

Indication and Outcome of Re-laparotomy Following Cesarean Section

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Abstract

Introduction: Cesarean section is the most commonly performed operation in obstetric practice to circumvent maternal complications. Re-laparotomy after cesarean section (C/S) is considered a near-miss fatality situation. Emergency laparotomy has inherent complications culminating in significant morbidity and mortality. This study aimed to evaluate indications and outcomes of re-laparotomy after cesarean section. **Methods:** This longitudinal study was carried out at the Department of Obstetrics & Gynaecology, in Rangpur Medical College Hospital from July 2019 to June 2020. A total of 30 patients were selected as study subjects by purposive sampling method. All data were collected using a pre-formed questionnaire. The collected data were compiled and findings were presented in the form of tables and graphs. Appropriate statistical analysis of the data was done using a statistical package for social science (SPSS, version 23.0). **Result:** The most common indication of re-laparotomy in this study was primary postpartum hemorrhage 14 (46.7%) followed by secondary PPH 7 (23.3%), rectus sheath hematoma 6 (20.0%), and septicemia or pelvic abscess 3 (10.0%). Regarding procedures performed at re-laparotomy, a maximum of patients 23 (76.7%) had total abdominal hysterectomy followed by drainage of sub-rectal hematoma 6 (20.0%) and drainage of pus 1 (3.3%). Concerning outcome, there were 2 (6.7%) maternal deaths following re-laparotomy caused by shock following cardiac arrest, and PPH. **Conclusion:** The re-laparotomy rate following C/S was 0.96% due to uncontrolled primary PPH, rectus sheath hematoma, and secondary PPH. In this study, re-laparotomy after C/S was associated with a case fatality rate of 6.7%.

Keywords: Re-laparotomy, Cesarean Section, Post-partum Hemorrhage, hysterectomy.

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INTRODUCTION

The term re-laparotomy (RL) refers to laparotomy performed within 60 days of the first operation [1]. Whereas the term early re-laparotomy refers to laparotomy performed within 21 days of the first operation [2]. This includes any reoperation where the skin incision is reopened for exploration [3]. Over the last few decades, the incidence of cesarean section deliveries has shown a dramatic increase throughout the world [4]. In the UK rate of CS was 9% in 1981 which exceeds 21% in 2001 [5]. According to WHO, the ideal

rate for caesarean sections should be between 10% and 15% of all births per country [6]. C-section rate increased by 51% between 2016 and 2018 in Bangladesh [7]. Annual health survey (AHS) data of nine states in India found that the median CS rate in the private sector with 28% and public sector with 5%. While the safety of cesarean section has increased considerably with advanced operative technologies, anesthesia coverage, and blood transfusion facilities, it is still a major operation associated with certain risks and complications [8]. It may cause major complications such as infections (40-80%), hemorrhage, and injury to other organs [9].

The rate of complications associated with a cesarean section is several folds than that of vaginal delivery [10]. The common indications of re-laparotomy following cesarean section include postpartum hemorrhage, intraperitoneal hemorrhage, septicemia, burst abdomen, rectus sheath hematoma, etc. [11]. Maternal mortality is two to four times higher after cesarean section than vaginal delivery [12]. The procedures are tailored according to the indications of exploration during laparotomy. Procedures are drainage of blood clots, securing angles of uterine incision, removal of foreign body, drainage of pus, uterine artery ligation, internal iliac artery ligation, hysterectomy, repair of urinary bladder or bowel injury, and suturing abdominal wall. Complications of re-laparotomy after cesarean section have shown mortality rates ranging from 0.4% to 3.5% and mortality rates reported as high as 45% from a study in India [13]. These complications are largely attributed to the lack of appreciation of blood loss during the procedure, anesthesia complications, septicemia, and multi-organ failure [14]. Re-laparotomy is associated with a highly critical clinical-surgical scenario, but there are quite a few large-scale studies in the world regarding repeat laparotomy following cesarean section [15]. One study from a teaching hospital in our capital city of Dhaka with a CS rate of 48.43%, showed a re-laparotomy rate of 0.63% of the cesarean section [16]. Re-laparotomy after caesarean delivery is not uncommon considering the emergency and overwhelming referral load of the hospital. The role of re-laparotomy is to manage the complications of previous surgery, prevent intra-abdominal infection or sepsis, maintain hemostasis, and carry out delayed curative surgery [10].

OBJECTIVE

General Objective

- To evaluate indications and outcome of re-laparotomy after cesarean section.

Specific Objectives

- To identify the indications of re-laparotomy after cesarean section.
- To estimate the time interval from cesarean section to re-laparotomy.
- To determine the procedures or interventions performed during re-laparotomy.
- To observe the intraoperative findings during re-laparotomy.
- To determine the complications after re-laparotomy.
- To determine the length of stay in hospital.

- To observe the outcome of re-laparotomy after cesarean section.

METHODS

This longitudinal study was carried out at the Department of Obstetrics & Gynaecology, in Rangpur Medical College Hospital from July 2019 to June 2020. All patients who were admitted for re-laparotomy in Rangpur Medical Hospital following caesarian section (primary cesarean section done either at this hospital or outside hospitals or clinics) for a variety of indications during the study period were considered as the study population. A total of 30 patients were selected as study subjects by purposive sampling method as per inclusion and exclusion criteria.

Inclusion Criteria

- Patients who required re-laparotomy following cesarean section within 60 days of primary operation (C/S).
- Patients who were willing to give consent.

Exclusion Criteria

- All gynecological surgeries (i.e: spontaneous or instrumental vaginal deliveries, ruptured uterus-scarred or un-scarred, or septicemia)
- Re-laparotomy was performed after 60 days of primary cesarean section.
- Patients with a history of ongoing anticoagulant treatment.
- Patients who did not give consent to participate in the study.

The data of the patients were obtained from patients' history sheets, operation theatre records, and discharge and referral notes of the primary cesarean section. The following data were collected –age, parity, indication of primary cesarean section, indication of relaparotomy, time interval from primary cesarean section to reopening, procedures undertaken on repeat operation, total units of blood transfused, duration of hospital stay. All data were collected using a pre-formed questionnaire. The collected data were compiled and findings were presented in the form of tables and graphs. Appropriate statistical analysis of the data was done using a statistical package for social science (SPSS, version 23.0). Ethical clearance was taken from the ethical committee of Rangpur Medical College Hospital. Informed written consent was obtained from the participants.

RESULTS

Table 1: Distribution of the study patients by demographic variables (N=30)

Demographic variables	n	%	95% CI Lower-Upper
Age (years)			
20-30	11	36.7	20.0 – 53.3
31-40	19	63.3	46.7 – 80.0
Mean ± SD	30.3±5.8		
Range	(20-40) years		
Educational level			
Primary	23	76.7	60.1– 90.0
Secondary	4	13.3	3.3 – 26.7
Higher Secondary	2	6.7	0.0 – 16.7
Graduate	1	3.3	0.0 – 10.0
Occupation			
Housewife	26	86.7	73.3 – 96.7
Service holder	4	13.3	3.3 – 26.7
Monthly family income (Taka)			
Lower middle class	19	63.3	46.7 – 80.0
Middle class	11	36.7	20.0 – 53.3

It was observed that the majority 19 (63.3%) of patients were in the age group 31-40 years followed by 11 (36.7%) women in were age group 20-30 years. The mean age of patients was 30.3±5.8 years ranging from 20 to 40 years. The majority 23 (76.7%) of patients had a

primary level of education and more than two third (86.7%) patients were housewives. More than half of 19 (63.0%) patients came from the lower middle class. [Table 1]

Table 2: Distribution of the study patients by obstetric profile (N=30)

Obstetric profile	n	%
Parity		
1	9	30.0
2-4	19	63.3
≥ 5	2	6.7
Gestational age (weeks) of delivery		
33-36 weeks	11	36.7
37-40 weeks	15	50.0
> 40 weeks	4	13.3
Antenatal Care		
None	4	13.3
Regular	4	13.3
Irregular	22	73.3

Nine cases were primi para (30.0%), 19 were of parity 2 to 4 (63.3%), and 2 cases of parity 5 and above (6.7%). 15(50.0%) patients had gestational age 37-40 weeks followed by 36.7% patients had 33-36 weeks.

13.3% of patients received regular antenatal checkups, and 73.3% of patients were on irregular antenatal checkups. [Table 2]

Table 3: Distribution of the study patients by maternal comorbidity (N=30)

Maternal comorbidity	n	%
No	22	73.3
GDM	6	20.0
Preeclampsia	1	3.3
Chronic hypertension	1	3.3
Total	30	100.0

Maximum (20.0%) patients had GDM, 1(3.3%) patients had preeclampsia and 1(3.3%) patients had chronic hypertension. [Table 3]

Table 4: Distribution of the study patients by indication of primary cesarean section (N=30)

Indication of primary cesarean section	n	%
Previous caesarean section	14	46.7
Fetal distress	8	26.7
Obstructive labor	1	3.3
Severe preeclampsia	1	3.3
Unsatisfactory progress of labor	6	20.0
Total	30	100.0

Regarding indications of primary cesarean section, a maximum (46.7%) of patients had previous carcinoma sections followed by 26.7% of patients who

had fetal distress, and 20.0% of patients had unsatisfactory progress of labor. [Table 4]

Table 5: Distribution of the study patients by indications of re-laparotomy (N=30)

Indications	n	%	95% CI Lower-Upper
Primary postpartum hemorrhage	14	46.7	26.7 – 63.3
Secondary PPH	7	23.3	10.0 – 40.0
Rectus sheath hematoma	6	20.0	6.7 – 36.7
Septicemia or pelvic abscess	3	10.0	0.0 – 23.3
Total	30	100.0	

The most common indication of re-laparotomy in this study was primary postpartum hemorrhage 14 (46.7%) followed by secondary PPH 7 (23.3%), rectus

sheath hematoma 6 (20.0%), and septicemia or pelvic abscess 3 (10.0%). [Table 5]

Table 6: Distribution of the study patients by preventive measures taken to avoid hysterectomy (N=30)

Preventive measures to avoid hysterectomy	n	%
Uterotonic drugs	14	46.7
Fundal massage	14	46.7
Bimanual uterine compression	10	33.3
Suturing of placental bed	10	33.3
B lynch brace suture	6	20.0
Exploration of the uterine cavity	8	26.7
Broad spectrum antibiotic	16	53.3

In this series, the maximum number of patients (46.7%) had uterotonic drugs, and fundal massage (46.7%) [Table 6].

Table 7: Distribution of the study patients by procedures performed at re-laparotomy (N=30)

Procedures	n	%	95% CI Lower-Upper
Total abdominal hysterectomy (TAH)	23	76.7	60.0 – 90.0
Drainage of sub-rectal hematoma	6	20.0	6.7 – 36.7
Drainage of pus	1	3.3	0.0 – 10.0
Total	30	100.0	

In this study maximum of patients 23 (76.7%) had total abdominal hysterectomy followed by drainage

of sub-rectal hematoma 6 (20.0%), and drainage of pus 1 (3.3%). [Table 7]

Table 8: Distribution of the study patients by the time interval between CS and re-laparotomy (N=30)

Time interval	n	%	95% CI Lower-Upper
<24 hours	6	20.0	6.7 – 36.7
24 hours to 7 days	23	76.7	60.0 – 93.3
> 7 days	1	3.3	0.0 – 10.0
Total	30	100.0	
Mean±SD	7.67±8.1		

Re-laparotomy was done 24 hours to 7 days after cesarean in 23 cases (76.7%) and 6(20.0%) patients within 24 hours. Only 1 case underwent re-surgery after

7 days of cesarean section. The mean time interval of re-laparotomy was 7.67 ± 8.1 days. [Table 8]

Table 9: Distribution of the study patients by complication during re-laparotomy (N=30)

Complications during re-laparotomy	n	%	95% CI Lower-Upper
Profuse bleeding	16	53.3	33.3 – 70.0
Injury to surrounding organs	3	10.0	0.0 – 20.0
Bladder injury	2	6.7	
Ureteric injury	1	3.3	
Shock	2	6.7	0.0 – 16.7
Cardiac arrest	4	13.3	3.3 – 26.7
Delayed recovery	5	16.7	6.7 – 30.0
Total	30	100.0	

Regarding complications during re-laparotomy, 16 cases (53.3%) had profuse bleeding, injury to surrounding organs in 3 (10.0%) cases, shock in 2 (6.7%)

cases, cardiac arrest in 4 (13.3%), delayed recovery in 5 (16.7%). [Table 9]

Table 10: Distribution of the study patients by complication after re-laparotomy (N=30)

Postoperative Complications after relaparotomy	n	%	95% CI Lower-Upper
Wound infection	19	63.3	46.7 – 80.0
Shock	8	26.7	13.3 – 43.3
Paralytic ileus	2	6.7	0.0 – 16.7
Fever	1	3.3	0.0 – 10.0
Total	30	100.0	

Regarding complications after re-laparotomy, a maximum of 19 (63.3%) had wound infection, shock 8

(26.7%), paralytic ileus 2 (6.7%), and fever 1 (3.3%). [Table 10]

Table 11: Distribution of the study patients by outcome (n=30)

Outcome	n	%	95% CI Lower-Upper
Survived	28	93.3	83.0 – 100.0
Death	2	6.7	0.0 – 16.7
Total	30	100.0	

There were 2 (6.7%) maternal deaths following re-laparotomy caused by shock following cardiac arrest, PPH. [Table 11]

Table 12: Distribution of the study patients by hospital stay (n=28)

Hospital stay (days)	n	%	95% CI Lower-Upper
<10	3	10.7	0.0 -24.9
10-20	14	50.0	2.1 – 67.9
20-30	11	39.3	21.4 – 57.1
Total	28	100.0	
Mean± SD	19.8±9.4		
Range	(2 – 30) days		
ICU required	8	26.7	

Eight (26.7%) patients required admission to the intensive care units and the average length of hospital stay was 19.8 ± 9.4 days. A maximum number of patients 14 (50%) had a hospital stay of 10-20 days followed by 39.3% of patients who had a hospital stay of 20-30 days and 3 (10.7%) patients stayed <10 days. [Table 12]

DISCUSSION

In the present study majority of 19 (63.3%) of patients were in the age group 31-40 years. The mean age of patients was 30.3 ± 5.8 years ranging from 20 to 40 years. Khan *et al.*, [17] reported 25 (92.6%) cases were

in the age group of 20 to 35 years and only one case was above 35 years old. In the present study, the most common indication of re-laparotomy was primary postpartum hemorrhage 14 (46.7%) followed by secondary PPH 7 (23.3%). In accordance, Raagab *et al.*, [18] reported the leading indication for re-laparotomy was hemorrhage in 24 (92.3%) patients. Intra-operative findings were intra-abdominal bleeding 41.7%, and hematoma 29.2%. The second indication for re-laparotomy was pelvic infections accounted for 7.7%. Comparable rates were reported by some authors [19,20]. A study by Shyamal *et al.*, [21] showed the major cause of re-laparotomy to be intraperitoneal hemorrhage 23 (48.93%), rectus sheath hematoma 10 (21.28%), sepsis 6 (12.76%), intestinal complications 3 (6.39%), and burst abdomen 3 (6.39%). Levitt *et al.*, [22] reported indications for re-laparotomy included intra-peritoneal bleeding (62%), wound infection or dehiscence (22%), peritonitis (9%) and other (7%) such as intestine injury. In the present study, a maximum of patients 23 (76.7%) had total hysterectomy followed by drainage of sub-rectal hematoma 6 (20.0%) and drainage of pus 1 (3.3%). The result is close to that of Akhter *et al.*, [9] who found it to be 35 (64.81%) where a hysterectomy was done. subtotal hysterectomy was done in secondary PPH in 10% as in our study. In the present study time interval between cesarean section and re-laparotomy was done 24 hours to 7 days after cesarean in 23 cases (76.7%) and 6(20.0%) patients within 24 hours. Only 1 case underwent re-surgery after 7 days of cesarean section. The mean time interval of re-laparotomy was 7.67 ± 8.1 days. Shrestha *et al.*, [23] reported in their series the meantime of re-laparotomy was 5.4 days after CS. In the present study regarding complications duration re-laparotomy, 16 cases (53.3%) had profuse bleeding, injury to surrounding organs in 3 (10.0%) cases, shock in 2 (6.7%) cases, cardiac arrest 4 (13.3%), delayed recovery 5 (16.7%). After re-laparotomy, a maximum of 19 (63.3%) had wound infection, shock 8 (26.7%), paralytic ileus 2 (6.7%), and fever 1 (3.3%). There is a wide variety of maternal complications after re-laparotomy reported in different studies [14,11,4] In the present study eight (26.7%) patients required admission to the intensive care units and the average length of hospital stay was 19.8 ± 9.4 days. Maximum patients 14 (50%) had a hospital stay of 10-20 days. There were 2 (6.7%) maternal deaths following re-laparotomy caused by shock following cardiac arrest, PPH. Maternal mortality and severe morbidity after re-laparotomy are quite common. Raagab *et al.*, [18] noted the second indication for re-laparotomy was pelvic infections accounting for 7.7%. Seven (26.9%) patients required admission to the intensive care units and the average length of hospital stay was 4.0 ± 2.87054 days. A rate of 15.38% were reported in the study of Thombarapu *et al.*, [25], while no deaths were encountered in the study done by Lurie *et al.*, [26].

CONCLUSION

Emergency re-laparotomy is a lifesaving procedure. The interval between initial operation and re-laparotomy is among the utmost important factors that influence results. Every obstetrician should be capable enough not only to perform a caesarian section but should be able to tackle effectively the different complications during and related to the operation. Complicated CS and emergency gynecological conditions where a diagnosis is in controversy should be referred to higher centers. The risk of re-laparotomy can be minimized by proper diagnosis, recognizing high-risk patients, utilizing meticulous surgical technique and referral when needed to a tertiary care centre. Implementation of law and periodic supervision should be done to prevent surgeries by untrained surgeons.

RECOMMENDATION

Good and strict monitoring after CS for early detection of postoperative complications should be sought. Experienced obstetricians should be involved in such cases and the possibility for complications including re-laparotomy should be emphasized. Policies, protocols and guidelines should be adopted to deal with Caesarean Section to reduce the risk of re-laparotomy. Experienced specialist should be involved in all difficult cases and in supervision for all surgeries. Multidisciplinary team should care about the re-laparotomy patient.

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