



Coblation® intracapsular tonsillectomy:

an effective, safe and minimally-invasive alternative to traditional tonsil surgery

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Mr Daniel Tweedie led a pioneering study in the UK of a new form of tonsil surgery, which is highly effective but has minimal morbidity and complication rates. This is now available for patients of all ages at Parkside.

Tonsillectomy remains one of the most commonly performed procedures in the UK, with over 50000 carried out per 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 (subcapsular) tonsillectomy by various methods still has high rates of morbidity and complications including pain, delayed discharge, haemorrhage (3-5% of cases) and a recognised mortality risk. This is because the underlying pharyngeal muscle is exposed as the tonsils are stripped off. This muscle is very sensitive and takes up to two weeks to heal and it is perforated by large blood vessels which have to be cauterised or tied off during surgery, and may bleed profusely.

Intracapsular tonsillectomy (or tonsillotomy) has been proposed as an alternative in the USA and parts of Europe. The tonsil tissue is removed from within the surrounding fibrous capsule which is left intact. Unlike the traditional methods, the remaining capsule protects the sensitive underlying muscle and blood vessels from injury, with potential benefits in terms of speeding up recovery, reducing analgesic requirements and minimising the risks of haemorrhage.

Here I present my experience using Coblation® ('cold' radiofrequency ablation) intracapsular tonsillectomy in one hundred consecutive paediatric patients at Evelina London Children's Hospital, the first such series from the UK. The study is currently in press. This method has produced excellent symptomatic resolution, rapid post-operative recovery (2-3 days) with minimal analgesic requirements, excellent parental feedback, and no instances of delayed discharge, readmission or post-tonsillectomy haemorrhage whatsoever. I anticipate that this form of intracapsular tonsillectomy will have wider applications across paediatric and adult populations, for both obstructive and infective indications.

Patients and methods

The study looked prospectively at 100 consecutive paediatric patients undergoing Coblation® intracapsular tonsillectomy for both obstructive and/or infective (tonsillitis) indications. All patients had open access in the event of problems, and all were followed up after surgery. Parents were asked to complete validated tonsil symptom/quality of life questionnaires both before the procedure and at follow up, and were also asked about their children's post-operative analgesic requirements, return to normal activities and whether or not they would recommend the surgery to other parents.

Surgical procedure

Coblation® refers to a range of 'cold' radiofrequency ablation (RFA) equipment marketed by the Arthrocare® Corporation. Radiofrequency current is delivered by electrodes at the tip of a probe ('wand'), also incorporating a suction channel and saline irrigation. The radiofrequency energy excites electrolytes within the saline to form a focused gas 'plasma'. This ablates tissues by breaking down molecular bonds; fragmented debris is aspirated via the suction channel.

In 'ablate' mode, very precise removal of tissue is achieved at low temperatures (40-50°C), with simultaneous coagulation of small vessels and minimal collateral tissue injury. A 'coagulation' mode may also be used to cauterise vessels through resistive heating (maximum 50-70°C). The technology does not involve any charring, burning or cauterisation at all, in contrast to traditional 'hot' cauterisation techniques (monopolar and bipolar diathermy, and laser).

The ablation of the tonsil tissue effectively dissolves it away, until the inner fibrous capsule is reached. Thin islands of denatured tonsil tissue are all that remain; no tonsil crypts are left to trap bacteria.

Post-operative recovery

Most of my patients, even very young children, are able to eat normally straight away and go home as day cases – unless other circumstances are unfavourable (comorbidities, severe OSA, or isolated home address). I offer regular paracetamol and ibuprofen, together with co-amoxiclav to reduce halitosis as the tissues heal. Initially, I recommended two weeks off nursery or school, as for traditional tonsillectomy, but I have now started to allow children to return to education after 5-7 days – prompted by the very rapid recovery reported by parents.

and cause tonsillitis, and regrowth is also therefore highly unlikely. Additionally, the underlying muscle and blood vessels are not exposed at all. Intraoperative blood loss is less than 2-3ml. Local anaesthetic is applied topically at the end of the procedure, which takes a total of 10-15 minutes.



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.



Appearances before and after Coblation® intracapsular tonsillectomy. Minimal tonsil tissue remains, there is negligible blood loss and the surrounding tissues are not injured.

Coblation® intracapsular tonsillectomy cont...

Results Summary

- 100 children (age range 6 months to 16 years, mean 4.5 years) underwent Coblation® intracapsular tonsillectomy between March and November 2013. Of these, 76/100 had OSA as a primary indication, 16/100 had OSA and recurrent tonsillitis and 8/100 had tonsillitis as a sole indication for surgery.
- There were no perioperative complications whatsoever. In particular, there were no delayed discharges on account of pain or poor oral intake, no telephone calls from parents afterwards (despite open access), no readmissions and no haemorrhages at any time.
- Parents reported that their children were typically able to eat and drink normally within hours of surgery, and continued to do so in the following days – with none of the build up of pain at days 5-7 seen after traditional tonsillectomy.
- Children were able to participate in normal activities, to the extent that many parents allowed them to return to education far quicker than I had initially recommended.
- None of the patients required visits to local doctors for advice or additional analgesia after surgery.
- In terms of symptom resolution, prospective pre- and post-procedure questionnaires demonstrated very large symptomatic improvements for both obstructive and infective symptom modalities.
- There have been no cases of symptom recurrence attributable to tonsil regrowth or recurrent remnant tonsillitis reported.
- 99/100 sets of parents said they would recommend this surgery to others, and 1/100 was unsure. But none had any negative feedback whatsoever, and typically reported an excellent peri-operative experience.
- Anecdotally, older teenagers and adult patients who were not part of this study have also reported similar positive experiences, with rapid recovery and minimal pain.

Conclusions

Coblation® intracapsular tonsillectomy has proved to be an extremely effective and well-tolerated procedure in a traditionally high-risk tertiary paediatric population, with minimal morbidity and no complications whatsoever seen to date. The response from children and their 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.