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## Adenoid and Tonsil Surgeries in Sokoto: A Nine-year Review

**Stanley Baba Amutta**

Senior Lecturer/ENT Surgeon, ENT Department, Usmanu Danfodiyo University/Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

**Mohammed Abdullahi**

Senior Lecturer/ENT Surgeon, ENT Department, Usmanu Danfodiyo University/Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

### **Abstract:**

*Background: Adenoidectomy, Tonsillectomy or both are common surgical procedures performed by Otorhinolaryngologist worldwide. The indications for the surgeries are numerous including recurrent infection and obstruction of the upper airways.*

*Aims and objectives: Audit intent and comparison with similar work.*

*Methodology: This was a 9-year retrospective study of the patients who had adenoidectomy, adenotonsillectomy and tonsillectomy from January 2007 to December 2015 at the Ear, nose, and throat (ENT) department of the Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria. The case notes of the patients were retrieved from the hospital medical record department, and the biodata, indications, and types of adenoid and tonsil surgeries, surgical techniques, complications, and outcome of the surgeries were extracted. Data obtained was analysed by descriptive statistic using IBM.SPSS version 21.0*

*Results: A total of 123 patients were seen; comprising 88 (71.5%) children, 35 (28.5%) adults; male 51 (41.5%) and female 72 (58.5%) with a male to female ratio of 1:1.4 had adenoid and tonsil surgeries. The age ranged from six months to 50 years with the mean age of 11.9 years. Adenoidectomy alone was exclusively in children of 1-5-year age group, and nasal obstruction was the predominant indication. Similarly, adenotonsillectomy was also confined to children who were age  $\leq 10$  years, and OSA was the most frequent indication. Recurrent tonsillitis was the dominant indication for tonsillectomy alone among the children and the adults. Curettage adenoidectomy and cold steel tonsillectomy were the techniques employed, complications encountered were throat pain, convulsion and rhinolalia aperta.*

### *Conclusion*

*Overall, the outcome was good. Therefore, the old traditional, cheap, effective curettage adenoidectomy and cold steel dissection tonsillectomy still have an important role in resource challenge developing country like Nigeria. Pre-operative transcranial Doppler ultrasonography in children with sickle cell anaemia may help in identifying those at risk of developing CVA and institute preventive measures.*

**Keywords:** adenoidectomy, tonsillectomy, techniques, complications, Sokoto

### **1. Introduction**

Adenoidectomy, tonsillectomy or adenotonsillectomy are common surgical procedures performed by otorhinolaryngologists all over the world (Olusesi et al., 2013, Nguyen et al., 2004, Discolo et al., 2001 and Ahmed et al., 2014). The indications for these surgical operations are many and often controversial (Baugh et al., 2011). The adenoid, tonsil or both are surgically removed for recurrent tonsillitis/adenoiditis, persistent or recurrent nasal obstruction predisposing to otitis media and rhinosinusitis, which are resistant to appropriate antibiotic therapy (Baugh et al., 2011). Moreover, socially disruptive snoring and obstructive sleep apnoea are acceptable indications for adenotonsillectomy. Peritonsillar abscess is an indication for quinsy tonsillectomy or interval tonsillectomy where incision and drainage are the initial treatment for complete resolution of the abscess before tonsillectomy (Johnson et al., 2003). Furthermore, tonsillectomy is required in unilateral tonsillomegaly for histopathological studies of tonsillar biopsy to exclude malignancy especially in the adult (Hoddeson et al., 2009). Also, tonsillectomy may be a component of other procedures such as uvulopalatopharyngoplasty or provide access to other structures such as avulsion of symptomatic, elongated styloid process. Tonsillectomy is also indicated when the tonsils become a focus for distant infection, e.g., glomerulonephritis (Stelter, 2014). Over the years, there has been a revolution in modernizing the instruments and techniques of adenotonsillectomy to lower the complications and get optimal results. The traditional, modern cold steel blunt dissection technique of tonsillectomy is still popular among many otolaryngologists (Sharma et al., 2016). Monopolar electrocautery, coblation tonsillectomy, peak plasma blade, harmonic

scalpel tonsillectomy and powered intracapsular tonsillectomy using microdebrider in patients with obstructive sleep-disordered breathing are some of the most recent techniques of tonsillectomy (Sharma et al., 2016).

Curette adenoidectomy emerged in the early stage of the description of adenoidectomy. This technique is the most common widespread surgery for the removal of the adenoid (Discolo et al., 2001 and Sharma et al., 2016). Recent advances in adenoidectomy techniques lead to the introduction of electrocautery ablation, coblation, CO<sub>2</sub> laser adenoidectomy and powered instrumentation using microdebrider and functional endoscopic sinus surgery instruments (Discolo et al., 2001).

The aim of this study is for audit intent and comparison of the findings with similar studies.

## 2. Materials and Methods

This was a retrospective study of patients who had adenoidectomy, tonsillectomy or adenotonsillectomy over a 9-year period from January 2007 to December 2015 at the Ear, Nose, and Throat (ENT) Department of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria. The case notes of the patients were retrieved from the Medical record department. Age, gender, type of surgery (adenoidectomy, tonsillectomy or adenotonsillectomy), indications for surgery, surgical techniques, complications, and outcome of the surgery were extracted from the case notes. The patients were classified into children who were defined as age 15 years and below, while adults were 16 years and above. Inclusion criteria were all patients that had adenoidectomy, tonsillectomy, and adenotonsillectomy during the period under review. However, those patients with incomplete clinical records or missing case notes were excluded. The data was analyzed with IBM. SPSS version 21.0

## 3. Results

A total of one hundred and twenty-three (123) patients were seen; comprising 88 (71.5%) children, 35 (28.5%) adults, male 51 (41.5%) and female 72 (58.5%) with a male to female ratio of 1:1.4 had adenoidectomy, tonsillectomy or adenotonsillectomy were included in this study. The age ranged from six months to 50 years with the mean age of 11.9 years. Twelve (9.8%) patients had adenoidectomy alone; adenotonsillectomy accounted for 25 (20.3%) patients and those that had tonsillectomy alone were 86 (69.9%). All the surgeries were done as in-patients under general anaesthesia via endotracheal intubation with pharyngeal pack to prevent aspiration. The patients were admitted and fasted overnight for at least 6-8 hours and the duration of hospitalization range from 2-5 days. Twenty-one patients were excluded from the study because of incomplete clinical information in the case notes or missing case notes.

### 3.1. Adenoidectomy

The adenoidectomy accounted for 12 (9.8%) of the adenoid and tonsillar surgeries, and was exclusively done in the 1-5-year age group (figure 1), and the predominant indication for the adenoidectomy was nasal obstruction which constituted 9 (75%), followed by OSA with 2(16.7%) and persistent rhinorrhoea in 1(8.3%) patient.

### Adenotonsillectomy

Adenotonsillectomy were 25 (20.3) and confined to the pediatric age groups (figure 1). There were 17 (68%) patients in the 1-5-year age group, followed by 6-10-year age group with 6 (24%) and 2 (8%) in 11-15-year age group. OSA was the most common indication for adenotonsillectomy in 11 (44%) patients, followed by snoring 7 (28%), nasal obstruction 6 (24%) patients and otitis media in 1 (4%) patient.

### 3.2. Tonsillectomy

Unlike Adenoidectomy, Tonsillectomy alone was performed in 86 (69.9%) of the total patients in this study and it was observed across all the age groups (figure 1). Fifty-one (59.3%) children and 35 (40.7%) adults had tonsillectomy. The frequency in each age group were 8 (6.5%) in 1-5-year age group, 26 (21.1%) in 6-10-year age group, 17 (13.8%) in 11-15-year age group, 10 (8.1%) in 16-20 age group, 6 (4.9%) in 21-25-year age group, 13 (10.6%) in 26-30-year age group and 6 (4.9%) in those above 31-year age group. In both children and adult recurrent tonsillitis 46 (53.5%) was the major indication for the tonsillectomy, followed by snoring 38 (44.2%), OSA 2 (2.3%) and quinsy with 1 (1.2%). Summary of the indications for adenoidectomy, tonsillectomy or adenotonsillectomy is shown in Table 1.

### 3.3. Surgical Techniques

The adenoidectomy and tonsillectomy were done under general anaesthesia via endotracheal intubation with pharyngeal pack to prevent aspiration. The nasopharynx was visualized before and after adenoidectomy with postnasal mirror to ensure removal of adequate adenoid tissue, and irregular remnants. The total number of the patients that had the adenoid remove were 37 (adenoidectomy alone 12 patients and 25 patients had adenotonsillectomy). Adenoidectomy was carried out by using curette adenoidectomy in most of the patients, except five of them, who had endoscopic adenoidectomy with zero and 70-degree telescope, and microdebrider.

The total number of tonsillectomies in this study was 111 comprising 25 from the combined adenotonsillectomy and 86 tonsillectomies alone. Tonsillectomy was accomplished by cold steel blunt dissection with Wilson tonsil dissector in 75 patients, while 36 patients had the tonsils removed by using bipolar diathermy.

### 3.4. Complications

Post-operative pain in the first 72-hours was the most common complaint, which was observed in 103 (83.7%), readmission due to local infection in tonsillar fossae 3 (2.4%), convulsion and rhinolalia aperta accounted for 1 (0.8%) each and 15 (12.2%) had no complications (figure 2).

### 3.5. Outcome of the adenoid and tonsil surgery

Complete resolution of nasal obstruction, snoring and obstructive sleep apnoea, but 7 (5.7%) of the adult patients' complaint of residual, recurrent pain in the tonsillar fossae.

## 4. Discussion

Adenoidectomy alone in this study was performed exclusively in children of 1-5-year age group, and nasal obstruction was the predominant indication. Similarly, adenotonsillectomy was also confined to the pediatric age group with 92% done in children who were age ten years and below as shown in figure 1. Upper airway obstruction resulting in obstructive sleep apnoea, snoring and nasal obstruction were the dominant indications for the adenotonsillectomy in this study, while recurrent tonsillitis was the main indication for tonsillectomy alone. Moreover, the frequency of tonsillectomy alone was higher in children than adult.

In this study, the procedures of adenoidectomy and adenotonsillectomy exclusively in the pediatric age group is not surprising because it is predominantly the disease of children (Aydin et al., 2008 and Robb et al., 2008). Obstruction was the main indication for the Adenoidectomy and adenotonsillectomy in this study. Comparatively, this is like the report from Kano, Nigeria (Ahmed et al., 2014) and a retrospective study from the United States of America titled trends in the indications for pediatric tonsillectomy or adenotonsillectomy (Parker et al., 2011). Furthermore, the limitation in this comparison is the fact that the study in Nigeria and the USA were confined to the pediatric age group.

Contrastingly, recurrent tonsillitis was the major indication for tonsillectomy in the pediatric population in this study when tonsillectomy alone was the only procedure unlike other studies (Ahmed et al., 2014 and Parker et al., 2011) that reported obstruction. The reason for this difference is not obvious in this study. However, the small sample size and being a hospital based study may account for this difference. Multiple-institution studies with chart review of pediatric patients undergoing adenoidectomy, adenotonsillectomy or tonsillectomy may resolve this issue. In this study, the main indication for tonsillectomy in the adult patients was recurrent tonsillitis. This agrees with another study where recurrent tonsillitis was reported as the most common indication for tonsillectomy in adult (Hoddeson et al., 2009).

In this study, the adenoidectomy was largely performed by using adenoid curette, which is reported to be the most widespread type of adenoidectomy (Sharma et al., 2016), while Cold steel dissection of the tonsils and bipolar diathermy were the principal techniques employed for the tonsillectomy. Nigeria, like many developing countries has competing needs with very limited resources. Thus, the public hospitals are not adequately equipped. Therefore, the old traditional, cheap, effective adenoid curettage is our technique of choice over the many recent techniques of adenoidectomy under visualization. Similarly, we make do with cold steel dissection tonsillectomy.

In this study, the most common complication of the adenoidectomy, adenotonsillectomy or tonsillectomy was post-operative throat pain. The throat pain was encountered in most of the patients despite, post-operative prescription of combined non-steroidal anti-inflammatory drugs and paracetamol. Similarly, these drugs were used to managed post adenoidectomy, adenotonsillectomy or tonsillectomy alone pain in south-western Nigeria (Ameje et al., 2016) and South Africa (Strauss, 2012). The recent evolved coblation, harmonic scalpel, and microdebrider technologies had less post-operative pain but increased risk of secondary haemorrhage (Sharma et al., 2016 and Gallagher et al., 2010). We achieved tolerable pain within 72 hours' post-operative period, and oral fluid diet commenced in the 1-5 years' pediatric age group within few hours after surgery when full recovery from anaesthesia was evident, whereas those children above five years of age and adult resumed oral feeding from the first post-operative day.

We did not encounter primary or secondary haemorrhage in this study, although cold steel dissection was the most frequent technique applied. Cold steel dissection tonsillectomy is associated with increased intra-operative bleeding in literature (Sharma et al., 2016). Adenoidectomy and tonsillectomy haemorrhage is rare (Sharma et al., 2016 and Strauss et al., 2012) and the management is challenging to the Otolaryngologists and Anaesthetists. In this study, the procedures were performed by four academic Otolaryngologists and Senior Residents under supervision. The Otolaryngologists ensured pre-operative work-up to exclude bleeding disorders and meticulous adherence to safe operative technique to prevent haemorrhage.

Readmission in this study was 2.4%, and it was due to post-operative infection of tonsillar fossae. Non-compliance with oral medication was common among these patients. The infection was eradicated with intravenous Augmentin and Metronidazole. However, third generation cephalosporin was substituted whenever there were troublesome vomiting and diarrhoea associated with administration of Augmentin and Metronidazole.

A tonsillectomy alone in a 5-year old boy with known sickle cell anaemia was complicated by repeated episodes of convulsion, right-sided hemiparesis and dysarthria within the first 8 hours after the procedure. There was no haemorrhage. Besides, the tonsillectomy was uneventful. Computerized tomography of the brain did not show any area of infarction or intracranial haemorrhage. Magnetic resonant imaging (MRI) was not done due to non-availability. We made a provisional assessment of cerebrovascular accident (CVA), but the cause was not obvious. However, sickle cell anaemia is a major risk factor for CVA in children (Adams et al., 1998, Jiya et al., 2015 and Makani, 2004), and the incidence of a first CVA reported to be highest between 2-5 years of age with 1.02% per 100 patients (Adams et al., 1998). This patient was co-managed by Otolaryngologists and Pediatricians. He had pre-operative blood transfusion

with fresh whole blood from a compatible haemoglobin genotype AA that raised his haematocrit count to 12g/dl. Blood transfusion that reduces haemoglobin S to  $\leq 30\%$  can prevent stroke in children with sickle cell anaemia (Adams et al., 1998, Jiya et al., 2015 and Makani, 2004), although, the mechanism by which it prevents stroke is unknown (Adams et al., 1998). We do not know if this child had increased velocity of blood flow in the circle of Willis. Transcranial Doppler ultrasonography usually detects this abnormality (Adams et al., 1998, Jiya et al., 2015 and Makani, 2004). Therefore, preventive measures can be instituted.

In this study, an adenoidectomy in a 7-year old girl was complicated by hypernasal speech (rhinolalia aperta), which we attributed to mild velopharyngeal incompetence. Velopharyngeal incompetence is a rare complication of adenoidectomy (Saunders et al., 2004). The risk factors for the velopharyngeal incompetence following adenoidectomy were not demonstrated clinically by a bifid uvula which is an ominous sign of submucous cleft, notching of the hard palate and midline translucency of the soft palate elicited by nasendoscopy (Sanders et al., 2004) was not performed due to non-availability of flexible fiberoptic nasopharyngoscope. Also, there was no residual wedge of adenoid tissue which could prevent the soft palate from closing against the posterior pharyngeal wall thereby aid escape of air around the residual and irregular wedge of adenoid tissue (Sanders et al., 2004). Furthermore, we could not rule out the presence of a neuromuscular abnormality. She did well on speech therapy and the rhinolalia aperta improved remarkably.

Overall, the outcome of the adenoidectomy, adenotonsillectomy and tonsillectomy were very good. The indications for the surgeries were completely resolved in the children in this study, whereas, 7-adult who had tonsillectomy had recurrent throat pain and we could not unravel the cause of this pain.

**5. Conclusion**

Adenoidectomy alone was exclusively in children of 1-5-year age group, and nasal obstruction was the predominant indication. Similarly, adenotonsillectomy was also confined to children who were age  $\leq 10$  years, and OSA was the most frequent indication. Recurrent tonsillitis was the dominant indication for tonsillectomy alone among the children and in adult. Curettage adenoidectomy and cold steel dissection tonsillectomy were the predominant techniques employed. We did not encounter primary or secondary haemorrhage, but throat pain, convulsion, and rhinolalia aperta were the complications observed. Overall, outcome was good. Therefore, the old traditional, cheap, effective curettage adenoidectomy and cold steel dissection tonsillectomy still have important role in resource challenge developing country like Nigeria.

Pre-operative transcranial Doppler ultrasonography in children with sickle cell anaemia may help in identifying those at risk of developing CVA and institute preventive measures.

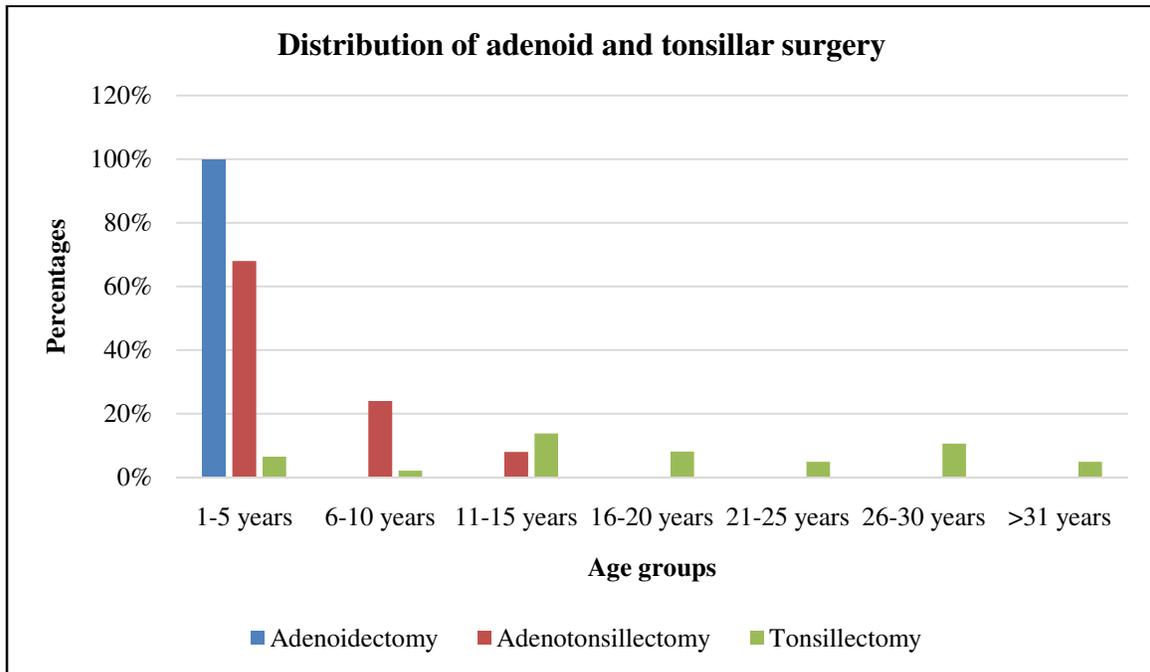


Figure 1: Distribution of adenoidectomy, adenotonsillectomy, and tonsillectomy by age group

Group	Indications for surgery (frequency (percentage))							Total
	Recurrent tonsillitis	Obstructive Sleep apnoea	Nasal Obstruction	Quinsy	Snoring	Otitis media	Persistent rhinorrhea	
Children	21 (17.1)	14 (11.4)	16 (13)	-	35 (28.5)	1 (0.8)	1 (0.8)	88(71.5)
Adults	25 (20.3)	-	-	1 (0.8)	9 (7.3)	-	-	35(28.5)
Total	46 (37.4)	14 (11.4)	16 (13)	1 (0.8)	44(35.8)	1 (0.8)	1 (0.8)	123(100)

Table 1: Summary of the indications for adenoidectomy, tonsillectomy or adenotonsillectomy among the children and adults

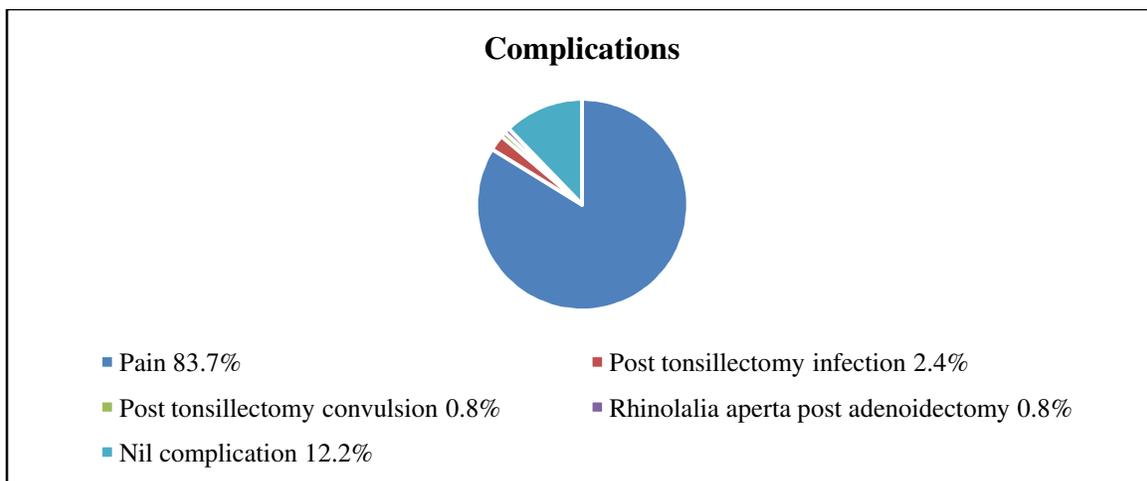


Figure 2: Complications of the adenoidectomy, adenotonsillectomy, and tonsillectomy

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