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**Original Research Article**

# Assessing intraoperative and postoperative complications associated with tonsillectomy in children: institutional study

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## ABSTRACT

**Background:** Tonsillectomy, a common procedure in children aged 2 to 18, aims to improve their well-being and minimize tonsil-related complications. Comprehensive risk assessment pre and post-surgery is crucial. This study analyzed numerous pediatric tonsillectomy cases to enhance our understanding of its safety and identify associated risk factors.
**Methods:** A 24-month retrospective cohort study focused on 100 children (aged 2-18) who underwent unilateral or bilateral tonsillectomy at Sharda Hospital's ENT Department. Factors like age, gender, and complications during and up to 7 days post-surgery were analyzed.
**Results:** Gender and age were assessed for their correlation with complications in tonsillectomy patients. No significant correlation was found between gender and intraoperative or postoperative complications (p-values: 0.679584 and 0.822866). The low phi coefficient (1.501E-22) supports this, aligning with the infrequent occurrence of intraoperative complications. Age also showed no significant association with complications (p=0.77216). Postoperatively, 49.11% experienced no issues within 7 days, while common problems included pain/discomfort (31.25%), nausea/vomiting (9.82%), and secondary hemorrhage (5.36%).
**Conclusions:** This 24-month study on 100 pediatric tonsillectomy cases revealed no significant correlation between gender/age and complications. Postoperatively, the most prevalent issues included pain/discomfort, nausea/vomiting, and secondary hemorrhage, affecting nearly half of the patients.

**Keywords:** Tonsillectomy, Pediatric, Complications, Risk assessment, Gender, Age

## INTRODUCTION

A tonsillectomy refers to the surgical removal of the tonsil, and when coupled with adenoidectomy, it entails the entire extraction of the tonsil, including its capsule. This is accomplished by carefully dissecting the space surrounding the tonsil capsule from the muscular wall.[1] This procedure is commonly executed in children to treat a variety of conditions related to the tonsils, such as persistent throat infections and sleep-related breathing disorders. While adenotonsillectomy is typically perceived as a straightforward surgery with minimal risk of respiratory complications, certain predispositions can increase these risks. Specifically, children under 3, and those with conditions like airway abnormalities, Down syndrome, blood clotting irregularities, neuromuscular disorders, and pronounced obstructive sleep apnea are at higher risk.[2] Other potential complications comprise bleeding, pain after the operation, and postoperative nausea and vomiting. In an RCT led by Borgström et al 79 children between 2-6 years suffering from OSA were studied.[2] They aimed to determine the efficacy of

Adenotonsillectomy (ATE) versus Intracapsular Adenotonsillectomy (ATT). Prior studies hinted at ATT causing fewer post-surgery complications like pain and bleeding. This investigation revealed that children subjected to ATT faced much less pain post-surgery than those who went through ATE. Also, post-surgery bleeding was rarer in the ATT group, with two cases found in the ATE group.

Hashmi et al, RCT at the ENT Department of Combined Military Hospital, Kharian, focused on assessing the impact of a preoperative dexamethasone dosage on postoperative symptoms in children having tonsillectomies.[3] They compared two sets of 50 children, aged 4 to 12, one receiving dexamethasone and the other a saline solution pre-surgery. Their findings underscored that children given dexamethasone encountered less vomiting post-surgery and had quicker first oral intakes. Additionally, they reported diminished throat pain after the operation. The conclusion was that dexamethasone before surgery effectively minimizes postoperative issues in children undergoing this particular surgery. Ericsson et al, compared traditional tonsillectomy (TE) and intracapsular tonsillectomy using radiofrequency surgery in a group of 67 kids.[4] The latter method led to faster recovery, reduced pain, and had similar benefits for snoring and infections as TE. Both methods enhanced sleep patterns, behavior, and overall life quality. The research indicates that using radiofrequency surgery for TT might be a more suitable choice for pediatric tonsil treatments.

Carr et al set out to examine the outcomes of children getting outpatient narcotic prescriptions post-tonsillectomy versus those who didn't.[5] They assessed outcomes over 14 days post-surgery, like dehydration, ED visits, and readmissions. From their sample of 294,795 patients, 60.9% were prescribed narcotics. Interestingly, while the narcotic group witnessed a marginal increase in bleeding instances and ED visits, they had fewer readmissions. The study implied that the pros and cons of post-tonsillectomy narcotics are quite minimal. Lastly, a study spearheaded by Klemetti et al[9], explored whether preoperative counselling and enhancing fluid intake could diminish postoperative complications following pediatric tonsillectomies. Families were randomly assigned to receive either counselling or standard instructions. Results showed that while both groups experienced increased pain and nausea post-surgery, those who received counselling seemed better prepared to cope with postoperative symptoms. It became evident that pre-surgery counselling could potentially aid in reducing pain and bolstering the resilience of children to post-surgery symptoms.

### *Aim and objectives*

Aim was to assess the intraoperative and postoperative complications associated with tonsillectomy in children aged 2-18 years. Objectives were; to assess the percentage of patients who presented with intraoperative bleeding, postoperative secondary, haemorrhage, nausea/ vomiting, infections, dehydration, edema, and taste changes after tonsillectomy, to assess readmission rates post-tonsillectomy and to correlate factors like age, and sex with intra and postoperative complications.

## METHODS

An analytical review of past cases was undertaken within the ENT Department of Sharda Hospital to gauge the outcomes of tonsillectomies in pediatric patients. The research evaluated children who had the procedure and experienced various complications both during and up to 7 days after the surgery. The ethical approval was not required by the Sharda Hospital as this was a retrospective study and the data was anonymous. Historical data was sourced from patient medical files, and the analysis considered pediatric patients aged between 2 to 18 years who underwent a tonsillectomy.

### *Study design, location duration and population*

Retrospective cohort study was conducted at department of otolaryngology, Sharda hospital, school of medical sciences & research (SMSR), Greater Noida for a duration of 24 months. Children (2-18 years) who presented with chronic tonsillitis and underwent tonsillectomy excluding children with already existing medical conditions that could confound results were taken as study population.

### *Sample size*

A sample of 100 Children who presented with chronic tonsillitis and underwent Tonsillectomy, unilateral or bilateral were selected.

### *Statistical method and tool used for analysis*

The p testing and Chi (squared) testing with 95 percent confidence on Excel were selected as methods and tools for statistical analysis.

## RESULTS

The p value between Gender and intraoperative complications is 0.679584, since the value is much greater than 0.05, we don't have enough evidence to correlate Gender with Intraoperative complications which may arise. The p value between Gender and postoperative complications is 0.822866, Since The p value is much greater than 0.05, we don't have enough evidence to correlate Gender with postoperative complications that may arise. The phi coefficient is 1.501E-22, A low value of phi represents no correlation between intra-op and post-op complications as expected from the low count of intra-op complications. The p value of 0.77216, an Extremely high p value indicates no clear correlation between age and complications.

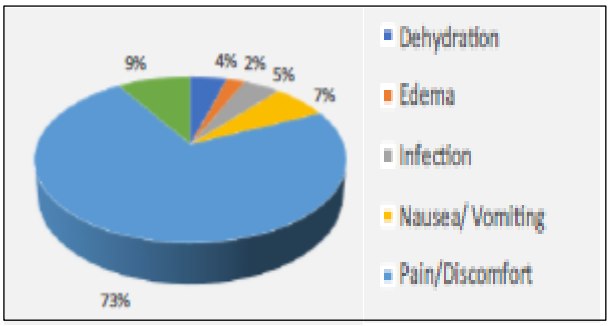


**Figure 1: Post-operative complications among patients.**

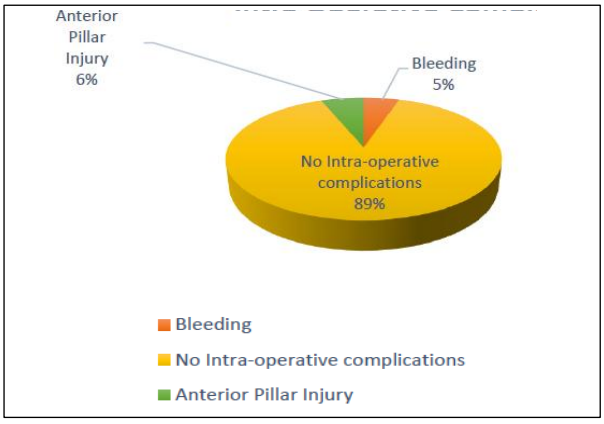


**Figure 2: Intra-operative complications by sex.**

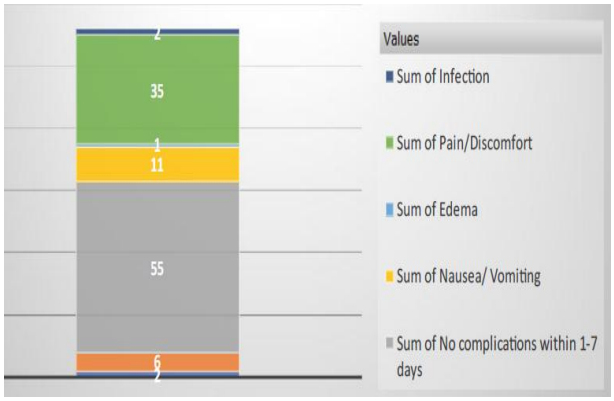


**Figure 3: Distribution based on complications.**

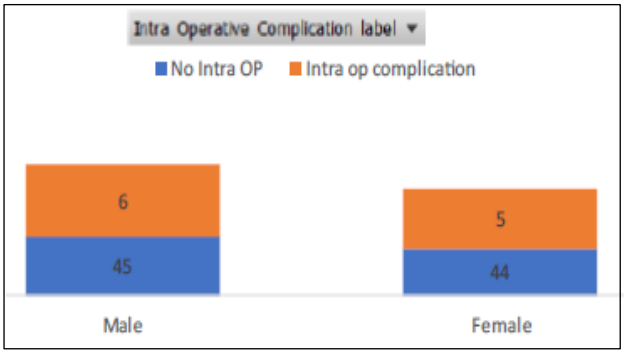


**Figure 4: Gender verses intra-op complications.**

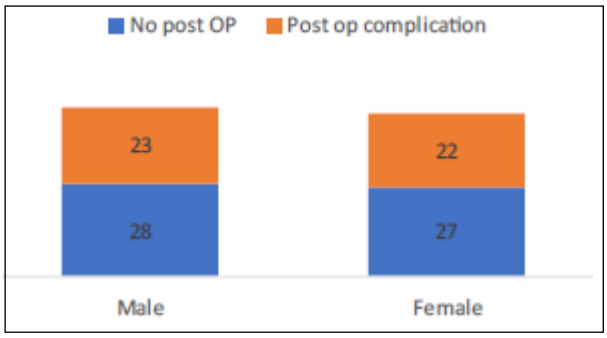


**Figure 5: Gender verses post-op complications.**

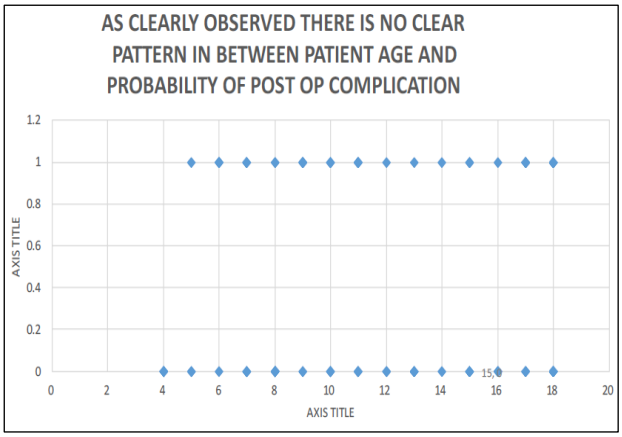


**Figure 6: Relationship between patient age and probability of post-op complications.**

## DISCUSSION

Postoperatively, it was seen that out of 100 patients who underwent tonsillectomy, no complications were seen within 7 days in 55 cases (49.11%), pain or discomfort was seen in 35 cases (31.25%), nausea or vomiting was seen in 11 cases (9.82%), secondary haemorrhage was seen in 6 cases (5.36%), infection was seen in 2 cases (1.79%), dehydration was seen in 2 cases (1.79%), edema was seen in 1 case (0.89%). No intraoperative complications were seen in 95 cases (95%) intraoperative bleeding was seen in 3 cases (3%). In Borgström et al study, involving 79 children, aged 2-6 years, the ATE group had a 5% occurrence of postoperative hemorrhage, with one primary case (2.5%) needing a return to surgery within 24 hours and another secondary case occurring 7 days after surgery. Meanwhile, no postoperative bleeding was observed in the ATT group.[2]

In comparison to another study by Chang DT et al a total of 1583 patients were involved in comparing complications between IT (intracapsular tonsillectomy) and TT (total tonsillectomy) groups. The overall complication rates were found to be similar in both groups, with IT at 2.6% and TT at 3.8%. However, the specific complications differed significantly. IT had mainly tonsillar regrowth at 2.2%, while TT had oropharyngeal bleeding at 2.9% and dehydration at

0.8%.[3-14]

### *Limitations*

The study has some limitations, the young age of the children included. There is no validated tool for assessing pain in children under four years old, which weakens the study. Additionally, children's self-report of pain is prone to bias. The amount of bleeding and severity of pain is not taken into consideration, and the study only includes cases presented to the ENT OPD.

## CONCLUSION

This study on complications associated with pediatric tonsillectomy provides crucial insights to improve patient care. The analysis did not find significant correlations between gender, age, and complications, further research with larger sample sizes is required to explore these relationships comprehensively. Previous studies have been limited, with only a handful including children as young as 2 years old. It offers a detailed overview of potential complications and areas where surgical outcomes could be enhanced. The research also highlights the importance of conducting larger prospective studies to establish a conclusive link between patient demographics and post-surgical complications. This groundwork will facilitate the development of improved surgical techniques and targeted interventions to enhance patient outcomes.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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