

# Use of Adeno-Tonsillectomy for Relief of Upper Airway Obstruction in Children.

Sufian Nawaiseh, MD, Suliman Al-Zaidaneen, MD,\*and Ibrahim Ali Alwedyan, MD

Department of ENT, Queen Alia Military Hospital- Royal Medical Services  
Amman, Jordan

## Abstract

We conducted a prospective study of 80 children, aged 2 to 14 years, who had enlarged tonsils and/or enlarged adenoids. A quarter of these patients underwent adenoidectomy and the remaining three quarters underwent adenotonsillectomy. All patients were followed every 2 weeks for up to 2 months following surgery. At 2 months postoperatively, the overall success rate in terms of the resolution of upper airway obstruction was 84%. Our findings demonstrate that both adenoidectomy and adenotonsillectomy were effective for the treatment of upper airway obstruction in-patients with enlarged adenoids and/or tonsils, which is concordant with the findings of other studies. We concluded that our study results proved again with no doubt that ENT surgeons have been always justified in recommending adenoidectomy or adenotonsillectomy for treating paediatric upper airway obstruction that is due to adenotonsillar hypertrophy. But we have always to keep in mind that only with proper case selection is much to be gained from surgery.

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## Keywords

Adenoidectomy, Adenotonsillectomy, Upper airway obstruction, Obstructive sleep apnea.

## Introduction

Upper Airway Obstruction (UAO) in children is fairly a common issue in most of the cases is caused by adenotonsillar hypertrophy. Obstructive Sleep Apnea (OSA) caused by adenotonsillar hypertrophy is a definite indication for surgery.<sup>1,2</sup> Using adult criteria to detect OSA

that is, the hourly number of apneic events with complete airway obstruction will not identify most children who have serious UAO during sleep.<sup>3,4</sup> Hypopnea can occur when airflow is impaired but not completely obstructed.<sup>5</sup> Among children, clinically significant obstructive hypopnea with partial UAO is more common than OSA with complete obstruction.<sup>3,5</sup>

There are many other causes of UAO and consequent sleep apnea in children, including nasal obstruction, micrognathia, generalized facial anomalies, laryngeal disorders and neuromuscular problems.<sup>6</sup>

Long-term partial airway obstruction during sleep may result in significant hypercapnia and hypoxemia, as well as daytime somnolence, night sweats, irritability, hyperactivity, behavioral problems, personality changes, poor school performance, morning headache, failure to thrive, obesity and enuresis.<sup>7</sup>

Cor pulmonale develops in some children because of vasoconstriction in pulmonary blood vessels as a result of frequent episodes of hypoxemia during recurrent apnea. Only a small percentage of susceptible children with severe UAO go on to develop pulmonary hypertension.<sup>8</sup>

Children with UAO virtually always snore. The airway obstruction in such children may be exacerbated by upper respiratory tract infection to the degree that the situation may become life threatening to the child.<sup>9</sup>

Recent reports suggest that snoring may occur in the normal child.<sup>10-12</sup>

The aim of this article is to review the main complaints of children who have marked UAO caused by large adenoids and/or tonsils, and to document the effect of surgery and postoperative results and their success rate.

## Patients and Methods

We selected for this study 80 patients (46 boys and 34

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**Correspondence should be addressed to:**

Suliman AL-Zaidaneen, MD  
P. O. Box: 800 Tal Al Ali  
Jordan –Amman  
Email; [suli32@hotmail.com](mailto:suli32@hotmail.com)

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girls) from a total of 167 children who had undergone Adenoidectomy (AS) or Adenotonsillectomy (ASTS) between March 2003 and March 2004 at the Queen Alia Military Hospital in Amman- Jordan. Children with contraindications for surgery were excluded such as cleft palate bleeding diathesis. These children were selected because their UAO was the result of either large adenoids and/or large tonsils. The children ranged in age from 2 to 14 years; most (63%) were between 3 and 7 years of age.

The majority of these children had been referred for the treatment of snoring or noisy breathing and recurrent sore throat. The children were otherwise healthy. A total of 60 children underwent ASTS, while the other 20 had only an AS.

All surgeries were performed with the patients under general inhalational endotracheal tube anesthesia. Postoperative follow-up was performed every two weeks for up to two months. Prior to surgery, each child was examined and investigated thoroughly. All children were admitted one day before surgery. The same surgical team performed the operations. Most of the children were discharged the following day; none of them had any post-operative complications. T-test was used to test significance at 0, 05 level.

## Results

Most of the children experienced marked resolution of their symptoms. After surgery, 82% of them had good improvement in the general overall well being and about two-thirds reported improvement in their school performance. Table ( 1) shows the frequency of symptoms in eighty children who presented with UAO before and after AS or ASTS in which the overall success rate was shown to be 84%. Snoring and sleep apnea patients were improved in 94% and 80%, respectively; post surgery, while mouth breathers and noisy breathing children took 2 to 3 weeks to improve. All children who had cyanosis, restlessness and choking were improved completely. The only symptom that was not alleviated by surgery in our series was enuresis; only 2 of the 12 children (16%) who were bed-wetters and showed improvement.

*Table ( 1): The prevalence of symptoms in 80 children with upper airway obstruction before and after adenoidectomy or adenotonsillectomy.*

<i>Symptoms</i>	<i>Before surgery (n)</i>	<i>After surgery (n)</i>	<i>Success rate %</i>
<b><u>Miscellaneous</u></b>			
<i>Improved general condition</i>		66	82%
<i>Improved study performance</i>		56	70%
<i>Improved appetite</i>		50	62%
<b><u>Daytime Symptoms</u></b>			
<i>Sleepiness</i>	48	0	100%
<i>Noisy eating</i>	46	0	100%
<b><u>Nocturnal Symptoms</u></b>			
<i>Snoring</i>	70	4	94%
<i>Restlessness</i>	64	0	100%
<i>Mouth breathing</i>	60	6	90%
<i>Noisy breathing</i>	54	0	100%
<i>Sleep apnea</i>	20	4	80%
<i>Choking</i>	20	0	100%
<i>Enuresis</i>	12	2	16%
<i>Cyanosis</i>	24	0	100%
<b><u>Overall success rate</u></b>			<b>84%</b>

## Discussion

The study results show that the obstructive symptoms due to enlarged adenoids and/or tonsils are treatable by surgery, and this finding is concordant with those of similar studies.<sup>9, 12, 13</sup> Sleep apnea may persist after surgery, but these episodes are likely to represent central apnea, and they are likely to be fewer in number.<sup>14</sup> In those children, whose respiration was monitored, breathing irregularities were less common and apneic episodes were fewer and shorter after surgery.<sup>13, 15</sup> It has been suggested that in patients with UAO, polysomnography is desirable to facilitate a more precise prediction of the outcome of a specific treatment.<sup>16</sup> Unfortunately, we do not have the advantage of this important investigation tool.

Others have documented the symptomatic relief of obstruction following AS or ASTS, and although the numbers of patients in these reports were small, the results were consistently good.<sup>5, 9, 13, 15, 17</sup>

Adenotonsillar hypertrophy with UAO, even without frank OSA, is an indication for TS or AS.<sup>1, 2</sup>

We suggest that for those children who have breathing difficulties, which may be caused by large adenoids and/or tonsils; surgery should not be withheld or delayed solely because of a lack of objective evidence. In fact, symptomatic relief can be anticipated with some degree of confidence. Most of the symptoms are reversible after relief of the UAO by AS or ASTS. Alleviation of mouth breathing, behavioral problems, enuresis, poor appetite, right ventricular strain, and poor concentration have been documented following ASTS.<sup>5, 18-20</sup> Nevertheless, a proper case selection of those who really need relief of their airway obstruction should be studied carefully in order to prevent unwanted complications.

## Conclusion

The main complaints in UAO in children is snoring, and this should prompt further investigation regarding other sleep-related symptoms. In children who have large adenoids and/or tonsils, substantial benefit may be attained by removing the offending lymphoid tissue, even though the child may not have a history of severe sleep apnea and even though objective evidence from polysomnography may be lacking. Our study results prove again with no doubt that ENT surgeons have been always justified in recommending AS or ASTS for the treating pediatric UAO that is due to adenotonsillar hypertrophy. But we have always to keep in mind that with proper case selection much is to be gained from surgery.

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## إجراء عملية إستئصال اللوزتين والناميات للتخلص من إنسداد المجاري التنفسية العلوية عند الأطفال

د. سفيان النوايسة، د. سليمان الزيدانين، د. ابراهيم الوديان - قسم الانف والالانف والحنجرة مستشفى الملكة علياء العسكري

### ملخص:

### الهدف:

يستخلص من هذه الدراسة نجاح عمليات إستئصال اللوزتين والناميات في التخلص من إنسداد المجاري التنفسية العلوية عند الأطفال.

### مفتاح الكلمات:

إستئصال الناميات، إستئصال اللوزتين والناميات، إنسداد المجاري التنفسية العلوية.

أجريت هذه الدراسة على ثمانين طفلاً تتراوح أعمارهم ما بين عامين الى 14 عاماً يعانون من تضيق المجاري التنفسية العلوية نتيجة لتضخم اللوزتين والناميات وقد تم إختيارهم من بين 167 طفلاً أجريت لهم عمليات إستئصال الناميات أو إستئصال اللوزتين والناميات معاً في مستشفى الملكة علياء العسكري بعمان للفترة ما بين آذار 2003 وآذار 2004. تبين من تحليل النتائج بعد مرور شهرين من إجراء الجراحة بأن نسبة النجاح في التخلص من إنسداد المجاري التنفسية العلوية ( 84%).