that, in 44.44% cases, the major indication of relaparotomy was intra peritoneal hemorrhage. Also in the study by Levin et al, intra peritoneal hemorrhage and PPH were the main indications of relaparotomy after caesarian section. In our study, there was 10.81% cases which had PPH as indication. Other 5.40% cases due to uterian necrosis, 16.21% cases had intra peritoneal abscess and 5.40% cases had bowel ischemia. We found that the majority of relaparotomy cases are due to rectus sheathe hematoma which had some additional complications like intra-peritoneal hemorrhage and in all of these cases the parietal peritoneum is not properly apposed during LUCS.

The major finding of relaparotomy was rectus sheathe hematoma (29.72%) followed by PPH (10.81%). Intra peritoneal hemorrhage was common in most of the cases. In the study by Ahmed Khan [13] and Shyamal D [18], intraperitoneal hemorrhage was found in 44.44% and 48.93% cases respectively. Hemodynamic shock and subcutaneous hematoma were major findings in the study of Shinar S [24]. In our study, other findings includes intra peritoneal abscess (16.21%),bladder based hematoma(2.70%) and negative relaprotomy (21.62%). According to many studies, hemorrahage was the leading cause where early relaparotomy after caesarian section were needed. To reduce the post partum complications, care during transverse cutting and safe procedure of suturing the lower uterine segment incision were required.In our study, in case of 18.91%, hysterectomy was required. The percentage of hysterectomy was very high (77.78%) in the study report by Ahmed Khan [13], but the percentage was low (5.55%) in a study by Lurie [20]. Alone ligation of bleeding point was required in 24 cases (64.86%) in our study which in the case of Ahmed Khan [13], only required in 2 cases out of 27 cases. Hysterectomy was required in 38.18% cases in the study by Biswas SP [25] and conservative surgery including removal of subrectus hematoma and ligation of ovarian and uterine vessels was needed in 61.82% cases. Hysterectomy was done in 31.3% cases in the case report by Kessous Roy [26].Unfortunately, 2 maternal deaths occur in our report accounted for 5.40%. In both cases the intra-operative findings was rectus sheathe hematoma. The procedure of re-laparotomy was drainage of hematoma and hemostasis in bladder based hematoma in both cases. The percentage of maternal death was 18.52% in the report by Ahmed Khan [13] in 4 of them, findings at relaparotomy was intraperitoneal hemorrhage. 11.5% and 15.38% maternal death occur in the study by Raagab AE [22] and Shyamal D [18] respectively. According to several study reports, maternal mortality is high in case of emergency caesarian cases but in case of elective caesarian cases, the rate of mortality is very low.

Conclusion

In today's world, caesarean section leading obstetric practice and emergency relaparotomy is life saving method. Every caesarian section should be performed sincerely and all obstetricians should have the capacity to tackle different complications effectively that happen during and after the operation. We strongly recommend proper closure of parietal peritoneum during LUCS to minimize the complication and early diagnosis of rectus sheathe hematoma. As hemorrhage was the major cause of relaparotomy, strict monitoring of patient within the first 1 day after CS should be done carefully. Proper diagnosis of the high risk patients, conscientious surgical procedures can minimize the risk of relaparotomy. If complication arises, patient should be referred to higher centres.

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