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Morbidity Following Cesarean Section Warranting Relaparotomy-A Review

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ABSTRACT

Objective: To review cases following elective and emergency caesarean section with maternal morbidity warranting relaparotomy and critical care management

Methods: An analysis of cases undergoing relaparotomy after cesarean section was done in a tertiary care centre, Institute of Maternal & Child health, Government Medical College Kozhikode, Kerala in the year 2022 –April 2024.A series of 9 cases needing relaparotomy were studied.

Results: There were total 9 cases of relaparotomy following cesarean section. Most common reason for relaparotomy was haemorrhage (4 cases) rectus sheath haematoma causing hemoperitoneum (2 cases), sepsis (2 cases) and 1 case of bladder injury not detected during primary cesarean section. Majority of cases were previous cesarean section (5 cases)

Conclusion: Meticulous steps should be taken during primary surgery to avoid complications of relaparotomy and subsequent morbidity during cesarean section.

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Introduction

Caesarean section is a major surgery and like any other surgical procedures, there are inherent risks involved. Sometimes complications are inevitable in cesarean section. In some circumstances, they may call for a re-laparotomy, requiring the patient to go back to the operation theatre which includes hemorrhage, infection and injury to other organs. The goal of relaparotomy is to manage complications arisen due to previous surgery, prevent intra- abdominal infection or sepsis, maintain hemostasis and carry out delayed curative surgery [1]. This study tries to analyze the causes for relaparotomy and subsequent findings.

Materials and methods: The study was done in Department of OBG from May 2022 to April 2024 to find out life threatening complications following cesarean section needing relaparotomy. This study also reflects on cases who needed dialysis, ventilator support, ICU admission or/and blood product transfusions of more than 5 units along with or apart from any major surgical intervention following a Cesarean Section. Data was collected form operation theater register and case sheet. Cases were analyzed according to the demographic data like age, obstetric score referral status, date of primary surgery, indication and date and findings of relaparotomy, other supportive treatment, need for blood and product transfusion, haemodialysis and date of discharge from the hospital Study setting, Data source Institute of Maternal & Child Health, Government Medical College Kozhikode, Kerala, India Participants: All those patients who underwent relaparotomy at our institution

Results

There were 9 cases of post caesarean relaparotomy (Table 1). Age group ranged from 23 to 40 years.8 cases were referred . According to various studies the rate of relaparotomy ranges from 0.2 to 0.7% [2-4]. In our study there were 9 cases over 2 years. All the cases were referred cases and in majority the indication was previous two cesarean section. It is observed that development of systemic sepsis, systemic inflammatory response syndrome, and multiple organ failure maintain a high rate of morbidity and mortality after re-laparotomies despite the advances in critical care, surgical technique and antibiotics in our series 2 cases developed Acute kidney injury needing haemodylasis and one case needed ventilator support [1]. Two cases had rectus sheath haematoma with hemoperitoneum, there was one case of bladder injury and 4 cases of postpartum haemorrhage and 2 cases of sepsis with caesarean scar disruption.(Table 1)

Table 1: Case Series Which Needed Relaparotomy

.S no	Age years	Booked(B) Referred(R)	Date of I0 Surgery Date of I0 Surgery	Date of I0 Surgery	GA Weeks	Day of relap	Sp investigation for Δ	Relap findings	Surgery done	Blood/product transfused	Final Δ	DOD
1	31	R	Severe PE,Failed induction	02/05/2022	36	POD 4	Ultrasound POCUS	Haemoperitonium	Subtotal hysterectomy	3-PRBC 1FFP,1PRP	Secondary PPH	POD 16
2	40	R	Failed Vacuum extraction	06/01/2023	37.4	POD 1	Ultrasound POCUS	Atonic PPH .Failed medical management	Total hystererectomy	6-PRBC 8FFP, 5PRP 1 cryoppt	Atonic PPH Ventilator support	P0D 15
3	30	R	Prev 2CS PAS Caesarean Hysterectomy	20/04/2023	36.6	POD1	Ultrasound POCUS	Oozing from stumps	Re-enforecment of stumps	4-PRBC 2FFP	Post hysterectomy stump bleeeding	POD 10
4	28	R	Prev 2CS	16/07/2023	37.2	POD 1	Ultrasound POCUS	Rectus sheath bleeder Suspected bladder injury	Haemostatic suture Cystotomy and ureteric stenting	4-PRBC 4FFP 4PRP	Inferior epigastric artery bleeding-AKI 1 Cycle CRRT, 3 SLED. 3 HD	POD 29
5	25	R	PROM FAILED INDUCTION	07/08/2023	37.4	POD 27	Contrast CT showing pelvic abscess and disruption of cesarean scar	Abscess connected to uterine cavity with disruption of uterine scar	Subtotal hysterectomy	3-PRBC 1FFP,1PRP	Sepsis with uterine scar disruption	POD 21
6	27	B	Prev2CS	15/11/23	37.4	POD 3	Ultrasound Fall in Hb	Haemoperitonium Bleeder rectus sheath.Inferior epigastric artery bleed	Sutures at rectus sheath	3- PRBC ,2FFP,1PRP	Inferior Epigastric artery bleed	POD 19
7	31	R	Prev 3cs	16/12/2023	39	POD 6	USG (Ascites) Elevated Urea and creatinine in ascetic tap CT Urogram	Defect in bladder dome	Repair of bladder rent	-	Bladder injury undetected	POD 18
8	29	R	Severe PE,Abruptio placenta	17/12/2023	34.3 weeks	POD 2	Ulrasound POCUS	Rectus sheath bleeder	Haemostatic suturing	14-PRBC 8FFP, 11PRP 8cryoppt	Inferior epigastric artery bleeding-AKI 4 cycles of HD	POD 20
9	23	R	Prev 2CS	29/01/2024	38 WEEKS	POD 17	Contrast CT	Sepsis with pelvic abscess and disruption of uterine scar	Subtotal hysterectomy	2-PRBC	Sepsis with disruption of uterine scar	POD 23

Discussion

Hemorrhage as Reason for Relaparotomy

There were three cases of inferior epigastric vessel injury (case 4,6,8 Table 1) leading to haemo peritoneum, one case developed hemorrhagic shock and acute kidney injury needing 1 Cycle continuous renal replacement therapy (CRRT),3 cycles Sustained Low efficiency Dialysis (SLED) and 3 hemodialysis (HD).

Two cases of postpartum haemorrhage (1,2 Table 1), one case was a case of preeclampsia failed induction at 36 weeks referred with secondary PPH. Relaparotomy with subtotal hysterectomy was done after an ultrasound examination showing hemoperitoneum on day 4. The other case was following failed vacuum extraction undergoing total hysterectomy on same day due to atonic PPH. Another case was a case of placenta praevia accrete (case 3 Table 1) underwent primary subtotal hysterectomy with intraperitoneal bleed needing relaparotomy and reinforcement of sutures.

Hemorrhage may occur from hypogastric, epigastric or uterine arteries or even the uterine incision Extra-abdominal vessels laceration frequently occurs in the lower epigastric arteries (Figure1) and leads to formation of a hematoma within the rectus abdominis muscle (rectus sheath hematoma) or to an extraperitoneal hemorrhage with blood collection in the pre-vesical space, posterior to the rectus and transversalis muscles and anterior to the peritoneum (subfascial hematoma) [1,5].These two clinical entities can coexist and may present as hemoperitoneum

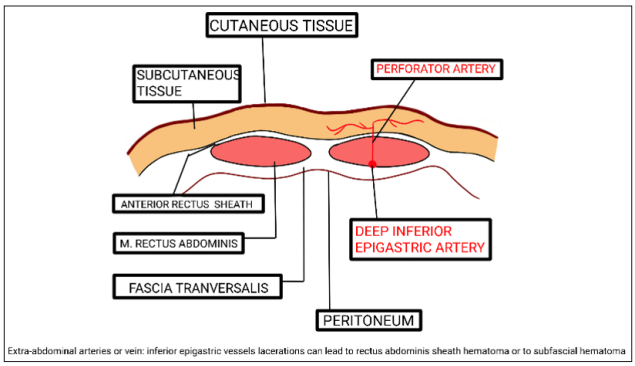

Figure1: Anatomy of Inferior Epigastric vessel

In study by Seal SL et al post-partum hemorrhage (42.4%) and rectus sheath hematoma (27.3%) were the leading causes for relaparotomy [6]. In study by Levin et al, as cited by Ahmed Khan NB et al the main indication for re-laparotomy was hemodynamic instability due to suspected intra-abdominal bleeding or uncontrolled PPH during primary surgery [4]. Bleeding secondary to atony or placenta previa are unpreventable situations, but complications of bleeding into the abdomen or hematoma formation, depend on the surgeon's, surgical techniques and tissue factor [7].

In case of hysterectomy failure to ligate securely a significant bleeding vessel, bleeding from vaginal cuff, and slippage of ligature or avulsion of tissue before or after clamping can be the cause of haemorrhage [7]. Bleeding due to uterine atony is preventable by adopting active management of the third stage of labor in women with identifiable risk factors for uterine atony by either rectal misoprostol or oxytocin infusion Active management of third stage of labour protocol of 5 units of oxytocin diluted in 5 unit of normal saline IV followed by 10 units of oxytocin IM goes a long way in prevention of PPH reducing blood loss [8].

Uterine Scar Disruption Following Lower Segment Cesarean Section (LSCS) As A Reason for Relaparotomy

There were two cases of uterine wound disruption (case 5,9 Table 1), primary indication for cesarean section being PROM Failed induction and previous 2 cesarean section respectively. Both needed relaparotomy on day 27 and day 17 respectively of primary surgery with subtotal hysterectomy at the level of uterine scar disruption. Both cases needed higher antibiotics blood and blood products, The incidence of this complication is very rare 0.6% [9]. This condition usually presents with peritonitis, and sepsis and diagnosis needs high index of suspicion in addition to Computed tomography, and magnetic resonance imaging [1,5,7]. The need for hysterectomy was marked infection of the wound, pelvic abscess and pelvic endomyometritis. There are some "Red flags" for uterine dehiscence which include the presence of a bladder flap hematoma > 5 cm and large pelvic collection. Sometimes there may be presence of gas within the uterine defect, extending from the endometrial cavity to the extra uterine parametrium in association with hemoperitoneum. If the imaging is able to demonstrate a continuous pathway between the endometrial cavity and the extrauterine collection, either by CT or MRI, it is a pathognomonic finding for uterine wound disruption. Magnetic Resonance imaging is superior to Computer tomography for differential diagnosis between uterine dehiscence and disruption There may be risk factors to develop a cesarean scar disruption which may be non-modifiable and modifiable ones. Non-modifiable risk factors are usually mother-related (age, retroverted uterus) or labor-related ones (duration of labor> 5 h and cervical dilation at the time of delivery > 5 cm). Both our cases were late in labour when cesarean section was done. Modifiable risk factors are mostly related to the surgical technique like incision close to internal so, exclusion of endometrium during repair, single-layer closure etc. [6,9,10]. With the use of high end antibiotics ,the pus may resolve but patient may have collection of organized pus with uterine wound disruption which needs to be tackled. All our cases underwent relaparotomy (Day 17,27) after full treatment with antibiotics.

Bladder Injury Reason for Relaparotomy

Bladder injury is a complication of cesarean section especially with previous cesarean section. The reported overall incidence is 0.22-0.44% of cesarean section [11]. Our patients should be made aware of such risks and surgeons should make careful intraoperative considerations with close postoperative follow-ups. Our patient was a case (case 7 Table 1) of previous 2 LSCS referred postoperatively for baby's sake admission on day 3. She had ascites which was increasing and disappeared on cathterization. Computed tomography urogram revealed a rent in bladder and she underwent relaparotomy and bladder rent repair.

Conclusion

In our series the main causes for relaparotomy included haemorrhage, sepsis and bladder injury. Several measures must be undertaken to prevent re-laparotomy such as careful surgical technique, meticulous hemostasis and strict asepsis.

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