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Case Report

Innovative mucosal flaps for post-operative pain relief in endoscopic assisted tonsillectomy

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ABSTRACT

Tonsillectomy the "bread and butter" surgery of the Otorhinolaryngologist has graduated from the Gullitone to the state of the art plasma knife technique, vis a vis patient and surgeon comfort. The excruciating post recovery pain is due to breach in the oro-phayngeal mucosa and thereby irritation of the terminal arborizations of the glossopharyngeal and vagal innervations. Moreover, the surgical trauma induced inflammation and spasm of the constrictor muscles leads to ischemia and a protracted cycle of pain. An endoscopic assisted bi -mucosal flap technique with precision and homeostasis is ideal as it covers the raw bed of the tonsil and there thereby reduces the intensity of the postoperative pain.

Keywords: Tonsillectomy, Postoperative pain, Mucosal flaps

INTRODUCTION

Infective or hypertrophic tonsils necessitate surgical intervention in the pediatric and the adult age group, when medical therapy proves futile. Surgical intervention conventionally began from a Gullitone method, whereby the tonsils were retracted medially and then chopped in one go, by the blade of a medical grade gullitone, followed by meticulous cold knife dissection using an anterior pillar dissection and snaring the inferior pole. Ligation of the inferior, superior poles and the paratonsillar veins or mono polar or bipolar cauterization of the feeders or aneurysm needle ligation maybe required if the need be. The Coblation dissection using plasma knife is the technique adopted nowadays.[1,2]

Emphasis is on postoperative pain and hemorrhage when comparing different tonsillectomy techniques. Unlike most operative interventions, which are closed primarily, tonsillectomy results in an open wound that heals by secondary intention, thus the primary issue in this intervention is pain and secondary hemorrhage. The pain is the result of the discontinuity in the faucial mucosa and irritation of the glossopharyngeal and vagal nerve endings, followed by inflammation and spasm of the pharyngeal muscles that leads to ischemia and a protracted cycle of pain.[3]

A novel technique of bi mucosal flaps has been adopted whereby the denuded muscular bed is covered with a marked reduction of local pain and referred otalgia.

CASE REPORT

A 15 year old lady was taken up for tonsillectomy under magnified vision, utilizing zero degree endoscope and visualization on a 27 inch high resolution monitor. Under "Rose's "accentuated cervical lordosis and atlanto-occipital hyper extended position; supplemented by a palatal-glossal, Boyle Davis/retraction, the tonsillar fauces were "pouted". Superior and inferior tonsillar poles were delineated. A topical sub mucosal saline adrenaline mixture was injected followed by a pure saline sub mucosal hydro dissection (Figure 1). A prominent blanch after 5 minutes of infiltration confirmed onset off action. A cranio-caudal incision using mono polar cautery was given and using the sharp end of a pillar dissector, anterior and posterior mucosal flaps were developed. (Figure 2). The tonsillar lymphoid tissue was held with the fine curved artery forceps and retracted caudally, thereby delineating the superior feeders the palatine arteries (Figure 3). The latter were liga clipped, thereby mobilizing the superior tonsillar pole (Figure 4). Meticulous caudal peeling of the tonsil was undertaken to skeletonise the inferior vascular pedicel namely the tonsillar branches of the lingual and facial arteries (Figure 5). The pedicel was suture ligated (Figure 6). The intact anterior and posterior mucosal flaps were reposited over the fascia of the superior constrictor muscle in the, tonsillar bed. A surgicel was spread over it to cover any exposed area (Figure 7). Saline irrigation, aaesthetist's Valsalva and gag relaxation confirmed homeostasis. Patient was extubated and wheeled out of the theatre.

Post-operative period was uneventful to marked pain relief in the first week as compared that noted in other procedures.

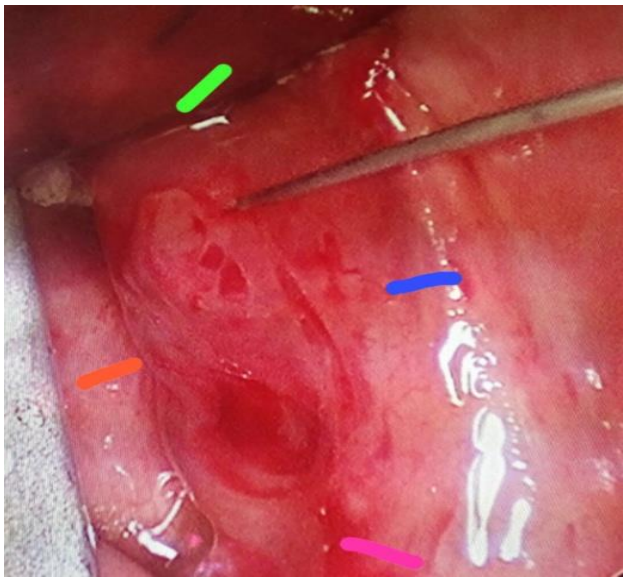

Figure 1: Topical sub mucosal infiltration hydro dissection. Green: inferior pole; Pink: superior pole; Blue: Anterior pillar; Orange: posterior pillar.

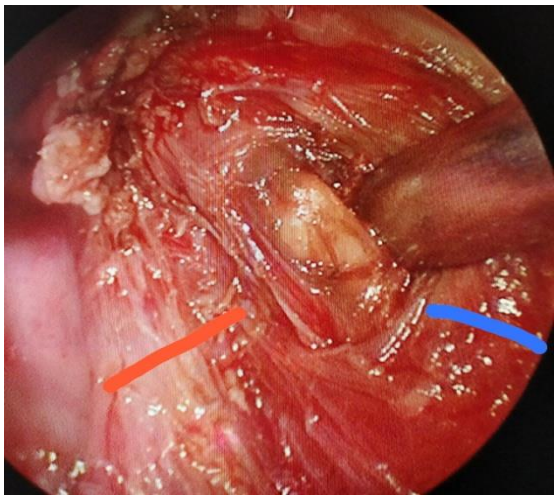

Figure 2: Blue: anterior mucosal flap; Orange: posterior mucosal flap.

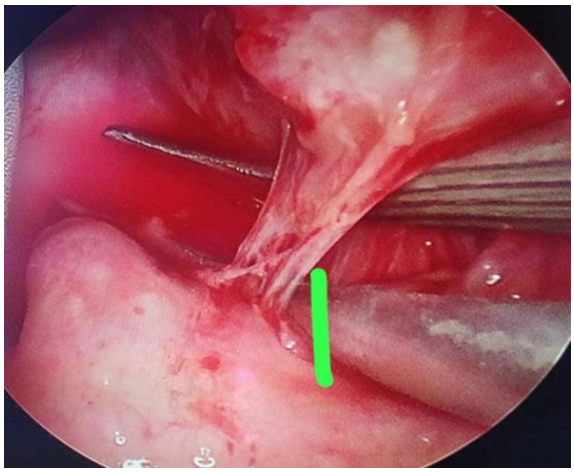

Figure 3: Superior vascular pedicel dissected out.

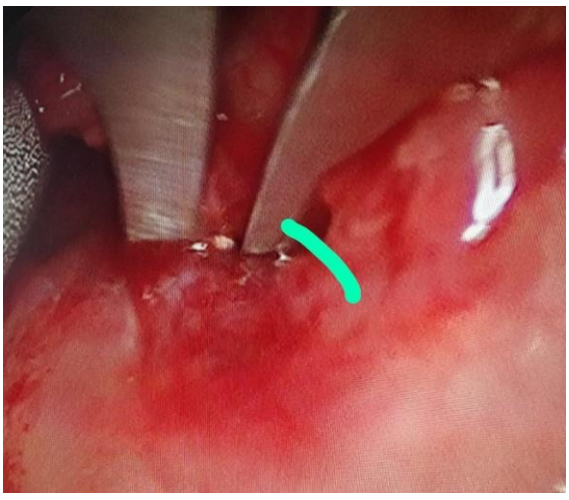

Figure 4: Liga clipped superior vascular pedicel.

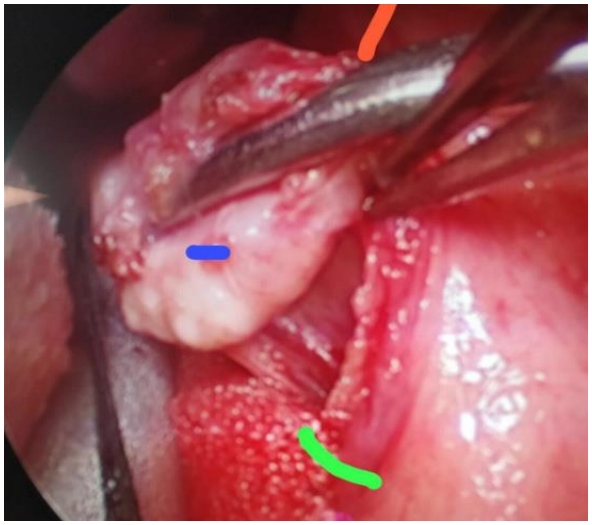

Figure 5: Tonsil being lifted out of tonsillar Fauces. Blue: tonsil; Green: superior pole; Orange: inferior pole.

Figure 6: Inferior pole being skeletonised.

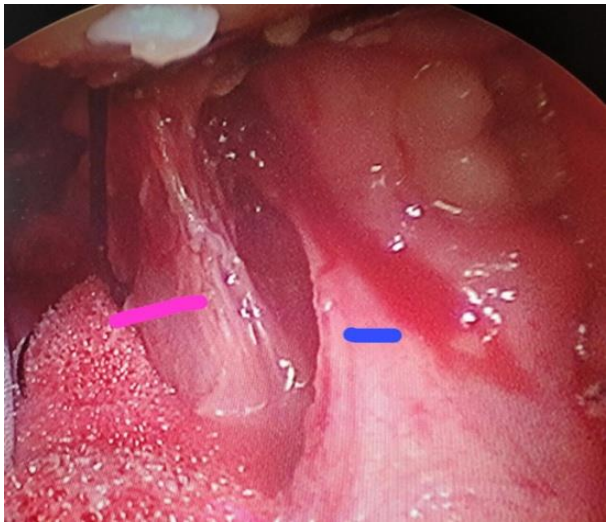

Figure 7: Mucosal flaps (blue: anterior flap; pink: posterior flap).

DISCUSSION

Multiple modalities namely Guillotine, cold steel dissection, monopolar cautery, bipolar diathermy dissection, bipolar scissors dissection, cryosurgery, laser tonsillectomy, ultrasonic removal, microdebrider and thermal welding have been introduced to reduce operative time ,intra -op hemorrhage ,postoperative pain , morbidity and reduce the recuperative period.[4,5] Unfortunately neither has achieved a global acceptance as the being the ideal method of tonsillectomy.

Scalpel no. 12 blade mounted on Bard Parker handle or the Eve's tonsillar snare or, Metzanbaum curved scissor, are the conventional interventions. Electrosurgical modality which has superseded the cold technique, reduces the intra-operative hemorrhage as well as the operative time, though incidence of postoperative pain and bleed is on the higher side.[6,7] The postoperative local and referred pain, odynophagia and dehydration are consequent to a direct contact of the electro surgery electrode and tonsillar bed .The former is likely to raise the local temperature to 400–600 °C,

Coblation ablates lymphoid tissue of tonsils at a reduced temperature than that of bipolar diathermy. There is dissociation of isotonic saline between the tips of electrodes, into sodium ions that break molecular bands between the cells .[8]

The temperature during here is about 45–85 °C wrt 400–600 °C in electrocautery.[8-10]

Tonsillar fossa obliteration utilizing absorbable sutures is an innovative modality with reduced pain due to less exposed raw tonsillar bed postoperatively However; there are insufficient studies on this aspect.

Moreover the pillar suture procedure following tonsillectomy reduces postoperative bleeding though at the cost of increasing pillar edema in pediatric tonsillectomy. Postoperative pain-relief, palatal hematoma, palatal discomfort sensation, site infection, and velopharyngeal insufficiency are not significantly altered compared to tonsillectomy alone.[11]

Sealing the raw tonsillar muscular bed with a rotated adjacent mucosal flap reduces post-operative pain in tonsillectomy patients and is recommended whenever anatomically feasible.[12]

A rotated mucosal palatopharyngeal arch flap coverage of the tonsillectomy bed, too markedly reduces pain after the third postoperative day. The flap side heals early and better compared to the denuded site. Unfortunately, the sutures in the mucosal flap lead to more edema of the tissues. Sutures though have no significant effect on postoperative infection. Thus, mucosal flap may be used as an adjuvant surgical technique to reduce pediatric tonsillectomy pain as a supplement to analgesics.[13]

The technique of posterior pillar mucosal suspension too facilitates wound healing; maintains preoperative anatomical integrity, with marked pain relief. Thereby reducing analgesic prescription.[14]

Steroid administration, usually dexamethasone decreases postoperative pain along with prolongation of the duration of local anesthetic peripheral nerve blocks. Moreover Dexamethasone significantly decreases postoperative nausea and vomiting (PONV) Studies document that dexamethasone approximately doubles the duration of postoperative analgesia when it is combined with intermediate-acting (lidocaine, mepivacaine) or long-acting (bupivacaine, ropivacaine) local anesthetics.[15] A meta-analysis revealed that the addition of buprenorphine to a local anaesthetic peripheral nerve block prolonged postoperative analgesia for about 8 h but significantly increased the risk for PONV. Perineural administration was more effective than systemic application but was associated with a similar risk of PONV.[16]

A fibrin sealant study showed that it significantly reduced pain the evening after pediatric tonsillectomy and also decreased the chance of experiencing emesis. Thus supporting its clinical utility as an adjunct to tonsillectomy. Patient pre-donated 40 ml of blood from which autologous concentrated fibrinogen was prepared by cryo precipitation, was used. The fibrin sealant fibrinogen and topical bovine thrombin were sprayed onto the surgical site to form fibrin sealant at the conclusion of tonsillectomy.[17]

Vis a vis the above studies. limiting the tonsillar fossa exposure post tonsillectomy and layering it with rotated mucosal, palatoglossal and palatopharyngeal flaps markedly reduces pain. The flap side heals better when compared to the denuded site, though exhibiting edema around the sutures in the flaps. In our subject we too adopted the mucosal flap technique with a marked postoperative pain reduction and early healing of the fossa. We avoided suturing the flaps to prevent a seroma or hematoma to form and obviated any likelihood of edema formation.

CONCLUSION

Bi mucosal flaps are ideal as they cover the muscle bed of superior constrictor with less pain and trismus in the post-operative period. Moreover, the endoscopic visualization gives a magnified view with clear delineation of tissue planes and feeding vessels thereby with excellent homeostasis Oral intake thus improves with early recuperation.

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