

## ANALYTIC STUDY OF “INTRAOPERATIVE DIFFICULTIES IN REPEAT LOWER SEGMENT CAESAREAN SECTION”

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### Abstract

**Background:** Analytic study of Intraoperative difficulties in Repeat Caesarean Section. The present study aimed to investigate the intraoperative difficulties encountered during repeat Caesarean section procedures and the on-table management of complications. The study was conducted over a one-year period from August 2022 to July 2023, and it included 200 consecutive cases of repeat Caesarean sections performed at a Government General Hospital in Rajamahendravaram. **Materials and Methods:** The study sample consisted of 200 women who underwent repeat Caesarean section, selected based on the prevalence rate of repeat Caesarean sections (47%). Inclusion criteria encompassed all women who had undergone one or more previous Caesarean sections, regardless of age and parity, and included both booked and un booked cases. Exclusion criteria: women with a history of other abdominal surgeries, twin gestation, or coagulation disorders. The procedure of the study involved the collection and analysis of case histories of repeat Caesarean section deliveries. Surgeons meticulously noted the intraoperative difficulties encountered during the procedures. The collected data were analysed to identify the types and incidences of intraoperative problems. The observed intraoperative difficulties were further categorized based on age, parity, and the number of previous and present Caesarean sections. Routine investigations, including haemoglobin, blood grouping and typing, urine analysis for albumin, sugar, and microscopy, and VDRL tests, were conducted for all patients. Special investigations including ultrasound, were performed as needed. Clinical evaluations, including gestational age confirmation and pelvic assessments, were carried out on admission. The decision for repeat Caesarean section was based on factors such as the progression of labour, foetal condition, station and position of the foetus in the pelvis, maternal condition, and patient preference regarding VBAC (vaginal birth after Caesarean section). The choice of anaesthesia was left to the discretion of the anaesthetist. Intraoperative details were meticulously noted, and any complications were managed promptly. All cases were attended by a paediatrician, and postoperative periods were closely monitored with prompt management of complications. Patients with uneventful postoperative periods were discharged after the 5th postoperative day. Upon discharge, patients received a summary card, and a follow-up checkup was advised after 6 weeks. Mandatory hospital delivery for successive pregnancies was recommended to all patients. **Result:** Out of the total cases studied, 114 cases (57%) had no complications, while 86 cases (43%) experienced various intraoperative difficulties. The majority of patients (88.5%) had undergone one previous Caesarean section, followed by 11% with two previous sections and only 0.5% with three previous sections. The age group of 20-29 years showed the highest prevalence of previous Caesarean sections (93.5%). Complications were more prevalent in the age group of 20-29 years (44.4%) compared to 30-



35 years (25%). The most common complications encountered during surgery were adhesions (83.72%), followed by thinned out lower uterine segment (37.2%), haemorrhage (10.9%), placenta previa (8.13%), and extension of the uterine incision (6%). Other complications, such as bladder injury and injuries to the newborn, were less frequent. Regarding the number of previous Caesarean sections, cases with two previous sections had the highest incidence of complications (81.8%), followed by cases with one previous section (37.8%) and three previous sections (100%). Adhesiolysis was the most common management approach for different types of complications (69.87%), followed by adhesiolysis with an inverted T incision (14.45%) and adhesiolysis with uterine extension suture (3.6%). **Conclusion:** The study highlighted the prevalence of intraoperative difficulties during repeat Caesarean sections and provided valuable insights into the management of various complications encountered. Adhesions were the most common complication, and appropriate on-table management was crucial for successful outcomes.

## INTRODUCTION

Origin of "Caesarean section" is controversial. It's not from Julius Caesar's birth. It may be linked to Roman law "lex Cesarea" or Latin "Cedere" meaning "to cut." Early cases were risky, often fatal for the mother. Survival improved with advancements in technique, anaesthesia, and antibiotics. The first successful Caesarean in the US was in 1794.

Risks of Caesarean Section include Maternal risks like 1) Postoperative complications like adhesions, hernias, and infections 2) Anesthesia challenges and increased risk in emergency situations. 3) Severe blood loss, potentially requiring a blood transfusion. 4) Postdural puncture headaches. 5) Higher risk in subsequent pregnancies, including placenta accreta and emergency hysterectomy 6) Increased risks in subsequent deliveries, such as malpresentation, placenta previa, hemorrhage, and preterm birth. Fetal or neonatal risks include 1) Elective Caesareans before 39 weeks increase baby's risks with no benefit to the mother. 2) Neonates born before 39 weeks may face 2.5 times more complications like respiratory distress, jaundice, and low blood sugar. 3) Increased incidence of sepsis, respiratory distress syndrome (RDS), hypoglycemia, respiratory support, NICU admission, and prolonged hospitalization 4) Developmental problems, including slower learning in reading and maths. Other risks include wet lung, potential for early delivery, complications, and higher infant mortality risk.

Caesarean Delivery Trends: The caesarean delivery rate has been steadily increasing over the years: 1992-93: 2.9% in 2017-2018: 49.63%. This rise is mainly due to an increase in repeat operations and primary caesarean deliveries for difficult labor and fetal distress.

## MATERIALS AND METHODS

Hospital based study during the period of August 2022 to July 2023(1 year).

The present study is a study of intraoperative difficulties in the repeat Caesarean section, a study of 200 cases that were seen consecutively in the

department of Obstetrics and Gynaecology during a period as mentioned above. The cases were taken from government district general hospital Rajamahendravaram. These cases were taken to study the intraoperative difficulties in repeat C-section and on table management of complications.

**Study design:** Hospital based cross sectional study.

**Study sample size:** Total number of cases studied: 200 repeat c-sections. 200 patients are taken based on the prevalence rate of repeat caesarean section is 47% Inclusion criteria: All women who have undergone one / more caesarean section irrespective of age and parity, booked un booked cases. Exclusion criteria: All the women who have undergone other abdominal surgeries, twin gestation, coagulation disorders.

**Statistical analysis:** All statistical analysis will be performed by using SPSS software version 20.0 and MS excel 2007. All descriptive statistical data will be presented as mean  $\pm$  standard deviation and percentages. Data also tabulated and graphically represented.

**Procedure of study:** Patients were selected according to the inclusion criteria. Case histories of repeat caesarean section deliveries were studied and the data were recorded. As surgeons, the particular difficulties we encounter while operating a repeat caesarean section were meticulously noted. The collected data was analyzed for type and incidence of the intraoperative problems. The observed intraoperative problems were analyzed and categorized in relation to age, parity, number of C-section for both previous and present were studied. The routine investigations like haemoglobin percentage, blood grouping and rhesus typing, urine for albumin, sugar and microscopy, VDRL were done. As and when required special investigations including ultrasound were done. Patients were immunized against tetanus as required. As and when required special investigations including ultrasound were done. On admission gestational age was confirmed by available parameters. Abdominal examination was done to know the gestational age by fundal height for uterine activity signs of threatened rupture of uterus presentation, lie, position of the foetus. If vertex presentation whether it is engaged or

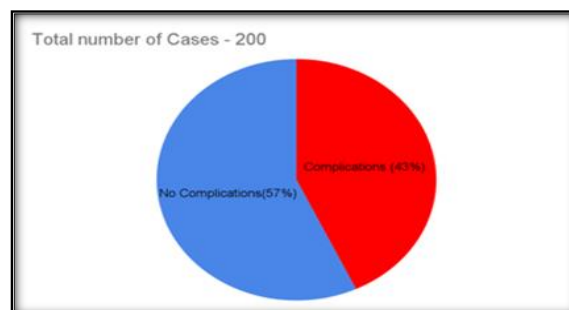
palpable per abdomen. In per vaginal examination dilatation and effacement of cervix, position and station of presenting part, presence or absence of caput and molding if present its grading, color and smell of the liquor, pelvic assessment and test for cephalopelvic disproportion were done. The decision for caesarean section was taken based on clinical evaluation of progression of labour, foetal condition, station and its position (in pelvis), maternal condition and patients not willing for VBAC (vaginal birth after caesarean section) The nature of the anaesthesia was left to the decision of anaesthetist. All the intraoperative details were noted and complications were managed promptly. All cases were attended by a paediatrician. The postoperative period was monitored and all the complications were managed promptly. Patients with uneventful postoperative period were discharged after the 5th postoperative day. On discharge a summary card was given and postoperative checkup, after 6 weeks was advised. All cases were advised to have mandatory hospital delivery in successive pregnancies.

## RESULTS

Present study was performed in randomly selected 200 cases of repeat C-section from government

district general hospital, Rajamahendravaram, to analyze and categorize intraoperative difficulties in repeat lower segment caesarean sections and on table management. Out of 200 cases studied 114 cases of repeat C-section did not show any complications, and remaining 86 cases showed a variety of complications

Total no of repeat caesarean section cases



**Figure 1: No of repeat sections with complications**

Out of 200 cases of repeat C-sections studied, 117 cases had undergone 1 previous C-section (88.5%), 22 cases had undergone 2 previous C-sections(11%), 1 case had undergone 3 previous C-sections(0.5%).

**Table 1: number of previous caesarean section**

No of Previous C-Sections	No	Percentage
1	177	88.5
2	22	11.0
3	1	0.5
Total	200	100

**Table 2: age group and complications**

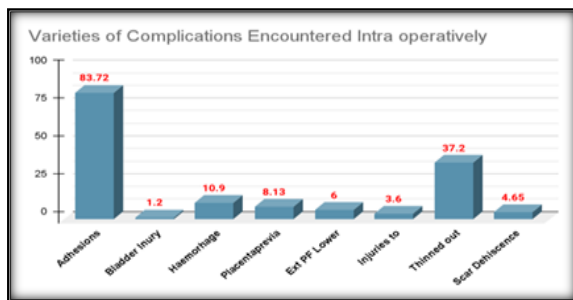
Age (Yrs)	No. of Patients	Complications	%
<20	1	0	0
20-29	187	83	44.4
30-35	12	3	25

**Table 3: types of complications in different age groups**

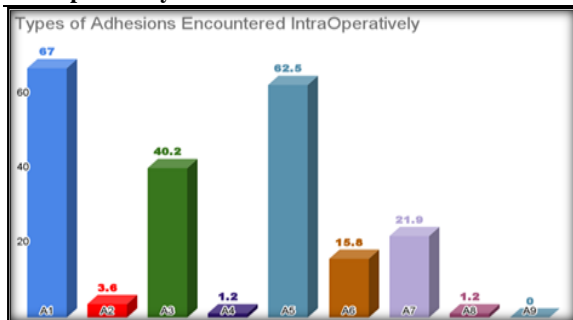
Type of complication	< 20 yrs	20-29yrs	30-35yrs
	No. of Cases	No. of Cases	No. of Cases
Adhesions	0 (0%)	77 (41.1%)	3 (75%)
Haemorrhage	0 (0%)	9 (4.81%)	0 (0%)
Placenta Previa	0 (0%)	7 (3.7%)	0 (0%)
Extension Uterine incision	0 (0%)	5 (2.67%)	0 (0%)
Bladder Injury	0 (0%)	1 (0.53%)	0 (0%)
Injuries to newborn	0 (0%)	3 (1.60%)	0 (0%)
Thinned out LUS	0 (0%)	32 (17.11%)	0 (0%)
Scar Dehiscence	0 (0%)	4 (2.13%)	0 (0%)

**Table 4: Relation between the no.of Previous c-sections with incidence of complications**

No of Previous CS	No of Cases	No of Complications	Percentage
1	177	67	37.8%
2	22	18	81.8%
3	1	1	100%
Total	200	86	



**Figure 2: varieties of complications encountered intraoperatively**

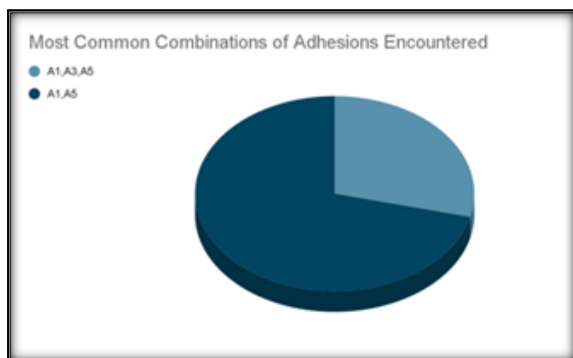


**Figure 3: types of adhesions**

In our study the age group of cases which underwent C-section was between 18-35yrs, with a mean age group of 24.23 yrs. The highest prevalence of previous C-section was seen in the age group 20-29 yrs, which accounted for (93.5%). [Table 1]

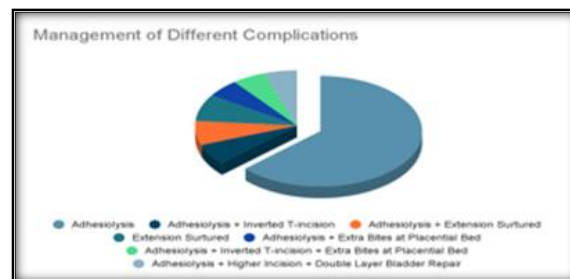
The complications were noted to be highest, i.e out of 187 patients in the age group 20-29 yrs, 83 patients had complications (44.4%), and out of 12 patients in the age group 30-35 yrs, 3 had complications (25%). [Table 2]

Out of 200 cases, 114 cases of repeat caesarean section did not show any complications (57%), and remaining 86 cases showed a variety of intraoperative complications encountered (43%), and the most common type of complications come across were 72 cases of adhesions (83.72%), 32 cases of thinned out lower uterine segment (37.2%), 9 cases of haemorrhage (10.9%), 7 of cases placenta previa (8.13%), 5 cases of extension of the uterine incision(6%), 4 cases of scar dehiscence(4.65%), 1 case of bladder injury (1.2%), 3 cases had injuries to the newborn (3.6%) intraoperatively. There were no cases of scar rupture, bowel injury, caesarean hysterectomy in the study population.



**Figure 4: most common combinations of adhesions encountered.**

Out of 72 Cases with various combination of Adhesions, 15 cases have the most combination of adhesions which was between parietal peritoneum, anterior surface of the uterus and omentum (20.8%) and 37 cases have combination of parietal peritoneum, anterior surface of the uterus alone(51.3%).



**Figure 5: management of different adhesions**

Out of 83 cases with different varieties of complications, each case was managed accordingly. In 58 cases only adhesiolysis was done (69.87%), in 12 cases adhesiolysis with inverted T incision was done (14.45%), in 3 cases adhesiolysis with uterine extension was sutured(3.6%), in 2 of the cases only uterine extensions were sutured (2.4%), in 2 cases adhesiolysis was done along with taking extra bites at the placental bed a through and through bladder injury during the opening of the abdomen, the bladder was repaired in 2 layers along with methylene blue dye installation and continuous catheterization for 14 days was done (1.2%), in 4 cases on table scar dehiscence was diagnosed along with adhesion for which adhesiolysis with rent repair was done (1.2%), and in 1 case adhesiolysis with rent repair was done (1.2%), and in 1 case adhesiolysis with inverted T incision with extra bites on the placental bed was taken(1.2%).

## DISCUSSION

Intraoperative complications 1. Haemorrhage: Average blood loss at C-section is around 700 to 1000 ml. Causes for blood loss (> 1.5 Lt ) in repeat C-section during intraoperative and postoperative period includes- a) Severity of adhesions during surgery: As a result of severe adhesion the duration of the operation was longer in repeat caesarean section when compared to primary C-section, hence greater blood loss and drop in the haemoglobin levels postoperatively which was justified in a study done in 167 patients by Mumtaz Rashid and Rabia s Rashid in Saudi Arabia during Jan 1994 to December 2002 for a period of 8 years1. b) Incidence of abnormal placentation (placenta previa, placenta increta, percreta, accreta): Peripartum haemorrhage remains cause of significant maternal morbidity and mortality worldwide.<sup>[1-3]</sup> Abnormal placentation is one of the leading causes of peripartum haemorrhage.<sup>[3-6]</sup> The main forms of abnormal placentation include placenta accreta, placenta previa and low- lying placenta. The incidence of abnormal placentation is

increasing secondary to the increased incidence of caesarean section.<sup>[2,7]</sup> The obstetrician and the obstetric anaesthesiologist must know, on the spot, how to deal with abnormal placentation related peripartum bleeding.<sup>[8]</sup> Placenta accreta is an abnormal adherence of the placenta to the uterine wall owing to an absent or faulty decidua basalis. Separation of the placenta accreta from the uterine wall can result in foetal haemorrhage.<sup>[9-11]</sup>

Association of placenta accreta with other forms of abnormal placentation such as low lying placenta or placenta previa is common haemorrhage Clark et al,<sup>[1]</sup> Noted that women with placenta previa and an unscarred uterus had a 5% incidence of placenta accreta.<sup>[3]</sup> The diagnosis of placenta previa and history of four or more previous caesarean sections increased the incidence of placenta accreta to 67% milosevic et al. studied the incidence of abnormal placentation in parturients with history of previous caesarean section.<sup>[4]</sup> The incidence of placenta previa in the control group (parturient with no history of previous caesarean section) was 0.33%. The incidence of placenta previa was 1.86% after one previous caesarean section ( $p < 0.001$ ), 5.49% after two previous caesarean sections and 14.28% after three previous caesarean section.

The authors concluded that previous caesarean section is an important risk factor for the development of placental complications of caesarean hysterectomy (prospective, 2 years observational study at 13 academic medical centres conducted between January 1, 1999, and December 31, 2000) in all women who underwent a hysterectomy at the time of caesarean section.<sup>[12]</sup> A total of 186 caesarean hysterectomies (0.5%) were performed from a cohort of 39,244 women who underwent caesarean delivery. The leading indications for hysterectomy were placenta accreta (38%) and uterine atony (34%). Of the hysterectomy cases with diagnosis recorded as accreta, 18% accompanied a primary caesarean section, and 82% had a prior procedure ( $p < 0.001$ ). Major maternal complications of caesarean hysterectomy included transfusion of red blood cells (84%) and other blood products (34%), fever (11%), subsequent laparotomy (4%), ureteral injury (3%), and death (1.6%). Accreta hysterectomy cases were more likely than atony hysterectomy cases to require ureteral stents (14% compared with 3%,  $p = 0.03$ ) and to instill sterile milk into the bladder (23% compared with 8%,  $p = 0.02$ ). The authors concluded that despite the use of effective therapies and procedures to control haemorrhage at caesarean delivery, some women continue to require hysterectomy to control haemorrhage from both uterine atony and placenta accreta.<sup>[12]</sup>

c) Uterine atony d) obesity e) prolonged 2nd stage of labour f) preeclampsia g) general anaesthesia h) elective c-section as lower uterine segment would not have been formed in cases of elective c-section, leading to increased blood loss i) classical uterine incision - in general Pfannenstiel incision was used to open the abdominal cavity and a transverse incision

is given if the patient has already had longitudinal incisions( to avoid multiple scars) or if there is a history of severe pelvic adhesions obliterating the lower uterine segment and high attachment of bladder to the abdominal wall. Pfannenstiel incisions however allowed more room and visualisation for safe preparation of the isthmic area and atraumatic delivery of the baby. Intraoperative extension of uterine incision.<sup>[13]</sup>

#### **On table management of haemorrhage**

1. Strategies to reduce or minimise the blood loss during C-section: A) Ensure that the loose utero-vesical fold of peritoneum is picked up and incised rather than fascia over the uterine serosa. B) Avoid wide lateral dissection of the bladder which damages the enlarged venous plexuses in the broad ligament. C) Plan an appropriate uterine incision. D) Careful delivery of foetal head to avoid extension of the uterine incision. E) Preferring spontaneous expulsion of placenta which reduces blood loss upto 300 ml. F) Prophylactic use of oxytocic drugs. G) Clamping the edges of the uterine incision with haemostatic forceps. If angle bleeding is profuse, angles must be taken separately.
2. Control of intraoperative bleeding: a) pressure by a sponge holder or a pack to isolate the bleeding site and then deep interrupted sutures to ligate the bleeder. b) Uterine artery ligation c) Internal iliac artery ligation d) B- lynch procedure e) Peripartum hysterectomy f) Pelvic packaging
3. Adhesions are fibrous bands that form between abdominal organs or between the peritoneum and abdominal wall due to inflammation and tissue disruption after trauma, infections, surgery, or chemical irritation. The healing process involves fibrin deposition and inflammation. Adhesions start forming immediately after surgery, but new adhesions are unlikely to form after one-week post-surgery or the initial event. Risk factors for adhesion formation include infection, intra-peritoneal blood, dissection of previous adhesions, and the presence of reactive foreign bodies. Genetic variation might also contribute, but no predictive factors have been identified yet. Surgical techniques that involve careful tissue handling, avoidance of free blood, and maintenance of tissue moisture are expected to reduce adhesion formation. The closure of the peritoneum after caesarean delivery is controversial, with some studies showing no protection from adhesions when both visceral and parietal peritoneum are closed. Hysterectomy closure techniques may also affect adhesion formation, with single-layer closure possibly associated with more frequent bladder adhesions. The reported incidence of adhesion development after a primary caesarean section ranges from 46-65%, with variations in size, location, and density of adhesions.

#### **Adhesion Scoring System**

Adhesion scoring systems are designed to correlate with disease outcome and guide management. Numerical grading is preferred over qualitative

assessment for better correlations. Adhesion scoring helps with prognosis and can determine appropriate therapy.<sup>[14-18]</sup>

#### **ADHESION SCORE BY Myers et al 2005**

Grade 1 - No adhesion present Grade 2 - Adhesions present but no surgery required. Grade 3 - Adhesiolysis was required and there was inability to exteriorize the uterus. Grade 4 - Adhesiolysis was required prior to delivery.

Grades of adhesion based on extent,<sup>[19]</sup> Extent numeric value: 0. None(no adhesion) 1.Localised(<1/3 of the site covered) 2 Moderate(1/3-2/3 Of the site covered) 3Extensive(>2/3 of the site covered) 3.

Grades of adhesion based on severity none,<sup>[19]</sup> mild and severe Burden of adhesion: - no adhesion,- a filmy avascular adhesion- a dense organised cohesive vascular adhesion. Postsurgical adhesions that originate from any abdominal or pelvic surgeries, can lead to a number of complications: Subfertility Bowel obstruction Post surgical, chronic pain 3) Extension of uterine incision: Frequent cause of haemorrhage, as latter extension causes injury to uterine vessels leading to broad ligament hematoma. Downward extension can cause bladder trigone injury. Inadvertent vaginal incision may lead to urethral damage. 4) scar dehiscence / scar rupture 5) uterine rupture Uterine rupture is a rare but severe complication in obstetrics, with previous caesarean section being the main risk factor. As caesarean rates increase globally, more women with prior caesareans face higher uterine rupture risks during trial of labor (TOL). Uterine ruptures during TOL have significantly higher risks for serious consequences in both mother and newborn, including severe bleeding, exposure to general anaesthesia, hysterectomy, and increased perinatal death and brain injury due to newborn asphyxia. A Norwegian study found that TOL for women with previous caesarean sections had an 8-fold higher risk of rupture compared to repeated elective caesarean sections, with induction of labor (using prostaglandins) associated with an even higher risk of uterine rupture.<sup>[20]</sup> 6) need for hysterectomy Unplanned peripartum hysterectomy is carried out typically as a last resort to control life threatening haemorrhage, which often is caused by placenta previa, placenta accreta, uterine atony, and uterine rupture.<sup>[21]</sup> 7) Increase in operative time and hospital stay Operative time of a CD is defined as time from the initial incision to skin closure. Delivery time is defined as the time from incision to delivery. Longer operating time increases the risk of surgical site infection(ie, incisional site infections and endometriosis,<sup>[22]</sup> greater blood loss, and adverse neonatal outcomes, which include an increased likelihood of umbilical artery cord gas PH of <7.1 and reduced 5 minute Apgar scores.<sup>[23]</sup> 8) Bladder injury.<sup>[24]</sup> The rise in primary caesarean delivery leads to an increase in repeat caesarean deliveries, resulting in a higher incidence of complications, including bladder injury. A study found that bladder injury associated with repeat caesarean was 3.82%,

compared to only 0.28% for primary caesarean, indicating a fourfold increased risk. Age and BMI were identified as confounding factors for repeat caesarean and bladder injury. Bladder injuries were more common in older and more parous women, with data suggesting that adhesions from previous caesarean increase the risk of bladder injury during subsequent procedures. Bladder injury is more common due to adhesions and fibrosis, posing a high risk of subsequent fistula formation. Precautions: 1) Methylene blue installation via per urethral catheter. 2) Careful sharp dissection of bladder adhesion during caesarean delivery is recommended. 3) As much as possible the utero-vesical fold of the peritoneum is separated from the lower uterine segment and the bladder is pushed down. 4) An incision over the lower uterine segment is placed a little above the normal site. In case of bladder injury: Two layered repairs with 3-0 or 4-0 absorbable suture is done. Indwelling urinary catheter is kept for a long time (14 days) until microscopic haematuria clears. 9) Ureteral injury Rare but may occur during attempts to control bleeding following latter extension of the transverse uterine incision.

In case of ureteral injury: Should involve a urologist to evaluate. Indigo carmine testing, cystoscopy may be required to visualise ureteral orifice. 10) Bowel injury Extremely rare as the gravid uterus displaces the bowel. Small bowel serosal damage may not require suturing. Deeper injuries- repaired by suturing right angles to the bowel axis in two layers using 3-0 or 4-0 absorbable sutures for the first layer and the second layer by 4-0 silk. Colon injuries are rare, can occur due to extensive adhesions. Small tears can be over sewn as above. Extensive damage may need diverging colostomy.

11) other complications: Injuries to newborn may occur. Caesarean scar pregnancy, amniotic fluid embolism, thromboembolism, deep vein thrombosis, secondary infertility, unanticipated gynaecological or surgical pathology (leiomyomas and ovarian pathology) can be associated. Adhesion formation is a well known complication of abdominal and pelvic surgery with the rate of adhesive disease exceeding 90% in some cases.<sup>[25]</sup> Theoretically, it is possible that adhesion formation may be less frequent because the postpartum period is a time of altered wound healing to allow for uterine involution and repair.<sup>[26]</sup> Adhesion prevention methods: 1)Surgical principles Several methods have been suggested to reduce adhesion-related complications, but proper surgical technique remains essential for good outcomes and risk reduction. Techniques such as careful tissue handling, maintaining tissue moisture, meticulous haemostasis, and using micro and atraumatic instruments can help prevent adhesions. Avoiding peritoneal contamination with infectious agents and foreign bodies is also crucial. While some authors advocate keeping the uterus in the peritoneal cavity during caesarean delivery, there is no evidence that this technique lessens adhesion formation. Irrigation of the peritoneal cavity and packing the gutters have

no proven impact on adhesion formation. The presence of foreign bodies, like glove powder, textile fibres, sutures, and debris, is strongly associated with adhesion formation. Efforts are being made to ban cornstarch powder on medical gloves in the US to reduce adhesion risks. 2) Peritoneal closure: The value of peritoneal closure in caesarean delivery has been debated for over two decades, with conflicting reports. Some studies suggest that closure of the parietal and visceral peritoneum is associated with slightly longer operating time and more postoperative pain. However, other studies indicate that non closure of the peritoneum increases the odds of adhesion formation compared to closure. The debate over peritoneal closure in caesarean delivery is ongoing, with conflicting data reported in various studies. Similarly, other surgical approaches to caesarean delivery are also subject to debate. 3) Incision selection: The optimum approach to uterine incision and closure in caesarean delivery remains unclear. Some studies suggest that single-layer closure through a Pfannenstiel incision with peritoneal closure may result in lower pelvic adhesion scores. However, the impact of using a vertical abdominal wall opening after repeated prior Pfannenstiel incisions on adhesion formation has not been determined. Single-layer closure has been associated with benefits like decreased blood loss, operative time, and postoperative pain. However, a recent study found an increased incidence of bladder adhesions with single-layer closure. The type of suture material used during caesarean delivery does not appear to affect adhesion formation, but the use of fibrin glue may reduce adhesion incidence based on animal studies.

#### **Adhesion prevention products:**

**1. Hydrofolation:** Liquid solutions like saline, Ringer's lactate, and high molecular weight dextran have been used for adhesion prevention by floating intra-abdominal structures. However, a meta-analysis found that crystalloid solutions had little benefit in preventing postoperative adhesions. A 4% Icodextrin solution (Adept) was introduced for laparoscopic surgery with limited FDA-approved indication for secondary prevention of adhesive disease, but its efficacy is not as effective as barrier methods.

#### **2. Pharmacology**

Various adhesion prevention methods have been proposed, including agents that alter the fibrin cascade and act as physical barriers. Adhesion formation is a complex process involving the balance between fibrin deposition and degradation, as well as the involvement of the immune system and its cells, such as natural killer cells.

## **CONCLUSION**

The most effective approach to reducing the multiple potential risks of repeat CS is to minimize the rates of both primary and repeat CS whenever possible.

This underscores the importance of carefully evaluating the medical indications for a caesarean section and promoting practices that support safe vaginal deliveries when they are deemed appropriate.

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