Intracapsular Tonsillectomy

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The Tonsillectomy remains one of the most commonly performed procedures in the UK, with over 50,000 carried out each year. This is particularly the case in the paediatric population, with increasing recognition of its value in the management of obstructive sleep apnoea (OSA) in ever younger patients.

But traditional extracapsular tonsillectomy by various methods still has high rates of morbidity, including pain, delayed discharge, haemorrhage (3-5% of cases) and a recognised mortality risk. This is because the underlying pharyngeal muscle is exposed. The muscle is very sensitive and takes up to four hours to begin to recover following the surgery. Therefore, the patients are kept in the unit until this time, and in many cases the surgery is carried out on the same day.

With intracapsular tonsillectomy, which is removed from within the surrounding capsule, it protects the sensitive underlying muscle, reducing anaesthetic requirements and the risk of bleeding.

Here I present my experience of using this technique in London Children’s Hospital, the first at which it was performed.

Patients and methods

I have prospectively evaluated 300 children (adenotonsillectomy) for obstructive and I have been published. All patients have been adeno-tonsillectomies were performed with intracapsular tonsillectomy.

All patients have had access to the validated tonsil symptom severity score (TSSS) and post-operative analgesic requirements and have been compared to other children.

Surgical procedure

Coblation® refers to a range of "cold" radio frequency ablation (RFA) equipment marketed by Arthrocare Corporation, part of Smith and Nephew®. It has been used for various indications including the removal of tonsillar tissue. One of its unique features is its ability to ablate tissue while preserving the underlying muscle, which makes it a particularly safe option for children. The radiofrequency energy excites the electrolytes in the tissue to form a plasma, which ablates the tissue by breaking down molecular bonds, and fragmented debris is aspirated via the suction channel.

Very precise removal of tissue is achieved at low temperatures (40-50°C), with simultaneous coagulation of small vessels and minimal collateral tissue injury. This technology does not involve any clipping, cutting, or cauterisation, in contrast to traditional "hot" cauterisation techniques (monopolar and bipolar diathermy, and laser).

The Coblation® wand gently ablates the tonsil tissue in a highly controlled fashion, with minimal heat and collateral tissue damage, and no bleeding. Underlying muscle and blood vessels are not encountered. Diagram courtesy of Arthrocare®.

The ablation of the tonsil tissue effectively dissolves it away, until only the inner fibrous capsule is reached and thin islands of denatured tonsil tissue are all that remains. No tonsillar crypts are left to trap bacteria and cause tonsillitis, and regrowth is also
therefore highly unlikely. Additionally, the underlying muscles and blood vessels are not exposed at all, and intraoperative blood loss is typically negligible. Local anaesthetic is applied topically at the end of the procedure, which takes a total of 15-20 minutes. Adenoidectomy can be performed in addition, using the same equipment.

Appearance before Coblation® intracapsular tonsillectomy.

Appearance immediately after Coblation® intracapsular tonsillectomy.

Nine months after treatment. Minimal tonsil tissue remains, there is negligible blood loss and the surrounding tissues are not injured.

Post-operative recovery

The vast majority of patients, even very young children, are able to eat and drink normally straight away and go home as day case, unless circumstances are unfavourable (age under three years, comorbidities, severe OSA, or isolated home address).

I offer only regular paracetamol and ibuprofen for one week (opiates are not needed, even in teenagers), together with co-amoxiclav to reduce halitosis as the tissues heal.

The mean duration of analgesia in my series is 3.8 days. Parents do not report a worsening of pain over several days, as is often seen after traditional extracapsular tonsillectomy.

Otherwise, parents report that their children are able to return to normal activities straight away, including playing with friends, riding a bike or bouncy on a trampoline the day after surgery. Patients are allowed to return to school or nursery as soon as their parents feel that they are ready. The current mean time to return to education is 2.9 days, but some children return as little as three days.

Complications and sequelae

There have been no delayed discharges or readmissions because of pain in this series of 300 cases. None of the patients has required additional opioid or other analgesia at home, or via GP. Not one has had any primary haemorrhages. Two cases had small-volume (50ml) secondary haemorrhages after one week, but these settled immediately without any intervention.

Symptomatic regrowth rates have been very low. Two cases, both with severe OSA, who first underwent surgery at an age of one year, had modest regrowth and required revision treatment. One child also had revision surgery for recurrent tonsillitis in the fossa recess. Interestingly, the respective parents were still delighted with their treatment, and would have undertaken the same original surgery again, given the choice. The overwhelming majority of cases have had no problems at all post-operatively.

Parental feedback

Over 99% of parents said that they would recommend the procedure to others, and two sets of parents said they were unsure. There has been an exceptionally positive response, and in particular to the children’s rapid recovery and absence of any significant post-operative problems. Older teenagers and adult patients who were not part of this study have also reported similar positive experiences, with rapid recovery and minimal pain, and only simple analgesia.

Conclusions

Coblation® intracapsular tonsillectomy has proved to be an extremely effective and well-tolerated procedure in a traditionally high-risk tertiary paediatric population. It has allowed a rapid return to normal activities and education, and complication rates have been very low to date.

The response from children and parents has been overwhelmingly positive, and I anticipate that this technique will have wider applications in both children and adults, for obstructive and subjective indications.


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