

Original Articles

Relaparotomy after Cesarean Section : Experience from a Tertiary Referral and Teaching Hospital of Bangladesh

SALMA ROUF¹, SABERA SHARMIN², FARHANA DEWAN³, SALMA AKHTER⁴

Abstract:

Objectives: The objective of the study was to find out the incidence, indications, risk factors and outcomes of cases requiring relaparotomy following caesarean delivery during the puerperium.

Material and Methods: This was a retrospective descriptive study set in a tertiary referral and teaching hospital (Dhaka Medical College Hospital) in Dhaka, capital of Bangladesh.

Results: Over a period of one year from January 1st to 31st December 2007, there were 3830 caesarean deliveries (48.43%) out of a total of 7909 deliveries. Relaparotomy was done in 24 patients (0.63%) of the caesarean sections. The indications of repeat laparotomy were secondary postpartum haemorrhage (PPH) in 11 cases(45.8%), primary PPH due to uterine atony in 8 cases (33%), uterine sepsis with haemorrhage in 1 case (4.17%), rectus sheath haematoma in 2 cases (8.3%), internal haemorrhage after caesarean section in 1 case (4.17%) and abdominal wound dehiscence in 1 case (4.17%). Of these 24 cases, in 4 cases, primary caesarean section was done in this institution while 20 had caesarean delivery at other hospitals and clinics at (5 cases) and outside Dhaka (15 cases). Main surgeries performed at relaparotomy were subtotal hysterectomy in 12 cases, total hysterectomy in 5 cases, drainage of haematoma and peritoneal toiletting in 2 cases, resuturing of uterine incisions in 1 case, ligation of uterine vessels in 2 cases and internal iliac arteries in 1 case and others. More than one procedure was often performed in one case. There were 6 maternal deaths following relaparotomy caused by shock following PPH, septicaemia and internal haemorrhage.

Conclusion: Repeat laparotomy within six weeks of caesarean delivery was required 1 in 200 cases in this institute. Case fatality rate was high (25%). Near miss fatalities were also common. Majority of these were preventable. Identification of risk factors, adequate attention during primary surgery, expert decision, prompt intervention and proper case management during relaparotomy will improve the outcome.

Key words – Caesarean delivery, relaparotomy.

Introduction:

Cesarean section (CS) is the most common obstetric operation carried out in daily obstetric practice and the incidence has shown a dramatic increase over the last few decades globally.¹ With the improvement of operative technologies, anaesthesia coverage and blood transfusion facilities, safety of cesarean section has increased considerably. Still it is a major operation and is associated with certain risks and complications.

Complications rate associated with cesarean section is known to be several fold than that of vaginal deliveries.^{2,3} This may be due in part to the pathology underlying the indication for the operation or the quality of surgery.

In some cases, the complications mandates a repeat laparotomy - (Relaparotomy) requiring the patient to return to the operating theater. Most of the time, relaparotomy is performed when the conditions of

-
1. Assoc. Prof of obs and gynae, DMCH.
 2. HMO, Mat II, DMCH
 3. Prof. of obs and gynae, DMCH
 4. HMO, Mat IV, DMCH

the patient is too critical to withstand the risk of anesthesia and repeat surgery. Often it is a very difficult decision and requires good clinical judgement. On one hand it is the last resort to save a mother's life; and on the other hand, the mother's reproductive capability is sacrificed in most of the cases.^{4,5} So relaparotomy may be considered as a near miss maternal mortality situation.⁶ Postpartum haemorrhage (PPH) following CS both primary and secondary, intraperitoneal haemorrhage, septicaemia, burst abdomen, rectus sheath haematoma have been encountered as common indications of relaparotomy following cesarean delivery.^{6,7} There are very few large scale studies on relaparotomy following cesarean section and the maternal mortality and morbidities associated with relaparotomy has not been studied in detail.

Dhaka Medical College Hospital is the most well known tertiary referral and teaching government hospital located in the centre of the capital dealing with all types of obstetric emergencies referred from urban, peri-urban and rural hospitals and clinics.

The objective of this study was to find out the incidence, indications, risk factors and outcome of cases requiring relaparotomy following cesarean delivery done either in this institute or referred from outside during the puerperium. In this study we critically evaluated the cases of relaparotomy following cesarean delivery to identify the risk situations and the suggestions and precautions to be taken to improve the quality of care for preventing this dreadful complication of cesarean section.

Materials and Methods:

This was a retrospective descriptive study done in the Obstetric and Gynaecology department of Dhaka Medical College Hospital (DMCH) over a period of one year from 1st of January to 31st December 2007. Over this period 3830 cesarean deliveries were performed in this hospital out of total of 7909 deliveries. Cesarean section rate was 48.43%. Relaparotomy was done in 24 patients and the rate was 0.63% of the cesarean section. Dhaka Medical Hospital has a wide catchment area and the referrals are received from other hospitals and clinics in the city and from nearby outside peri-urban and rural hospitals.

Of these 24 cases, in 4 cases primary operations (cesarean section — we will call it primary CS) was

done in this institute while 20 had primary CS at other hospitals and clinics of Dhaka city. Fifteen cases were referred from hospitals and clinics outside the Dhaka city.

This hospitals, being a teaching and training institute residential medical officers and the post graduate trainees usually perform the cesarean delivery under the direct assistance and guidance of the senior surgeons like post graduate registrars, consultants, residential surgeon and professors. Cases where relaparotomy needed, were done by senior registrars, consultants, residential surgeon and professors. All cases requiring repeat laparotomy within 6 weeks of primary CS were analyzed. The data of the patients were obtained from patients history sheets, operation theater records, discharge and referral notes of the primary CS. The following data were collected — age, parity, indications of primary CS, indications of relaparotomy, time interval from primary CS to reopening, procedure under taken on repeat operation, total units of blood transfused, duration of hospital stay, and the outcome following relaparotomy. Data analysis was carried out by mean, median, percentage and relative risk for relaparotomy with 95% confidence intervals to calculate where possible. The SPSS was used for analysis. Statistical significance was $p < 0.05$.

Results

There were a total 3830 cesarean deliveries out of total of 7909 deliveries for the period under the study and the cesarean section rate was quite high (48.43%). Twenty four patients (0.63%) required relaparotomy.

The ages of the patients ranged from 15 to 35 with a mean of 27 years. The parity ranged form 1 to 5 with a median of 2. All the patients were house wife and none of them were working lady. Six patients were very poor and the rest 18 came from average socio economic condition. Only 4 patients had regular antenatal check up, 15 had irregular follow up, and 5 patients did not have any checkup. Seventeen patients had C/S at term, 2 with gestational age less than 37 weeks and 5 patients were post dated. Six patients had one CS delivery before (post cesarean pregnancy) while 2 patients had 2 previous CS delivery (repeat cesarean pregnancy) in the past. None of the cases had primary elective cesarean section and all were done on emergency basis.

Table I shows the commonest indication for repeat surgery was post partum haemorrhage (PPH) in 19 cases (79.17%) of which secondary PPH cases were 11 (45.8%) and primary PPH due to uterine atony were in 8 cases (33%). Rectus sheath haematoma occurred in 2 cases (8.3%) and was included in these series as peritoneal cavity was explored in both of these cases in addition to drainage of haematoma.

Table II describes the indications of primary CS and their risk association with relaparotomy in the study population. Of these 24 relaparotomy cases all had undergone emergency CS and the commonest indication of primary CS was post CS and repeat CS Pregnancy (6 + 2) 8 cases. All the post CS and repeat CS cases came with prolonged labour. A more careful study of the primary indications and their relative risk for repeat laparotomy were analyzed.

Table III summarizes the procedures undertaken at relaparotomy. Main surgeries performed at relaparotomy were subtotal hysterectomy in 12 cases, and total hysterectomy in 5 cases.

Table IV summarizes the time interval between primary CS and relaparotomy. Total 9 cases had relaparotomy within 24 hours. These were the cases of primary PPH (8 cases) and one with internal haemorrhage. Only one patient had relaparotomy within 6 hours of primary operation. In majority of the secondary PPH cases (9) relaparotomy was done after the first week of operation.

Table 5 describes the case fatality in details. A total of 6 patients died following resurgery with a case fatality rate about 25% (6 out of 24).

Table-I
Indications of Relaparotomy

Indications	Number of Cases (n=24)	Percentage
Postpartum Haemorrhage	19	79.17
a. Primary PPH	8	33
b. Secondary PPH	11	45.8
Rectus Sheath Haematoma	2	8.3
Uterine Sepsis with haemorrhage with septicaemia	1	4.17
Internal haemorrhage from CS wound	1	4.17
Abdominal wound dehiscence	1	4.17

Table-II
Indications of CS for Primary Operation and Risk Association of Relaparotomy in the Study Population

Indication of Primary CS Operation	Number of Patients Delivered with this Indication in the Study Period	Number of Patients needed Relaparotomy (n=24)	Risk association		P value
			Relative Risk (RR) with 95 % of Confidence Interval (CI)	RR	
Post Cesarean Pregnancy (1CS before)	293	6	0.356	0.804-2.04	0.1056'
Repeat CS (≥ 2CS Before)	63	2	0.076	0.292 -1.532	0.54
Obstructed Labour	81	6	0.0985	0.227-1.013	0.9306
Prolonged Labour	134	4	0.163	0.358-1.6	0.472
Foetal Distress	177	4	0.215	0.67-1.91	0.184
APH with Placenta Praevia	74	2	0.09	0.1-1.34	0.729

Table-III
Procedures Undertaken During Relaparotomy

Procedure Undertaken	Number of Cases (n=24)*
Subtotal Hysterectomy	12
Total Hysterectomy	5
Bilateral Uterine Artery Ligation	2
Internal Iliac Artery Ligation	1
Resuturing of Uterine Incision	1
Repair of Bladder Injury	2
Drainage of Blood Clots from Undersurface of Rectus Sheath and Peritoneal Cavity Toileting	2
Repair of Anterior Abdominal Wall	1
Repair of Intestinal Injury	1
More than one procedure was undertaken in some cases	

Table-IV
Time Interval from CS to Relaparotomy and their Indications

Time Interval from Primary CS to Relaparotomy	Indications of Relaparotomy	Total Number of Cases (n=24)
Within 24 Hours	Primary PPH : 8 Internal Haemorrhage :1	9
Within 7 th POD	Secondary PPH: 2 Rectus Sheath Haematoma : 1	3
Within 8 th to 15 th POD	Secondary PPH: 5 Rectus Sheath Haematoma : 1 Burst Abdomen : 1 Septicaemia : 1	8
Within 16 th to 42 nd POD	Secondary PPH - 4	4

Table-V
Case Fatality Following Relaparotomy

Causes of Death	Number of Death (N=6)	Indications of Relaparotomy	Indications of CS Delivery	Time Interval between Primary CS to Death	Time Interval between Relaparotomy to Death
Haemorrhagic Shock	4	PPH with Haemorrhage Shock	Foetal Distress:2	27 hours	14 Hours
			Obstructed Labour :1	28 hours	3 Hours
			Placenta Praevia : 1	52 hours	24 Hours
				17 hours	4 Hours
Septicaemia with Haemorrhage	1	Septicaemia with Secondary PPH	Obstructed Labour	15 Days	7 Days
Internal Haemorrhage with Coagulation Failure	1	Internal Haemorrhage with PPH	Previous CS with PIH with Jaundice	13 Hours	2 Hours

Discussion:

In this descriptive study the incidence, indications, risk factors of cases requiring relaparotomy in the puerperium following cesarean deliveries and analysis of case fatalities associated with reopening of the abdomen were analyzed. There were very few published case series in the world literature regarding this repeat laparotomy and none in Bangladesh. Along with the rising trends of cesarean deliveries, especially at tertiary level, obstetricians are now dealing with this complicated procedure associated with high risk of morbidities and mortalities.

One study from a teaching hospital in Ghana with a CS rate of 17% showed a relaparotomy rate of 0.7% out of a total of 36012 deliveries.⁷ Another study from India showed a relaparotomy rate of 0.33% out of 12967 CS deliveries (CS rate 34.8%).⁶ In our hospital CS rate was 48.43% during the study period and repeat laparotomy was noted in 0.63% of cesarean section. So the incidence was found more or less similar in these three studies although the CS rate was quite high in our hospital similar to the Indian study.⁶ In Ghana study, commonest indication of CS where relaparotomy needed was cephalo pelvic disproportion and obstructed labour and the commonest indication of relaparotomy was PPH due to uterine atony.⁷ The study in India also showed the same result, where the commonest indication of primary CS was prolonged and obstructed labour and the commonest reason for relaparotomy was PPH.⁶ Our study revealed that, the commonest indication of primary CS was post cesarean pregnancy followed by obstructed labour. PPH was the commonest reason for relaparotomy in our series similar to the findings of other studies. Although post cesarean pregnancy was the commonest indication, all the patients came with prolonged labour and home trial. One interesting findings was that among the PPH cases secondary PPH demanding relaparotomy was more (45.8%) than the primary PPH cases due to uterine atony (33%). This result is also consistent with the result of study in india where the secondary PPH accounts for 30.30% cases of relaparotomy.⁶ This finding demands special attention. Along with the rising trend of cesarean section rate the incidence of secondary PPH following CS is also increasing. In both of these cases we initially tried conservative management in the form of uterine massage, oxytocic such as injection oxytocin, ergometerine and misoprostol, fluid replacement and blood transfusion. In case of uterine atony we also

explored the uterus for injuries and did intrauterine balloon catheter where needed. In case of secondary PPH combination of injectable antibiotics covering gram +ve, gram -ve and anaerobic strains were also given. When the conservative management failed to stop the bleeding the surgical interventions were undertaken.

Secondary PPH following CS was difficult to control and all the 11 cases were referred cases. Exact causes of PPH could not be detected as exploration failed to detect any retained bits of placental tissues. On opening of the vesico uterine pouch the wound found sloughed out in 8 cases with haemorrhage occurring from the sloughing margin. Uterus was found severely infected in rest of the 3 cases. All the secondary haemorrhage cases needed hysterectomy. Conservative surgery in the form of bilateral ligation of uterine vessels (2 cases) and of internal iliac artery (1 case) were attempted and found successful in primary PPH cases. The management and findings were also similar with the Indian study where conservative surgery by vessel ligation were attempted but failed in 11 cases of secondary PPH, who required a third laparotomy and eventually needed a hysterectomy.⁶ In an Australian study PPH too was found the commonest reason for relaparotomy.⁸ When conservative measures failed laparotomy followed by step wise ligation of vessels-B-Lynch sutures, bilateral uterine artery ligation, ligation of the utero ovarian anastomosis near the uterine cornue and internal iliac arteries ligation has been recommended but found effective only in 50% cases.^{9,10,11}

Although the post CS pregnancy was found to be the commonest indication of the primary operation (8 cases) in this study, all these cases were referred cases. Detailed history revealed that all these cases were associated with prolonged labour. The second common reason for primary operation in this study was obstructed labour and the cesarean sections were done in second stage of labour. CS done in second stage with an impacted head could be technically difficult and is associated with increase trauma to the lower segment and lateral extension of tear to involve uterine vessels, cervix, vagina and bladder, increase haemorrhage and infection.¹² In our study repair of bladder injury was done in two cases along with total hysterectomy, one with the history of previous 2 CS with prolonged labour and another with obstructed labour. Laceration in the lower segment of the uterus could be avoided during delivery of the impacted head

by pushing the head up transvaginally.¹² All extension and laceration should be looked for in every difficult case for careful repairing to avoid subsequent traumatic PPH.¹³

From table I it was evident that in 19 cases relaparotomy was done for PPH. Out of 19 cases, conservative surgery in the form of bilateral ligation of uterine arteries (2 cases) and internal iliac artery ligation (1 case) were successful only in 3 cases. Rest of the 16 cases needed hysterectomy either total or subtotal. Total hysterectomy was also done in case where haemorrhage occurred from sloughing of uterine suture following sepsis. In case of internal haemorrhage from cesarean section wound resuturing of the uterine incision was done. Drainage of blood clots from undersurface of the rectus sheath and peritoneal cavity were done in 2 cases of rectus sheath haematoma. Peritoneal cavity was opened and inspected routinely in these cases. Cases of burst abdomen had repair of anterior abdominal wall. Repair of bladder injury was done in two patients along with total abdominal hysterectomy one with 2 previous CS delivery and other with obstructed labour. Pregnancy with repeat cesarean section also had repair of intestinal injury. More than one procedure was undertaken in one case.

Bilateral ligation of uterine vessels were found successful in 2 cases of primary PPH where primary CS was done for placenta praevia and for fetal distress and conservation of uterus was possible. It is recommended to ensure proper haemostasis from the placental bed before closing the uterine incision. Another case of placenta praevia with PPH was initially tried to manage conservatively by intra uterine balloon catheterization but failed and eventually needed hysterectomy. She died of profound haemorrhagic shock.

Maternal mortality was quite high in patients who required relaparotomy following CS. In this study it was 25% (6 out of 24) where as mortality was 9.1% in African study and 12.1% in Indian study.^{6,7} Four patients died due to haemorrhagic shock with PPH within 3-24 hours of relaparotomy. One patient developed coagulation failure and died within 2 hours of relaparotomy. Indication of relaparotomy of that case was intraperitoneal haemorrhage and PPH with shock where the primary CS was done for previous CS pregnancy with PIH with jaundice. Another patient died from multiorgan failure due to sepsis within 7 days of

relaparotomy. She also developed renal failure and indication of primary CS was obstructed labour. Among the maternal death all cases had emergency CS done outside the institute. Two patients died within 24 hours, 3 patients within 72 hours and one patient within 15 days of primary operation.

Those who survived (18 patients) also developed post operative complications in the form of abdominal distention (2 cases), renal failure (2 cases) managed with dialysis, septicaemia (4 cases), wound infection (6 cases), febrile morbidities (10 cases) and peritonitis in one case. Six patients required admission to the intensive care unit and 12 patients required massive transfusion of more than 10 units of blood during and following surgery.

Conclusion:

The present study provides a profile of relaparotomy cases and their risk association in a tertiary teaching hospital of the capital of Bangladesh. Although the cesarean delivery can be a life saving operation, serious complications could arise following the operation which mandates the patient to return to the theatre. The maternal mortality and severe morbidity after relaparotomy are quite common. Obstetrics patients who return to theatre all face near miss fatalities and potential risk of death. These cases demand judicial decision and supervision by expert surgeons, good surgical technique to minimize haemorrhage and organ damage. In the post operative period these cases should be managed in the intensive care units.

Finally a lower CS rate will reduce the overall rate of complications including relaparotomy. At the time of decision making and counseling of risky patients possibility of these dangerous consequences must be remembered.

References:

1. Rouf S., Siddique SF, Mian A H, Begum A. The Rising Trend for Caesarean Birth Rate in a Tertiary Referral and Teaching Hospital. *Bangladesh Journal of Obstetrics and Gynaecology* 2000; 15: 15-23.
2. Depp R. Caesarean Section and other Surgical Procedures. In Gabbe SG, Niebyl JR, Simpson JH, editors. *Obstetrics: Normal and Problem Pregnancies*, 2nd edition. New York: Churchill Livingstone; 1991. Pg 657 – 72.

3. Rubin GL, Peterson HB, Robert RW, McCarthy BJ, Terry JS. Maternal death after Caesarean Section in Georgia. *Am J Obstet Gynaecol*, 1981, March 15: 139 (6): 681-5.
4. Kant Anita, Wadhvani Kavita. Emergency Obstetric Hysterectomy. *J Obstet Gynaecol India* 2005; 55(2): 132-134.
5. Rouf S, Nasreen N, Begum J, Begum R, Begum A, Shamsunnahar. Emergency Peripartum Hysterectomy in a Developing Country. *Journal of Bangladesh College of Physicians and Surgeons*. 2002; 20(2): 68-75.
6. Seal SL, Kamilya G, Bhattacharyya SK, Mukherji J and Bhattacharyya AR. Relaparotomy after Cesarean Delivery: Experience from an Indian Teaching Hospital. *J Obstet Gynaecol Res*. 2007; 33(6): 804-9.
7. Seffah J.D, Relaparotomy after Cesarean Section. *International Journal of Gynaecology and Obstetrics* 2005; 88: 253-57.
8. Ashton P, Beischer N, Cullen J, Ratten G. Return to Theatre – Experience at the Mercy Maternity Hospital, Melbourne 1971-82. *Australia NZ J Obstet Gynaecol*. 1985; 25,159-169.
9. Allahabadia G. Hypogastric Artery Ligation: A New Perspective. *J Gynaecol Surg*. 1993; 9; 35-42
10. Clark SL, Phalen JP, Yeh S-Y. Hypogastric Artery Ligation for Obstetric Haemorrhage. *Obstet Gynaecol*. 1985; 66:353-363.
11. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Gilstrap LC III, Wenstrom KD. (Eds) *Williams Obstetrics*, 2nd Edition. New York: McGraw – Hill, 2005, 828-854.
12. Fasubaa DB, Ezechi OC, Orji Eo et al. Delivery of the Impacted Head of the Fetus at Caesarean Section after Prolonged Obstructed Labour. A Randomized Comparative study of Two Methods. *Obstet Gynaecol* 2002; 22: 375-378.
13. Ghosh TS, Kwawukume Ey. Delivery of the Impacted Fetal Head at Caesarean Section:- Surgical Technique. *Ghana Med J* 1992; 28: 423-5.