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 rate. This is because the underlying pharyngeal muscle is exposed and is very sensitive and takes up to 3 months to be cauterised or tied off during the surgery.

With intracapsular tonsillectomy, which is a procedure where the tonsil is removed with the surrounding tissue, it protects the sensitive underlying muscle, which reduces anesthetic requirements and ensures faster recovery.

Here I present my experience of using this technique at the London Children's Hospital, the first and only centre in London to offer it.

Patients and methods

I have prospectively evaluated 300 children who have undergone a traditional adenoidectomy for obstructive sleep apnoea, and I have been published on my results.

All patients have open access to the validated tonsil symptom questionnaire, which children's post-operative anaesthetics rating to other parents.

Surgical procedure

Coblation® refers to a range of “cold” radio frequency ablation (RFA) equipment marketed by Arthrocare® Corporation, part of Smith & Nephew Inc., which has US FDA approval. Radio frequency current is delivered by electrodes at the tip of a probe (“wand”), which also incorporates a suction channel and saline irrigation. The radio frequency energy excites electrolytes within the saline to form a focused gas “plasma”. This ablates 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. The technology does not involve any charring, burning 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 the inner fibrous capsule is reached and thin islands of denatured tonsil tissue are all that remains.

No tonsil crypts are left to trap bacteria and cause tonsillitis, and regrowth is also

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therefore highly unlikely. Additionally, the underlying muscle and blood vessels are not exposed at all, and intraoperative blood loss is typically negligible. Local anaesthetic is applied locally at the end of the procedure, which takes a total of 15-20 minutes. Adenoidectomy can be performed in addition, using the same equipment.

## Post-operative recovery

The vast majority of patients, even very young children, are able to eat and drink normally straight away and go home the same day, 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 anaesthesia in my series is 8.8 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 bouncing 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 6.5 days, but some children return in as little as three days.

## Complications and sequelae

There have been no delayed discharges or re-admissions because of pain in this series of 300 cases. None of the patients has required additional opiate or other analgesia at home, or via their GP. Not have there been 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 one year of age, had modest regrowth and required revision treatment. One child also had revision surgery for recurrent tonsillitis in the fossa pharyngealis. Interestingly, the respective parents were still delighted with their treatment, and would have undergone the 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 infective indications.

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