

Original Research Article

A study on post-tonsillectomy immediate and delayed complications

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Abstract

Background: Adenoidectomy is often correlated with additional surgical procedures, including tonsillectomy, or placement of tympanostomy tubes, and most tonsillectomies are usually performed in conjunction with adenoidectomies.

Aim of the study: To evaluate the incidence of immediate and delayed complications following adenotonsillectomy.

Materials and methods: This observational study was conducted in the Department of Otorhinolaryngology, Govt. Kilpauk Medical College & Hospital during the period January 2016 to December 2016. 100 children between 5 and 15 years who had a conventional tonsillectomy and 50 children who had coblation tonsillectomy. Intra-operative and postoperative complications were observed and compared between the two groups.

Results: Common preoperative symptoms were odynophagia (96.0%), throat pain (95.3%) and difficult swallowing (89.3%). Among the intra-operative anesthetic complications, compression of the endotracheal tube was observed in 19(12.7%), accidental extubation in 10 (6.7%), and dislodging of a loose tooth in 9 (6.0%) patients. Regarding intra-operative surgical complications, primary hemorrhage was seen in 43 (28.7%), edema uvula in 39 (26.0%), and pillar injury in 33 (22.0%) patients. The commonest postoperative complication was oropharyngeal pain (18.7%) followed by reactionary hemorrhage (14.0%) and nausea, vomiting (13.3%). Immediate complications like primary hemorrhage (p-value 0.0001) and uvula edema (p-value 0.018) were significantly associated with the conventional tonsillectomy group while delayed complications like secondary hemorrhage (p-value 0.011) and referred otalgia (pvalue 0.0001) were with coblation tonsillectomy group.

Conclusions: Compression of the endotracheal tube and primary hemorrhage were the commonest intra-operative anesthetic and surgical complications respectively. Immediate complications were significantly associated with the conventional tonsillectomy group while delayed complications were with coblation tonsillectomies.

Key words

Conventional Tonsillectomy, Coblation Tonsillectomy, Primary hemorrhage, Secondary Haemorrhage.

Introduction

Adenoidectomy is often correlated with additional surgical procedures, including tonsillectomy, or placement of tympanostomy tubes, and most tonsillectomies are usually performed in conjunction with adenoidectomies [1]. Despite the vast body of adenoid-focused research, debate remains concerning the indications for adenoidectomy [2]. Primary and secondary hemorrhages are major complications for all patients undergoing adenoidectomy and adenotonsillectomy. The first complication is immediate bleeding, which arises during the procedure. This is considered rare as it occurs in only 0.4% of the cases. Major bleeding requiring operating room transfer occurs in 4 out of 1000 patients [3]. Significant delayed bleeding is observed in roughly 2% of patients undergoing tonsillectomy, but it is not generally observed with adenoidectomy [4]. Dehydration and refractory emesis are complications that can be alarming in pediatric patients because of their reduced hemodynamic reserves [5]. Major complications include velopharyngeal insufficiency, torticollis, nasopharyngeal stenosis, an atlantoaxial subluxation (Grisel's syndrome), mandibular condyle fracture, and Eustachian tube injury [6]. In recent years, obstructive breathing has replaced infection as the most common indication for adenotonsillectomy among pediatric patients [7]. With strict adherence to current academic recommendations, a significant portion of patients undergoing adenotonsillectomy because of an obstructive disease may be excluded from outpatient procedural consideration [8]. Changes in surgical techniques over the past years have included the widespread transition from adenoid curette use to Punch and Magill forceps and electrocautery Bovie adenoidectomy [9]. Newer techniques are well documented in older patients, and several articles have confirmed that these newer techniques were associated with better

outcomes, such as decreased incidences of primary hemorrhage and shorter recovery time [10].

Materials and methods

This observational study was conducted in the Department of Otorhinolaryngology, Madha Medical College and Research Institute in December 2020. 100 children between 5 and 15 years who had a conventional tonsillectomy and 50 children who had coblation tonsillectomy. Intraoperative and postoperative complications were observed and compared between the two groups.

Inclusion criteria: Age group: 5–14 Years, Sex: Male and Female, Patients diagnosed with acute recurrent tonsillitis, Peritonsillitis, Streptococcal carriers, OSA, Conductive hearing loss due to secretory otitis media, Diphtheria carriers.

Exclusion criteria: Patients with age <5 years and >14 years, Acute tonsillitis, Blood dyscrasias, Palatal abnormalities like submucous cleft palate, Down's syndrome.

Post nasal examination: Post nasal examination can be done by using St. Clair Thompson's post nasal mirror. This examination can be augmented using a 2.7 mm internal diameter 0° nasal endoscope. The size of the adenoid can be graded using Clemens grading. X-ray neck lateral view of the soft tissues will usually reveal the degree of adenoid hypertrophy. X-ray cervical spine in Down's syndrome to check C₁C₂ subluxation. Following investigations are done and the patient was assessed before surgery.

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Frequencies and percentages were generated for categorical variables. Associations between categorical

variables were tested using either Pearson's, chi-square, or Fisher's exact test. All tests performed were two-tailed and probability values (*P*) less than 5% were considered statistically significant.

Results

In the Conventional Tonsillectomy group, 43(43.0%) were males and 57(57.0%) were females. In the same manner, in the Coblation Tonsillectomy group, 21 (42.0%) were males and 29 (58.0%) were females and so both groups are comparable as evident by p-value >0.05. The minimum age of the study population is from 5 years to a maximum of 15 years. The mean age was 9.42 years with a standard deviation of 2.67 years. The mean age (\pm standard deviation) in the

Conventional Tonsillectomy group was 9.67 (\pm 2.69) years while the mean age (\pm standard deviation) in the Coblation Tonsillectomy group as 8.92 (\pm 2.58) years. This difference was not significant as the p-value was > 0.05. So both the groups are comparable by age too.

Regarding the preoperative symptoms of the study population, Odynophagia as the most common symptom as seen in 144 (96.0%) patients followed by Throat pain in 143 (95.3%) and Difficulty in swallowing in 134(89.3%) patients. Then Mouth breathing was seen in 85(56.7%) of the patients and Snoring was seen in only 35(23.3%) patients (**Table – 1**).

Table – 1: Preoperative symptoms.

	Number	Percentage
Throat Pain	143	95.3
Odynophagia	144	96.0
Difficulty in Swallowing	134	89.3
Mouth Breathing	85	56.7
Snoring	35	23.3

Table – 2: Intra-operative anesthetic complications.

	Number	Percentage
Dislodging of Loose Tooth	9	6.0
Dislodging of Temporo-Mandibular joint	0	0.0
Accidental Extubation	10	6.7
Kinking of ET Tube	19	12.7

Table – 3: Intra-operative surgical complications.

	Number	Percentage
Primary Hemorrhage	43	28.7
Edema Uvula	39	26.0
Pillar Injury	33	22.0

Among the Intraoperative Anesthetic complications in the study populations, Compression of ET tube was the commonest complication as seen in 19 (12.7%) patients followed by Accidental Extubation seen in 10(6.7%) patients and Dislodging of Loose Tooth seen in 9 (6.0%) patients. None of the patients had any Dislocation of the TemporoMandibular joint (**Table – 2**).

Regarding Intraoperative Surgical complications, Primary Hemorrhage was seen in a maximum of as many as 43 (28.7%) patients followed by Edema Uvula seen in 39 (26.0%) and Pillar Injury seen in 33 (22.0%) patients (**Table – 3**).

Oropharyngeal Pain was the commonest Postoperative Complication in the study population as seen in 28(18.7%) followed by

Primary Hemorrhage seen in 21 (14.0%) patients and Nausea, Vomiting seen in 20(13.3%) patients. Referred Otolgia and Secondary Hemorrhage were observed in 12 (8.0%) patients respectively each and Loss of Taste was seen in 6(4.0%) of the patients (**Table – 4**).

Table – 4: Post-operative complications.

	Number	Percentage
Nausea, Vomiting	20	13.3
Loss of Taste	6	4.0
Reactionary Hemorrhage	21	14.0
Oropharyngeal Pain	28	18.7
Referred Otolgia	12	8.0
Secondary Hemorrhage	12	8.0

Table – 5: Post-operative other rare complications.

	Number	Percentage
Dehydration	9	6.0
Pneumonia Atelectasis	3	2.0
Velopharyngeal Insufficiency	0	0.0
Nasopharyngeal Stenosis	0	0.0

Table – 6: Comparison of preoperative symptoms.

Symptoms		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi ² Value	p-Value
Throat Pain	Yes	143	96(96.0%)	47(94.0%)	0.300	0.584
	No	7	4(4.0%)	3(6.0%)		
Odynophagia	Yes	144	94(94.0%)	50(100%)	3.125	0.077
	No	6	6(6.0%)	0(0.0%)		
Difficulty in Swallowing	Yes	134	89(89.0%)	45(90.0%)	0.035	0.852
	No	16	11(11.0%)	5(10.0%)		
Mouth Breathing	Yes	85	53(53.0%)	32(64.0%)	1.643	0.200
	No	65	47(47.0%)	18(36.0%)		
Snoring	Yes	35	24(24.0%)	11(22.0%)	0.075	0.785
	No	115	76(76.0%)	39(78.0%)		

Regarding Post-operative other rare complications, Dehydration was observed in 9 (6.0%) and Pneumonia Atelectasis was seen in 3 (2.0%) of the patients. Velopharyngeal Insufficiency and Nasopharyngeal Stenosis werenot seen in any of the patients (**Table – 5**).

Table - 6 shows the Comparison of Preoperative symptoms between both Conventional Tonsillectomy and Coblation Tonsillectomy groups of patients. Throat Pain was seen in 96(96.0%) of the Conventional tonsillectomy patients and 47(94.0%) of the Coblation

Tonsillectomy patients. This difference was not statistically significant as seen in p-value >0.05. In the same way, Odynophagia was seen in 94(94.0%) of the Conventional Tonsillectomy patients and all the 50 (100%) of the Coblation Tonsillectomy patients. But this difference is not statistically significant as seen in the p-value was 0.077. Regarding Difficulty in Swallowing, it was seen in 89 (89.0%) of the Conventional tonsillectomy patients and 45(90.0%) of the Coblation Tonsillectomy patients, and this difference is not statistically significant (p-value– 0.852). Mouth Breathing was seen in 53(53.0%)

of the Conventional Tonsillectomy patients and 32 (64.0%) of the Coblation Tonsillectomy patients. But this difference is not statistically significant as the p-value is 0.200. Snoring was observed in 24(24.0%) of the Conventional

Tonsillectomy patients and 11 (22.0%) of the Coblation Tonsillectomy patients and there is no statistically significant difference between the groups as the p-value was only 0.785 (**Table – 6**).

Table – 7: Comparison of intra-operative anesthetic complications.

Complications		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi ² Value	p-Value
Dislodging of Loose Tooth	Yes	9	7(7.0%)	2(4.0%)	0.532	0.466
	No	141	93(93.0%)	48(96.0%)		
Accidental Extubation	Yes	10	6(6.0%)	4(8.0%)	0.214	0.642
	No	140	94(94.0%)	46(92.0%)		
Kinking of ET Tube	Yes	19	15(15.0%)	4(8.0%)	1.476	0.224
	No	131	85(85.0%)	46(92.0%)		

Table – 8: Comparison of intraoperative surgical complications.

Complications		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi ² Value	p-Value
Primary Hemorrhage	Yes	43	40(40.0%)	3(6.0%)	18.844	0.0001
	No	107	60(60.0%)	47(94.0%)		
Edema Uvula	Yes	39	32(32.0%)	7(14.0%)	5.613	0.018
	No	111	68(68.0%)	43(86.0%)		
Pillar Injury	Yes	33	19(19.0%)	14(28.0%)	1.573	0.210
	No	117	81(81.0%)	36(72.0%)		

Table – 7 shows the comparison of Intraoperative Anesthetic Complications between the two groups. Dislodging of Loose Tooth was seen in 7 (7.0%) of the Conventional Tonsillectomy patients but it was observed in only 2 (4.0%) of the Coblation Tonsillectomy patients but this difference as not statistically significant (p-value=0.466). Accidental Extubation was seen in 6(6.0%) of the Conventional Tonsillectomy patients and it was seen only 4(8.0%) of the Coblation Tonsillectomy patients and this difference is not statistically significant (p-value=0.642). Compression of ET Tube was seen in 15 (15.0%) of the Conventional Tonsillectomy patients but it was seen in only 4 (8.0%) of the Coblation Tonsillectomy patients but this difference was not statistically significant (p-value=0.224) as per **Table - 7**.

Primary Hemorrhage which is the commonest Intra Operative Surgical Complications was observed in 40 (40.0%) of the Conventional tonsillectomy patients while it was seen in only 3 (6.0%) of the Coblation Tonsillectomy patients. This is the highly statistically significant difference as seen in p-value 0.0001. In the same way, Edema Uvula was observed in 32 (32.0%) of the Conventional tonsillectomy patients while it was seen in only 7 (14.0%) of the Coblation Tonsillectomy patients. This difference was also statistically significant as seen in p-value 0.018. Pillar Injury was observed in 19 (19.0%) of the Conventional tonsillectomy patients and 14 (28.0%) of the Coblation Tonsillectomy patients but this difference is not statistically significant (p-value=0.210) as per **Table - 8**.

Discussion

Tonsillectomy with or without adenoidectomy is the most commonly performed pediatric

otorhinolaryngological procedure. A variety of techniques and approaches for adenotonsillectomy have been tested and tried over the years. Yet post-operative complications were mostly noted in terms of oropharyngeal pain, bleeding, and referred otalgia [11]. Viral infections that can involve the tonsils include influenza, the common cold, herpangina, infectious mononucleosis, and, less commonly, herpes zoster, measles, and acute HIV infection [12]. Viral tonsillitis can be distinguished clinically from bacterial tonsillitis through the presence, not only of odynophagia and tonsillar swelling, but also of symptoms and signs typically absent in bacterial tonsillitis, such as rhinorrhea, coughing, a mucosal efflorescence, or generalized lymphadenopathy [13]. Isolated cervical lymphadenopathy, however, is a common finding in acute bacterial tonsillitis. Viral tonsillitis without airway obstruction is not an indication for surgery. There is only weak evidence to support the hypothesis that tonsillectomy can lower the frequency of viral pharyngitis or improve the clinical course of mononucleosis [14]. Breathing disturbances during sleep that arise because of adenotonsillar hyperplasia are the most important and most common indication for (adeno-) tonsillectomy in childhood. Adenotonsillar hyperplasia in children is caused by a normal response of the lymphatic system and is not a pathological condition in itself [15]. If the hyperplasia is only mild, there may be no symptoms at all, or else symptoms may arise only in certain situations, e.g., in the presence of a concomitant upper respiratory infection. On the other hand, severe adenotonsillar hyperplasia—particularly when combined with other risk factors such as obesity or craniofacial malformations—may produce very marked symptoms, including the full clinical picture of sleep apnea with nocturnal snoring and respiratory pauses [16]. In our study, postoperative reactionary hemorrhage in adenoidectomy occurred in 2.43% (20/824) of the patients, which is remarkably low. As for adenotonsillectomy, primary hemorrhage was observed in 4.1% (14/344) [17]. These results were similar to those of Udayan K, et al. in that

adenotonsillectomy was associated with a higher prevalence of bleeding than adenoidectomy alone. Other risk factors that appeared to increase the risk of bleeding (intraoperative primary hemorrhage) were the history of abnormal type C tympanogram, patients with lower-grade (grade 2) tonsils, and those with URTIs [18]. Wang JH, et al. noted that adenoidal regrowth occurred more often in children who were treated postoperatively with antibiotics, and in postoperative settings, an association was noted between increased antibiotic consumption and adenoidal regrowth [19]. These results stand in contrast to those found in our study, where 57% of the patients were treated with multiple antibiotics preoperatively and no patients experienced regrowth or needed revision surgery. Notably, we reviewed the incidence of minor postoperative complications including malodor, snoring, and fever that did not exceed 38.5 °C. These data have not been reported previously [20].

Conclusion

The invention of equipment like Coblation, mono/ bipolar electrocautery, and Laser has made the outlook better for Adenotonsillectomies concerning intra-operative and postoperative complications. Primary hemorrhage and uvula edema are found to be the statistically significant complications in Conventional tonsillectomy. Secondary hemorrhage and referred otalgia, are the statistically highly significant complications in Coblation tonsillectomies. Emphasis must be placed on explaining the risk of post-operative hemorrhage to the patient, teaching the correct technique like checking the power settings before surgery, and the potential hazards of the Coblation technique. Every complication should be recorded and analyzed regularly to improve the patient's safety. Yet it can be concluded that the use of Coblation tonsillectomy is equivalent to the use of Conventional technique in the current scenario concerning intra and post-operative complications.

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