A Dissertation on

A STUDY ON

POST TONSILLECTOMY

IMMEDIATE AND DELAYED COMPLICATIONS

Submitted to the

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY

In partial fulfilment of the requirements

For the award of the degree of

M.S.BRANCH IV
(OTORHINOLARYNGOLOGY)

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CHENNAI, TAMILNADU

APRIL 2014

DECLARATION

I, **Dr. S.GERALD PARISUTHAM**, Solemnly declare that the dissertation, titled **"A STUDY ON POST TONSILLECTOMY IMMEDIATE AND DELAYED COMPLICATIONS"** is a bonafide work done by me during the period of AUG 2012 to SEP 2013 at Government Stanley Medical College and Hospital, Chennai under the expert supervision of **PROF.DR.T.BALASUBRAMANIAN, M.S., D.L.O.,** Professor and Head, Department of Otorhinolaryngology, Government Stanley Medical College and hospitals, Chennai.

This dissertation is submitted to The Tamil Nadu Dr. M.G.R. Medical University in partial fulfilment of the rules and regulations for the M.S. degree examinations in Otorhinolaryngology to be held in April 2014.

Chennai-1 **DR.S.GERALD PARISUTHAM**

Date:

CERTIFICATE

This is to certify that the dissertation presented **"A STUDY ON POST TONSILLECTOMY IMMEDIATE AND DELAYED COMPLICATION"** by **DR.S.GERALD PARISUTHAM,** is an original work done in the Department of Otorhinolaryngology, Government Stanley Medical College and Hospital, Chennai in partial fulfillment of the regulations of the Tamilnadu Dr. M.G.R. Medical University for the award of degree of M.S. (Otorhinolaryngology) Branch IV, under my supervision during the academic period 2012-2014.

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CONTENTS

A STUDY ON POST TONSILLECTOMY IMMEDIATE AND DELAYED COMPLICATIONS

ABSTRACT

This is an analytical study on evaluation of incidence of post tonsillectomy immediate and delayed complications. Since adenotonsillectomy is done by both conventional and coblation method, the incidence of immediate and delayed complications were compared in both technique and statistical significance is obtained. This study includes 150 patients of age group above 5 and below14 years who underwent adenotonsillectomy, among them 100 patients undergone conventional technique and 50 patients under gone coblation technique. The study emphasis explaining the risk of postoperative haemorrhage to patient, expertise training of Surgeons in securing haemostasis in both conventional and modern technique, recording and analyzing the complications to improve patient safety.

Key Words: Conventional Tonsillectomy, Coblation Tonsillectomy, Primary haemorrhage and Secondary Haemorrhage.

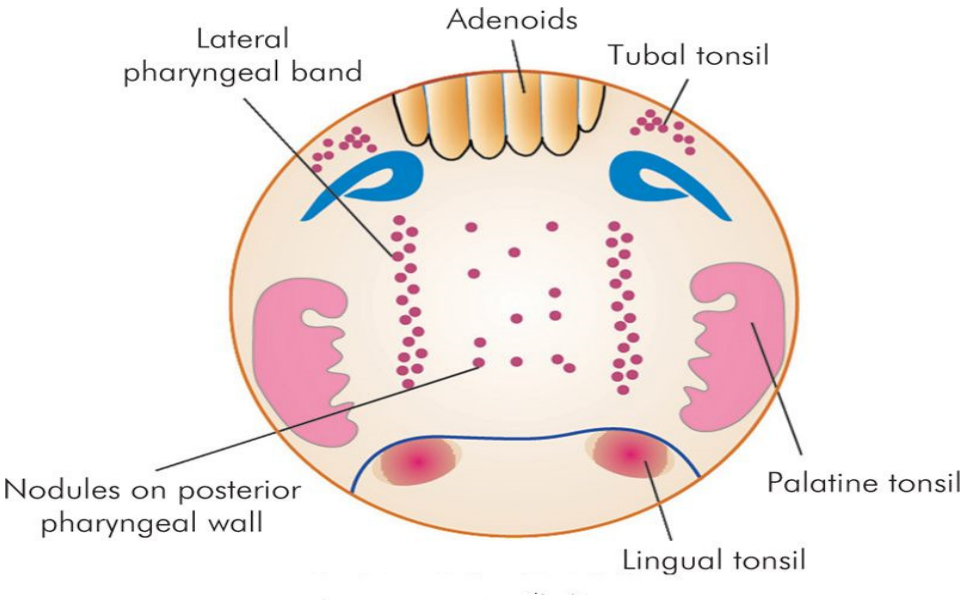
1. INTRODUCTION

Aggregated Mucosa Associated Lymphoid Tissue (MALT) in the subepithelial pharyngeal layer at the entrance of the aerodigestive tract are collectively called as the Waldeyer's ring.[1]

WALDEYER'S RING consists of :

1. Adenoid or Lushka tonsil
2. Tubal tonsils
3. Nodules (Posterior pharyngeal wall)
4. Palatine tonsils
5. Lateral pharyngeal bands
6. Lingual tonsil

WALDEYER'S RING



Tonsils and adenoid act as host defense and sentinels[2] at the portal of aerodigestive tract. The T-lymphocytes in the parafollicular region of these lymphoid aggregates provide cell mediated immunity. The crypts in the tonsils increase the surface area for contact with foreign substances.

B-lymphocytes in the germinal centers of these lymphoid tissue produce IgA antibodies. The most common problems affecting the tonsils and adenoid tissue are recurrent infections (throat or ear), significant enlargement and obstruction that causes swallowing and breathing problems. Abscesses around the tonsils and chronic infections can also affect the tonsils and adenoids, making them sore and swollen. Tumors are rare, but can grow on the tonsils.

METHODS OF TONSILLECTOMY

Varying techniques for tonsillectomy have been described under Cold and Hot Tonsillectomy.

COLD	HOT
1. Dissection and snare method	1. Electrocautery
2. Guilletone method	2. Laser tonsillectomy
3. Intracapsular tonsillectomy	3. Coblation tonsillectomy
4. Hormonic scalpel	4. Radiofrequency
5. Plasma mediated ablation technique	
6. Cryosurgical technique	

Varying techniques for tonsillectomy have been described in cold and hot Tonsillectomy. There remains a debate as to the optimal method with the least patient morbidity.

2. AIM OF THE STUDY

1. To evaluate the incidence of immediate and delayed complications following adenotonsillectomy.

2. To compare the postoperative morbidity in cold and hot tonsillectomy.

3. REVIEW OF LITERATURE

HISTORY OF TONSILLECTOMY

Roman surgeon Aulus Cornelius Celsus and Paul of Aeigina[3] in 30 AD were the first to describe early tonsillectomies by blunt removal using fingernail or hook and to remove them with a knife.

Guillotine: Philip Syng Physick (1768-1867), of Philadelphia in 1828 modified an instrument which was earlier designed by Benjamin Bell for uvulotomy and used it for tonsillectomy. It is the predecessor of all guillotomes. Physick's tonsillectomy had two plates with knife sliding between them. Fahnestock introduced a guillotine with a prong or fork to catch the tonsil, known as Malhieus guillotine. This was later modified by Morel Mackenzie.

Greenfield Sluder of Louis after improvization of the instrument demonstrated its safety. Hence guillotine tonsillectomy is also known as Sluder tonsillectomy in his honour.

- **Morel Mackenzie** (1837-1892) is considered as true **founder of modern tonsillectomy**.

- **1909** - George Ernest Waugh of England removed entire tonsils by **dissection**.
- **1917** - Samuel J. Crowe published his report on 1000 tonsillectomies and popularized the use of Crowe**-Davis mouth gag and sharp dissection**.
- **1930** - Fowler of Philadelphia performed **modern tonsillectomy**.
- **1970** - **Cryosurgery** of freezing the surface of tonsil at -195degree for 1-1.5 minutes revolutionized Tonsillectomies but the failure rate were more due to regrowth of tonsil and excessive scarring. Brymill Cryospray II liquid nitrogen unit with a vaccum probe is used.
- **1994 – Laser tonsillectomy** described by Grud Meyer-Schwickerath achieved the functional reduction in tonsil volume by Co_2 and KTP-532 laser without the morbidity of pain and bleeding.
- **2002** - **Microdebrider and Coblation tonsillectomy** evolved with minimal intra operative bleeding. Now a days Coblation has become a more commonly practiced technique for tonsillectomy.

Newer tools such as the Coblator and **Plasma Knife** have gained popularity with some surgeons, which make the practicing patterns even more diverse.

ANATOMY

ADENOID EMBRYOLOGY

Adenoids begin forming in the **3rd month** of fetal development. **Glandular primordia** on posterior pharynx are infiltrated with lymphocytes. It is covered by pseudostratified ciliated epithelium. It is **fully** formed by **7th month** as a single pyramidal mass of tissue on the base of posterior-superior nasopharyngeal surface folded without true crypts[3].

BLOOD SUPPLY

1. Ascending palatine branch of the facial artery
2. Ascending pharyngeal artery
3. Pharyngeal branch of internal maxillary artery.

NERVE SUPPLY

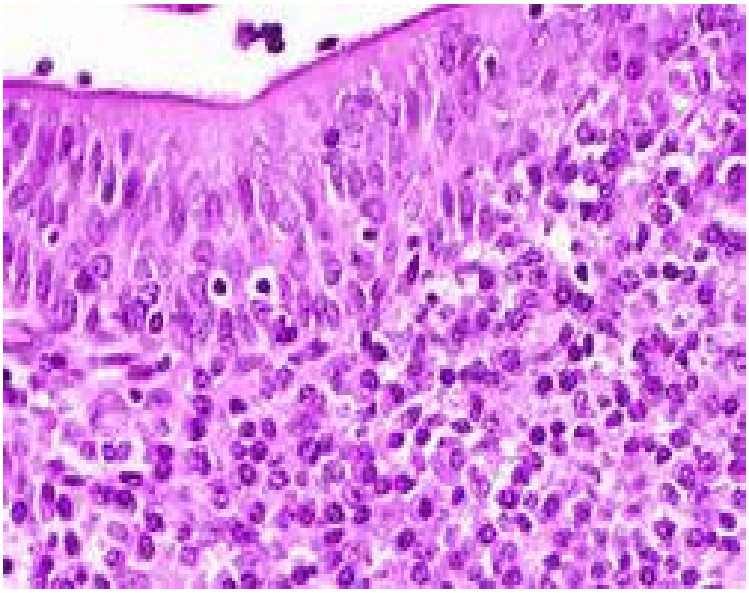
Glossopharyngeal nerve and Vagus nerve are the two innervators.

LYMPHATIC DRAINAGE

No afferent lymphatics, efferents drain into the retropharyngeal and upper deep cervical nodes.

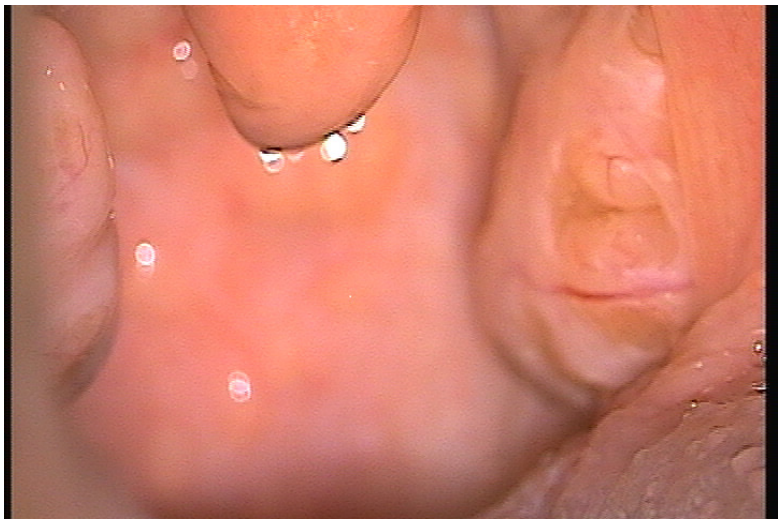
HISTOLOGY

Histology of Adenoid



The adenoid is lined by a pseudostratified ciliated columnar epithelium[3] that is plicated to form numerous surface folds. The nasopharyngeal epithelium lines a series of mucosal folds, around which the lymphoid parenchyma is organized into follicles and is subdivided into 3-4 lobes by connective tissue septa.

TONSIL



EMBRYOLOGY

Palatine tonsils begin to develop in the **3rd month** of fetal development[3]. Tonsil develops from the **ventral second pharyngeal pouches** as 8-12 buds of epithelium growing into the pharyngeal walls, forming 10-30 crypts. Branching of crypts occur in the last trimester. Paired, sitting within tonsillar sinus is limited anteriorly by palatoglossal arch, posteriorly by palatopharyngeal arch, laterally by superior pharyngeal constrictor. It is enclosed within a fibrous capsule.

BLOOD SUPPLY

1. Tonsillar and ascending palatine branches of facial artery
2. Ascending pharyngeal artery
3. Dorsal lingual branch of the lingual artery
4. Palatine branch of maxillaryartery.

NERVE SUPPLY

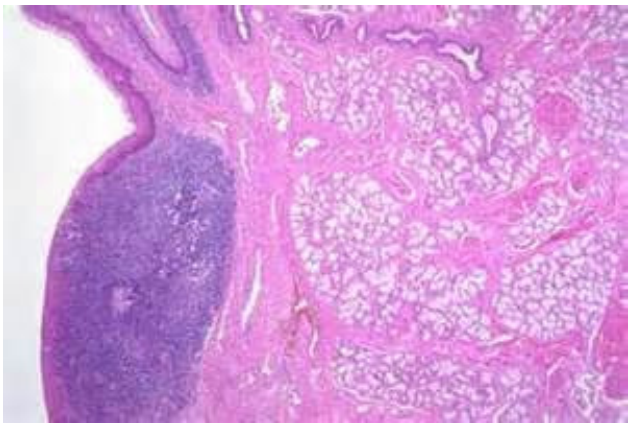
Innervation to the tonsil comes from the Sphenopalatine ganglion via **lesser palatine and glossopharyngeal nerves.**

LYMPHATIC DRAINAGE

No afferent lymphatics, efferents drain into upper deep cervical lymph nodes.[4]

HISTOLOGY

Histology of Tonsil



The tonsil consists of a mass of lymphoid follicles supported by a connective tissue framework. The lymphocytes are dense in the center of each nodule, an area commonly referred to as the germinal center (because multiplication of lymphocytes takes place at this center). **The tonsillar crypts** penetrate nearly the whole thickness of the tonsil and **distinguishes it histologically from other lymphoid organs**. The luminal surface of the tonsil is lined with nonkeratinizing stratified squamous epithelium, and it is continuous with that of the remainder of the oropharynx.

PATHOPHYSIOLOGIC VARIANTS

TONSIL

Tonsillar **involution begins at puberty**; by old age, only a little tonsillar tissue remains. Tonsillar crypts contain desquamated epithelial debris and cells. Usually, this debris is cleared from the crypts. Rarely, debris may remain within the crypts, become hardened and yellow in appearance.

ADENOID

The adenoid **grows rapidly after birth** and usually undergoes a degree of involution and **atrophy** from the age of **7-10 years**. It is rarely seen in adults.

IMMUNOLOGY AND FUNCTION

It is part of the **secondary immune system** with no afferent lymphatics.

Immunologic structure is divided into 4 compartments:

I. Reticular crypt epithelium,
II. Extrafollicular area,
III. Mantle zone of the lymphoid follicle, and
IV. Germinal center of the lymphoid follicle.

PATHOPHYSIOLOGY

Microbiology of adenotonsillitis

Group A beta-hemolytic Streptococci[5] is the most commonly recognized pathogen. Many other organisms are also involved, few of particular importance are beta-lactamase producing organisms like Staphylococcus aureus, Moraxella catarrhalis, and Hemophilus influenza[6].

In polymicrobial infections[7] beta-lactamase producing organisms can protect Group A Streptococci from eradication with Penicillins.

Any virus infection can initiate an attack of acute tonsillitis which also predisposes to secondary bacterial infection. The viruses implicated in acute tonsillitis include adenovirus, Epstein barr virus and herpes simplex virus. Anaerobes[8] have also been found to be present in moderate amounts in 30% of superficial swabs.

PATHOPHYSIOLOGY OF ADENOTONSILLAR HYPERTROPY:

Pathologic manifestations include recurrent adenoiditis, recurrent acute tonsillitis, peritonsillar abscess, obstructive sleep apnea and corpulmonale[9].

OSA

Adenotonsillar hypertrophy clearly plays a role in the pathogenesis of childhood OSAS[10]. The vast majority of children with OSAS has large tonsils and adenoids, which usually improves after adenotonsillectomy[11]. Isono and colleagues studied children with OSAS during anesthesia and skeletal muscle paralysis and determined that the site of upper airway closure was at the level of the tonsils and adenoids, whereas in normal children, it was at the level of the soft palate.

ADENOTONSILLITIS

Chronic adenotonsillar hypertrophy [12]—manifesting as various degrees of airway obstruction in children—has become the most common indication for adenotonsillectomy. Typically, the tonsils and adenoids are very small at birth and progressively enlarge over the first five years of life as a result of increased immunologic activity. Brodsky and colleagues reported that the hypertrophied and chronically infected tonsils and adenoids had greater loads of pathogenic bacteria, especially β-lactamase producers, than non diseased tonsils and adenoids. These studies were based on core samples that were believed to be more accurate than surface cultures of the tonsils and adenoids. It is possible that equilibrium exists between the normal flora of the adenotonsillar tissue and their local immunologic response and that this equilibrium can become disrupted with recurrent acute viral or bacterial infections.

CLASSIFICATION

Acute tonsillitis is classified as

1. Acute **catarrhal** or superficial tonsillitis
2. Acute **follicular** tonsillitis
3. Acute **parenchymatous** tonsillitis
4. Acute **membranous** tonsillitis

1. Acute catarrhal or superficial tonsillitis

Tonsillitis as part of generalized pharyngitis.

2. Acute follicular tonsillitis

ACUTE FOLLICULAR TONSILLITIS

Infection spreads to the crypts which becomes filled with the purulent material, which presents at the openings of the crypts as yellowish spots.

3. Acute parenchymatous tonsillitis

Tonsil is uniformly enlarged and red.

4. Acute membranous tonsillitis

Exudates from the crypts coalesces to form a membrane on the surface of tonsil.

CHRONIC TONSILLITIS - CLASSIFICATION

1. Chronic **follicular** tonsillitis
2. Chronic **parenchymatous** tonsillitis
3. Chronic **fibrotic** tonsillitis.

CHRONIC FOLLICULAR TONSILLITIS

SYMPTOMS

1. Sore throat[13]

2. Difficulty in swallowing

3. Odynophagia

4. Fever.

SIGNS

1. Halitosis

2. Hyperaemia of pillars

3. Significantly enlarged and tender jugulodigastric node

COMPLICATIONS

1. Chronic Tonsillitis

2. Peritonsillar abscess[14]

3. Parapharyngeal / Cervical abscess

4. Acute otitis media

5. Rheumatic fever[15]

6. Acute glomerulonephritis

7. SABE.

4. MATERIALS AND METHODS

STUDY METHOD

The analysis is based on patient attending the Department of Otorhinolaryngology at Stanley medical college hospital.

An Analytical study of **150 patients** of age group **5-14 years** who had undergone adenotonsillectomy **between August 2012 to September 2013** are included.

MATERIALS AND METHODS

The study was conducted in 150 patients who had undergone adenotonsillectomy in Government Stanley Medical College.

Ethical committee approval was obtained.

INCLUSION CRITERIA

1. **Age group**: 5 – 14 Years
2. **Sex** : Male and Female
3. Patients diagnosed with

i. Acute recurrent tonsillitis,

ii. Peritonsillitis,

iii. Streptococcal carriers,

iv. OSA,

v. Conductive hearing loss due to secretory otitis media[16]

vi. Diphtheria carriers.

EXCLUSION CRITERIA

1. Patients with age < 5 years and > 14 years,
2. Acute tonsillitis,
3. Blood dyscariasis,
4. Palatal abnormalities like submucus cleft palate,
5. Down's syndrome[17]

CLINICAL ASSESSMENT - HISTORY TAKING

Accurate history taking is essential.

History of

i. throat pain,

ii. odynophagia,

iii. difficulty in swallowing,

iv. mouth breathing,

v. snoring,

vi. ear block and

vii. recurrent upper respiratory tract obstruction should be taken.

CLINICAL EXAMINATION

1. **Adenoid facies** - Elongated face, short open upper lip, crowded teeth, high arched plate and hyponasal speech.

2. **EXAMINATION OF THROAT: [Oral cavity and Oro pharynx].**

The oral cavity includes

1. Lips
2. Teeths
3. Gums
4. Tongue
5. Palate - both hard and soft
6. Floor of the mouth
7. Cheeks

The oropharynx include

1. Uvula
2. Soft palate
3. Anterior and posterior tonsillar pillars
4. Tonsils
5. Posterior pharyngeal wall.

GRADING OF TONSIL[18]

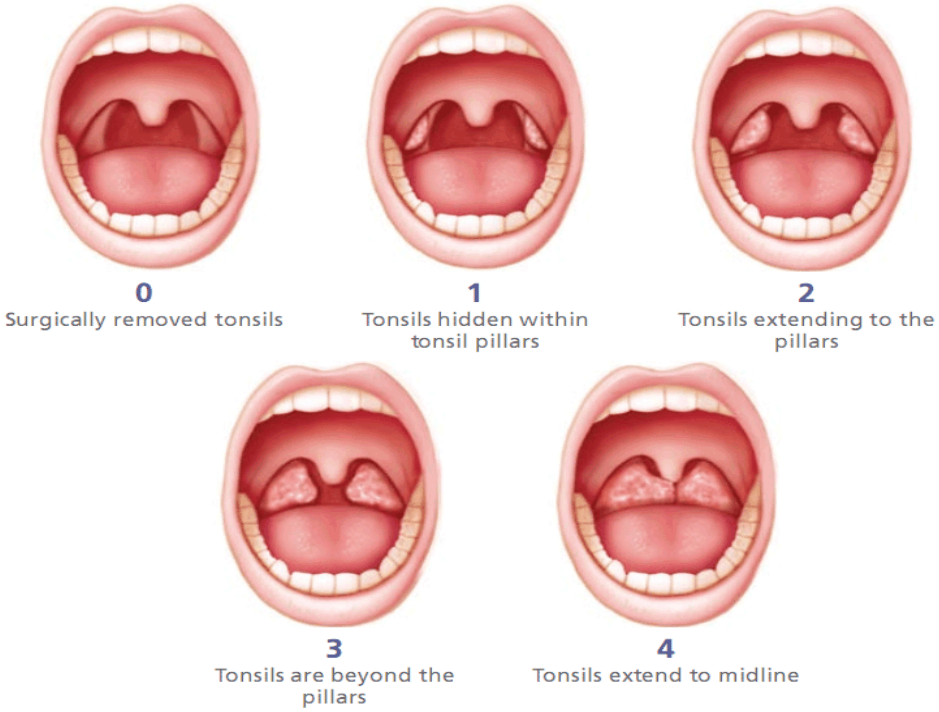
Grade 0 **:** Tonsils absent

Grade 1 : Hidden behind tonsillar pillars

Grade 2 **:** Extend to pillars

Grade 3 **:** Visible beyond pillars

Grade 4 **:** Enlarged touching in midline



POST NASAL EXAMINATION:

Postnasal examination can be done by using St.Clair Thompson's post nasal mirror. This examination can be augmented using a 2.7 mm internal diameter 0° nasal endoscope. The size of the adenoid can be graded using Clemens grading.

CLEMEN'S CLINICAL GRADING OF ADENOID ENLARGEMENT [20]

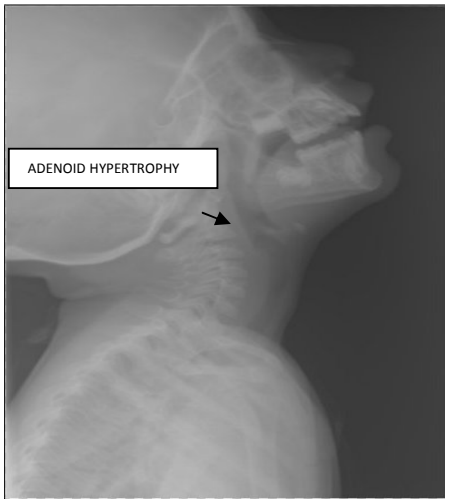
GRADE I - Adenoids filling 1/3 of vertical portion of choana

GRADE-II - Adenoids filling1/3 to 2/3 of the choana

GRADE III - Adenoids filling 2/3 to complete choana

GRADE IV - Complete choanal obstruction

RADIOLOGICAL ASSESSMENT[21]



X ray Neck Soft tissues – Lateral view

CT image of the Nasopharynx

X ray neck lateral view of the soft tissues will usually reveal the degree of adenoid hypertrophy.

X ray cervical spine in **Down's syndrome** to check **C_1 C_2 subluxation**.

Following investigations are done and the patient is assessed prior to surgery.

BLOOD: Haemoglobin %

Total count

Differential count

Erythrocyte sedimentation rate

Bleeding time

Clotting time

Blood grouping and Rh typing

Prothrombin time

Absolute Partial thromboplastin time

URINE: Albumin, Sugar and deposits

X ray chest PA view

Diagnostic Nasal Endoscopy

Pure Tone Audiometry

SURGICAL PROCEDURE AND METHODS

ANAESTHESIA

General anesthesia is administered via cuffed endotracheal tube.

POSITION

SISTER ROSE POSITION

"ROSE POSITION" - patient lying in supine position with head and neck in extension by keeping sand bag under the shoulder.

Set of instruments for adenotonsillectomy[22]

1. Toothed and non-toothed Waugh's forceps
2. Dennis Browne Tonsil holding forceps
3. Mollison Tonsil dissector and anterior pillar retractor
4. Luc's forceps
5. Scissor
6. Birkett Curved artery forceps
7. Negus second artery forceps
8. Eve Tonsillar snare
9. Boyle Davis mouth gag with three sizes of tongue blades
10. Jenning mouth gag
11. Kliner Mouth gag
12. Doughty tongue blade
13. Russell Davis tongue blade
14. Magauren plate
15. Draffin’s bipods
16. St.Clair Thompson adenoid curette with cage
17. Beckman adenoid curette without cage
18. Adenoid through cutting forceps
19. Laforce adenotome
20. Muck forceps
21. Colveler tonsillar forceps
22. Gwynne tonsillar dissector

23. Birkett straight artery forceps

24. Negus knot tier and ligature pusher

25. Irwin More pillar suturing needle

26. Ballenger's guillotine

27. Doyen's mouth gag

28. Tonsil swab

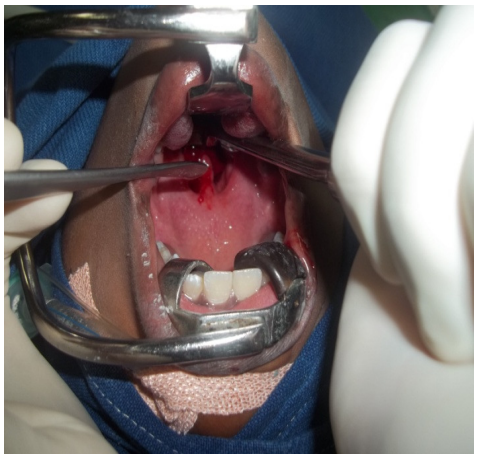
29. Yankauer pharyngeal suction tube.

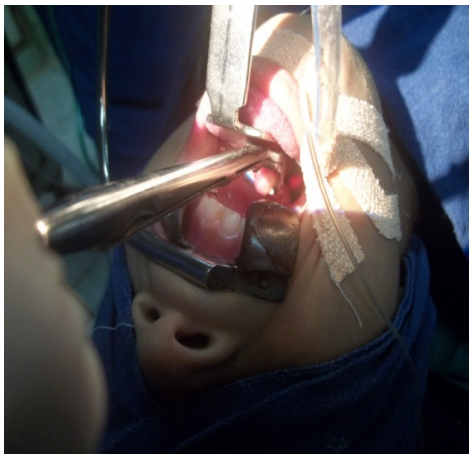
PROCEDURE

Boyle - Davis mouth gag is introduced, slided in and fixed in optimum position using Draffin's bipods.

SURGICAL STEPS OF ADENOIDECTOMY

1. **CONVENTIONAL ADENOIDECTOMY**[23]

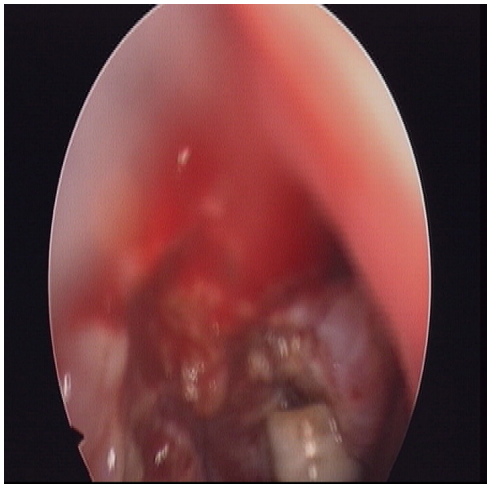


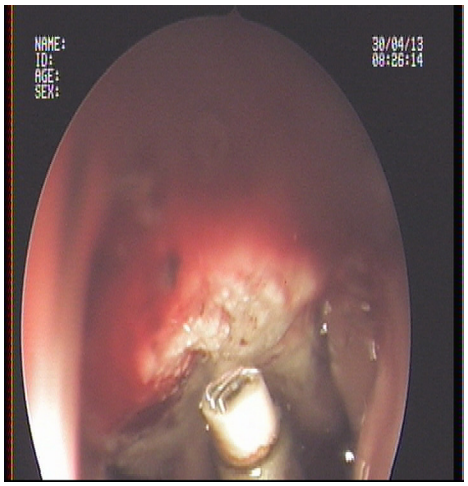


A red rubber catheter is introduced through the anterior nares and brought out through the oral cavity retracting the soft palate. Nasopharynx is examined by digital palpation to confirm the presence and size of adenoids.

St. Clair Thomson's adenoid curette with guard is introduced into nasopharynx till it touches the posterior border of nasal septum. Curette with guard is passed to engage the adenoids. At this level head should be slightly flexed to avoid injury to atlanto occipital joint during curettage. With gentle sweeping movements adenoid is curetted in midline. No attempt should be made to curette adenoid more laterally so as to avoid injury to the Eustachian tubes. Lateral mass should be removed ideally using a currete without cage to prevent injury to Eustachian tube orifice. Pack is kept in the nasopharynx to obtain haemostasis.

2. **ENDOSCOPIC ASSISTED COBLATION ADENOIDECTOMY**

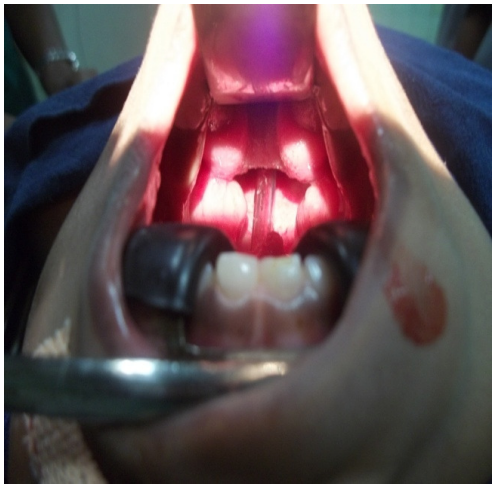




The nasal cavities and nasopharynx are examined with 0 or 30 degree 2.7mm Karl storz endoscope. Appropriate sized adenoid curette is selected and is placed transorally into the nasopharynx. Under nasal endoscopic guidance the adenoid tissue is curetted either by **Conventional curettage** or by **Coblation** technique. **Endoscopic assisted technique[24] has the advantage of complete removal of adenoid without remnants.**

SURGICAL STEPS OF TONSILLECTOMY

DISSECTION AND SNARE METHOD



INCISION OF TONSIL CAPSULE BY DISSECTION METHOD

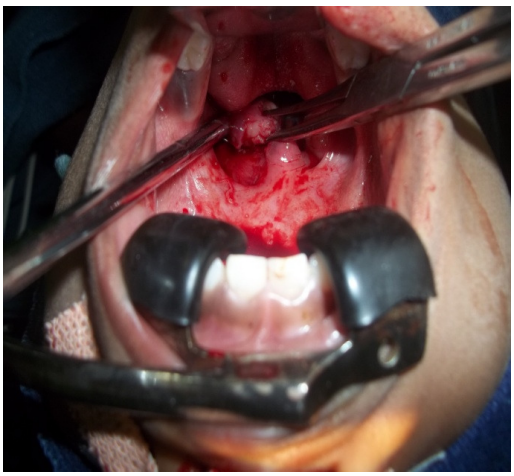

1. Tonsil is grasped using Tonsil holding forceps at the superior pole and drawn firmly in the inferomedial direction, thus exposing mucosa lateral to the free edge of anterior faucial pillar. The **curvilinear incision** is made half way between the superior and inferior pole of tonsil to the depth of the surgical 'capsule' of the tonsil.

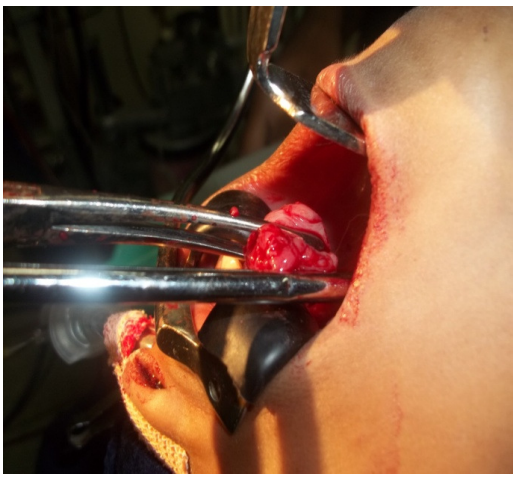
2. **The plane of dissection is the loose areolar tissue plane** which lies between the capsule and the pharyngeal superior constrictor muscle and it is **essential** that the dissection is **performed strictly** in this plane[25].

3. **The Superior pole is first mobilized** and dissected as close as possible to the capsule throughout the dissection.

4. Towards the lower pole of the tonsil there is a firm fibrous triangular fold which tends to hold the dissection at this point. A **cold –wire snare**[25] is threaded over the tonsil which is finally removed by closing the snare at the level of tonsillolingual sulcus. This ensures that the lingual 'tongue' of lymphoid tissue is removed with the tonsil proper.

REMOVAL OF TONSIL BY SNARE





5. Minor bleeding usually stops **spontaneously** if a gauze swab is placed gently and firmly in the tonsillar fossa for 2 to 3 minutes. Minor persistent bleeding may be controlled quickly and effectively with insulated **diathermy** forceps. **The fossa should be absolutely dry at the end of the procedure**.

6. When all the bleeding points has been secured, suctioning of the collected blood from nasopharynx is done.

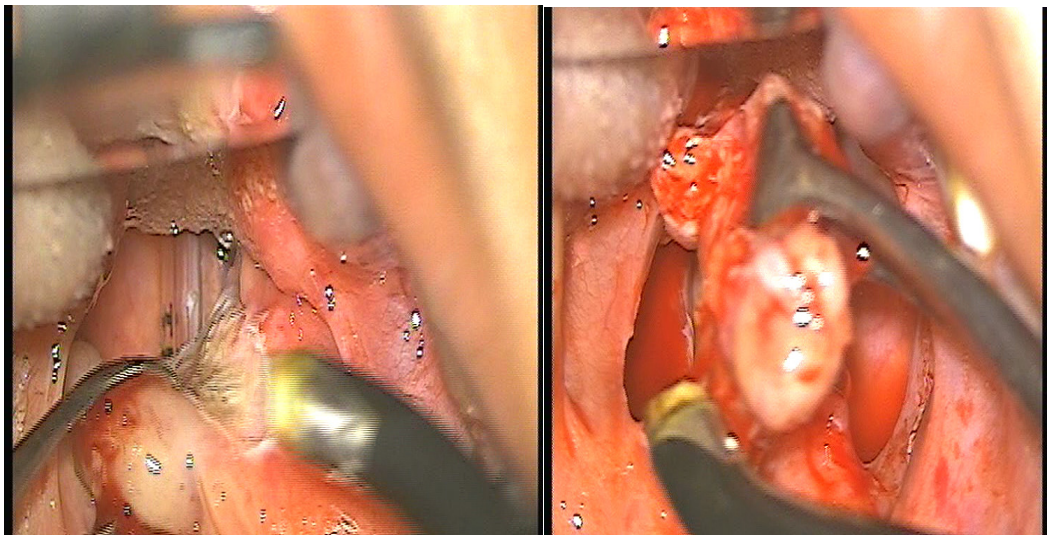
7. All the swabs should be removed and count should be obtained.

8. The patient is kept in the post tonsillectomy recovery position i.e. on the side with the head down so that if haemorrhage happens blood will flow out of nose and mouth and will not get aspirate into the larynx.

9. Adequate sedation is given to relieve immediate post operative pain.

COBLATION TONSILLECTOMY

DISSECTION OF TONSIL CAPSULE BY COBLATION



Coblation[26] means controlled ablation involving transmission of radiofrequency bipolar electrical current at low temperature (60-100degree) through a medium of normal saline, producing a plasma field of sodium ions that dissects the tonsillar tissue by disrupting intercellular bonds leading to

tissue vaporization thereby preserving the surrounding healthy tissue. The technique employs a bipolar probe to generate radiofrequency electrical current[27]. Coblation heats surrounding tissue less than diathermy.

LASER TONSILLECTOMY[28]

Anaesthesia: General Anesthesia with laserflex endotracheal tube .

Laser used: **1. Co_2 laser** **2.KTP-532 laser[28]**

Method: Use of operating microscope with laser attached.

Procedure

The Co_2 laser is set on 15 watts with a spot size of 1 mm. The superior pole of tonsil is then grasped and a medial traction applied, cutting with laser is begun superiorly and the tonsil is delivered with anterior and posterior pillars intact. Any tonsillar tissue left can be vapourized. Good visualization of the tonsillar plane allows identification of major vessels before they are cut or injured. With this technique and precautions blood loss is minimal, usually less than 1-2 ml.

Advantages

1. Less operative time

2. Minimal intraoperative blood loss

3. Less pain following surgery

4. Quicker healing

5. Less post operative bleeding - only 2%

CRYO TONSILLECTOMY

Indication: Tonsillectomy in **blood dyscrasias**[29]

Anaesthesia: Topical anaesthesia with oral lavage of 4%lidocaine solution

Position: Patient placed in semiprone position with tongue depressed and anterior pillar retracted .

Procedure: The Cryosurgical probe is applied appropriately over the surface of the tonsil and freezing is performed at -195degree C .The tonsil is elevated from the tonsillar fossa with gentle medial traction using the cryosurgical probe. Care is taken not to freeze adjacent anterior and posterior pillars, tongue bed, softpalate, and uvula. The duration of freezing cycle and probe temperature is adjusted so that the entire tonsil mass is uniformly included in the frozen circle.

Postoperative measures: Patient is observed in the postoperative ward for one hour prior to discharge.

Follow up: 7th to 14th post operative day.

HARMONIC SCALPEL

It is an **ultra sound coagulator and dissector** that uses ultrasonic vibrations to cut and coagulate the tissues[30]. The cutting and dissection operation is made possible by a sharp knife with a vibratory frequency of 55.5 KHz over a distance of 87 micro meters. Coagulation occurs due to transfer of vibratory energy to tissues. This breaks up the hydrogen bonds of proteins in tissues and generates heat from tissue friction[31].

PLASMA-MEDIATED ABLATION TECHNIQUE

It is a cold method. In this ablation method, protons are energized to break molecular bonds between tissues. It does not cause thermal injury

INTRACAPSULAR TONSILLECTOMY

With the use of powered instruments (micro debrider with a 45 degree hand piece) tonsillar tissue is removed but its capsule is preserved in the hope to **reduce post-operative pain**[32].

ELECTROCAUTERY

Diathermy uses heat energy from a high-frequency electric current to dissect the tonsils. The heat can also be used to seal the blood vessels to stop any bleeding by coagulation[32]. There are two types of diathermy:

1. **Monopolar**
2. **Bipolar**

In monopolar diathermy, the electric current passes between the tips of the diathermy instrument and a plate that is in contact with the patient's skin.

In bipolar diathermy, the current passes between the two tips of the diathermy forceps.

Both unipolar and bipolar electrocautery has been used. It **reduces blood loss but causes thermal injury to adjoining tissues.**

POST –OPERATIVE CARE

1. **Regular Observation of Pulse**: Every 15 minutes for 2 hours

   Every 30 minutes for further 2 hours

DANGER SIGNS: (a) Rapid increase of pulse rate,

(b) Pallor and

(c) Vomiting of blood

It must be observed seriously for any precipitated haemorrhage. In case of active bleeding, patient must be shifted to the operation theatre and the bleeding point must be ligated.

2. **Post operative analgesia** - Parenteral or Oral.

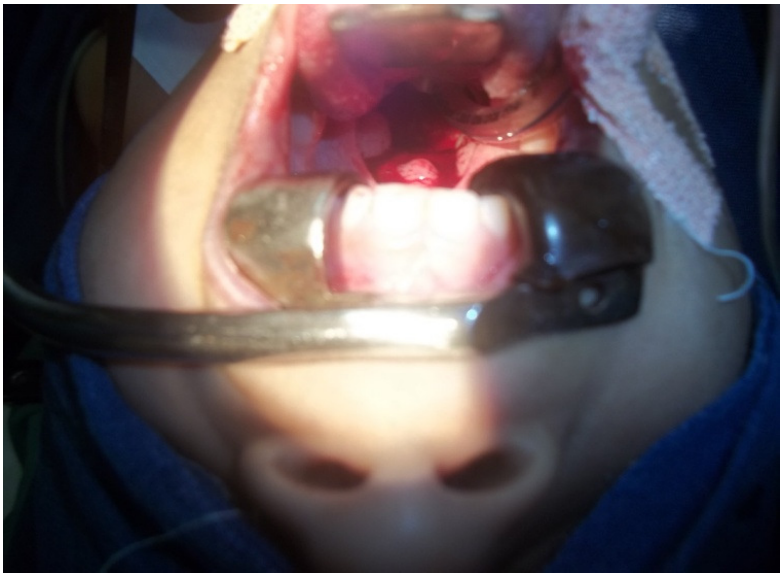
3. **Antibiotics** parenterally for 2 days, followed by orally for 1 week decreases the morbidity.

4. The patient is put on **Post tonsillectomy position** [Left lateral position] facilitating removal of secretions from mouth and throat avoiding aspiration.

5. Patient is encouraged to take **soft oral diet** initially followed by **normal diet.**

COMPLICATIONS OF ADENOIDECTOMY

1. PERIOPERATIVE HAEMORRHAGE



Bleeding after adenoidectomy is usually treated by adequate compression with nasal pack or bipolar cautery.

Patient with **persistent bleeding** should be taken to operation theatre, to examine the nasopharynx for **adenoid tissue remnants,** if present to facilitate its removal and securing perfect homeostasis.

2. Nasopharyngeal blood clot / Coroner's clot

Blood may pool and clot in the nasopharynx during adenoidectomy. The nasopharynx must be suctioned out clearly before extubation. Failure

to suction the nasopharynx postnasally may result in clot **dislodgement and aspiration into lungs.**

3. **Airway obstruction**

Post adenoidectomy airway obstruction occurs due to oedema of the tongue, soft palate and nasopharynx.

4. Injury to Eustachian tubal orifice may lead to stricture and consequent otitis media as a complication.
5. Cervical spine dislocation: (**Grisel's syndrome**)

Atlanto-occipital dislocation due to injury of anterior longitudinal ligament of spine is a rare complication.

6. **Velopharyngeal insufficiency**

It occurs due to incomplete closure of the soft palate to the posterior and lateral pharyngeal wall. Persistent VPI occurs in patients with palatal abnormality.

7. **Nasopharyngeal stenosis**

These patients presents with deep scar tissue in the absence of identifiable muscle tissue in the nasopharynx, soft palate, and anterior and posterior pillars.

Also significant was the presence of scarring at two levels of the nasopharynx.

First, there was **stenosis of the choanae**, usually with complete obliteration of the nasopharynx.

Second, there was also scarring of the **nasooropharynx** at the level of soft palate and posterior pillars with scarring to the posterior walls of the oropharynx.

COMPLICATIONS OF TONSILLECTOMY

I. PEROPERATIVE

II. POSTOPERATIVE

Immediate

Intermediate

Late

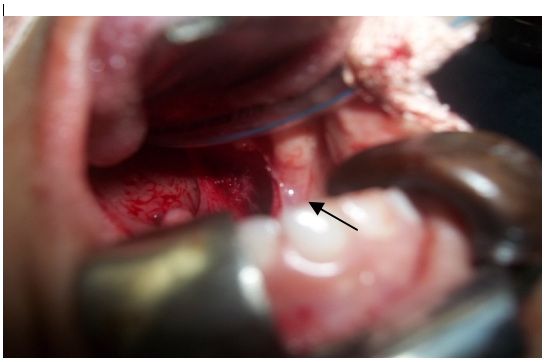
I. PEROPERATIVE

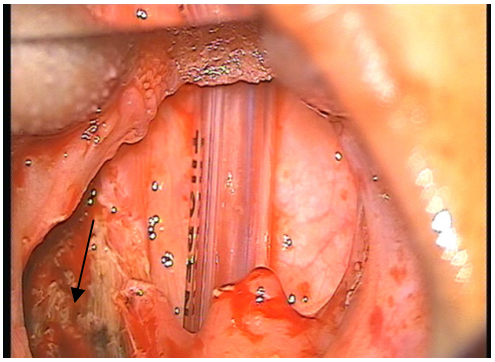
1. **TRAUMA DUE TO INSTRUMENTATION**

- Damage to **teeth and angle of the mouth** - minimized by gentle insertion of the gag.

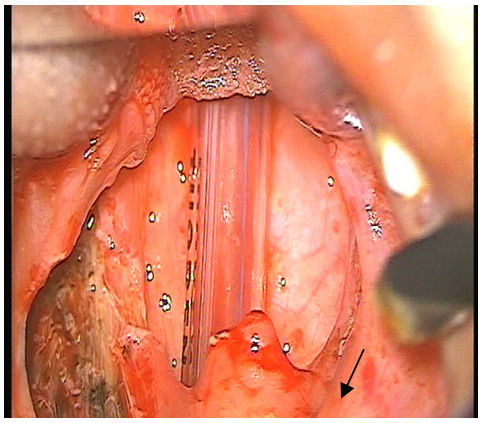
- Damage to **posterior pharyngeal wall** by tongue blade.
- Anterior **pillar injury** due to badly placed mucosal incision.
- Ischemia of the tongue
- Haematoma and **oedema of uvula**
- Damage to posterior pillar due to blunt dissection of tonsillar capsule
- Temporomandibular joint dislocation
- **Loss of taste** due to compression of papilla by tongue blade
- Thermal burns in the mouth secondary to the use of diathermy in the presence of high oxygen concentration.

Pillar injury in Conventional and Coblation tonsillectomy



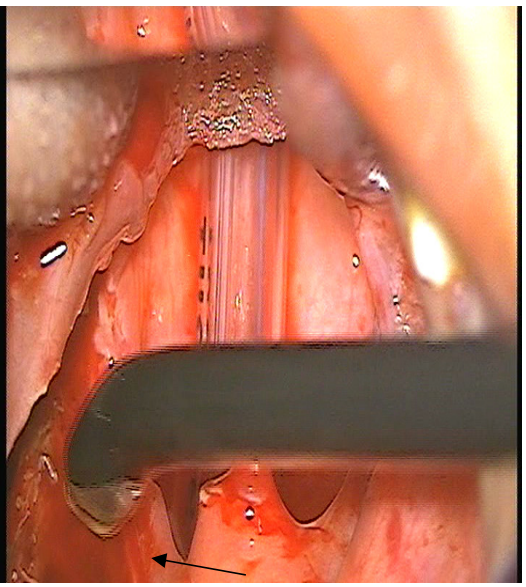


Oedema of Uvula in Conventional and Coblation tonsillectomy



2. **PRIMARY HEMORRHAGE**[15]:

CONVENTIONAL TONSILLECTOMY	COBLATION TONSILLECTOMY



It is the most significant complication. It is the amount of bleeding during tonsillectomy and it varies with individual patients, surgical methods and operating surgeons. Average blood loss may be 100-120ml.

Factors responsible for primary haemorrhage may be due to

1. Recent infection

2. Previous peritonsillar abscess

3. Blunt intratonsillar dissection

Management of primary haemorrhage

1. Careful dissection technique and ligature of all bleeding points.

2. Excessive haemorrhage is controlled by compression packing of the fossa.

3. Oversewing the pillars which can be removed the following day by dividing the sutures. A pack of absorbable materials like Calgitex or Gelfoam can be used.

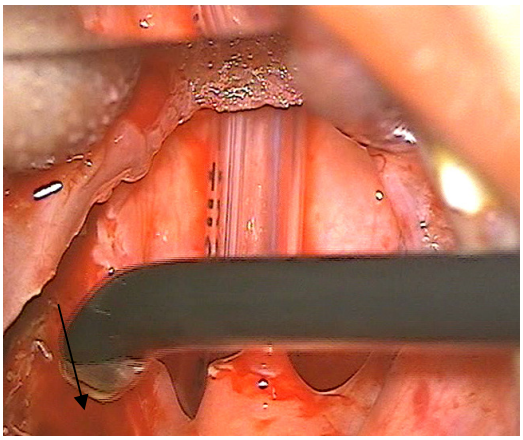
II. POSTOPERATIVE

IMMEDIATE COMPLICATIONS

1. REACTIONARY HAEMORRHAGE

CONVENTIONAL TONSILLECTOMY

COBLATION TONSILLECTOMY



Haemorrhage can occur up to 24 hrs postoperatively[16], most often within the **first 8 hours**.

The possible **cause** of fresh bleeding may be due to:

(a) **Dislodgement of clot** from the vessel lumen.

(b) **Vasodilatation of the vessel** possibly **under spasm** at the time of surgery. Changes in BP or the state of vessels by anaesthetic agents may have a role.

(c) **Venous bleed** postoperatively, which may be due to excessive venous pressure induced by coughing or retching.

It is dangerous in two aspects:

(i) During the phase of recovery from anaesthesia, cough reflex is not fully established, hence the blood in the airway can asphyxiate the patient by mechanical occlusion of airway.

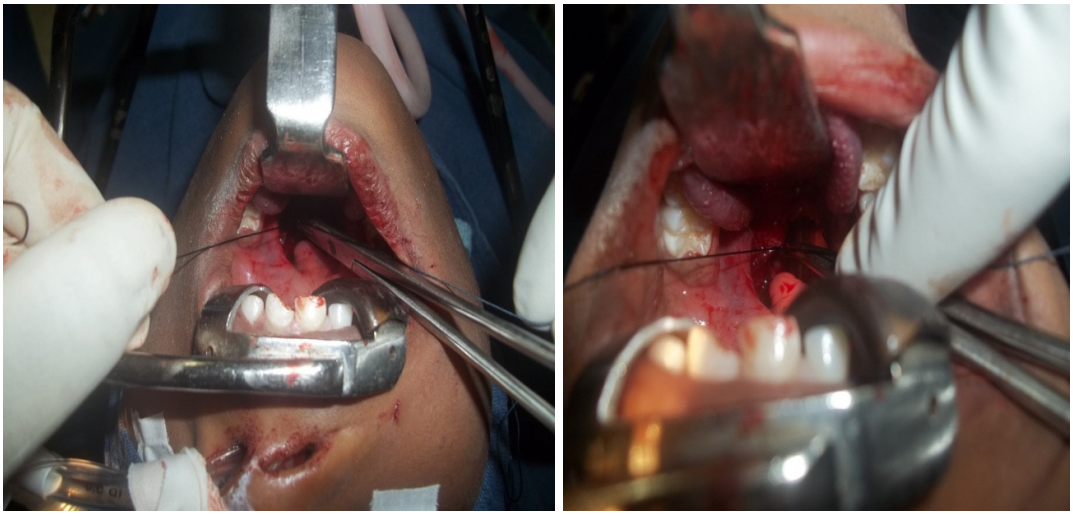
(ii) Haemorrhage, leading on to hypovolemia can cause peripheral circulatory failure and death.

MANAGEMENT OF REACTIONARY HAEMORRHAGE

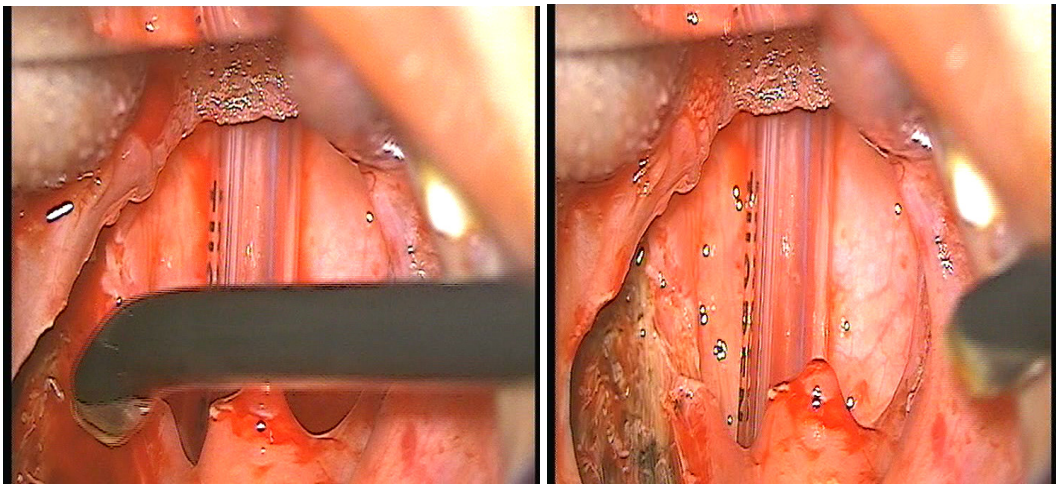
a. **Cross matching** of blood at the first sign of haemorrhage for transfusion if needed.

b. Tonsillar **fossa must be frequently inspected** from time to time for recurrence of bleeding. If bleeding is persistent shift the patient to operation theatre, **reanaesthetise [23] and ligate** the bleeding point is under GA.

LIGATURE APPLICATION - CONVENTIONAL TONSILLECTOMY[17]



CONTROL OF PRIMARY BLEEDING - COABLATION TONSILLECTOMY[18]



c. In severe haemorrhage ligation of external carotid artery may be necessary.

4. NAUSEA AND VOMITING

Post tonsillectomy vomiting is associated with multiple etiologies.

Increased incidence

- Female sex
- History of postoperative vomiting
- Motion sickness
- History of gastroparesis
- Obesity[19].

Triggering factors

- Activation of chemoreceptors and mechanoreceptors in the oropharynx
- Swallowed blood in the stomach
- Intraoperative manipulation causing
    - Direct stimulation of the chemoreceptor trigger zone (CTZ) in the area postrema,
    - Stimulation of the trigeminal nerve,
    - Vestibular input to the vomiting center[20].

INTERMEDIATE COMPLICATIONS

1. **Secondary Haemorrhage**: Haemorrhage which occurs 24 hours after the surgery and classically within 6-8 days. It is usually less severe and less common.
2. **Necrosis and loss of uvula** can occur due to damage to its arterial supply.
3. **Infection of tonsillar fossa**: Postoperatively, normal tonsillar fossa contains whitish slough which gets rarely infected in the first week clinically manifesting with fever and ear ache. If untreated it **can lead to serious secondary haemorrhage.**
4. **Pulmonary atelectesis**: Pulmonary atelectasis leading to pneumonia, lung abscess due to inhalation of blood or fragments of tonsillar tissue.
5. Subacute bacterial endocarditis (**SABE**): Tonsillectomy in valvular heart disease patients may cause SABE due to transient bacteremia.
6. **Pain:** Post tonsillectomy pain[21] is the **commonest manifestation** in the first week.
7. **Ear ache:** Postoperative earache is usually a referred pain from tonsillar fossa due to glossopharyngeal neuralgia.

DELAYED COMPLICATIONS[22]

1. Post operative scarring

Traumatic instrumentation with loss of mucosa on the soft palate can result in scar tissue in the soft palate limiting mobility of palate and affecting the voice of the patient.

2. Tonsillar remnants

Incomplete dissection can leave behind islands of tonsillar remnant at the lower pole, leading to recurrent acute infection and peritonsillar abscess.

3. Lingual tonsillar hypertrophy

Hypertropy of the lingual tonsils is a late complication and can occur as compensatory to the loss of palatine tonsils.

RARE COMPLICATIONS

- Aspiration of foreign bodies:

  Dislodged teeth, gauze pieces, cotton ball, lymphoid tissue
- Mediastinal emphysema
- Paralysis of glossopharyngeal nerve
- Salivary gland fistula from submandibular gland to the tonsillar fossa
- Meningitis and Brain abscess
- Behaviour abnormalities like aggressive and delinquent behavior[22] attention problem as per child behavior check list scale.

5. RESULTS

6.1 General Description of the Study Population

There were 100 patients in Conventional Tonsillectomy group and 50 patients in Coblation Tonsillectomy group.

Table 6.1.1 GENDER DISTRIBUTION

	COLD Tonsillectomy	HOT Tonsillectomy	Total
Male	**43 (43.0%)**	**21 (42.0%)**	**64 (42.7%)**
Female	**57 (57.0%)**	**29 (58.0%)**	**86 (57.3%)**
Total	**100 (100%)**	**50 (100%)**	**150 (100%)**

Chi^2 – 0.014 p-Value – 0.907

In the Conventional Tonsillectomy group, 43 (43.0%) were males and 57 (57.0%) were females. In the same manner, in the Coblation Tonsillectomy group, 21 (42.0%) were males and 29 (58.0%) were females and so both groups are comparable as evident by p-value > 0.05.

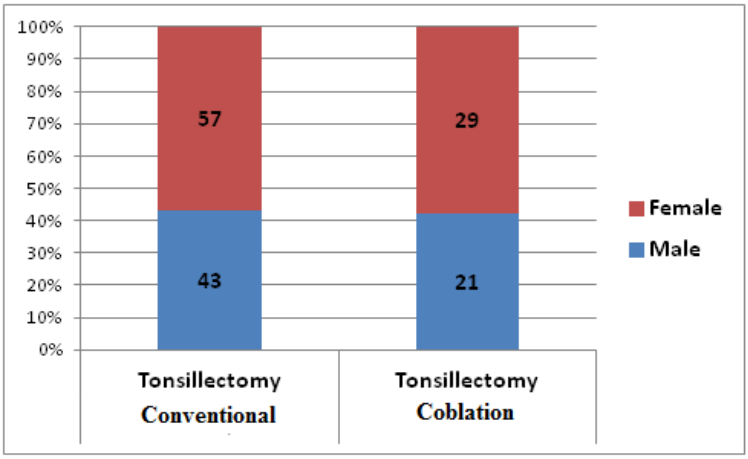


Fig. 6.1.1 Showing Gender distribution of the Study Population

Table 6.1.2 AGE DISTRIBUTION

Category	N	Mean	Standard Deviation
COLD Tonsillectomy	100	9.67	2.69
HOT Tonsillectomy	50	8.92	2.58
Total	150	9.42	2.67

T – Value 2.66 p-Value – 0.105

The minimum age of the study population is from 5 years to maximum of 15 years. The mean age was 9.42 years with standard deviation of 2.67 years. The mean age (± standard deviation) in Conventional Tonsillectomy group is 9.67 (± 2.69) years while the mean age (± standard deviation) in Coblation Tonsillectomy group is 8.92 (± 2.58) years. This difference is not significant as the p-value is > 0.05. So both the groups are comparable by age too.

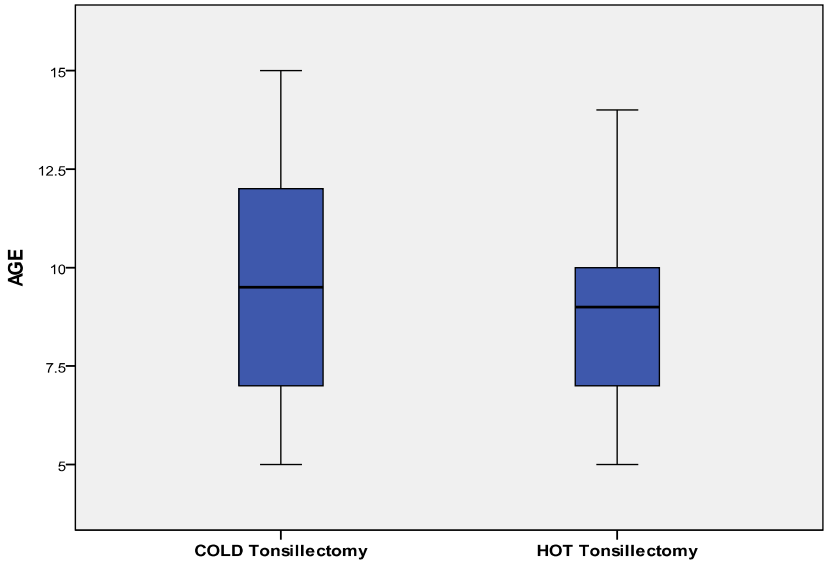


Fig. 6.1.2 Showing Age Distribution of the Study Population

6.2 PREOPERATIVE SYMPTOMS

Table 6.2 PREOPERATIVE SYMPTOMS

	Number	Percentage
Throat Pain	**143**	**95.3**
Odynophagia	**144**	**96.0**
Difficulty in Swallowing	**134**	**89.3**
Mouth Breathing	**85**	**56.7**
Snoring	**35**	**23.3**

Regarding the preoperative symptoms of the study population, Odynophagia is the most common symptom as seen in 144 (96.0%) patients followed by Throat pain in 143 (95.3%) and Difficulty in swallowing in 134 (89.3%) patients. Then Mouth breathing is seen in 85 (56.7%) of the patients and Snoring is seen only 35 (23.3%) patients.

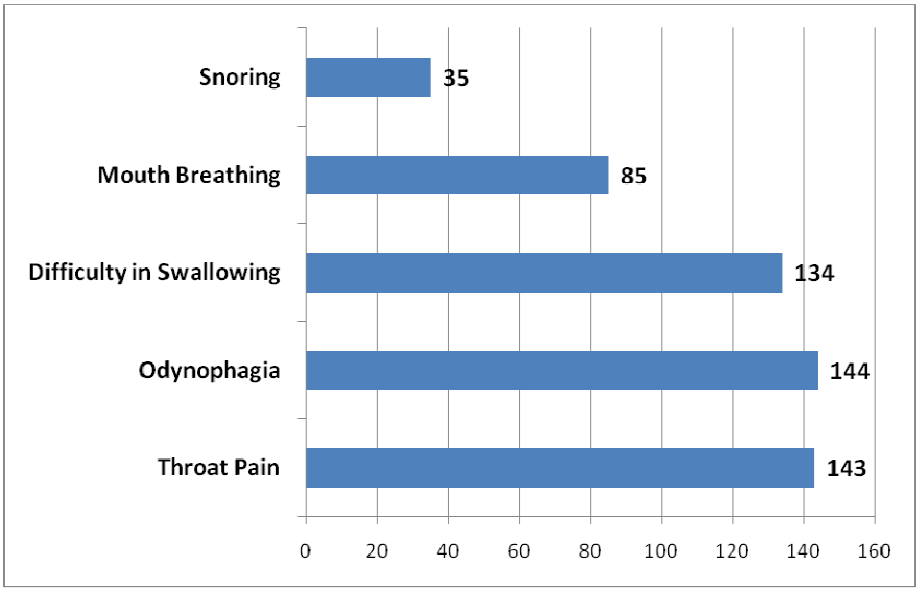


Fig. 6.2 Showing Preoperative Symptoms of the Study Population

IMMEDIATE COMPLICATIONS

6.3 Intraoperative Complications

Table 6.3.1 INTRAOPERATIVE ANAESTHEIC COMPLICATIONS

	Number	Percentage
Dislodging of Loose Tooth	**9**	**6.0**
Dislodging of Temparo Mandibular joint	**0**	**0.0**
Accidental Extubation	**10**	**6.7**
Kinking of ET Tube	**19**	**12.7**

Among the Intraoperative Anesthetic complications in the study populations, Compression of ET tube is the commonest complication as seen in 19 (12.7%) patients followed by Accidental Extubation seen in 10 (6.7%) patients and Dislodging of Loose Tooth seen in 9 (6.0%) patients. None of the patients had any Dislocation of Temparo Mandibular joint.

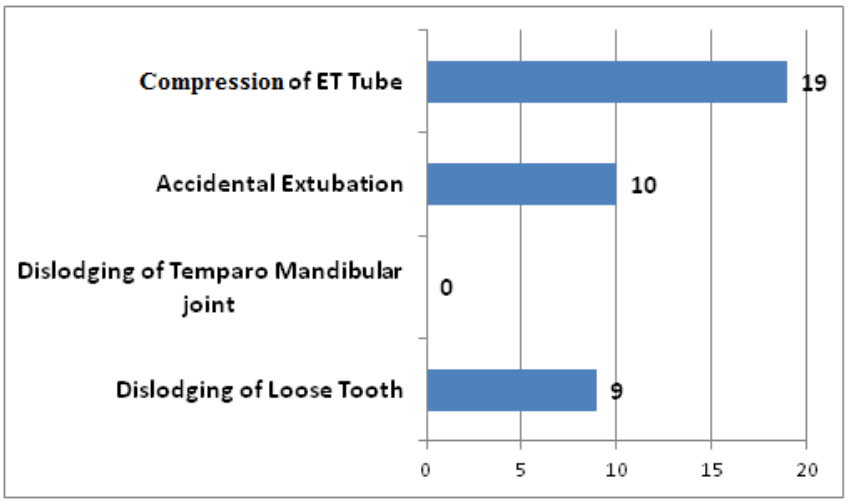
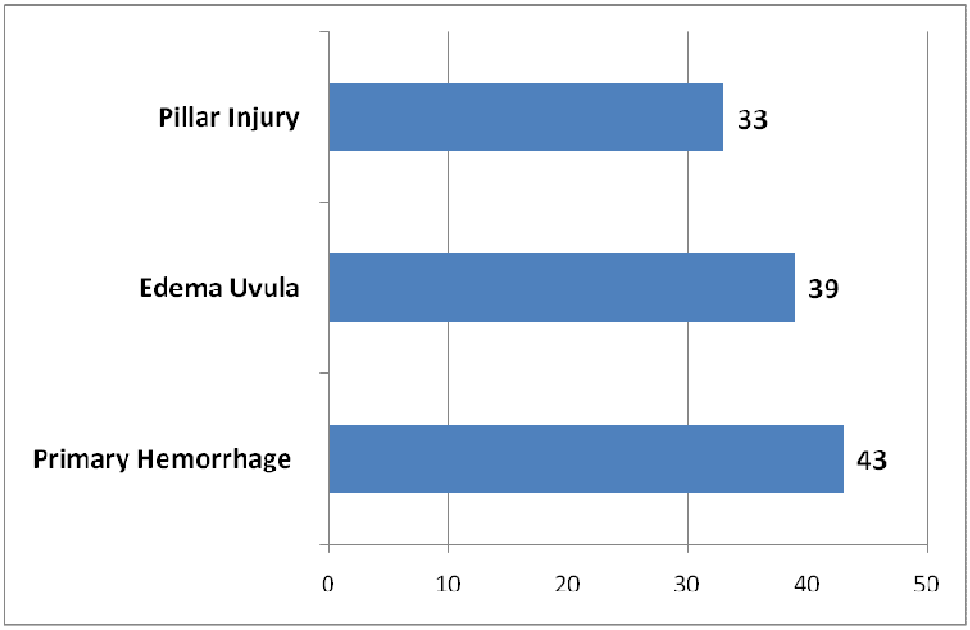


Fig. 6.3.1 Showing Intra Operative Anaesthetic Complications

Table 6.3.2 INTRAOPERATIVE SURGICAL COMPLICATIONS

	Number	Percentage
Primary Hemorrhage	**43**	**28.7**
Edema Uvula	**39**	**26.0**
Pillar Injury	**33**	**22.0**

Regarding Intraoperative Surgical complications, Primary Hemorrhage is seen in maximum as many as 43 (28.7%) patients followed by Edema Uvula seen in 39 (26.0%) and Pillar Injury seen in 33 (22.0%) patients.



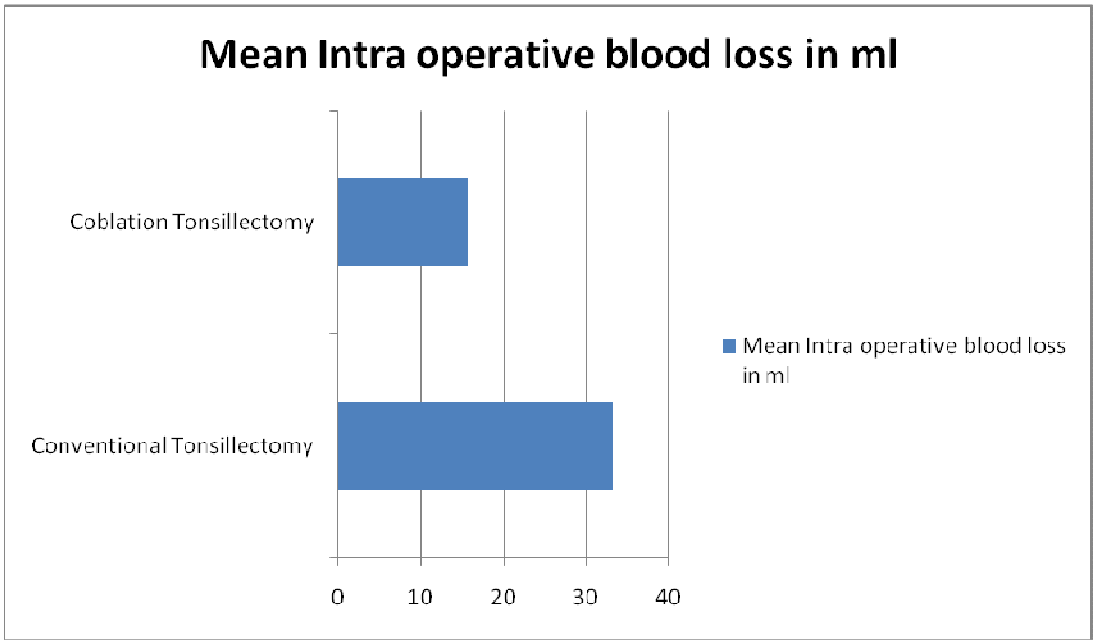


Fig. 6.3.2 Showing Intra Operative Surgical Complications

6.4 Postoperative Complications

Table 6.4.1 POSTOPERATIVE COMPLICATIONS

	Number	Percentage
Nausea, Vomiting	**20**	**13.3**
Loss of Taste	**6**	**4.0**
Primary Hemorrhage	**21**	**14.0**
Oropharyngeal Pain	**28**	**18.7**
Referred Otolgia	**12**	**8.0**
Secondary Hemorrhage	**12**	**8.0**

Oropharyngeal Pain is the commonest Postoperative Complication in the study population as seen in 28 (18.7%) followed by Primary Hemorrhage seen in 21 (14.0%) patients and Nausea, Vomiting seen in 20 (13.3%) patients. Referred Otolgia and Secondary Hemorrhage were observed in 12 (8.0%) patients respectively each and Loss of Taste was seen in 6 (4.0%) of the patients.

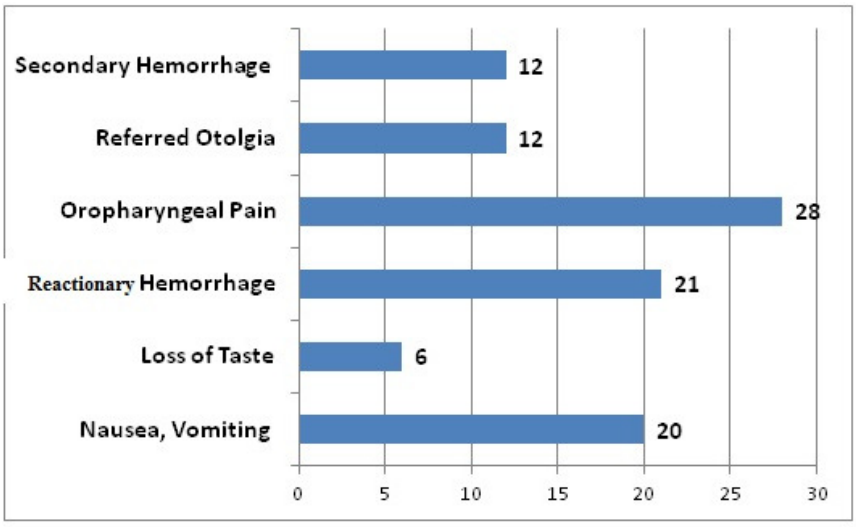


Fig. 6.4.1 Showing Post Operative Complications

Table 6.4.2 POSTOPERATIVE OTHER RARE COMPLICATIONS

	Number	Percentage
Dehydration	**9**	**6.0**
Pneumonia Atelectasis	**3**	**2.0**
Velopharyngeal Insufficiency	**0**	**0.0**
Nasopharyngeal Stenosis	**0**	**0.0**

Regarding Postoperative other rare complications, Dehydration was observed in 9 (6.0%) and Pneumonia Atelectasis was seen in 3 (2.0%) of the patients. Velopharyngeal Insufficiency and Nasopharyngeal Stenosis were not seen in any of the patients.

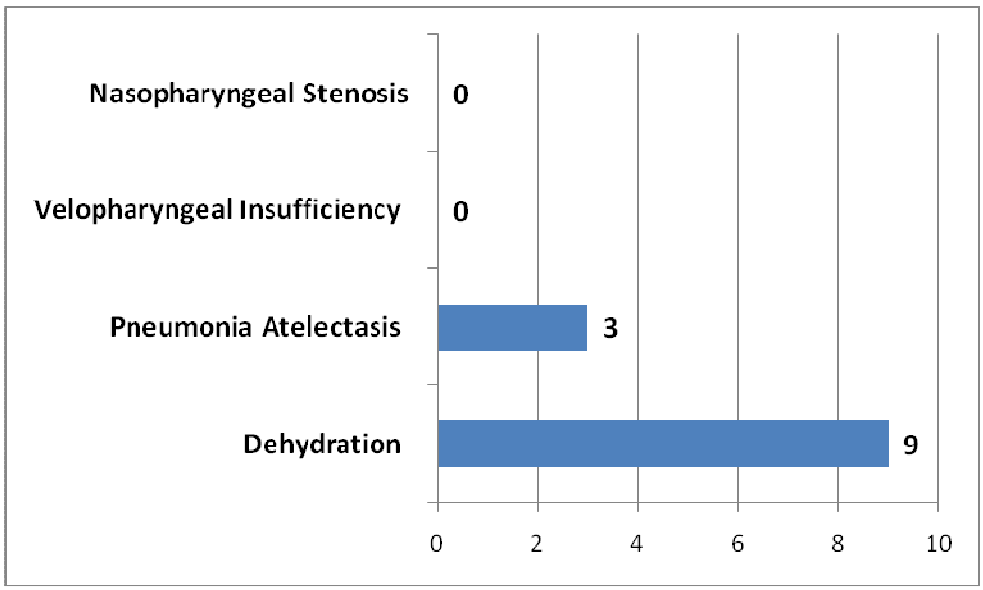


Fig. 6.4.2 Showing Post Operative other Rare Complications

6.5 Comparison of Preoperative Symptoms

Table 6.5 COMPARISION OF PREOPERATIVE SYMPTOMS

Symptoms		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi^2 Value	p-Value
Throat Pain	Yes	143	96 (96.0%)	47 (94.0%)	0.300	0.584
	No	7	4 (4.0%)	3 (6.0%)		
Odynophagia	Yes	144	94 (94.0%)	50 (100%)	3.125	0.077
	No	6	6 (6.0%)	0 (0.0%)		
Difficulty in Swallowing	Yes	134	89 (89.0%)	45 (90.0%)	0.035	0.852
	No	16	11 (11.0%)	5 (10.0%)		
Mouth Breathing	Yes	85	53 (53.0%)	32 (64.0%)	1.643	0.200
	No	65	47 (47.0%)	18 (36.0%)		
Snoring	Yes	35	24 (24.0%)	11 (22.0%)	0.075	0.785
	No	115	76 (76.0%)	39 (78.0%)		

Table 6.5 shows the Comparison of Preoperative symptoms between both Conventional Tonsillectomy and Coblation Tonsillectomy group of patients.

Throat Pain was seen in 96 (96.0%) of the Conventional tonsillectomy patients and 47 (94.0%) of the Coblation Tonsillectomy patients. This difference is not statistically significance as seen in p-value > 0.05.

In the same way, Odynophagia was seen in 94 (94.0%) of the Conventional Tonsillectomy patients and all the 50 (100%) of the Coblation Tonsillectomy patients. But this difference is not statistically significance as seen in p-value is 0.077.

Regarding Difficulty in Swallowing, it was seen in 89 (89.0%) of the Conventional tonsillectomy patients and 45 (90.0%) of the Coblation Tonsillectomy patients and this difference is not statistically significance (p-value – 0.852).

Mouth Breathing was seen in 53 (53.0%) of the Conventional Tonsillectomy patients and in 32 (64.0%) of the Coblation Tonsillectomy patients. But this difference is not statistically significance as p-value is 0.200.

Snoring was observed in 24 (24.0%) of the Conventional Tonsillectomy patients and in 11 (22.0%) of the Coblation Tonsillectomy patients and there is no statistically significant difference between the groups as p-value is only 0.785.

6.6 Comparison of Intraoperative Complications

Table 6.6.1 COMPARISON OF INTRAOPERATIVE ANAESTHEIC COMPLICATIONS

Complications		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi^2 Value	p-Value
Dislodging of Loose Tooth	Yes	9	7 (7.0%)	2 (4.0%)	0.532	0.466
	No	141	93 (93.0%)	48 (96.0%)		
Accidental Extubation	Yes	10	6 (6.0%)	4 (8.0%)	0.214	0.642
	No	140	94 (94.0%)	46 (92.0%)		
Kinking of ET Tube	Yes	19	15 (15.0%)	4 (8.0%)	1.476	0.224
	No	131	85 (85.0%)	46 (92.0%)		

Table 6.6.1 shows the comparison of Intra operative Anesthetic Complications between the two groups.

Dislodging of Loose Tooth was seen in 7 (7.0%) of the Conventional Tonsillectomy patients but it was observed in only 2 (4.0%) of the Coblation Tonsillectomy patients but this difference is not statistically significant (p-value – 0.466).

Accidental Extubation was seen in 6 (6.0%) of the Conventional Tonsillectomy patients and it was seen only 4 (8.0%) of the Coblation

Tonsillectomy patients and this difference is not statistically significant (p-value – 0.642).

Compression of ET Tube was seen in 15 (15.0%) of the Conventional Tonsillectomy patients but it was seen in only 4 (8.0%) of the Coblational Tonsillectomy patients but this difference is not statistically significant (p-value – 0.224).

Table 6.6.2 COMPARISION OF INTRAOPERATIVE SURGICAL COMPLICATIONS

Complications		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi^2 Value	p-Value
Primary Hemorrhage	Yes	43	40 (40.0%)	3 (6.0%)	18.844	0.0001
	No	107	60 (60.0%)	47 (94.0%)		
Edema Uvula	Yes	39	32 (32.0%)	7 (14.0%)	5.613	0.018
	No	111	68 (68.0%)	43 (86.0%)		
Pillar Injury	Yes	33	19 (19.0%)	14 (28.0%)	1.573	0.210
	No	117	81 (81.0%)	36 (72.0%)		

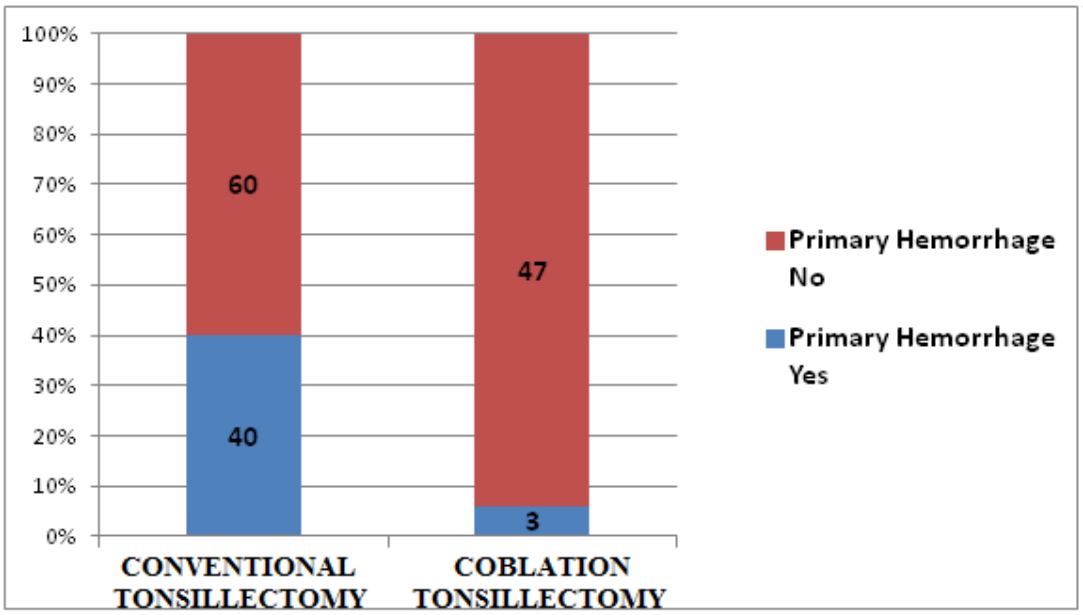
Table 6.5 compares the Intra Operative Surgical Complications between the groups

Primary Hemorrhage which is the commonest Intra Operative Surgical Complications was observed in 40 (40.0%) of the Conventional tonsillectomy patients while it was seen in only 3 (6.0%) of the Coblation Tonsillectomy patients. This is the **highly statistically significant** difference as seen in p-value 0.0001.

In the same way, **Edema Uvula** was observed in 32 (32.0%) of the Conventional tonsillectomy patients while it was seen in only 7 (14.0%) of the Coblation Tonsillectomy patients. This difference is **also statistically significant** as seen in p-value 0.018.

Pillar Injury was observed in 19 (19.0%) of the Conventional tonsillectomy patients and 14 (28.0%) of the Coblation Tonsillectomy patients but this difference is not statistically significance (p-value – 0.210).

Fig. 6.6.2.1 Showing Comparision of Intraoperative Surgical Complication – Primary Hemorrhage



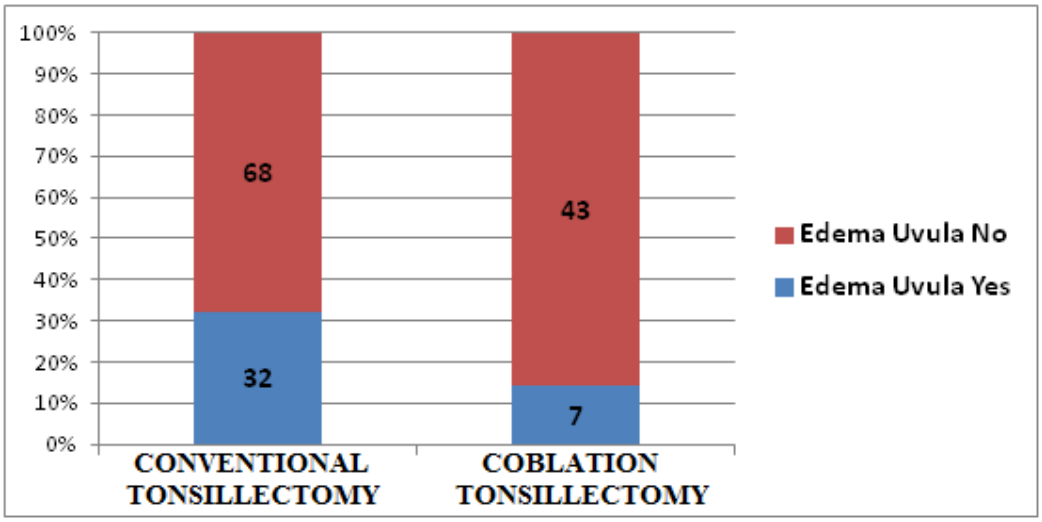


Fig. 6.6.2.2 Showing Comparison of Intraoperative Surgical Complication – Edema Uvula

6.7 Comparison of Postoperative Complications

Table 6.7 COMPARISION OF POSTOPERATIVE COMPLICATIONS

Complications		N	COLD Tonsillectomy	HOT Tonsillectomy	Chi^2 Value	p-Value
Nausea, Vomiting	Yes	20	12 (12.0%)	8 (16.0%)	0.462	0.497
	No	130	88 (%)	42 (84.0%)		
Loss of Taste	Yes	6	2 (2.0%)	4 (8.0%)	3.125	0.077
	No	144	98 (98.0%)	46 (92.0%)		
Primary Hemorrhage	Yes	21	12 (12.0%)	9 (18.0%)	0.997	0.318
	No	129	88 (88.0%)	41 (82.0%)		
Oropharyngeal Pain	Yes	28	19 (19.0%)	9 (18.0%)	0.022	0.882
	No	122	81 (81.0%)	41 (82.0%)		
Referred Otolgia	Yes	12	4 (4.0%)	8 (16.0%)	6.522	0.011
	No	138	96 (96.0%)	42 (84.0%)		
Secondary Hemorrhage	Yes	12	0 (0.0%)	12 (24.0%)	26.087	0.0001
	No	138	100 (100%)	38 (76.0%)		

Table 6.7 compares the Post Operative Complications between the groups.

Nausea, Vomiting was observed in 12 (12.0%) of the Conventional tonsillectomy patients and it was seen in 8 (16.0%) of the Coblation Tonsillectomy patients. But this is difference is not statistically significant as seen in p-value is only 0.497.

In the same way, Loss of Taste was observed in 2 (2.0%) of the Conventional tonsillectomy patients while it was seen in 4 (8.0%) of the Coblation Tonsillectomy patients. But this difference is also statistically not significant as seen in p-value 0.077.

Primary Hemorrhage was observed in 12 (12.0%) of the Conventional tonsillectomy patients and 9 (18.0%) of the Coblation Tonsillectomy patients but this difference is not statistically significance (p-value – 0.318).

Oropharyngeal pain which was commonest among the post operative complications was observed in 19 (19.0%) of the Conventional tonsillectomy patients and it was seen in 9 (18.0%) of the Coblation Tonsillectomy patients and the difference is not statistically significant as seen in p-value is only 0.882.

Referred Pain was observed only in 4 (4.0%) of the Conventional tonsillectomy patients but it was seen in 8 (16.0%) of the Coblation Tonsillectomy patients. This difference is statistically significant as seen in p-value 0.011.

Secondary Hemorrhage was not observed in any of the Conventional tonsillectomy patients but it was observed in 12 (24.0%) of the Coblation Tonsillectomy patients. This difference is highly statistically significant as seen in p-value – 0.0001.

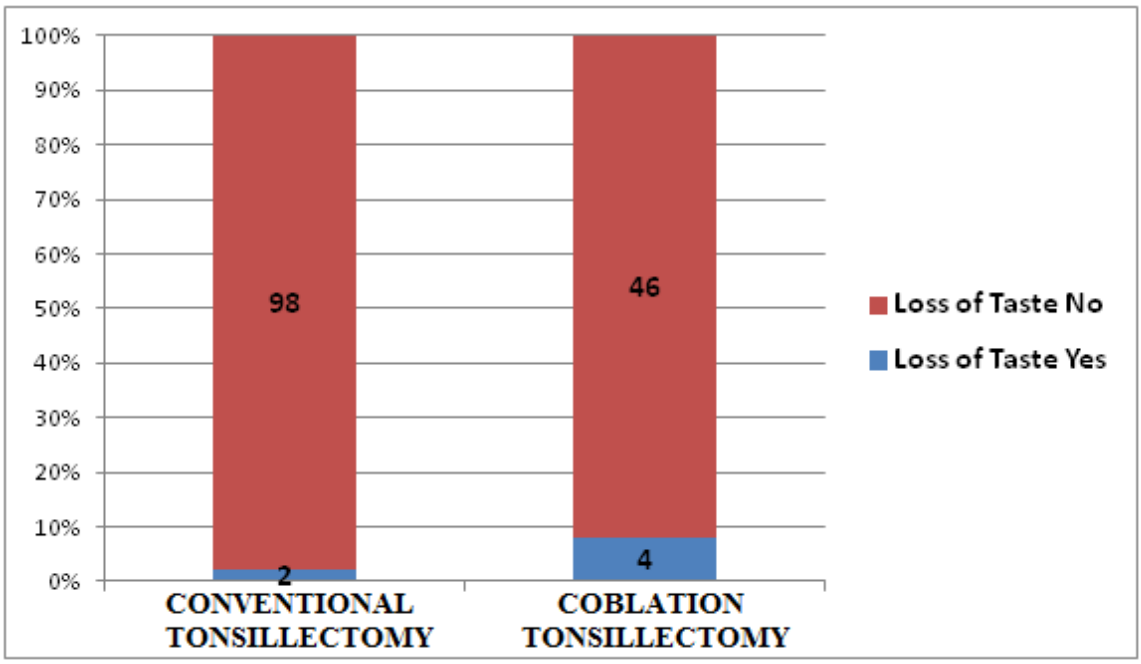


Fig. 6.7.1 Showing Comparison of Postoperative Complication – Loss of Taste

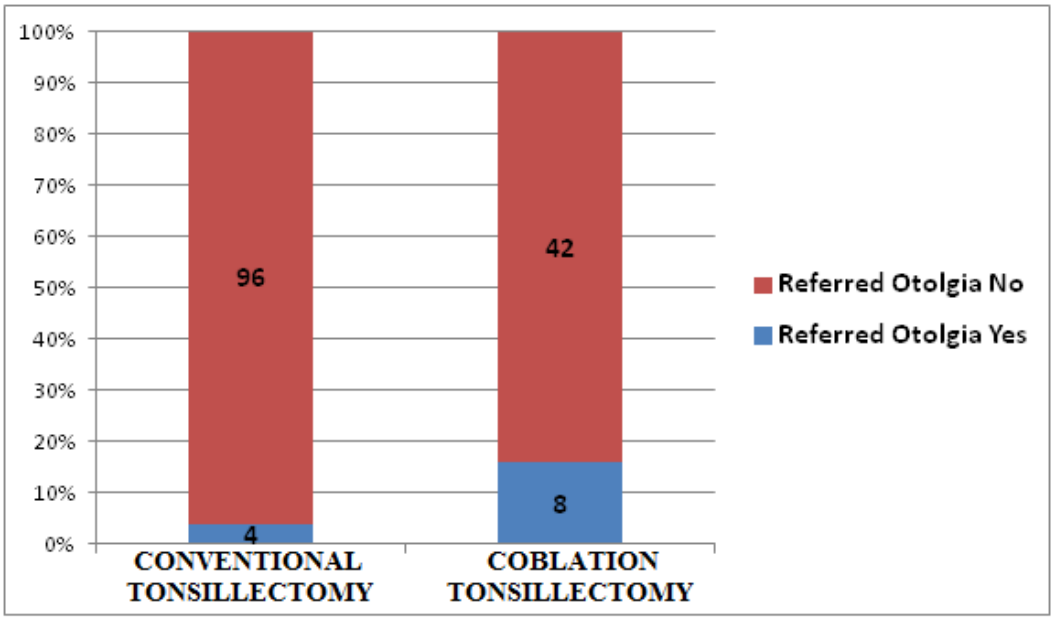


Fig. 6.7.1 Showing Comparison of Postoperative Complication – Referred Otolgia

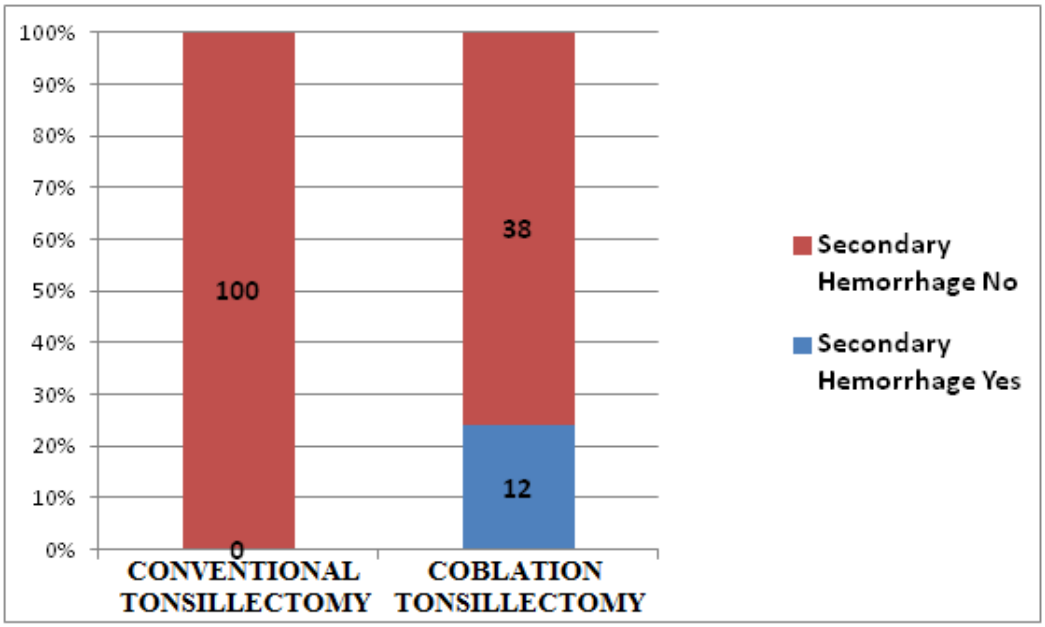


Fig. 6.7.3 Showing Comparison of Postoperative Complication – Secondary Hemorrhage

6. DISCUSSION

Tonsillectomy with or without adenoidectomy is the most commonly performed pediatric otorhinolaryngological procedure. Variety of techniques and approaches for adenotonsillectomy have been tested and tried over the years. Yet post operative complications were mostly noted in terms of oropharyngeal pain, bleeding, and referred otalgia.

An analytical study to ascertain the incidence of immediate and delayed complications following adenotonsillectomy during the period from August 2012 – September 2013 was conducted in Government Stanley Medical College and Hospital. Since in our hospital we do adenotonsillectomy by both Conventional and Coblation methods, a comparison is also made between them on the immediate and delayed complications.

For the study purpose the complications of adenotonsillectomy are classified into

1. Intra operative complications
    a. Anaesthetic complications
    b. Surgical complications.
2. Post operative complications.

I. INTRA OPERATIVE COMPLICATIONS

a. ANAESTHETIC COMPLICATIONS

With regard to intra operative anaesthetic complications, it has been found that the **compression and obstruction of the anesthetic tube** is the predominant complication due to selection of faulty size of the blade of Davis mouth gag[33]. In our study also compression of the endo tracheal tube is the most frequently noted complication in the **conventional tonsillectomy** group.

Accidental extubation while changing the head position and also during Doughty's tongue blade removal is another commonly encountered anaesthetic complications in **both conventional and coblation tonsillectomy.**

b. SURGICAL COMPLICATIONS

The onset of hemorrhage to the procedure defines 2 categories:
I. Primary haemorrhage occuring during surgery.

Tonsillar hemorrhage is defined as continuous bleeding for more than one hour, or more than 250ml of blood loss regardless of the duration of bleeding.

II. Delayed (Reactionary) with in 24 hours after surgery

At the minimum, a clinically significant posttonsillectomy hemorrhage requires return to the operating theatre for control of bleeding, with the inherent risk of aspiration during anesthesia induction.

Primary haemorrhage is the most commonly recorded intra operative surgical complication. The reason for primary haemorrhage may be due to

(a) inadequate pre operative patient preparation,

(b) faulty surgical technique

(c) in advertent injury to superior constrictor muscles and

(d) difficulty in ligating the bleeders in the tonsillar bed especially in superior and inferior pole.

The intraoperative blood loss is usually measured in terms of weighing swabs and also by measuring the volume of suction aspirate.

Edema of the uvula is another intra operative complication which is mainly encountered due to in advertent and frequent suctioning over the uvula.

II. POST OPERATIVE COMPLICATIONS

Odynophagia and referred otalgia are the two complications observed in the immediate post operative period following adenotonsillectomy.

Odynophagia is due to muscle spasm, especially the superior constrictor fibres and dissection of the tonsil substance. Similar irritation of the superior constrictor occurs while curreting the adenoids.

Referred otalgia is probably due to close removal of the tonsil from the tongue base.

DELAYED POST OPERATIVE COMPLICATIONS

Secondary haemorrhage is the most common delayed post operative complication observed in Coblation tonsillectomy because of dislodgement of the infective slough.

COMPARISON STUDY OF IMMEDIATE AND DELAYED COMPLICATIONS FOLLOWING ADENOTONSILLECTOMY USING CONVENTIONAL AND COBLATION TECHNIQUE

Immediate complications	Conventional	Coblation
Primary Haemorrhage	Significant ($P < 0.05$)	Not significant
Odynophagia	Significant($p < 0.05$)	Not significant
Referred Otalgia	Not significant	Significant

Primary Haemorrhage is less in Coblation technique because

1. Dissection is done extracapsular, hence no surgical trauma to the para tonsillar vein and the superior constrictor muscle which lies in the tonsillar bed
2. Hemostasis was possible for vessels less than 1 mm in diameter[24]
3. Histopathological thermal injury of only 0.13-mm depth is reported[24].

The mean intraoperative blood loss in the Conventional tonsillectomy group is more than double that of the Coblation group[25]. [33.1mL Vs 15.7 mL].

Referred otalgia is probably due to close removal of the tonsil from the tongue base.

Though **Oropharyngeal pain** is found to be the most commonest post operative complication which delays the early oral intake within the first 24 hour post operative period[26], it is statistically **insignificant in our study**.

According to Wong-Baker Faces Pain Rating Scale, Derbyshire Children's Hospital Paediatric Pain Chart and Bieri Faces Pain Scale[27] in Coblation vs Conventional technique, the pain score in the first week of post operative days is **significantly lower**, which is 3.3 in the **Coblation** group and 3.7 in conventional group.

7. CONCLUSION

Invention of equipments like Coblation, mono / bipolar electrocautery and Laser have made the outlook better for Adenotonsillectomies with respect to intraoperative and postoperative complications.

Primary haemorrhage and uvula edema are found to be the statistically significant complications in Conventional tonsillectomy.

Secondary haemorrhage and referred otalgia, are the statistically highly significant complications in Coblation tonsillectomies.

Hence training and experience of the surgeon, technical preferences and its complications, cost-effectiveness should be considered in choosing the surgical technique.

All trainee surgeons should become competent in Conventional dissection method and in achieving haemostasis using ligatures before learning other modern techniques.

Irrespective of seniority and experience, every surgeon should undergo appropriate training before using new techniques like Coblation.

Emphasis must be placed on explaining the risk of post operative haemorrhage to the patient, teaching the correct technique like checking the power settings prior to surgery and the potential hazards of Coblation technique.

Every complication should be recorded and analyzed regularly to improve the patient's safety.

Yet it can be concluded that the use of Coblation tonsillectomy is equivalent to the use of Conventional technique in the current scenario with respect to intra and post operative complications.

BIBILOGRAPHY

1. Hellings P,Jorrissen M, Ceuppens JL. The Waldeyers ring. Acta otorhinolaryngologica Belgica. 2000;54:237-41

2. Kenna MA, Amin A. Anatomy and physiology of the oral cavity. In: Snow JB, Wackym PA. Ballenger's Otorhinolaryngology Head and Neck Surgery. 17th ed. Shelton: BC Decker Inc; 2009:769-774.

3. Berkovitz BKB, Holland GR, Moxham BJ.Oral anatomy,histology and embryology, 3rd edition .London: Mosby;2002

4.Susan S, Harold E, Jermiah CH, David J, Andrew W. Pharynx (chapter 35). In: Gray's Anatomy: The Anatomical Basis of Clinical Practice. 39th ed. Philadelphia: Elsevier; 2005:619-631.

5. Falagas ME, Vouloumanou EK, Matthaiou DK, Kapaskelis AM, Karageorgopoulos DE. Effectiveness and safety of short-course vs long-course antibiotic therapy for group A -hemolytic streptococcal tonsillopharyngitis: ameta-analysis of randomized trials. Mayo Clin Proc. 2008;83(8):880-889.

6. STJERNQUIST- DESTNIK A. PRENELLER K AND SCHALEN , C (1991) High recovery of haemophilus influenza and group A streptococci in recurrent tonsillar infection and hypertrophy as compared with normal tonsils. Journal of laryngology and otology.105. 439-441. STRUNK. C L.

and Nichols M. L . (1990) A comparison of KTP/532 Laser tonsillectomy vs traditional dissection /snare tonsillectomy. Otolaryngology and Head and neck surgery 103, 966-971.

7. POLVOGT, L.M and CROWE,S J (1929) Predominating organisms found in cultures from tonsils and adenoid. Journal of the American Medical Association 92,962-964.

8. TONER J. G STEWART T.J CAMPBELL., J B HUNTER (1986) Tonsil flora in the very young tonsillectomy patient .Clinical otolaryngology. 11. 171-174

9. Woloszko J, Kwende MM, Stalder KR. Coblation in otolaryngology. Proc SPIE. 2003;4949:341-352.

10. MANGAT..,ORR.C.W and smith R C (1977) Sleep apnea, hypersomnolence and upper airway obstruction secondary to adenotonsillar enlargement. Archives of Otolaryngology, 103, 383-386.

11. CROFT, C B BROCKBANK M.J WRIGHT A. SWANSTON A.R 1990 Obstructive sleep apnea in children undergoing routine tonsillectomy and adenoidectomy clinical otolaryngology 15, 307- 314

12. EVERETT, M T (1979) The cause of tonsillitis. Practitioner, 223, 253-259.

Cochrane Database System Reviews. 2007; 7: CD001802. * 9. Paradise JL, Bluestone CD, Bachman RZ, Colborn DK,

13. PARADISE. J.L., BLUESTONE. C.D., BACHMAN. R.Z., KARANTONIS.G., SMITH. I. H SAEY. C. A. et al. (1978) History of recurrent sore throat as an indication for tonsillectomy. New England journal of Medicine 298, 409-413.

14.Schmidt R,Herzog A,Cook S,O'Reilly R, Deutsch E, Reilly J. Complications of tonsillectomy: a comparison of techniques. Arch Otolaryngol Head Neck Surg.2007;133(9):925-928.

15. DENNY F. W. WANNAMAKER I W and BRINK, W R 1950 Prevention of rheumatic fever. Journal of American Medical Association 143, 151-153

16. Scottish Intercollegiate Guidelines Network. Management - *Head and Neck Surgery.* 2003; 128: 318-25. of sore throat and indications for tonsillectomy. SIGN 36. Auf 1, Osborne JE, Sparkes C, Khalil H. Is the KTP laser publication No. 34. Available from: http://www.sign.ac.uk. effective in tonsillectomy? *Clinical Otolaryngology. 1997;*

17. Harley EH, Collins MD.Neurological sequelae secondary to atlatoaxial instability in Downs syndrome: implications in otolaryngology surgery.Arch Otolaryngology Head and Neck Surg.1994;120:159-165.

18. Wang JH, Chung YS, Jang YJ, Lee BJ. Palatine tonsil size and its correlation with subjective tonsil size in patients with sleep-disordered breathing. Otolaryngol Head Neck Surg 2009;141(6):716-21.

18. Papangelou L.Hemostasis in tonsillectomy a comparison of electrocoagulation and ligation.Arch Otolaryngology. 1972;96:358-360

19. Howard NS, Brietzke SE. Pediatric tonsil size: objective vs subjective measurements correlated to o 8. M. Fujioka, L.W. Young, B.R. Girdany.

20. Radiographic evaluation adenoid size in children: adenoid as key factor in upper airway infection. Int J Ped Otorhinolaryngol. 1995(June). 32:71-80. vernight polysomnogram. Otolaryngol Head Neck Surg 2009;140(5):675-81.

21. Kim DW, Koo JW, Ahn SH, Lee CH, Kim JW. Difference of delayed posttonsillectomy bleeding between children and adults. Auris Nasus Larynx. 2010; 37(4):456-460.

22.Rhodes SK, Shimoda KC, Waid LR, et al. Neurocognitive deficits in morbidly obese children with obstructive sleep apnea. J Pediatr. 1995;127:741-744.

23. Davis D.D (1964) Reanaesthetizing cases of Tonsillectomy and adenoidectomy because of persistent post operative haemorrhage British journal of anaesthesia 36 : 244 - 249

24. Tonsillectomy by Means of Plasma-Mediated Ablation: Udayan K. Shah, MD; Jeffrey Galinkin, MD; Rosetta Chiavacci, RN, BSN; Marianne Briggs, RN, MSN, CRNP; Arch Otolaryngol Head Neck Surg. 2002;128:672-676

25. Postoperative Tonsillectomy Pain in Pediatric Patients Coblation vs Cold Dissection and Snare Tonsillectomy — A Randomized Trial Desmond A. Nunez, FRCS(ORL); Janice Provan, FRCS; Michael Crawford, FFARCS

26. Linden BE, Gross CW, Long TE, Lazar RH. Morbidity in pediatric tonsillectomy.Laryngoscope. 1990;100:120-124.

27. Complications of Tonsillectomy A Comparison of Techniques: Arch Otolaryngol Head Neck Surg. 2007; 133(9):925-928.

S.NO	TONSILLECTOMY CATEGORY	NAME	IP.NO	AGE	SEX	THROATPAIN	ODYNOPHAGIA	DIFFICULTYINSWALLOING	MOUTH.BREATHING	SNORING	DISLODGING.LOOSETOOTH	DISLOCATION.TMJ	ACCIDENTAL.EXTUBATION	COMPRESSION OF.ET.TUBE	NAUSEA.VOMITING	LOSS.OF.TASTE	INTRAOP.PRIMARY.HEMORRHAGE	EDEMA.UVULA	PILLAR.INJURY	POSTOP.PRIMARY.HEMORRHAGE	OROPHARYNGEAL.PAIN	REFEREED.OTOLGIA	SECONDARY.HEMORRHAGE	DEHYDRATION	PNEUMONIA.ATELECTATIS	VELOPHRYNGEALINSUFFICIENCY	NASOPHARYNGEAL.STENOSIS
1	1	KAVITA	20391	10	F	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N
2	1	HEMAVATHI	20399	6	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N
3	1	SARATHY	20413	14	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4	1	MOHANAKRISHNA	20438	7	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
5	1	NANCY GRETA	20467	6	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	N	N
6	1	NAVEEN KUMAR	20480	7	M	Y	Y	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
7	1	AYESHA FATIMA	20519	8	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	N	Y	Y	N	N	N	N	N
8	1	JAMUNA	21902	12	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N
9	1	VISHAL	21903	13	M	Y	Y	Y	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
10	1	RANJITHA	21904	9	F	Y	Y	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
11	1	TAMIL SELVI	21906	13	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
12	1	SARAVANAN	21922	6	M	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
13	1	SHALINI	20473	6	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	Y	N	N	N	N	N	N
14	1	MOULI	20496	7	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	Y	N	N	N	N	N	N
15	1	KIRUPANITHIMARA	22271	7	M	Y	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
16	1	LOGESH	22290	12	M	Y	Y	Y	N	N	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N
17	1	SARANYA	22923	9	F	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N

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26	1	KOGILA	22879	11	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N
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34	1	PRADEEP	23166	7	M	Y	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	N	N	N	N	N	N	N	N	N
35	1	THOMAS	23204	14	M	Y	Y	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
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37	1	ANITHA	23278	6	F	N	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
38	1	HARISUDHAN	23309	13	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	N	N	N
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41	1	PREETHI	23405	9	M	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N
42	1	ANANDHI	23422	9	F	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
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44	1	VANISHREE	24650	11	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N
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46	1	DHANUSHREE	24688	12	F	Y	Y	Y	N	N	N	N	N	N	Y	N	Y	Y	N	N	N	N	N	N	N	N	N
47	1	ANANDHI	24706	7	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
48	1	ABDULRAHMAN	24729	12	M	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
49	1	RAMYA	24766	14	F	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
50	1	SARASU	24782	13	F	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
51	1	DEEPIKA	24833	6	F	Y	Y	N	Y	Y	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
52	1	JAIAKASH	24877	13	M	Y	Y	Y	N	N	Y	N	N	N	N	N	Y	Y	N	N	Y	N	N	N	N	N	N
53	1	HARISH	24909	12	M	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
54	1	ABDULRAHEEM	24932	12	M	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N
55	1	PRIYADHARSHINI	24949	11	F	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
56	1	KANAGALAKHSMI	24966	6	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N
57	1	SHRUTHI	24982	7	F	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
58	1	KARTHIK	24996	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N
59	1	ARJUNAN	25017	9	M	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N
60	1	SRIDEVI	24864	6	F	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
61	1	NANCY	34167	12	F	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
62	1	LATHA	34360	12	F	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N
63	1	KALPANA	35848	8	F	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N
64	1	ESTHER MARY	36060	12	F	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
65	1	UDAYA KUMAR	34801	9	M	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
66	1	SIVARANJANI	36166	11	F	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	N	N
67	1	RUBAN KUMAR	38664	11	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
68	1	PRIYADHARSHINI	39028	6	F	Y	Y	Y	Y	Y	N	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N
69	1	ASHOK KUMAR	41849	14	M	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
70	1	SHAFIULLAH	42997	12	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N
71	1	LOGANAYAGI	42544	7	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N

72	1	PRASANTH	39544	13	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
73	1	RAFIYA	35639	7	F	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
74	1	ISSAC	43653	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N
75	1	ARABIA BANU	43649	11	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N
76	1	THOUFIA	43652	11	M	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
77	1	BALAJI	43571	10	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
78	1	NANDHINI	38830	6	F	Y	N	Y	Y	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
79	1	RAMYA	33092	11	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
80	1	MUGESH	40383	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
81	1	SUBASH	49879	8	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
82	1	SHARMILA	40687	5	F	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N
83	1	MADHUNISHA	44462	6	F	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N
84	1	SREENIDHI	41328	6	F	N	Y	Y	Y	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
85	1	PRAKASH	24006	11	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
86	1	JOTHIKA	39919	10	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
87	1	PRIYANKA	53548	14	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
88	1	HEMAVATHY	45050	11	F	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
89	1	ABDUL KANI	45117	13	M	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N
90	1	ABINESH	48004	14	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
91	1	PRASANTH	45302	9	M	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N
92	1	EZILARASI	47083	12	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
93	1	PRAJAN	25899	7	M	Y	Y	Y	Y	N	N	N	N	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N
94	1	SANTHOSH KUMAR	50238	11	M	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N
95	1	PRIYADHARSHINI	48008	10	F	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
96	1	RAVINDRANATH	10442	8	M	Y	Y	N	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N
97	1	KAVYA	13801	10	F	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
98	1	SUGITH	47712	7	M	Y	Y	N	Y	Y	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N
99	1	SAKTHI	42701	9	M	Y	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N

100	1	RAMYA	13504	7	F	Y	Y	N	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	Y	N	N	N
101	2	ASFIYA	37033	9	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
102	2	PARVEEN	18830	10	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
103	2	SHREEN NISHA	37199	11	F	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	Y	N	Y	N	N	N	N
104	2	RASIYA BEGUM	22377	7	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
105	2	MOHAMMED	37417	13	M	Y	Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	N	Y	N	Y	N	N	N	N
106	2	LOKESH	37444	10	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
107	2	PUNITHA	24377	9	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N
108	2	SAKTHI	23688	8	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
109	2	SULAIMAN	23722	7	M	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
110	2	SANTOSH	24599	9	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
111	2	POOJA	37365	9	M	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N
112	2	GOURI	23658	8	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N
113	2	KRISHNAMOORTHY	24645	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
114	2	YOGALAKHSMI	37255	12	F	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
115	2	VIJAYA	36533	12	F	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
116	2	DINESH	37410	14	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N
117	2	JAYALAKSMI	31954	14	F	Y	Y	Y	N	N	N	N	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N
118	2	JAYASHREE	30678	5	F	Y	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Y	N	N	Y	N	N	N	N
119	2	SANJAY	30838	12	M	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
120	2	NITHYA	44183	8	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N
121	2	RUBASHREE	29904	6	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N
122	2	AFROZ BASHA	32922	15	M	Y	Y	Y	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
123	2	LOGESHWARI	30988	6	F	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
124	2	BHARATH	31127	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N
125	2	GAJENDREN	37336	9	M	N	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N
126	2	MOHAMMED	33767	11	M	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N

127	2	VIGNESH	33481	7	M	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
128	2	NIVEDHA	33817	5	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
129	2	YASHITHA	30661	5	F	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N
130	2	SOWMIYA	24207	9	F	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
131	2	HARINI	34960	8	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
132	2	MARIYAMMAL	29277	13	F	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
133	2	KISHORE	29043	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
134	2	LINGESHWARI	24228	9	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
135	2	PRADEEBA	23720	6	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
136	2	LEKHASHREE	39666	6	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
137	2	JANA	30159	10	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
138	2	SANGAMITHRA	27759	6	F	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N
139	2	ROHITH	29286	6	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N
140	2	BILAL	66258	8	M	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
141	2	DIVYA	88236	7	F	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N
142	2	HARINI	20499	9	F	N	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N
143	2	SNEHA	47136	8	F	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N	N
144	2	SUDHARSHANAN	51950	10	M	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
145	2	NIROSHA	44233	9	F	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N
146	2	KIRUTIKA	34319	6	F	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
147	2	UDAYA KUMAR	56700	13	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N
148	2	VEERA SAKTHI	26527	9	F	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
149	2	SRIRAM	36088	5	M	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
150	2	SUMAIYA	57120	11	F	Y	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N

1. CONVENTIONAL TONSILLECTOMY; 2. COBLATION TONSILLECTOMY, Y – Yes; N – No.

PROFORMA

SERIAL NO :

NAME :

AGE : / SEX

I.P.No :

ADDRESS :

D.O.A. :

D.O.S :

D.O.D :

Chief complaints

Throat pain	Yes/No
Difficulty in swallowing	Yes/No
odynophagia	Yes/No
Snoring	Yes/No
Mouth breathing	Yes/No

Insidious onset, progressive Yes/No

Aggravated by cool drinks Yes/No

Ear block/hard of hearing Yes/No

PAST H/O : NIL

H/O Previous surgery not a k/c/o DM/ BA/ epilepsy/ PTB/ drug allergy/ bleeding diathesis

FAMILY H/O :

PERSONAL H/O : diet

Bladder and bowel habits

GENERAL EXAMINATION:

Anemia	Jaundice	Cyanosis	Clubbing	Pedal edema	GLNE

CVS: S_1S_2(+) RS: NVBS(+) P/A: soft

CNS: NFND

PR: /min BP: / mmhg

LOCAL EXAMINATION

THROAT: ORAL CAVITY: LIPS, TONGUE, DENTITION, TONGUE, RETROMOLAR TRIGONE

OROPHARYNX: ANTERIOR PILLAR

GRADING OF TONSILLAR

HYPERTROPHY

POSTERIOR PILLAR

UVULA

NOSE: External pyramid

Columella

Vestibule

ANTERIOR RHINOSCOPY

RIGHT	Septum	INFERIOR TURBINATE	Mid turbinate	Mid meatus
LEFT				

POSTERIOR RHINOSCOPY

E/O EAR

	PRE AURICULAR AREA	PINNA	POST AURICULAR AREA	EAC	TM
RIGHT					
LEFT					

TFT:

RIGHT		LEFT	
	RINNIE		
	WEBER		
	ABC		

INVESTIGATIONS

Hb: Tc: Dc : P L E ESR: /

Platelets:

BT: CT: RBS: mg/dl BUN: mg/dl

Creatinine: mg/dl Prothrombin time:

Urine R/E: Sug: Alb: Dep: ECG: CXR:

BLOOD GP &Rh

x-ray nasopharynx x ray chest DNE PTA

SURGICAL PROCEDURE AND METHOD:

POST OPERATIVE EXAMINATION:

COMPLICATIONS:

FOLLOW UP:

INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : A study on post Tonsillectomy immediate and delayed complications

Principal Investigator : Dr. S. Gerald Parisutham

Designation : PG in MS (ENT)

Department : Department of ENT
Government Stanley Medical College,
Chennai-1

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 31.07.2012 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

MEMBER SECRETARY,
IEC, SMC, CHENNAI

தகவல் படிவம்

தங்களுக்கு செய்த பரிசோனைகள் மூலம் தங்கள் தொண்டையில் சதை வளர்ந்திருப்பது தெரியவந்துள்ளது. இதன் விளைவாக தங்களின் தொண்டையில் சதை சீல் பிடிக்க வாய்ப்பு உள்ளது.

இந்த நோயை குணப்படுத்த பலவகை அறுவை சிகிச்சை முறைகள் உள்ளன. அதில் ஒன்றான Adenotonsillectony அறுவை சிகிச்கை முறை பயன்படுத்தப்பட உள்ளது. இந்த அறுவை சிகிச்கை முறையில் தங்களின் தொண்டையில் வளர்ந்துள்ள Adenoid, Tonsil சதை அகற்றப்பட வேண்டும் மேலும் இந்த அறுவை சிகிச்சையின் மூலம் விளைவுகளை ஒப்பிட்ட ஆய்வு மேற்கொள்ளப்பட உள்ளது. இது குறித்த விவரங்களை ஆய்வில் பயன்படுத்த விரும்புகிறோம்.

தாங்கள் விரும்பினால் மருத்துவ ஆய்விலிருந்து எப்பொழுது வேண்டுமானாலும் விலகிக் கொள்ளலாம். எந்த சட்ட சிக்கலுக்கும் எப்பொழுது வேண்டுமானாலும் தங்கள் ஆய்விலிருந்து விலகிக் கொள்ளலாம்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களும் பரிசோதனை முடிவுகளும் தங்களின் ஒப்புதலின் மூலம் மட்டும் ஆய்வில் பயன்படுத்தப்படும்.

ஆய்வாளரின் கையொப்பம் :

ஆய்வாளரின் பெயர் :

இடம் :

நாள் :

சுய ஒப்புதல் படிவம்

ஆராய்ச்சி நிலையம் : காது. மூக்கு. தொண்டை பிரிவு
ஸ்டான்லி அரசு பொது
மருத்துவமனை மருத்துவக் கல்லூரி

பங்கு பெறுபவரின் பெயர் :

பங்கு பெறுபவரின் எண் :

மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. எனது தொண்டையில் சதை வளர்ந்துள்ளது என்பது தெரியப்படுத்தப்பட்டது. எனது தொண்டை நோய் பற்றிய சந்தோகங்களை கேட்கவும் அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. இந்த நோயைக் குணப்-படுத்த பலவகை அறுவை சிகிச்சை முறைகள் உள்ளன என்பதும், எனக்கு அதில் ஒன்றான Adenotonsillectomy அறுவை சிகிச்சை முறை பயன்படுத்தப் பட உள்ளது என்பதும், இந்த முறையில் எனது தொன்டையில் வளர்ந்துள்ள Adenoid, Tonsil சதை அகற்றப்படுவது விளக்கப்பட்டது. இந்த அறுவை சிகிச்சையின் விளைவுகளை ஆய்வில் பயன்படுத்தவும் தன்னிச்சையாக சம்மதிக்கிறேன். எக்காரணத்தினாலும் எந்தக் கட்டத்திலும் எந்தசட்ட சிக்கலுக்கும் உட்படாமல் இவ்வாய்வில் இருந்து விலகிக் கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

இந்த ஆய்வின் மூலும் கிடைக்கும் தகவல்களையும் பரிசோதனை முடிவுகளையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக் கொள்ளவும் அதை பிரசுரிக்கவும் தேவைப்பட்டால் என்னையும் எனக்கு நடக்கும் அறுவை சிகிச்சையையும் புகைப்படம் எடுக்கவும் நான் முழு மனதுடன் சம்மதிக்கிறேன்.

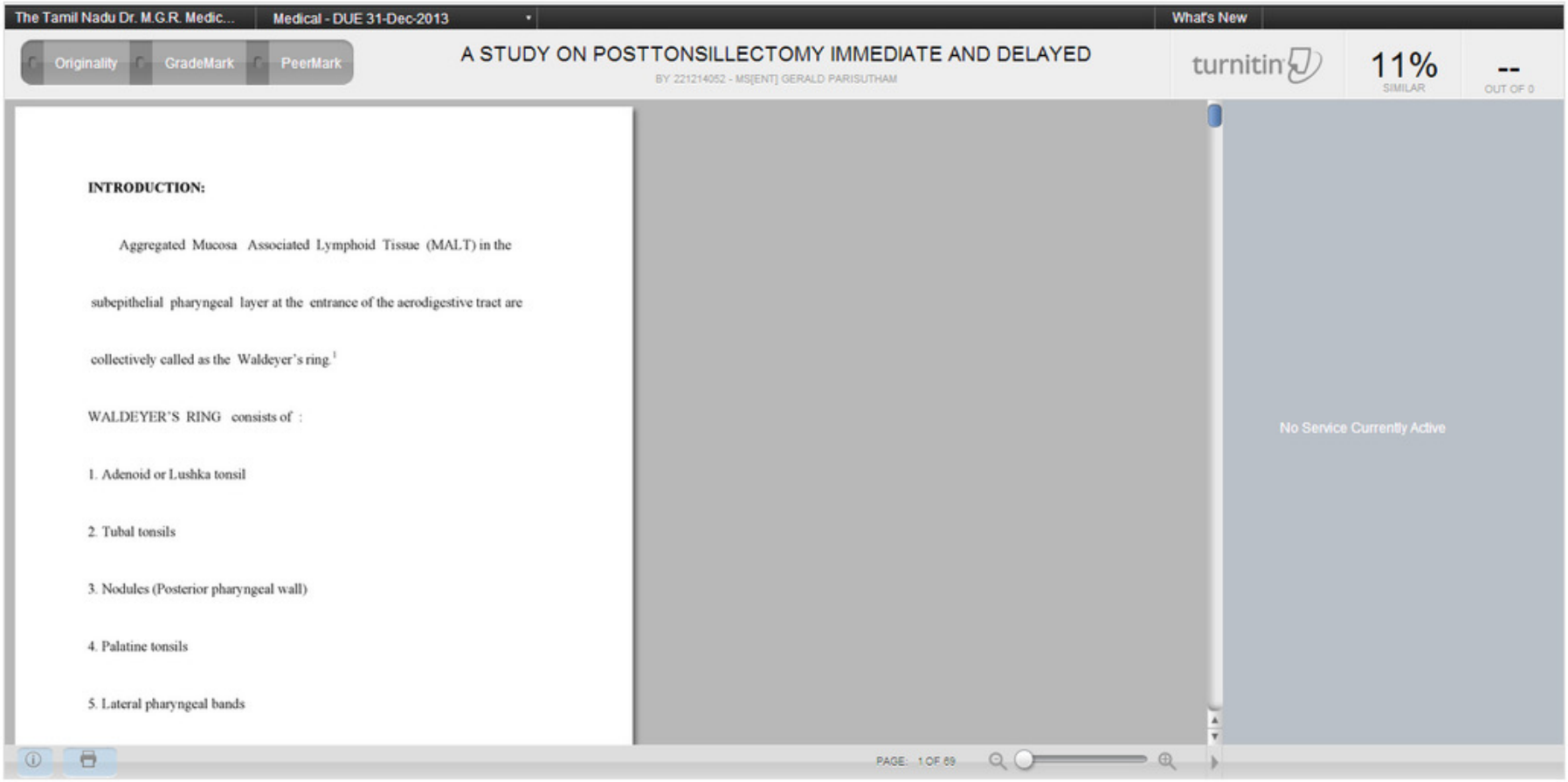
பங்கேற்பவரின் கையொப்பம் : நாள் :

கட்டைவிரல் ஒப்பம் இடம் :

பங்கேற்வரின் பெயர் மற்றும் விலாசம்

ஆய்வாளரின் கையொப்பம் : நாள் :

ஆய்வாளரின் பெயர் : இடம் :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INTRODUCTION:
Aggregated Mucosa Associated Lymphoid Tissue (MALT) in the subepithelial pharyngeal layer at the entrance of the aerodigestive tract are collectively called as the Waldeyer's ring.[1]
WALDEYER'S RING consists of :
1. Adenoid or Lushka tonsil
2. Tubal tonsils
3. Nodules (Posterior pharyngeal wall)
4. Palatine tonsils
5. Lateral pharyngeal bands
No Service Currently Active
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