



## Vigilance Beyond the Scalpel: The Post-op Story

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### OPEN ACCESS

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Received: 26-01-2025

Accepted: 28-02-2025

Available online: 06-03-2025



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### ABSTRACT

This study investigates the incidence, causes, and preventive measures for postoperative complications in obstetrics and gynecological surgeries conducted at SMS Medical College, Jaipur, over six months, the research identifies that approximately 10% of patients develop surgical site complications, with a higher prevalence in emergency procedures. The study emphasizes the need for preoperative correction of anemia, glycemic control, and hypertension, along with the use of Monocryl sutures, to reduce complications. The findings highlight the importance of comprehensive preoperative assessments and behavioural modifications to improve surgical outcomes. This study is significant as it provides insights into the prevention of surgical site complications, a major concern in obstetrics and gynecology. By identifying key risk factors and effective preventive strategies, the study aims to enhance patient safety and reduce the incidence of postoperative infections.

**Keywords:** Surgical site complications, Obstetrics and Gynecology, Postoperative care, Monocryl sutures, Emergency procedures.

### INTRODUCTION

After postpartum haemorrhage, infection is the second most common cause of maternal mortality in obstetrics and gynaecology.<sup>[1]</sup> CDC (Centre for Disease Control) defines surgical site infection as “an infection related to operative procedure that occurs at or near surgical incision within 30 days of surgical procedure or within a year if a prosthetic is implanted”. Surgical site infections (SSIs) are mainly caused by exogenous and endogenous microbes that penetrate the surgical site during surgery (primary infection) or after the procedure (secondary infection).<sup>[2]</sup> As per CDC, in a gynaecological surgery, the surgical site infection rate in USA is 1.7% while in developing countries like India, SSI rates vary from 11% to 18%, which is ten times higher than the rate observed in developed countries.<sup>[3]</sup>

Development of surgical site infections is related to patient factors such as nutritional status, smoking, medical co-morbidities and factors associated to surgical procedure like length of preoperative stay, skin antisepsis, preoperative shaving, duration of operation, antimicrobial prophylaxis, inadequate sterilization, the surgical site, and surgical techniques.<sup>[4]</sup> We chose to explore this subject due to the limited body of literature on surgical site infections in the field of obstetrics and gynecology. Furthermore, various departments within healthcare institutions have developed individualized protocols for preoperative assessments, intraoperative techniques, and postoperative care strategies, with a specific focus on the management of surgical site infections.

## PURPOSE OF STUDY

The purpose of this study is to analyse the incidence and factors contributing to postoperative complications in obstetrics and gynecological surgeries, with a focus on identifying effective preventive measures.

## METHODOLOGY

This was a hospital-based prospective study conducted in the Department of Obstetrics and Gynecology (Mahila Chikitsalya), SMS Medical College, Jaipur. Data was collected from January 2023 to June 2023 from women who underwent various obstetric and gynecological surgical procedures. The cumulative sample size consisted of 4,948 participants.

### Inclusion Criteria

- Women who underwent obstetric and gynecological surgery in the Department of Obstetrics and Gynecology (Mahila Chikitsalya), SMS Hospital, Jaipur.
- Women who reported any complaints related to the surgical site within 30 days of the procedure.
- Women who provided written informed consent.

### Exclusion Criteria

- Women who had other serious medical complications and were transferred to SMS Hospital, Jaipur.

A comprehensive and detailed medical history was collected from the female participants included in the study. For those who underwent caesarean sections, complete history was documented, encompassing the surgical indication (whether elective or emergency), antenatal care history, and any additional pregnancy-related complications like premature rupture of membrane, Anaemia, Diabetes and others.

Upon admission, all patients underwent comprehensive physical examinations and diagnostic assessments as part of their preoperative preparation for abdominal surgical procedures, whether elective or emergency. Standard wound assessments were carried out on the 4th postoperative day, and additional assessments were conducted as clinically indicated. In cases presenting with wound discharge, samples were collected for microbiological culture and antimicrobial susceptibility testing. Postoperative wound infections were graded according to the Southampton wound grading system. Microbiological agents were identified, and their antibiotic susceptibility profiles were established. Treatment plans were formulated based on the results of culture and susceptibility testing, with continuous monitoring of patient's clinical progress and responses to antimicrobial therapy. Secondary wound closure procedures were undertaken when deemed medically necessary and were documented accordingly.

## RESULTS

In our study, a total of 4,948 female participants were included. Approximately 55% of the participants were Muslim, while the remaining were Hindu. The majority of participants were housewives, with education up to the 10th grade, and about 15% were illiterate. Approximately 56% of the patients resided in urban areas, while the remainder were from rural areas. Among the participants, about 52% were booked cases, and the remaining 48% were unbooked or referred from peripheral centers. The demographic profiles are summarized in Table 1.

**Table 1: Demographic Profile of study participants**

S. No	Variables		Number(n)	Percentage (%)
	Education	Illiterate	742	15
		Secondary School	3810	77
		Graduate and above	396	8
	Religion	Hindu	2226	45
		Muslim	2697	54.5
		Others	25	0.5
	Occupation	Housewife	4453	90
		Employed	495	10
	Residence	Rural	2177	44
		Urban	2771	56
	Antenatal care	Booked	2573	52
		Referred/Un-booked	2375	48

Among the 4,948 participants, approximately half underwent emergency procedures, while the other half underwent elective procedures. We observed that surgical site complications were more prevalent in the emergency procedures group, with a rate of 15%, compared to the elective procedures group, which had a significantly lower rate of 4.9%. Similarly, emergency procedures required more resuturing (approximately 29%) compared to elective procedures, where 7.5% of cases needed resuturing. The distribution of surgical site infections is detailed in Table 2.

**Table 2: Distribution of surgical site complications in Emergency and Elective surgical procedures**

S. No.	Operative Procedure	Total	Surgical site complications (No.)	Surgical site complications (%)	Resuturing
1.	Emergency LSCS/ Laparotomy	2506	379	15%	108(21.6%)
2.	Elective Procedure(LSCS/Abdominal Hysterectomy/Myomectomy/Recanalization)	2446	120	4.9%	12(10%)

The highest number of surgical site complications were observed in cases using Subcuticular sutures with Vicryl 1-0, accounting for 12.2% of cases. The highest rate of resuturing was noted in cases using Mattress sutures with Vicryl 1-0, with 30.2% of cases requiring resuturing. In this study, no resuturing was observed in any of the 598 cases using Subcuticular sutures with Monocryl 2-0. Table 3 illustrates the relationship between surgical site infections (SSIs), surgical techniques, and suture materials.

**Table 3: Distribution of surgical site complications in different type of surgical techniques along with type of suture material**

S. NO.	Type of Surgical Technique and Surgical Suture (For Skin)	Total Cases	Surgical Complications (No. / %)	Site Resuturing (No. /%)
1.	Mattress with Vicryl 1-0 Suture	3182	346(10.8%)	106(30.6%)
2.	Subcuticular with Vicryl 1-0 Suture	1168	143(12.2%)	14(9.7%)
3.	Subcuticular with Monocryl 2-0 Suture	598	10(1.7%)	0

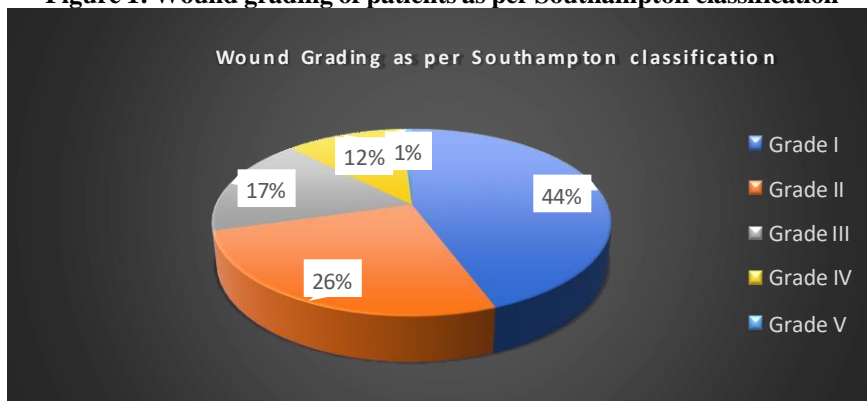
The highest number of surgical site complications were observed in patients who were diabetic, overweight, and anaemic, with approximately 25% of patients in each group experiencing complications. A summary of predisposing factors and surgical site complications is provided in Table 4.

**Table 4: Distribution of surgical site complications in relation to predisposing factors in patients undergoing obstetric and gynecological procedures**

S. No.	Predisposing Factors	Surgical Complications (No.)	Site Surgical Complications (%)
1.	Over Weight	129	25.8%
2.	Under Weight	72	14.4%
3.	Anaemia	130	26%
4.	Diabetes Mellitus	109	22%
5.	Hypertension	74	14.8%
6.	Others	56	11.2%

The observation revealed that the majority of patients with postoperative wound infections were classified as grade I and grade II according to the Southampton Wound Grading Classification, accounting for 70% of the cases.

**Figure 1: Wound grading of patients as per Southampton classification**



## DISCUSSION

With the advancement of surgical technology, increased expertise, and reduced hospital stays, there has been a decline in the occurrence of severe complications and fatalities. Nonetheless, notwithstanding all diligent efforts, surgery can still lead to issues affecting the prognosis.

A total of 4,948 participants were enrolled in our study after applying the inclusion and exclusion criteria. Surgical site infections were identified in 9.9% of these patients, a finding consistent with results from a study conducted at Maulana Azad Medical College, Delhi, in 2021.<sup>[5]</sup>

The incidence of surgical site complications was notably higher among emergency patients, accounting for 75% of the total participants who developed surgical site infections. Similarly, several authors have reported that emergency cesarean sections are strongly correlated with a higher risk of infections.<sup>[6,7,8]</sup> Incisional Surgical Site Infections (ISSIs) were observed to be four times more common in emergency surgeries compared to elective surgeries.<sup>[9]</sup>

Of the 499 patients experiencing postoperative complications, 352 (70%) in grades I and II were in stable condition, while those in grades III and IV and V required surgical interventions. Our findings are consistent with the existing literature. Gangane et al. observed that 92.5% of SSIs in their study were superficial.<sup>[10]</sup> Similarly, Bhartiya et al., in their study of 216 cesarean sections at a tertiary hospital in New Delhi, reported 88.4% of SSIs as superficial, 9.3% as deep, and 2.3% as organ/space SSIs.<sup>[11]</sup>

During the course of treatment, we administered daily wound care with povidone-iodine (Betadine) dressings and antibiotics, which proved to be an effective approach.<sup>[12]</sup> For patients requiring surgical intervention, we performed pus culture and sensitivity tests to identify the causative agent, followed by daily dressing changes prior to resuturing. During the resuturing process, we ensured proper approximation of the skin edges and carefully removed necrotic and unhealthy fibrogranulation tissue after achieving adequate hemostasis. Additionally, we observed that patients classified as grades IV and V according to the Southampton Wound Grading System had longer hospital stays.

Anemia (26%), obesity (25.8%), diabetes (22%), and high blood pressure posed the greatest risks for patients experiencing postoperative complications. Uncontrolled diabetes, in particular, can impede the wound healing process, leading to post-surgery complications. Alfonso-Sanchez et al. (2017) reported a strong positive relationship between an increased risk of SSIs and conditions such as anemia, hypertension, obesity, and diabetes mellitus.<sup>[13]</sup> More recently, Molla et al. (2019) found that patients with pregnancy-induced hypertension (PIH) were approximately five times more likely to develop SSIs compared to those without PIH.<sup>[14]</sup>

The highest rates of surgical site infections were observed with the use of Vicryl sutures. This phenomenon is attributed to the increased susceptibility of braided sutures to bacterial invasion. The gaps between the suture threads create a protective environment for bacteria, shielding them from phagocytosis by white blood cells and thereby facilitating bacterial proliferation. Vicryl 1-0 is commonly used in most cases due to its easy availability, cost-effectiveness, and widespread sourcing by public hospitals.

O. Sobodu et al. (2023) compared monofilament and multifilament sutures and suggested that multifilament sutures were more associated with postoperative complications. However, no significant differences were observed in the incidence of seroma, hematoma, or wound dehiscence between the monofilament and multifilament suture groups.<sup>[15, 16]</sup>

## CONCLUSION

Surgical site infections are pivotal in determining the ultimate outcomes of surgical procedures, as well as the morbidity and mortality of patients. This study highlights the importance of thorough preoperative assessments and the use of appropriate surgical techniques to minimize postoperative complications. By emphasizing patient-specific factors such as anemia, diabetes, and obesity, the research advocates for tailored preventive measures to improve surgical outcomes in obstetrics and gynecology. Commonly identified challenges include overcrowding within healthcare facilities, performing multiple operations simultaneously, limited capacity for postoperative isolation, and difficulties in strictly enforcing visitor restrictions within postoperative wards. It is imperative to conduct comprehensive preoperative assessments of patients, focusing on their hemoglobin levels, achieving optimal Glycaemic Control, and effectively managing hypertension before surgical procedures. Moreover, patients should be encouraged to embrace behavioural modifications, encompassing improvements in nutritional status, personal hygiene practices, and early post-operative ambulation. Psychological evidence underscores the potential benefits of offering motivational support to patients, which can contribute to improved surgical outcomes.

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