

COMPARISON OF INTRAOPERATIVE PROBLEMS IN PRIMARY VS. REPEAT CESAREAN SECTIONS

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Abstract

Background: Caesarean section (CS) is a widely performed surgical procedure in obstetric practice. After any laparotomy, the formation of scar tissue, adhesions, and bladder extension is quite common, and CS is no exception. Multiple CS procedures are known to be associated with more challenging surgeries and increased blood loss compared to planned second CS.

Methods: This observational comparative study, conducted at Jubilee Mission Hospital, Thrissur from March 2014 to March 2015, included women undergoing CS for the first time and those who had one or more previous CS procedures. The study encompassed 100 cases of primary CS and 100 cases of repeat CS.

Results: Among the primary CS group, 79% experienced no complications, while 21% encountered complications such as postpartum hemorrhage and extension of uterine incision. In the repeat CS group, 54% had no complications, while the remainder experienced various complications, including adhesions (34%), a thin lower uterine segment (17%), extension of uterine incision (3%), and two cases of placenta accreta necessitating obstetric hysterectomy. The incidence of complications increased with the number of CS procedures, yet adhesions and placenta previa showed no significant relation to the number of CS procedures. However, the incidence of a thin lower uterine segment and placenta accreta increased with the number of CS procedures.

Conclusion: Complications were more prevalent in emergency CS than in elective CS, with excessive bleeding being the most common complication. Therefore, it can be concluded that repeat cesarean sections are linked to higher morbidity. The most effective approach to mitigate this is by reducing the rates of primary sections.

Keywords: Cesarean Section, Adhesions, Placenta Previa, Placenta Accreta, Thin Lower Uterine Segment.

Introduction

Cesarean section (CS) is a surgical procedure performed when vaginal delivery is not feasible (emergency CS) or when there's a higher risk to the mother or fetus with vaginal delivery (elective CS), prioritizing the safety of both the mother and the fetus. The World Health Organization (WHO) issued guidelines in 1985, suggesting that CS rates should not exceed 10-15%. [1] A rate below 5% indicates inadequate access to surgical obstetric care, while a rate above 15% suggests overuse of the procedure for non-life-saving reasons. In 2009, the WHO acknowledged that the ideal rate remains uncertain, suggesting a range of 5-15% or allowing

regions to establish their standards. [2] In India, the prevalence of cesarean section deliveries increased from 3% to 10% between 1992-93 and 2005-06 (IIPS, 2007), though still lower than in some other developing nations like Brazil and China. Given India's status as the world's second most populous country, even a small percentage increase impacts a significant number of people. [3] However, there's considerable variation in CS rates across states. Among the larger states, Kerala has the highest proportion of women undergoing cesarean deliveries (31.8%), followed by Andhra Pradesh (29.3%) and Tamil Nadu (23.2%). Conversely, Rajasthan and Jharkhand have the lowest rates (4.2% in both states). [4] Except for Karnataka, all other southern states have exceeded the WHO recommended level of 15%. In major states, a CS rate of 5% or lower is observed in Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh, and Rajasthan. Moreover, a noticeable rural-urban disparity exists in CS rates across India, with urban areas generally experiencing higher rates than their rural counterparts in all states. After undergoing laparotomy, it is common to develop scar tissue, adhesions, and bladder extension. Cesarean section (CS) is no exception to this phenomenon. Multiple CS procedures are associated with more challenging surgeries and increased blood loss compared to planned second CS. The risk of major complications escalates with the number of previous CS procedures. [5] Scar tissue and adhesion formation significantly elevate major complication rates, ranging from 4.3% to 12.5%, depending on the number of prior cesarean sections. The incidence of intraperitoneal adhesions varies from 5.5% to 42.5%. [5] Women with a history of CS face an elevated risk of hemorrhage, placenta previa, uterine rupture, and stillbirth in subsequent pregnancies, contributing to both maternal and fetal morbidity. [6] This study aims to investigate the range of intraoperative complications experienced during repeat cesarean sections in comparison to those undergoing primary CS. It will comprehensively address the various complications associated with both elective and emergency CS procedures.

Material and Methods

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Rajiv Gandhi Institute of Medical Sciences, Adilabad, Telangana State. Institutional Ethical approval was obtained for the study. Written consent was obtained from all the participants of the study after explaining the nature of the study in the vernacular language. Cases were selected by convenience sampling method.

Inclusion Criteria:

1. All women underwent one or more cesarean sections irrespective of age and parity including emergency and elective.

Exclusion Criteria:

1. All women who have undergone other abdominal surgeries.
2. Women who had other co-morbidities may have complications.

A total of 100 cases were included in the study based on the inclusion and exclusion criteria. Patients were selected according to the inclusion criteria. Case histories of primary and repeat cesarean deliveries were studied and the data recorded. This is an observational comparative study done in 100 cesarean cases. This includes 50 consecutive cases of primary and 50 consecutive cases of repeat cesarean sections done in our hospital during the study period. The particular difficulties we encounter while operating were meticulously noted. The collected data were analyzed for the type and incidence of the intraoperative problems. The observed intra-operative problems were analyzed and categorized in relation to age, parity, number of CS, indication for CS for both previous and present, whether emergency or elective, etc. The intraoperative complications in both primary and repeat cesarean sections were compared with

respect to adhesions (peritoneal, bladder, bowel, omental, etc.), blood loss, difficulty in delivery of baby, an extension of tears over the uterus, bladder injury, abnormal placentation, scar dehiscence, uterine rupture, need for hysterectomy, etc.

Statistical analysis: All the available data was uploaded on an MS Excel spreadsheet and analyzed by SPSS version 23 in Windows format. The categorical variables were represented as mean, standard deviations, and percentages. The categorical variables were determined by a chi-square test represented as p values and ($p < 0.05$) were considered significant.

Results

Table 1 shows the demographic profile of the cases in the study. Maternal age: Group 2 women were older than Group 1 women (27.35 ± 5.03 years vs. 25.16 ± 3.29 years). Parity score: Group 1 women were more likely to be primiparous (first-time mothers) than Group 2 women (PRIMI vs. 2.1). Blood loss in ml: Group 2 women experienced more blood loss during surgery than Group 1 women (446 ± 60.8 ml vs. 410 ± 50.5 ml). Time taken for section (in minutes): Group 2 women had longer surgery times than Group 1 women (57.15 ± 18.36 minutes vs. 48.19 ± 10.36 minutes). Gestational age: Group 1 women were more likely to deliver at term (≥ 37 weeks) than Group 2 women (38.5 ± 2.2 weeks vs. 37.8 ± 2.5 weeks). Overall, the data in Table 1 suggests that Group 2 women were older, had more children, experienced more blood loss during surgery, had longer surgery times, and were more likely to deliver preterm than Group 1 women.

The results of Table 2 suggest that the number of previous cesarean sections (CS) is associated with an increased risk of complications during subsequent CS. The percentage of patients with complications increases with the number of previous CSs. This suggests that the risk of complications during CS increases with each subsequent CS. These complications can be serious and can lead to further health problems. For example, PPH can lead to anemia and shock. Extension of the uterine incision can lead to internal bleeding and infection. Adhesions can cause pain and infertility. Thinlus can increase the risk of uterine rupture during pregnancy and childbirth.

Table 1: Maternal Demographic Characteristics

	Group 1 (n=50)	Group 2 (n=50)	P value
	Mean \pm SD	Mean \pm SD	
Maternal Age	25.16 ± 3.29	27.35 ± 5.03	0.258
Parity Score	PRIMI	2.1	0.012*
Blood Loss in ml	410 ± 50.5	446 ± 60.8	0.036*
Time Taken for Section (In Minutes)	48.19 ± 10.36	57.15 ± 18.36	0.04*
Gestational Age	38.5 ± 2.2	37.8 ± 2.5	0.288

* Significant

Table 2: Relations between No. of CS and complications

No. of Prev Cs	PPH	Extension of Uterine incision	Adhesions	Thinlus	Total	Percentage
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0(n=50)	7	3	-	-	10	20.00
1(n=36)	2	1	12	3	18	50.00
2(n=13)	2	0	5	4	11	84.61
3(n=1)	0	0	0	2	2	100.00

The percentage of patients with adhesions increases with the number of repeat CS. This suggests that the risk of developing adhesions increases with each subsequent CS. The results of Table 3 suggest that the number of repeat CS is associated with an increased risk of developing adhesions. Adhesions can cause a variety of symptoms, including pain, infertility, and bowel obstruction. In some cases, adhesions may require surgery to remove them.

Table 3: Relation between No. of Repeat CS and Adhesions

No. of CS	Adhesions	Nil	Total	Percent
1(n=36)	12	24	36	33.33
2 (n=13)	5	8	13	62.50
3 (n=1)	0	2	2	00.00

A critical analysis of Table 4 shows there is no clear relationship between the number of repeat CS and placenta previa or placenta accreta. The table shows that a small percentage of patients with repeat CS had placenta previa or placenta accreta, but the percentage did not increase with the number of repeat CS. The results of Table 4 suggest that the number of repeat CS is not associated with an increased risk of placenta previa or placenta accreta.

Table 4: Relation between the number of Repeat CS and placenta previa

No. of Repeat CS	Placenta Previa	Placenta Accreta	Total	Percentage
1	1	1	2	4
2	1	0	1	2
3	0	0	0	0

In this study sample, 25% of the elective cesarean section (CS) group experienced some form of complication, while this percentage was higher at 40% for the emergency group. The predominant complication noted in emergency CS was hemorrhage.

Discussion

Contemporary obstetrics, driven by medical advancements, societal shifts, economic factors, and legal considerations, has seen a rise in primary cesarean section rates worldwide. Consequently, a prevalent clinical condition termed 'previous cesarean section' has emerged in subsequent pregnancies, categorizing the reference pregnancy as a high-risk scenario. "While peritoneal adhesions commonly form after intra-abdominal and pelvic surgeries, research suggests that individuals undergoing Caesarean sections may experience fewer adhesions. Adhesions persist even with lower uterine incisions, albeit less frequently towards the anterior abdominal wall compared to classical incisions. Several studies demonstrate an escalation in adhesion occurrence with an increasing number of performed CS procedures.[7] In individuals who had undergone a Caesarean section (CS), pelvic adhesive disease formation was observed. The delivery of the infant was delayed by 5.6 minutes (52%) with one previous cesarean birth, 8.5 minutes (79%) after two cesarean births, and 18.1 minutes (169%) during the fourth cesarean birth compared to primary cesarean sections.

In a similar study by Tulandi et al. [8], no adhesions were found in primary CS cases. However, significantly more women had adhesions after three CSs (42.8%) compared to those with a second CS (24.4%). The delivery time was significantly longer in subsequent CS compared to the first CS (7.7 +/- 0.3 minutes). Comparable complication rates were observed in those with two or more CSs compared to primary CS. Similar findings were reported by Juntune N et al. [12] and colleagues, who found a significantly higher risk of intraperitoneal adhesions in patients undergoing their fourth to tenth cesarean deliveries compared to those having their first, second, or third CS.

The overall adhesion formation rate in our study is 34%, which aligns with findings in other studies (27%). Many studies indicate that as the number of Caesarean sections (CS) increases, adhesions also tend to increase. However, in our study, we did not observe adhesions in individuals with three previous CS. This could be attributed to the relatively smaller number of patients in that group or could indicate that other factors, such as patient nourishment, duration between subsequent pregnancies, and the experience of the surgeon performing the previous CS, may influence the presence of dense adhesions. The most common adhesions found in our study were between the bladder and uterus, as well as between the parietal peritoneum and omentum. In the study by Tulandi et al. [8], a similar pattern of adhesions was observed, primarily between the bladder and uterus, and these adhesions increased with each subsequent delivery.

Despite the benefits associated with lower-segment CS scars, these scars are still prone to suboptimal healing. Juntunen et al., [9] highlighted a significantly higher occurrence of a thin lower uterine segment (less than 2 mm) in patients undergoing their 4th to 10th Caesarean delivery (CD) compared to those having their 1st, 2nd, or 3rd CD (control; odds ratio, 60.4; confidence interval, 18.4-198.3). Additionally, 10.1% of the study group presented with membranous, transparent, or 'lacerated' lower segment, a condition absent in the control group. A recent systematic review of 12 eligible studies [10] involving 1834 women, where ultrasound was utilized to assess the CS scar, reported a 6.6% rate of scar defect. Another study that incorporated a sonohysterogram into the evaluation found a much higher percentage (20%) with substantial defects. [11] Consequently, incomplete healing of the low transverse uterine incision, as determined through transvaginal ultrasound, may be more prevalent than previously believed. In our study, the overall incidence of a thinned-out lower uterine segment is 17%, comparable to the 11.6% observed in a similar study. [12] While our study did not present cases of scar dehiscence or scar rupture, this strongly indicates the potential for scar rupture to increase with a higher number of Caesarean sections. Therefore, for women with multiple CS, it is advisable to conduct transvaginal sonography (TVS) to evaluate scar thickness. In Kirkinen's review [13], 27% of patients with three or more previous Caesarean sections exhibited fenestration of the uterine scar. Additionally, Rozenberg et al. [14] discovered that lower uterine segment (LUS) thickness had an inverse correlation with the risk of rupture, and a thickness exceeding 3.5 mm was deemed protective against rupture. Another study by Samar et al. [15] concluded that there is no specific ideal cutoff value that can be universally recommended for clinical purposes, even though the association between LUS thickness and uterine scar defect is strong.

Numerous studies have underscored the significance of previous cesarean sections as a notable risk factor for placenta previa. The risk escalates from 0.26% with an unscarred uterus to 10% for women with four or more previous cesarean sections. [16] In a study by Getahun et al., the risk of placenta previa was 0.68% in comparison to vaginal delivery (0.3%). [17] However, our study observed that an increasing number of cesarean sections does not necessarily elevate the incidence of placenta previa. This aligns with the findings of Hershkovitz et al. [18] In our

study, we observed that the incidence of placenta accreta alongside placenta previa was 33%, and this increased to 50% with two previous Caesarean sections. A study noted that in the presence of placenta previa, the risk of placenta accreta was 3%, 11%, 40%, 61%, and 67% for the first, second, third, fourth, and fifth or greater repeat cesarean deliveries, respectively. [19] In cases with both placenta previa and placenta accreta, the average blood loss was 2500 ml, and both cases necessitated a cesarean hysterectomy. The average surgical duration was two and a half hours. These patients were managed in the ICU and required an average of 5 bags of blood transfusion.

Conclusion

Cesarean section is a widely performed surgical procedure in the field of obstetrics, and its rates have surged globally due to various factors in modern obstetrics. This increase has resulted in a larger population of patients with a history of previous cesarean sections, categorizing their subsequent pregnancies as high-risk. Consequently, decisions regarding the mode of delivery, whether a vaginal birth after a cesarean (VBAC) or an elective cesarean section, become pivotal. Moreover, repeat cesarean sections present specific challenges, elevating the surgical procedure's risk profile. Despite a significant reduction in mortality associated with Caesarean births owing to advancements in anesthesia and blood transfusion, there remains notable morbidity linked with this surgical procedure.

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