A COMPARISON OF DISSECTION METHOD AND DIATHERMY (BIPOLAR) TONSILLECTOMIES

*Ritu Gupta, **Kripamoy Nath

ABSTRACT

Objective: To compare the dissection and diathermy methods of tonsillectomy and evaluate their advantages and disadvantages during surgery and convalescence.

Materials and methods: This is a prospective randomised study performed in sixty patients undergoing tonsillectomy in department of ENT & Head and Neck Surgery, Silchar, Medical College and Hospital, Silchar, Assam between June 2012 to May 2013. 64 patients were enrolled; however, 60 patients completed the full evaluation as the technique had to be modified in 4 patients. Operating time, intraoperative blood loss, postoperative analgesia and complications & episodes of secondary bleeding were recorded.

Results: One year prospective study was done in 60 patients who underwent tonsillectomy by bipolar electrocautery on one side and dissection method on the other side. The average intra-operative blood loss was 6.5 gm with cautery and more than 50gm with dissection method. The average operative time was 18 minutes with cautery and 19.6 minutes for dissection. Post operative pain in accordance to visual analogue scale ranged between 3-5 in first five days in electrocautery side while ranged between 5-8 on dissection side. On tenth day follow up, post operative pain persisted on electrocautery side ranging between 2-4 while minimal pain was present on dissected side. We found lower amounts of blood loss, less operative time (though marginally less), less immediate post operative pain but delayed and longer duration of pain on electrocautery method. We did not encounter significant complications in either methods except more slough formation (80%) and more secondary haemorrhage (6.66%) in electrocautery method.

Conclusion: Bipolar diathermy tonsillectomy is an effective and safe technique with lesser amount of intraoperative blood loss, lesser operative time and lesser though prolonged post operative pain.

INTRODUCTION

Tonsillectomy was first reported by the Roman encyclopedist Celsus in 30 AD. It is a common operation done by otorhinolaryngologist, performed by a variety of techniques. These techniques have evolved over the years aiming to make the procedure safe and decrease the postoperative morbidity and complications. This entails a shorter procedure time, minimal blood loss during surgery, minimal risk of postoperative complications, mainly secondary haemorrhage and decreased morbidity.

A number of different techniques have been mentioned in the literature but the two most commonly used techniques are cold dissection and electro dissection. Beginners learn the procedure utilizing cold dissection technique, while the expert surgeons are divided between cold dissection and electro dissection techniques, most of the times on account of personal liking and not under the influence of statistical data. This prospective study was designed to evaluate the safety of bipolar electro dissection technique as quite frequently, in literature, this technique has been blamed for increased morbidity and risk of secondary haemorrhage.
Techniques of Tonsillectomy

- Cold dissection
- Electrocautery
- Bipolar radiofrequency ablation (Coblation)
- Monopolar radiofrequency ablation
- Laser tonsil ablation (LTA)
- Harmonic scalpel
- Thermal welding
- Microdebrider assisted partial tonsillectomy
- Ligasure Vessel Sealing System (LVSS) tonsillectomy
- Argon Plasma Coagulation (APC)

Tonsil removal has traditionally been achieved by cutting the pharyngeal mucosa with scalpel, then dissection of the tonsil from the lateral pharyngeal wall. This is the so-called ‘dissection’ tonsillectomy. Haemostasis is achieved with ligatures (ties), sutures or diathermy once the tonsil has been removed.

Diathermy uses an electric current to coagulate blood vessels (stop bleeding) or to cut tissue. There are two main types: bipolar and monopolar. In bipolar diathermy, current passes through the tissue between the tips of a pair of forceps. The electrical energy is concentrated in a small area, therefore the tissue heats extremely rapidly, resulting in coagulation of blood vessels. In diathermy tonsillectomy, the tonsil is removed and haemostasis secured simultaneously, using diathermy. Diathermy is used to incise the mucosa and divide the strands of tissue that bind the tonsil to the pharyngeal wall. At the same time the vessels that run in these strands are visualised and can be coagulated before they are divided, in theory minimising blood loss and speeding up the operation by 40% to 50%.

OBJECTIVES

To compare the morbidity associated with tonsillectomy by two different techniques – cold dissection and diathermy (bipolar).

METHODS

Types of studies

Prospective Randomised Controlled trials.

Types of participants

Adults or children undergoing tonsillectomy by dissection or diathermy in-patient setting, for any indication admitted in ENT and Head neck department of Silchar Medical College and Hospital between June 2012 and May 2013.

Types of interventions

Tonsillectomy by cold dissection or diathermy (bipolar).

Types of outcome measures

1) Intra operative time
2) Intra operative blood loss
3) Post operative pain
4) Post operative complications

Method

The tonsillectomy by electrocautery was defined as tonsillectomy performed with electrocautery dissection (bipolar) and with haemostasis also being achieved by electrocautery. Dissection method tonsillectomy was defined as tonsillectomy performed by a combination of sharp and blunt dissection, haemostasis being obtained with ligature. In our study, cold dissection was done on the right tonsil and electrodissection on the left tonsil. Intraoperative time was noted. Intraoperative bleeding was noted by weighing the cotton balls soaked in blood. The blood was soaked in cotton balls made of equal size weighed pre and post tonsillectomy. If more than fifty grams of blood loss occurred, it was not measured further and mentioned in the study as more than 50 grams.

Post operative pain was measured by visual analogue scale (Figure 1, Figure 2) on:

i. DAY 1
ii. DAY 2
iii. DAY 3
iv. DAY 5
v. DAY 10

Post operative complications were noted. Primary, reactionary and secondary haemorrhage, slough formation, infection etc.

RESULTS

One year prospective study was done in 60 patients who underwent tonsillectomy by bipolar electrocautery on one side and dissection method on the other side. The average operative time was 18 minutes with cautery and 19.6 minutes for dissection. (Figure 3). The average intra-
operative blood loss was 6.5gm with cautery and more than 50gm with dissection method. (Figure 4) We found lower amounts of blood loss (Figure 5,6), less operative time (though marginally less), less immediate post operative pain but delayed and longer duration of pain on electrocautery method.

We did not encounter significant complications in either methods except more slough formation (80%) (Figure 7,8) and more secondary haemorrhage (6.66%) in electrocautery method. Post operative pain in accordance to visual analogue scale ranged between 3-5 in first five days in electrocautery side while ranged between 5-8 on dissection side. On tenth day follow up, post operative pain persisted on electrocautery side ranging between 2-4 while minimal pain was present on dissected side. (Figure 9)
Graphs and Charts

Discussion

Tonsillectomy has been a common operation in otolaryngology, with over 1 million tonsillectomies being performed annually in the UK in the 1960’s and 70’s. However, recently, this figure has fallen considerably. Although the tonsillectomy is a quick operation, morbidity may be significant. Hemorrhage, apnea, pain, fever and poor oral fluid intake are all possible effects of surgery. All these effects can be minimized in experienced hands and improved techniques. There is no consensus on the best technique for a tonsillectomy. In the past, the guillotine or tonsillotome technique was used, but because of higher morbidity, this technique has been reported as unsatisfactory and its use has been decreased worldwide.

Dissection tonsillectomy is one of several frequently practiced techniques. Dissection tonsillectomy can be accomplished by blunt or sharp method, while other modifications of this technique includes dissection with electrocautery and laser. Laser tonsillectomy has achieved a growing popularity in the United States because of increasing availability of machines and reduction in morbidity (less intra-operative blood loss, reduced post-operative pain and more rapid healing).

The operative time is less with electrocautery, ranging from 11.2-13.5 minutes, while it ranges from 12.4-19.9 minutes for the dissection method.

The incidence of post-operative pain is significant after electrocautery but is not as severe as dissection method. In our study post operative pain in accordance to visual analogue scale ranged between 3- 5 in first five days in electrocautery side while ranged between 5-8 on dissection side. On tenth day follow up ,post operative pain persisted on electrocautery side ranging between VAS 2-4 while minimal pain around VAS 1 was present on cold dissected side.

Figure 7: Slough Formation In Cold Dissection

Figure 8: Slough Formation In Electrodissection.

Figure 9: Pain According To The Vas In Both Method.

Figure 10 : Increased slough formation on the Bipolar cautery side.
Post operative complications were similar except greater slough formation on the cautery side which was treated by H2O2 gargle. (Figure 10)

The reported intra-operative blood loss with electrocautery ranges from 26.6 ml - 33 ml, while for dissection method it ranges from 78.4-104 ml3,4.

CONCLUSION
In the prospective trial conducted at Silchar Medical College and Hospital to compare dissection and diathermy tonsillectomies following conclusions were made.

We found lower amounts of blood loss, less operative time, less immediate post operative pain but delayed and longer duration of pain on electro cautery method. We found increased slough formation as well as slightly higher incidence of secondary haemorrhage in the electro cautery method.

Our experience promotes electrodissection as our preferred method of tonsillectomy.

DISCLOSURES
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REFERENCES