Obstructive Adenoid Tissue

An Indication for Powered-Shaver Adenoidectomy

Thomas Havas, FRACS; David Lowinger, FRACS

Objectives: To quantify the incidence of intranasal extension of adenoid tissue and residual adenoidal obstruction of the posterior choanae following traditional curette adenoidectomy to determine the efficiency of adenoid curettage and the usefulness of intraoperative endoscopic examination and powered-shaver adenoidectomy in achieving better postnasal patency.

Design: Prospective intraoperative endoscopic evaluation of the posterior choanae and nasopharynx of a case series of 130 patients before and after curette and powered-shaver adenoidectomy.

Setting: Tertiary referral center.

Patients: One hundred thirty consecutive pediatric patients with obstructive adenoidal hypertrophy undergoing adenoidectomy.

Main Outcome Measures: The degree of residual postnasal obstruction due to adenoid tissue was assessed endoscopically (grades 0-3) after curette and adjuvant powered-shaver adenoidectomy. The presence of intranasal adenoid tissue was also recorded.

Results: Following traditional curette adenoidectomy, 51 (39%) of 130 patients had residual obstructive adenoid with 42 patients (32%) having occlusive intranasal adenoid tissue. Having determined the presence of remaining obstructive tissue with intraoperative nasal endoscopy in these 51 patients, complete airway patency was achieved with powered-shaver adenoidectomy.

Conclusion: The presence of intranasal extension of adenoids obstructing the posterior choanae is common in children with adenoid hypertrophy. Traditional adenoidectomy is ineffective in removing this tissue and may also leave obstructive tissue high in the nasopharynx. Intraoperative nasal endoscopy allows assessment of the completeness of surgery. Powered-shaver adenoidectomy enables complete removal of obstructive adenoid tissue thereby ensuring postnasal patency.


ADENOIDS, which are nasopharyngeal lymphoid tissue forming part of the Waldeyer ring, were initially described in 1868 by Meyer. Present from early gestation, adenoid growth continues until about 6 years of age, after which atrophy occurs. Adenoidal hypertrophy during childhood may both fill the nasopharynx and extend through the posterior choanae into the nose, resulting in nasal airway stenosis, impeding airflow. There is a significant relationship between the endoscopically determined size of obstructive adenoid tissue and symptomatic nasal obstruction in children. Sequelae include mouth breathing and rhinorrhea, sleep-disordered breathing, speech anomalies, feeding difficulties, chronic sinusitis, and craniofacial growth anomalies.

These clinical manifestations may be readily remedied with removal of obstructive hypertrophic adenoid tissue to restore airway patency. The widely used conventional curette adenoidectomy was first described in 1885. Dissatisfaction with this technique has prompted the use of other methods, including powered-shaver adenoidectomy.

While there is a perception that shaver adenoidectomy is more effective in clearing adenoid tissue compared with curettage, this has yet to be objectively assessed. We undertook this study to evaluate the adequacy of removal of obstructive adenoid with the traditional curette technique to determine whether endoscopically guided powered-shaver adenoidectomy would attain better clearance.

RESULTS

One hundred thirty consecutive patients requiring adenoidectomy were included in this study. Seventy-nine were male and 51 female, with ages ranging from 10 months to 14.1 years.

The indication for adenoidectomy was adenoidal hypertrophy causing nasal obstruction in all cases. In 40 cases the indication for surgery was obstruction alone. Twenty-three patients had associated persistent sinusitis and 67 had associated recurrent otitis media.
PATIENTS AND METHODS

PATIENTS

One hundred thirty consecutive pediatric patients with obstructive adenoid hypertrophy undergoing adenoidectomy were included in this study. All patients were assessed preoperatively with transnasal endoscopy and determined to have obstructive adenoid hypertrophy (grades 2 and 3). Only patients in whom a partial adenoidectomy was intentionally performed, such as those with palatal dysfunction, were excluded. All adenoidectomies were performed by or under the supervision of the senior author (T.H.).

The following grading system was used to standardize the endoscopic assessment of the degree of airway obstruction due to adenoid tissue:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Degree of Obstruction</th>
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<tbody>
<tr>
<td>0</td>
<td>0-30</td>
</tr>
<tr>
<td>1</td>
<td>30-59</td>
</tr>
<tr>
<td>2</td>
<td>60-99</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
</tr>
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</table>

“Significant obstruction” was determined to be stenosis of the posterior choanae of 60% or more (grades 2 and 3) based on clinical experience and nasal airflow models.

Operations were performed under general anesthesia. When tonsillectomy or myringotomy were performed and tubes were placed during the same anesthetic, these were completed prior to adenoidectomy.

METHODS

In each case, the patient was anesthetized and an oral endotracheal tube or laryngeal mask placed. The child was placed supine in the Rose position with a small pillow under the shoulders to allow slight neck extension and was covered with sterile drapes.

Using a 0° 2.7-mm rigid fiberoptic telescope (Storz, Tuttingen, Germany), obstructive adenoidal hypertrophy was confirmed. With a Boyle-Davis mouth gag splinting the mouth open, the palate and uvula were inspected and palpatated to exclude a soft palate cleft. An appropriately sized unguarded adenoid curette was then used to remove adenoid tissue. The surgeon was allowed to palpate the adenoid bed and repeat the curettage until satisfied with completeness of removal. The adenoid bed was then suctioned and a nasopharyngeal sponge placed for a few minutes for hemostasis. The sponge was then removed, a Y-suction catheter passed through the nose to ensure removal of any loose clot or tissue, and the nasopharynx inspected to ensure cessation of bleeding.

Following traditional curette adenoidectomy, each of the 130 patients was assessed endoscopically. Overall, 51 patients (39%) had remaining obstructive adenoid (grade 2 or 3).

Forty-two (32.3%) of the 130 patients had residual intranasal adenoid tissue still occluding the posterior choanae after curette adenoidectomy (Table 1). Nine other patients had significant residual obstructing adenoid tissue remaining high in the nasopharynx (grade 2 or 3).

These 51 patients had further adenoid removal with the small joint shaver, achieving complete postnasal patency (grades 0 and 1) (Table 2).

COMMENT

The objective of adenoidectomy is to remove the hypertrophic adenoid tissue that causes nasal airway stenosis leading to pathological restriction of nasal airflow.
Dissatisfaction with the traditional curette adenoidectomy in adequately and safely achieving this clearance has led to the development of alternative techniques that have been made possible by developments in fiberoptics and endoscopic instrumentation.\(^\text{3,5,6}\)

The main disadvantage of curettage is that it is a relatively “blind” technique that may lacerate the choanae and torus tubarius, gauge the nasopharyngeal mucosa, or skim the adenoid bulk, leaving behind obstructing tissue, particularly at the eustachian tube orifices, high in the nasopharynx, and at intranasal protrusions.\(^\text{7}\) The use of an adenoid punch or avulsion with grasping forceps, under endoscopic vision, may be similarly traumatic.

Insulated suction diathermy adenoid ablation has been a popular alternative.\(^\text{8}\)

While suction diathermy ablation usually minimizes blood loss, it may not address intranasal adenoid tissue, is slow, and carries the potential risks of cicatrization and collateral burns as does the use of the carbon dioxide laser, which also requires full laser precautions.

The powered-shaver method has been applied in a number of ways. It may be the primary technique, used as an adjunct to curettage, or coupled with other methods.

Route of visualization and access to the adenoid may be transoral, transnasal, or a combination. The transoral procedure is performed using an angled mirror and specially developed 40° curved blades with the cutting window on the circumference. Transnasal direct endoscopic vision combined with the powered shaver allows precise removal of obstructive tissue while preserving mucosa and normal nasopharyngeal structures. Intranasal adenoid tissue and tissue high in the nasopharynx may be readily identified and removed. The oscillating cutting action of the shaver blade minimizes bleeding and the continuous suction maintains a clear view enhancing safety. In cases that require partial adenoidectomy the precision and safety of this technique are of particular advantage. Further, by operating through the nose there is no need for hyperextension of the neck in patients, such as those with Down syndrome, who may have congenital instability of the cervical spine. By operating with the video attachment on the telescope, the theater staff may be more involved in the operation, and trainee teaching is facilitated.

Restrictions of powered-shaver adenoidectomy to date have largely been due to problems inherent in adapting an orthopedic instrument to nasal surgery. These included heavy handpieces with blade width and angles unsuitable to a crowded nose, leading to damage to normal nasal structures and poor maneuverability in the nasopharynx.\(^\text{6}\) We found that even in small children, transnasal surgery using the lightweight magnum handpiece and 2.9-mm blade with a triangulated window kept clear with continuous suction irrigation, combined with a 2.7-mm telescope, enabled a highly controlled adenoid clearance. Useful supplementary techniques were the transoral placement of an oxymetazoline-soaked sponge low in the nasopharynx before shaving and ensuring that the shaver suction was off during passage of the blade through the nose.

### Table 1. Intranasal Adenoid Findings

<table>
<thead>
<tr>
<th>Presenting Problem</th>
<th>No. of Patients</th>
<th>No. With Intranasal Extension of Adenoid Tissue</th>
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<tbody>
<tr>
<td>Nasal obstruction</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Recurrent otitis media</td>
<td>67</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>42</td>
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### Table 2. Airway Patency Assessment*<sup>*</sup>

<table>
<thead>
<tr>
<th>Stage of Operation</th>
<th>Maximum Grade of Airway Obstruction</th>
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<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Preoperative</td>
<td>0</td>
</tr>
<tr>
<td>After curettage</td>
<td>30</td>
</tr>
<tr>
<td>After shaver</td>
<td>68</td>
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</table>

*Data are given as number of patients.

Today there is a wide choice of methods available to perform this common operation. While it is tempting to presume that applying new technology is preferable to “old-fashioned” techniques, the benefits ought be critically quantified and assessed before accepting a change. This study has demonstrated that in up to 39% of children with clinically significant adenoid hypertrophy, curette adenoidectomy does not achieve adequate removal of obstructive adenoid tissue, especially when there is intranasal extension of adenoid or a bulky mass of adenoid high in the nasopharynx. In such cases the use of powered-shaver technique enables better clearance of obstructive adenoid.

We therefore recommend that endoscopic visualization during adenoidectomy is worthwhile and that in some cases the powered-shaver adenoidectomy provides more reliable restoration of nasal patency.

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### REFERENCES