Tonsillectomy with or without adenoidectomy is the second most common childhood surgery in the United States. Despite a range of different techniques, including electrocautery and cold steel dissection, postoperative pain remains the major side effect of the operation. A prolonged period of postoperative recovery lasting up to two weeks is standard and there is always the risk of a postoperative bleed. Coblation® is a low-temperature technique that has been shown to cause less pain and lead to a shorter recovery period than other methods of tonsillectomy.

For Children, Postoperative Pain is a Problem

Evidence from clinical studies shows that compared with other surgical techniques, including electrocautery, Coblation® results in less pain, less postoperative narcotic use, and a quicker recovery.

Children Experience Less Pain With Coblation®

In one study of 80 children, Coblation® tonsillectomy reduced severe pain and narcotic intake, and resulted in a more rapid return to normal diet compared with electrocautery (Figure 2). Children who had a Coblation® tonsillectomy were in severe pain for fewer days following surgery (4.33 vs. 6.07), used a narcotic for fewer days after surgery (2.58 vs. 3.33), and resumed a regular diet more quickly (5.36 vs. 6.29) than children who had their tonsils removed with electrocautery.

Coblation® Uses Lower Temperatures Versus Electrocautery

Today in the United States, the majority of physicians use monopolar electrocautery to remove tonsils. Electrocautery uses high temperatures (400° to 450° Celsius) that can cause burning and charring of target and surrounding tissue. Coblation® (Figure 1), a low-temperature procedure approved by the US Food and Drug Administration for tonsillectomy in 2001, applies radiofrequency energy to a conductive medium to vaporize tissue at temperatures of only 40° to 70° Celsius, with minimal collateral thermal tissue damage (Table 1). According to recent data, today about 38% of all tonsillectomy procedures are performed with Coblation®.

Postoperative Recovery: Technique Makes the Difference

Unlike electrocautery, which burns tissue at temperatures above 400° Celsius, Coblation® applies radiofrequency energy to a conductive medium to vaporize tissue at a temperature of only 40° to 70° Celsius.

Table 1. Coblation® Versus Electrocautery

<table>
<thead>
<tr>
<th></th>
<th>Coblation®—Based Devices</th>
<th>Conventional Electrocautery Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperatures</td>
<td>40°C to 70°C</td>
<td>&gt;400°C</td>
</tr>
<tr>
<td>Thermal Penetration</td>
<td>Minimal</td>
<td>Deep</td>
</tr>
<tr>
<td>Effects on Target Tissue</td>
<td>Gentle removal</td>
<td>Rapid heating</td>
</tr>
<tr>
<td></td>
<td>Dissolution</td>
<td>Burning</td>
</tr>
<tr>
<td></td>
<td>Charring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cutting</td>
<td></td>
</tr>
<tr>
<td>Effects on Surrounding Tissue</td>
<td>Minimal dissolution or burning</td>
<td>Inadvertent charring</td>
</tr>
</tbody>
</table>

Table 1. Coblation® and Electrocautery vs Harmonic Scalpel

<table>
<thead>
<tr>
<th>Tonsillectomy Technique</th>
<th>Mean pain score at 10 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coblation® (N = 25)</td>
<td>2</td>
</tr>
<tr>
<td>Electrocautery (N = 18)</td>
<td>4</td>
</tr>
<tr>
<td>Harmonic Scalpel (N = 17)</td>
<td>8</td>
</tr>
</tbody>
</table>

P = 0.007
In another study of 103 children who were randomly assigned to one of three surgical techniques (Coblation®, electrocautery, or the harmonic scalpel), Coblation® tonsillectomy had the lowest pain scores (Figure 3). Statistically significant differences in pain scores favored Coblation® versus electrocautery (P = 0.02) and Coblation® versus the harmonic scalpel (P = 0.003), with Coblation® having the lowest pain scores of all three techniques.

**Children Recover Faster With Coblation®**

In a study of 101 children ages 2 to 16 years, parents reported reduced pain and a faster return to normal activities for their children who had Coblation® tonsillectomies compared with electrocautery. Coblation® patients had significantly less reported pain (P < 0.005) and greater oral intake (P < 0.005) at all evaluations. Children who had Coblation® tonsillectomies returned to 70% of their normal activity levels earlier than other patients (Figure 4).

**Children Experience Less Dehydration With Coblation®**

In a retrospective chart review of 1997 children who had tonsillectomies, when compared with electrocautery, Coblation® had similar rates of primary and secondary hemorrhage but a lower incidence of postoperative dehydration (Figure 5).

**When compared with electrocautery, Coblation® had similar rates of primary and secondary hemorrhage but a lower incidence of postoperative dehydration.**

**Following Coblation® Parents Make Fewer Postoperative Calls To The Physician**

In a clinical study of 89 children between the ages of 3 and 12 years, parents of the patients treated with Coblation® made significantly fewer postoperative callbacks to the physician to discuss postoperative complications (33% vs. 54%, P = 0.081) (Figure 6). In addition, fewer Coblation® patients experienced associated postoperative nausea (35% vs 62%, P = 0.013) and Coblation® patients used fewer postoperative narcotics. More Coblation® patients rated the postoperative experience as ‘better than expected’ (79% v 60%, P = 0.055).

**Coblation® Reduces Surgical Time and Blood Loss**

Coblation® offers intraoperative benefits, as well. In a comparison of cold dissection adenotonsillectomy and Coblation® adenotonsillectomy in 46 children ages 2 to 16 years, 12 Coblation® resulted in significantly shorter surgical times (11.2 minutes vs. 17.0 minutes; P<0.001). Intraoperative blood loss with Coblation® was significantly less for both the adenoidectomy (P=0.001) and tonsillectomy (P=0.001) portions of the procedure (Figure 7).

Coblation® is a safe and effective tonsillectomy technique that has been shown to improve postsurgical outcomes for children. To learn more about the procedure, please visit www.entnet.org or www.tonsilfacts.org.

**Visit**
http://www.arthrocareent.com/set/page/info_pediatricians to learn more about Coblation® and to obtain a directory of otolaryngologists with Coblation® expertise.

**REFERENCES**