

A Retrospective Study on Postoperative Infection Incidence in Clean Facial Surgery Procedures

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Abstract:

Background: Facial surgeries are typically classified as clean procedures, with a generally low risk of postoperative infections. However, these infections, while rare, can cause significant complications, extend hospital stays, and increase healthcare costs. The study aimed to analyze the incidence, risk factors, and preventive strategies for postoperative infections following clean facial surgery.

Methods: This retrospective cohort study analyzed data from 135 patients who underwent various clean facial surgeries at Patna Medical College and Hospital between 2019-2022. The study focused on patient demographics, surgery type, duration, presence of comorbidities, and adherence to preoperative and postoperative care protocols.

Results: Out of 135 patients, 6 (4.4%) developed postoperative infections, primarily superficial incisional infections. Longer surgery duration (over 3 hours) and the presence of comorbidities were significantly associated with higher infection rates. There was no significant correlation between infection rates and age, gender, type of surgery, or adherence to preventive strategies like preoperative skin antisepsis.

Conclusion: This study underscores the importance of considering specific factors such as surgery duration and patient comorbidities in managing the risk of postoperative infections in clean facial surgery.

Recommendations: Surgeons should consider individual patient risks and emphasize careful postoperative monitoring. Implementing tailored strategies for patients with longer surgery durations or comorbidities may further reduce infection risks.

Keywords: Clean Facial Surgery, Postoperative Infection, Risk Factors, Surgical Outcomes.

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Introduction

Facial surgery, classified as a clean surgical procedure, is generally associated with a low risk of postoperative infections. However, the occurrence of such infections, although rare, can lead to significant morbidity, prolonged hospital stays, and increased healthcare costs. The skin of the face, being richly vascularized, typically heals well, but the unique microbiota of the skin and the proximity to the nasal and oral cavities, both of which harbor bacteria, pose specific challenges in infection prevention and control [1].

The incidence of postoperative infections following clean facial surgery varies in the literature, with reported rates ranging from less than 1% to over 3% [2]. These infections are often superficial but can occasionally progress to more serious complications, such as cellulitis or abscess formation. Factors influencing the risk of infection include the length and type of surgery, the patient's underlying health conditions, and the adherence to aseptic techniques [3].

Recent studies have focused on identifying the key factors that contribute to the risk of postoperative infections in facial surgery and developing strategies to mitigate this risk. These include preoperative skin preparation, intraoperative techniques, and postoperative wound care [4]. Understanding these factors is crucial for surgeons and healthcare providers to minimize the incidence of infections and improve patient outcomes.

The primary aim of this study is to comprehensively analyse the incidence, risk factors, and prevention strategies of postoperative infections following clean facial surgery.

Methodology

Study Design: This study was a retrospective cohort analysis.

Study Setting: The research was conducted at Patna Medical College and Hospital, between 2019-2022.

Participants: The study included 135 participants after meeting all the inclusion criteria.

Inclusion and Exclusion Criteria: Patients who underwent elective clean facial surgery, including cosmetic and reconstructive procedures, were included. Exclusion criteria involved emergency surgeries, surgeries with pre-existing infections, and patients with immunocompromising conditions.

Data Collection: Patient data were collected from medical records, encompassing age, gender, type of surgery, duration of surgery, use of prophylactic antibiotics, and any underlying health conditions. Postoperative follow-up data up to 30 days post-surgery were reviewed for signs of infection.

Infection Rate Analysis: The primary outcome was the incidence of postoperative infections. Infections were further categorized as superficial incisional, deep incisional, or organ/space infections.

Risk Factor Analysis: Statistical analysis was performed to identify potential risk factors for postoperative infections. Multivariate logistic regression was used to adjust for confounding variables.

Preventive Strategies Evaluation: The study also evaluated the effectiveness of various infection prevention strategies, such as preoperative skin antisepsis, intraoperative handling, and postoperative wound care. Compliance with these strategies and their association with infection rates were analyzed.

Statistical Analysis: Data were analysed using SPSS software. Descriptive statistics were used to summarize patient characteristics and infection rates. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: All patient data were anonymized to maintain confidentiality. The study only used data that was collected as part of routine patient care, and informed consent was waived due to the retrospective nature of the study.

Result

Table 1: Summary of Postoperative Infection Rates and Risk Factors in Clean Facial Surgery

Variable	Total Patients (N=135)	Patients with Infections (n=6)	Infection Rate (%)	P-Value
Gender				
- Female	78 (57.8%)	3 (50%)	3.8%	N.S.
- Male	57 (42.2%)	3 (50%)	5.3%	N.S.
Age Range	18-75 years	18-75 years		
- Mean Age	45.3 years	47.2 years		N.S.
Type of Surgery				
- Rhinoplasty	40 (29.6%)	2 (33.3%)	5%	N.S.
- Facelift	34 (25.2%)	1 (16.7%)	2.9%	N.S.
- Blepharoplasty	27 (20%)	1 (16.7%)	3.7%	N.S.
- Other Cosmetic Procedures	34 (25.2%)	2 (33.3%)	5.9%	N.S.
Surgery Duration				
- Less than 3 hours	95 (70.4%)	1 (16.7%)	1.1%	<0.05
- More than 3 hours	40 (29.6%)	5 (83.3%)	12.5%	<0.05
Comorbidities				
- Present	30 (22.2%)	5 (83.3%)	16.7%	<0.05
- Absent	105 (77.8%)	1 (16.7%)	1%	<0.05
Preventive Strategies				
- Preoperative Skin Antisepsis	128 (95%)	6 (100%)	4.7%	N.S.
- Postoperative Wound Care	132 (97.8%)	6 (100%)	4.5%	N.S.

N.S.= not significant; P-value < 0.05 is considered statistically significant.

In this retrospective cohort study, a total of 135 patients who underwent clean facial surgery were analyzed. The patient demographic consisted of 58% females and 42% males, with an age range of 18 to 75 years (mean age 45.3 years). The surgeries performed included rhinoplasty (30%), facelift (25%), blepharoplasty (20%), and other cosmetic procedures (25%).

Out of the 135 patients, postoperative infections were observed in 6 patients, resulting in an infection rate of 4.4%. Of these infections, 4 were classified as superficial incisional infections, and 2 as deep

incisional infections. No organ/space infections were reported. The infections were successfully managed with antibiotic therapy and local wound care, without any need for surgical intervention.

The analysis revealed that longer surgery duration (over 3 hours) and the presence of comorbidities (such as diabetes and smoking) were significantly associated with higher infection rates ($p < 0.05$). Age, gender, and the type of facial surgery did not show a statistically significant correlation with the incidence of postoperative infections.

Among the patients, 95% received preoperative skin antisepsis, and adherence to intraoperative aseptic techniques was noted in all cases. Postoperative wound care instructions were followed by 98% of patients. The study found no significant association between these preventive strategies and the reduced incidence of postoperative infections, possibly due to the already low infection rate.

Chi-square tests and t-tests were used for categorical and continuous variables, respectively. The statistical analysis supported the significance of surgery duration and comorbidities as risk factors for postoperative infections.

Discussion

In a retrospective cohort study of 135 patients who underwent various clean facial surgeries, a postoperative infection rate of 4.4% was observed, predominantly comprising superficial incisional infections. The study identified longer surgery duration (over 3 hours) and the presence of comorbidities like diabetes and smoking as significant risk factors for increased infection rates, while age, gender, and surgery type did not show a statistically significant correlation with infection incidence. Despite high adherence to preoperative and postoperative care protocols, including skin antisepsis and wound care, no significant correlation was found between these preventive strategies and the low incidence of postoperative infections.

In comparing the results of the study, several relevant studies offer valuable insights. A prospective study of 351 patients undergoing clean elective facial surgery highlighted significant risk factors for wound infection, reporting higher infection rates in specific facial areas [5]. Another retrospective study on orthognathic surgery involving 512 patients noted an 8% post-operative infection rate, examining factors like smoking and infection site [6]. A study on frontofacial surgery showed a notable reduction in infection rates from 41.7% to 13.3% after implementing a specific perioperative protocol [7]. Additionally, an article on surgical site infections in cosmetic surgery provides a broader perspective on infection rates across various cosmetic procedures [8]. These studies collectively contribute to a deeper understanding of infection rates and risk factors in facial surgeries.

Conclusion

This study highlights the importance of considering patient-specific factors, such as comorbidities and surgery duration, in managing the risk of postoperative infections in clean facial surgery. While adherence to preventive strategies is crucial, individualized patient care plays a key role in further reducing the risk of infections.

Limitations: The study's retrospective design and the potential for missing data were acknowledged as limitations. Additionally, the findings from a single center might not be generalizable to other settings.

Recommendations: Surgeons should consider individual patient risks and emphasize careful postoperative monitoring. Implementing tailored strategies for patients with longer surgery durations or comorbidities may further reduce infection risks.

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