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Retrospective Study on Relaparotomy Cases in the Department of Obstetrics and Gynaecology at a Tertiary Care Hospital in South India

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Relaparotomy, Caesarean section, Hemoperitoneum, Postpartum haemorrhage.

ABSTRACT

Objectives: Aim of the study was to determine incidence of relaparotomy and its indications, management, and outcome in the department of Obstetrics and Gynaecology, Karnataka Institute of Medical Sciences, Hubli.

Materials and Methods: It is a retrospective observational study performed for a duration of 2 years between August 2020 and July 2022. Data was obtained from the records maintained in the department of Obstetrics and Gynaecology, Karnataka Institute of Medical Sciences, Hubli. The data was analysed with respect to clinical presentation, pre-operative investigations, indication, procedure undertaken, intra-operative and post-operative complications and outcome. Total number of surgeries -10,520. Total number of relaparotomy- 28 which included referral cases**.**

Results: Incidence of relaparotomy was 0.26%. Indications of relaparotomy included internal haemorrhage in 11 cases (39.2%), postpartum hemorrhage (PPH) in 10 cases (35.7%), pyoperitoneum in 5 cases, bowel perforation in 1 case (3.5%) and burst abdomen in 1 case (3.5%). Average ICU stay was found to be 8 days. Most common procedure performed was subtotal abdominal hysterectomy -13 cases (46.4%). Various complications were observed such as requirement of mechanical ventilation, sepsis, DIC, peripartum cardiomyopathy, pneumonia, AKI, MODS. Mortality occurred in 9 patients (32.1%)

Conclusion: Emergency relaparotomy is a life-saving procedure. It is a very difficult decision requiring good clinical judgment and is critical for the patient to undergo second surgery within short span of time**.** 19 out of 28 patients who underwent relaparotomy were discharged home successfully. Timely diagnosis and intervention with relaparotomy in the indicated cases is the need of the hour.

1. Introduction

Relaparotomy is a Greek word with three components- Re-repeated, Laparo-stomach and Tomie-cut. If laparotomy is done within 60 days of primary surgery, it is called relaparotomy. If the laparotomy is done which is plannable, repeated and multiphasic to complete the primary surgery, it is not considered as relaparotomy.[1] Emergency operations are common occurrence in Obstetric practice. Major emergency operations are often associated with high risk. The need for a reoperation during the postoperative phase is one of the uncommon but serious complications of surgery. Not only is this still a significant problem for the surgeon, but it also presents a significant challenge for the patient to get another procedure done within a short period of time. Senior and skilled surgeons have to make the decision to operate and perform the actual surgical operation. In daily obstetric practice, caesarean sections are the most common obstetric procedures performed, and their frequency has dramatically increased in recent years. Operative technology, anaesthetic coverage, and blood transfusion facilities have all improved, significantly raising the safety of Caesarean sections. However, given the magnitude of the procedure, there are risks and difficulties involved.[2] On one hand relaparotomy is the last resort to save the mother's life, and on the other hand, the mother's reproductive capability is sacrificed in most of the cases.[3] Re-laparotomy after a caesarean section is therefore considered in the event of a near miss maternal mortality.[4]

A number of predisposing factors, including patient characteristics, initial surgical conditions, and the quality of perioperative care received, might increase a patient's risk of surgical complications that

result in relaparotomy. Internal haemorrhage, postpartum haemorrhage, septic peritonitis, intestinal obstruction, burst abdomen, and intestinal perforation are a few of the major indications of relaparotomy. The implementation of use of newer antibiotics and anaesthetic procedures, appropriate preoperative work-up, appropriate surgical technique and haemostasis, adequate abdominal drainage, and perioperative care are all recommended as ways to lower the incidence of relaparotomy. Understanding the predisposing factors and how to address them will help us lower the prevalence of relaparotomy. However, there are certain factors like emergency, sepsis, primary suppurating disease, because of which incidence of relaparotomy cannot be brought down further.[5]

Karnataka Institute of Medical Sciences, Hubballi is the most well-known tertiary referral and teaching hospital in North Karnataka dealing with all types of obstetric emergencies referred from urban, peri-urban, rural hospitals and clinics. The objective of this study was to find out the incidence, indications, risk factors, procedure undertaken during re-laparotomy and its outcome and how to prevent need of re-laparotomy.

2. Methods

This section deals with the methodology adopted for carrying out the study. It includes the following:

Study Design: This was a retrospective observational study in the department of obstetrics and gynecology of Karnataka Institute of Medical Sciences (KIMS) Hubballi, a tertiary care teaching institution and highest referral centre for North Karnataka, India.

Duration of Study: Over a period of two years from August 2020 to July 2022

Inclusion Criteria: Laparotomies that were done within 60 days of primary surgery whether it is from the institute or referred from other center for the sake of complications of the primary surgery irrespective of obstetric or gynaecology cases were included in the study.

Exclusion Criteria: Relaparotomies that were done after 60 days of the primary surgery were excluded from the study.

Methodology: Data was obtained from the records maintained in the department of Obstetrics and Gynaecology, Karnataka Institute of Medical Sciences, Hubli. The obstetric and demographic variables studied were: age, parity, indications of primary surgery, time interval between primary surgery and reoperation, intra-operative findings, surgical procedures done during relaparotomy, duration of ICU stay and outcome of reoperations including maternal mortality.

Statistical Analysis: Data collected was tabulated and analyzed using percentages and average.

3. Results

During the study period the total number of Obstetric surgeries were 8719, which include both emergency (8199) and elective (520). Total numbers of gynecological surgeries were 1102 (elective - 1069; emergency -33). Total number of family planning surgeries -1099. In this study we included even referral cases where primary surgery was done at other hospitals. Thus, the total number of surgeries during the study period was 10,920. Total number of cases requiring relaparotomy were 28. Incidence of relaparotomy in our institute was 0.26%. Among the 28 cases of relaparotomy, Institutional primary surgeries were 11 cases, incidence being 0.1%. Remaining 17 cases, primary surgeries were done elsewhere and were referred to our institute in view of complications (The percentage of cases undergoing re-laparotomy could not be calculated for referral cases, as they came from diverse peripheral hospitals).

The details of the patients who underwent relaparotomy are summarized in Table I. Most of the patients, 14 (50%) were in the age group of 21-24. 15 patients (53.6%) were multipara and 13 patients (46.4%) were primipara.

Table I: The details of the patients who underwent relaparotomy.

Sl.NO	TITLE	NO OF CASES
1.	Age	
a)	</= 20	2 (7.1%)
b)	21-24	14 (50%)
c)	25-29	7 (25%)
d)	30-34	2 (7.1%)
e)	35-39	1 (3.5%)
f)	40-44	2 (7.1%)
2.	Parity	
a)	Primi	13 (46.4%)
b)	Multi	15 (53.6%)

Indications of relaparotomy (Table II) were internal hemorrhage in 11 cases (39.2%), postpartum hemorrhage in 10 cases (35.7%), pyoperitoneum in 5 cases (17.8%), bowel perforation in 1 case (3.5%) and burst abdomen in 1 case (3.5%).

Table II: Indications for relaparotomy

INDICATIONS FOR RELAPAROTOMY	NO OF CASES	PERCENTAGE
Internal hemorrhage	1111	39.2%
Post partum hemorrhage	10	35.7%
Pyo-peritoneum	5	17.8%
Bowel perforation	1	3.5%
Burst abdomen	1	3.5%

The time interval between primary surgery and relaparotomy (Table III) was <12 hours in 14 cases (50%), 12-24 hours in 2 cases (7.1%), >1-7 days in 6 cases (21.4%), >7-14 days in 3 cases (10.7%), 14-30 days in 2 cases (7.1%) and >30 days -6 weeks in 1 case (3.5%).

Table III: Time interval between primary surgery and relaparotomy

TIME INTERVAL	NO OF CASES	PERCENTAGE
<12 hours	14	50%
12-24 hours	2	7.1%
>1-7 days	6	21.4%
>7-14 days	3	10.7%
>14-30 days	2	7.1%
>30 days-6 weeks	1	3.5%

Intraoperative findings during relaparotomy (Table IV) were bleeding from uterine angle in 3 cases (10.7%), broad ligament haematoma in 5 cases (17.8%), bleeding from tubal ligation stump in 1 case

(3.5%), rectus sheath haematoma in 2 cases (7.1%), atonic uterus with postpartum haemorrhage in 10 cases (35.71%), pelvic abscess with purulent collection in 5 cases (17.8%), vault bleeding in 1 case (3.5%), pyoperitoneum with bowel perforation in 1 case (3.5%), burst abdomen in 1 case (3.5%).

Table IV: Intraoperative findings during relaparotomy

INTRAOPERATIVE FINDINGS	NUMBER OF CASES	PERCENTAGE
Bleeding from uterine angle	3	10.7%
Broad ligament haematoma	5	17.8%
Bleeding from tubal ligation stump	1	3.5%
Rectus sheath haematoma	2	7.1%
Atonic uterus with postpartum haemorrhage	10	35.71%
Pelvic abscess with purulent collection	5	17.8%
Vault bleeding	1	3.5%
Pyoperitoneum with bowel perforation	1	3.5%
Burst abdomen	1	3.5%

Procedures undertaken during relaparotomy (Table V) were subtotal hysterectomy in 13 cases (46.4%), internal iliac artery ligation in 12 cases (42.8%), drainage of peritoneum in 5 cases (17.8%), uterine compression sutures with stepwise devascularisation in 3 cases (10.7%), rectus sheath hematoma evacuation in 2 cases (7.1%), control of haemorrhage site in 1 case (3.5%), repair of burst abdomen in 1 case (3.5%), control of haemorrhage of tuboovarian ligament tear (following tubectomy) in 1 case (3.5%), vault suturing in 1 case (3.5%), peritoneal lavage with sigmoid loop colostomy in 1 case (3.5%) and appendicectomy in 1 case (3.5%).

Table V: Procedures undertaken during relaparotomy.

PROCEDURE	NO OF CASES	PERCENTAGE
Subtotal hysterectomy	13	(46.4%)
Internal iliac artery ligation	12	(42.8%)
Drainage of pyoperitoneum	5	(17.8%)
Uterine compression sutures with stepwise devascularization	3	(10.7%)
Rectus sheath hematoma evacuation	2	(7.1%)
Control of haemorrhage site	1	(3.5%)
Repair of burst abdomen	1	(3.5%)
Control of haemorrhage of tuboovarian ligament tear (following tubectomy)	1	(3.5%)
Vault suturing	1	(3.5%)
Peritoneal lavage with sigmoid loop colostomy	1	(3.5%)
Appendicectomy	1	(3.5%)

The analysis of morbidity and mortality (Table VI) of the cases shows 15 cases required mechanical ventilation support, sepsis in 7 cases, DIC in 5 cases, Peripartum cardiomyopathy in 3 cases, bronchopneumonia in 4 cases, AKI in 2 cases, multiorgan failure in 4 cases, ARDS in 3 cases, repeat relaparotomy was required in 3 cases and 9 cases (7 referral and 2 institutional) of mortality.

Table VI: Analysis of morbidity and mortality in relaparotomy cases

COMPLICATION	NO OF CASES
Requirement of mechanical ventilation	15
Sepsis	7
Disseminated intravascular coagulation	5
Peripartum cardiomyopathy	3
Bronchopneumonia	4
Acute kidney injury	2
MODS	4
ARDS	3
Requirement of repeat relaparotomy	3
Mortality	9 cases (7-referral and 2-institutional)
a) Septic shock with multiorgan failure	4
b) DIC	2
c) Status epilecticus	1
d) Perpartum cardiomyopathy with ARDS	1
e) COVID positive status with multiorgan failure	1

4. Discussion

Surgery inevitably involves complications. Sometimes they would need a re-laparotomy, which would mean the patient would have to return to the operating room. Being a major abdominal operation, the woman may experience consequences from a caesarean section, such as hemorrhage, infection, and injury to other organs. In day-to-day obstetric practice we must deal with post caesarean complications associated with maternal morbidity and mortality. Maintaining hemostasis, preventing intra-abdominal infection or sepsis, managing post-operative complications, and performing delayed curative surgery are the goals of relaparotomy.[6]

During the study period, the total number of surgeries during the study period was 10,920. Total number of cases requiring relaparotomy were 28, institutional primary surgeries were 11 cases, and remaining 17 cases, primary surgeries were done elsewhere and were referred to our institute in view of complications. The incidence of relaparotomy in our study was 0.26%. It is comparable to another Indian study by Bijjaragi B et al[7], where incidence was found to be 0.25%. In a study by Das R et al[8], the incidence was 0.12%. In a study conducted in Sudan by A. B. Fazari et al.[9], the incidence was 0.66%. In a study conducted in Bangladesh by Salma Rouf et al.[10]

The most common indications for relaparotomy in our study were internal hemorrhage in 11 cases (39.2%), postpartum hemorrhage in 10 cases (35.7%), pyoperitoneum in 5 cases (17.8%). In a study by Bijjaragi B et al[7], the major indications were postpartum haemorrhage (30%), followed by burst abdomen (20%) and rectus sheath hematoma (20%). In a study by Das R et al[8] most common

indications of relaparotomy were intraperitoneal haemorrhage (46.87%), rectus sheath hematoma (28.12%) and postpartum haemorrhage in 15.62% cases. A. B. Fazari et al.[9] reported that internal hemorrhage was the commonest cause (44.1%). These findings indicate that emphasis should be given on active management of third stage of labour and ensuring proper hemostasis before closure of abdomen.

Among the intraoperative findings, most frequent finding in our study was atonic uterus with postpartum haemorrhage in 10 cases (35.71%). Study by Das R et al[8] showed common intraoperative findings at relaparotomy were rectus sheath hematoma in 9 cases (28.12%), atonic postpartum haemorrhage in 5 cases (15.62%). In the study by Seal et al[11] atonic pph seen in 42.4% cases and rectus sheath hematoma in 27.3% cases.

Most common procedures undertaken during relaparotomy in our study were subtotal hysterectomy in 13 cases (46.4%), internal iliac artery ligation in 12 cases (42.8%), drainage of peritoneum in 5 cases (17.8%), uterine compression sutures with stepwise devascularisation in 3 cases (10.7%), rectus sheath hematoma evacuation in 2 cases (7.1%). In the study by Das R et al[8], ligation of bleeding vessels were done in 11 cases (34.37%), resuturing of uterine incision done in 4 cases(12.5%), compression sutures with stepwise devascularisation done in 4 cases (12.5%), hysterectomy done in 2 cases(3.2%). In the study by Rouf et al.[10], most common procedure undertaken was subtotal hysterectomy in 50% cases. A. B. Fazari et al.[9] study showed common procedures to be bleeder ligation & re suturing the uterus in (17.6%) , hysterectomy in (14.7%), drainage of pus & peritoneal lavage in (14.7%) cases.

Maternal death following relaparotomy in our study was 32% (9 out of 28 cases). Maternal mortality was 21.8% in the study by Das R et al[8], 17.6% in study A. B. Fazari et al.[9], 12.12% in the study by Seal et al[11].

5. Conclusion

To prevent the need for a relaparotomy, precise surgical technique is essential to securing haemostasis during primary surgery. This includes meticulously suturing uterine angles, placing an intraperitoneal drain when necessary, and visually inspecting the posterior surface of the broad ligament for any hematomas or bleeders. The main determining factor in the outcome is the amount of time that passes between the primary operational surgery and relaparotomy. Thorough postoperative monitoring and meticulous recording of vital signs throughout the postoperative recovery phase are crucial for promptly identifying intraperitoneal hemorrhage, PPH, and further issues necessitating reoperation. Rising cesarean section rates, surgery performed at peripheral centres by less experienced obstetricians, and unavailability of blood banks increases the complications such as need for relaparotomy. Early referral in these situations, before the patient enters an irreversible shock state, will decrease the risks associated with relaparotomy, including mortality. Most of the time relaparotomy is a lifesaving procedure. In our study 19 out of 28 patients who underwent relaparotomy were discharged home successfully. Decision to perform and manage relaparotomy should always be multidisciplinary team approach with senior obstetricians and senior anesthesiologists, as these patients are usually in state of shock with multiorgan dysfunction and sepsis. Timely diagnosis and intervention with relaparotomy in the indicated cases is the need of the hour.

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Abbreviations

KIMS : Karnataka Institute of Medical Sciences

DIC : Disseminated intravascular coagulation

AKI : Acute Kidney Injury

ARDS : Acute Respiratory Distress Syndrome

MODS : Multi Organ Dysfunction Syndrome

PPH : Post Partum Hemorrhage

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