



## Treatment Updates

# Tonsillectomy – Evolving Techniques

## HISTORY OF TONSILLECTOMY

Tonsillectomy remains the most frequently performed operation in the world. The word "tonsil" comes from the Latin "tonsilla" which means mooring post. The operation dates back to the time of Celsus and is probably one of the oldest operations in surgery.

The main indication for tonsillectomy remains recurrent tonsillar Infections with oropharyngeal obstruction/obstructive sleep apnoea a close second.

It is estimated that approximately ten percent of adults and school aged children experience tonsillar infections annually. The vast majority of these infective episodes are managed medically.

## IMMUNOLOGY OF THE TONSILS

The tonsils are predominantly "B" cell organs with "B" lymphocytes comprising fifty to sixty five percent of all tonsillar lymphocytes.

"T" cells comprise approximately forty percent and three percent are mature plasma cells.

The tonsils are involved in inducing secretory immunoglobulins and regulating immunoglobulin production.

There are ten to thirty crypts in each tonsil that are ideally suited to trapping foreign material and transporting it to the lymphoid follicles.

The proliferation of "B" cells in the germinal centres of the tonsils and their response to antigenic signals is one of the most important tonsillar functions.

The human tonsils are immunologically most active between the ages of four years and ten years.

Involution of the tonsils begins after puberty resulting in a decrease in the "B" cell population and the relevant increase in the ratio of "T" to "B" cells.

## MICROBIOLOGY

The most common causes of tonsillar inflammation include:

- Adeno Virus
- Influenza Virus
- Para Influenza Virus
- Rhino Virus
- Respiratory Cytinithial Virus

In terms of bacterial aetiology the most common pathogen is by far:

- Group 'A' Beta-Haemolytic Streptococcus (GABHS)

Less common pathogens include organisms such as:

- Group "C" and Group "G" Streptococci
- Mixed anaerobes
- Various Neisseria and Corynebacterium

## INDICATIONS FOR TONSILLECTOMY

Indications for tonsillectomy remain:

- Five bouts of acute tonsillitis in one calendar year.
- Three bouts of acute tonsillitis a year for three consecutive years.
- Failure of long course low dose antibiotics to prevent recurrent tonsillar infection.
- Upper airway obstruction/sleep apnoea.
- Complications of tonsillitis such as:
  - Peritonsillar or parapharyngeal abscess.
  - Long suppurative complications such as Scarlet Fever Acute Rheumatic Fever Post Streptococcal Glomerulonephritis
  - Upper airway obstruction/obstructive sleep apnoea
  - Significant tonsillar asymmetry/clinically indicated suspicion for malignancy.

## TECHNIQUES OF TONSILLECTOMY

Tonsillectomy is performed under General Anaesthesia with endotracheal intubation in an operating room setting.



## **COLD STEEL DISSECTION TONSILLECTOMY**

This is the traditional technique for tonsillectomy that has been practised for over fifty years. The key to successful tonsillectomy with minimal bleeding is early identification of the plane between the capsule of the tonsil and the superior constrictor muscle of the pharynx. The earliest modification of traditional cold steel dissection tonsillectomy was the introduction of diathermy coagulation for control of haemostasis. Small bleeding points and occasionally paratonsillar veins are diathermied without the use of clips and ligatures.

## **DIATHERMY DISSECTION DIATHERMY COAGULATION**

The introduction of an insulated tonsillectomy needle (Benjamin Tonsillectomy Needle) has led to the evolution of this technique.

Haemostasis is achieved as the dissection proceeds either by the use of the Benjamin Diathermy or after the tonsil has been removed by using insulated monopolar diathermy forceps. Some studies (including a systematic review by the Cochran Group) have suggested that pain is increased after diathermy dissection. Other studies however (including that by the Comparative Audit Service of the Royal College of Surgeons of England 1997) found no significant difference between the use of diathermy dissection and cold steel. There is some evidence that the use of cold steel dissection leads to higher intra operative blood loss than diathermy. The difference is thought to be small and only thought to be significant by most surgeons when performing tonsillectomy in young infants.

## **NEWER TECHNIQUES**

Newer techniques are evolving – not so much to reduce the speed or the complication rate of tonsillectomy but in an attempt to minimise post operative pain.

## **COBLATION TONSILLECTOMY**

### **Technique**

Involves the use of a wand delivering Radiofrequency bi-polar current with an irrigating saline solution at a temperature of only sixty to seventy degrees Celsius. Whether this technique results in reduced post operative pain is unclear. The operating temperature is much less than that in laser or conventional diathermy surgery and

much less physical force is used in separating the tonsil from its bed than in conventional dissection. There is a theoretical basis as to why there should be a reduction in secondary haemorrhage compared to dissection plus bi-polar haemostasis inasmuch as there is no physical disruption of the muscle layers and there is less chance of encountering large blood vessels using this technique.

## **HARMONIC SCALPEL TONSILLECTOMY**

The Harmonic Scalpel consists of a generator device driving a re-usable handpiece. This is connected to a blade which acts as both a cutting and coagulating device. The generator produces a high frequency alternating current which is passed to the handpiece. The device is controlled by a foot pedal attached to a generator.

The blade simultaneously cuts and coagulates. Theoretically the Harmonic Scalpel has the following advantages:

- Reduced post operative discomfort.
- Early return to activity.
- Less discomfort from eating.

Unfortunately to date these theoretical advantages have not been shown to be significant. Unlike the use of Coblation the handpiece is re-usable.

## **POWERED INTRACAPSULAR TONSILLOTOMY**

Unlike conventional tonsillectomy this technique involves the use of a powered micro debrider for removing tonsillar tissue within the capsule of the tonsil. Theoretical advantage again is reduced peri-operative pain because the plane between the capsule of the tonsil and the superior constrictor muscle is not violated. A micro debrider can also be used to perform/ supplement adenoidectomy. The problem with this technique seems to be haemostasis.

The micro debrider provides a quick and efficient way of removing intracapsular lymphoid tissue but control of the bleeding usually involves bi-polar diathermy forceps therefore the theoretical advantage in peri operative pain achieved by using the micro debrider alone is negated by the almost invariable use of bi-polar diathermy forceps. The blade is disposable (currently the cost is around \$300.00).



### **BI-POLAR RADIO FREQUENCY TECHNOLOGY TO REDUCE THE VOLUME OF HYDROPLASTIC PALATINE TONSILS**

RFITT Bi-Polar Radio Frequency Technology is a method for the local destruction of pathological or excessive tissue. The tissue is heated up to a temperature of between six and one hundred degrees Celsius and coagulated whilst avoiding unintended side effects like massive vaporisation or carbonisation. RFITT is a surgical intervention used mainly for tonsillar hypertrophy associated with obstructive sleep apnoea in children. It is not a recommended procedure for recurrent infective tonsillitis and/or complications of tonsillitis. The radio frequency energy is applied to the tonsil via several Stab Incisions into the body of the tonsil – usually four to five on each side. The application of energy at each site takes only a few seconds so the total procedure time is in the order of ten minutes. Bleeding is uncommon but if it does occur it is difficult to control because it occurs from within the bed of the remaining lymphoid tissue. Occasionally conventional extracapsular tonsillectomy has to be performed to control bleeding.

### **CONCLUSIONS**

The complication rates for tonsillectomy are very similar for the techniques described and appear to be more surgeon dependent than technique dependent.

Although new techniques such as coblation and the Harmonic Scalpel offer some hope in reducing peri-operative morbidity essentially from pain their efficacy is as yet unproven. The increased costs of disposable and/or equipment has to be factored against any potential benefits that will be derived.

### **COMPLICATIONS OF TONSILLECTOMY**

**Primary Haemorrhage** (bleeding occurring within the first 24 hours):

- Incidence one in two hundred cases.
- Between half and two percent.
- Approximately one half of these cases require to be returned to the operating room for a second anaesthesia for the arrest of bleeding.

**Secondary Haemorrhage** (bleeding occurring between the fifth and tenth post operative day):

- Incidence approximately from one to three percent.
- Nearly always associated with decreased oral intake poor oral hygiene relative dehydration.
- Rarely requires return to operating room.
- Virtually never requires blood transfusion and is treated conservatively with antibiotics oral hygiene local hydrogen peroxide/antiseptic gargles.

**Peri-Operative Analgesia** remains the major challenge of anaesthesia for tonsillectomy. It is the greatest cause of morbidity of this procedure.

**If further information is required, please email us:**  
[enquires@earnosethroat.com.au](mailto:enquires@earnosethroat.com.au)