A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY

Dissertation Submitted to

THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY,

In partial fulfillment of the

rules and regulations, for the award of the

M.S. DEGREE IN OTORHINOLARYNGOLOGY BRANCH – IV

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THANJAVUR MEDICAL COLLEGE

THANJAVUR – 613004

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

CHENNAI – 600032

MAY - 2022

CERTIFICATE - I

This is to certify that dissertation entitled **A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY** is the bonafide record of work done by **DR.NAGOOR MOHIDEEN**, with **Register Number: 220420102506** for Degree of Master of Surgery (Otorhinolaryngology) to Tamilnadu Dr. M.G.R Medical University, Chennai is the result of original research work undertaken by him in the **Department of Otorhinolaryngology And Head and Neck surgery** Thanjavur Medical College, Thanjavur during his Post Graduate Course from 2020 – 2022 . This is submitted as partial fulfillment for the requirement of M.S. Degree Examinations – Branch IV (Otorhinolaryngology) to be held in May 2022.

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DECLARATION

I, **Dr.NAGOOR MOHIDEEN**, solemnly declare that this dissertation entitled **"A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY"** is a bonafide and genuine research work carried out by me in the Department of Otorhinolaryngolgy and Head &Neck Surgery, Thanjavur Medical College & Hospital, Thanjavur, during January 2021 to September 2021 under the guidance and supervision of **Prof.Dr.C.BALASUBRAMANIAN M.S.,(ENT),** Department of Otorhinolaryngolgy and Head & Neck Surgery, Thanjavur Medical College Hospital, Thanjavur.

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TITLE OF THE STUDY:

A prospective comparative study of coblation tonsillectomy and conventional tonsillectomy

PRINCIPAL INVESTIGATOR:

Dr. Nagoor Mohideen, Postgraduate in the Department of Otorhinolaryngology, Thanjavur Medical College.

This to certify that the protocol submitted by the principal investigator of the above mentioned study has been reviewed as per standard ethical guidelines and the same has been **APPROVED** by the members of the Institutional ethical committee at its meeting held on **22.01.2021**.

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Member Secretary of IEC
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CERTIFICATE - II

This is to certify that this dissertation work entitled **"A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY"** done by the candidate **Dr. NAGOOR MOHIDEEN** with **Registration Number : 220420102506** for the award of **M.S.,** degree in the branch of **Otorhinolaryngology.** I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows 8 percentage of plagiarism in the dissertation.

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TABLE OF CONTENTS

INTRODUCTION

1. INTRODUCTION

Despite the fact that tonsillectomy surgery is less common these days, it is still a common surgical treatment. Surgeons use a variety of methods (diathermy, LASER, cryo as well as coblation). ENT surgeons typically use the dissection and snare method among them. Due to the high expense of equipment alternative modalities are rarely employed. Many studies have shown favourable results using coblation tonsillectomy since the introduction of coblator. Tonsillectomy, in contrast to other surgical procedures, leaves an open incision that heals as a result of the secondary intention.[1]

Pain and bleeding are the most common postoperative morbidity issues. Inflammation as well as spasm in the pharyngeal muscles cause ischemia and prolong the pain cycle. The pain does not go away fully until 14–21 days following surgery, when the muscle is covered with mucosal tissue. This is caused by disturbance of the mucosa with glossopharyngeal nerve fibre stimulation. Secondary infection in cryosurgery, unipolar or bipolar electrocautery dissection, suction diathermy dissection, bipolar knife dissection, ultrasonic removal, as well as radiofrequency surgery are all causes of postoperative secondary bleeding.[1]

Disruption of veins in the tonsillar fossa results in bleeding. Dissection, LASER surgery are all options for tonsillectomy. If these techniques can be improved, the following advantages should result: Reduced operating duration, reduced intraoperative as well as postoperative haemorrhage, and reduced postoperative morbidity are all benefits of the procedure.[2]

To perform coblation, an electrical current is passed through a solution of normal saline using a radiofrequency bipolar device. This creates a plasma field that contains high-energy particles that break down intercellular connections and melt tissue at a temperature of about 70℃. (electrocautery cuts tissues at 400℃).[1]

Coblation tonsillectomy can be performed using one of two methods: It is possible to leave some tonsil tissue intact with subtotal intracapsular ablation, and with total subcapsular tonsillectomy, the entire mass is eliminated by dissecting between the tonsillar capsule and adjacent pharyngeal muscle.[3]

In agreement with other research, which say that partial tonsillectomy is not the optimum approach to adopt in chronic tonsillitis

since tonsillar tissue is retained behind and could lead to secondary infections, the subcapsular technique was used in this study to examine and analyze the efficacy of coblation and traditional procedure.

AIM OF THE STUDY

2. AIM AND OBJECTIVES

Primary objective

To systematically analyze and compare the advantages of Coblation Tonsillectomy and Conventional Tonsillectomy.

Secondary objective

To compare the Complications and Difficulties of Coblation and Conventional Tonsillectomy.

REVIEW OF LITERATURE

3. REVIEW OF LITERATURE

Tonsillectomy was originally documented in the 1st century AD by Celsus. He loosened the tonsil by scrapping and tore it out. Mouthwash containing vinegar helped to achieve hemostasis. Tonsillectomy was originally documented by Adtius of Amida in Tigris in the first part of the sixth century, who described using a hook and blade to snare as well as dissect the tonsil. He cautioned doctors against performing an excessively deep excision since it increases the risk of bleeding.[1]

Paul of Aegina documented further surgical procedures in 625, while Physick documented a forceps for tonsil removal that became the contemporary tonsil guillotine's precursor. The Physick tonsillotome was developed by Mackenzie(1800) and used widely for tonsil surgery in the late nineteenth century.. During the years 1911 to 1917, Crowe and his colleagues examined 1000 successive tonsillectomies. Tonsil as well as Nasopharyngeal Infection; Relationship to General Systemic Conditions was a paper that outlined an intricate surgical method by sharp dissection that discussed employing a Crowe-Davis mouth gag. Tonsillectomy complication rates today are far lower than those reported in the early studies.[4]

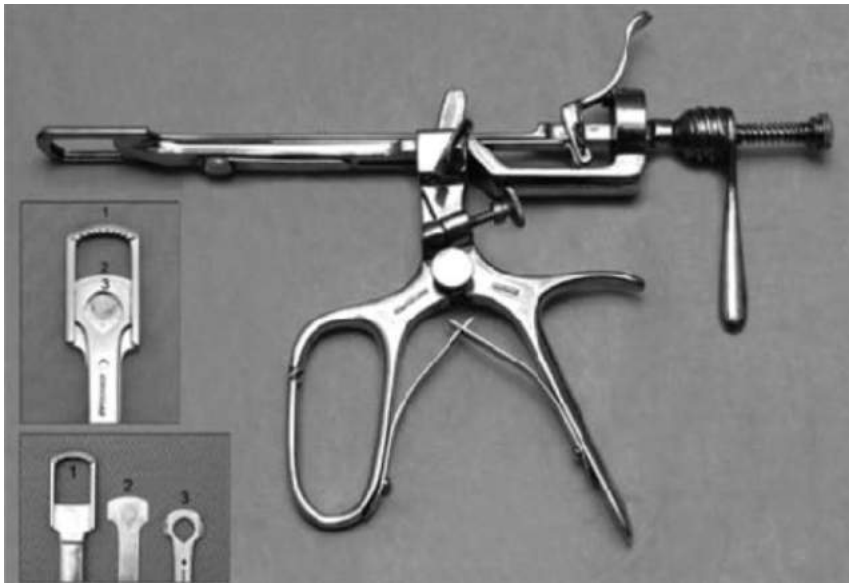


Figure 3.1. Popper's Guillotine.

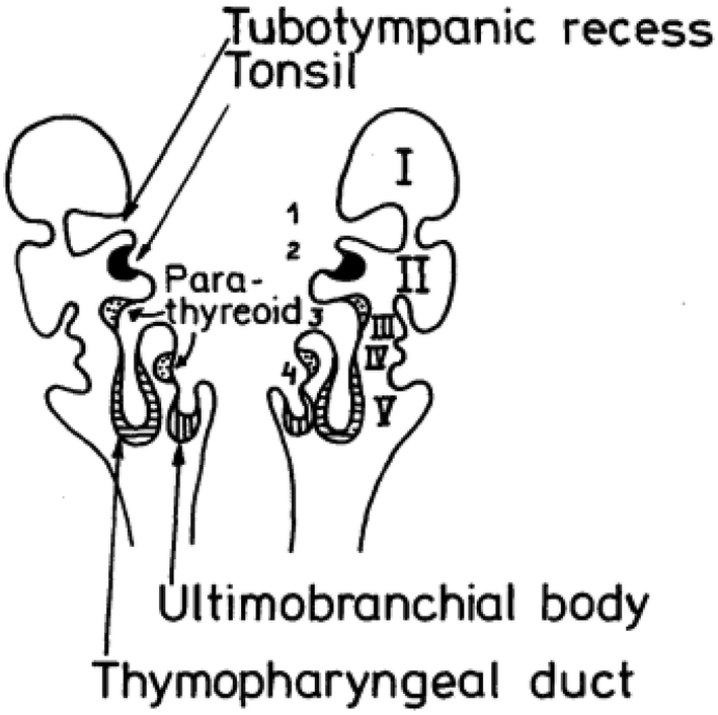


Figure 3.2. Pharyngeal pouches.

Embryology of Tonsil

The second pharyngeal pouch is completely incorporated into the pharyngeal wall throughout pharynx growth or lateral expansion. After the second pharyngeal pouch is gone, the epithelium of the palatine tonsil grows in its place. Tonsillar pillars are created by the dorsal migration of mesenchyme in the embryonic soft palate from the 2nd and 3rd branchial arches.

During the 14th embryonic week, when mononuclear cells enter the mesenchyme beneath the mucosa of the growing tonsillar fossa, the palatine tonsil begins to develop.[7]

Lymphoblastic stem cells and pre bursa associated cells give rise to these cells. Tonsillar lymphoid tissue develops from mesenchymal condensations in the bone marrow. Tonsillar primordium has a distinct organisation by the 16th week, and cystic structures appear later just after 6th month of gestation, which creates the main follicle.[7]

Tonsillar crypts form when the surface epithelium invades neighbouring connective tissue, and they are then invaded by lymphocytes produced from the thymus. The tonsils expand and thus the epithelial crypts divide, degrade, and reform as development goes on. Even after

delivery, this process continues. This tissue appears to originate from the mesenchyme that is immediately next to tonsillar tissue during the 20th week.[8]

Before birth, functional germinal centres are rare, but after birth, they become commonplace. An increase in the number of lymphocytes in the base of the tongue indicates lymphoid infiltrates there. It happens at the same time as the palatine tonsil develops. Epithelial development into the condensed connective tissue may also be involved in this process.[8]

It's also possible that the peritonsillar mucous glands form and contain lymphocyte excretory canals; these ducts typically open towards saccular crypts or even penetrate growing tonsillar lymphocytes. The lymphatic tissue that will become the pharyngeal tonsil or adenoid forms in the posterior wall of the nasopharynx during the fourth to sixth week.[8]

Modified crypts form in this tissue, which resemble epithelial folds and could also cover enlarged ducts of neighbouring mucous glands. This tissue grows in this way. Increasing the mass of this tissues has been due to response to the nasopharynx's ample blood supply, as well as post nasal infection. Whatever the case may be, the adenoid gland expands fast during childhood and adolescence before gradually contracting during puberty.

Anatomy of the Tonsil

Tonsils are a triangular mass of subepithelial lymphatic tissue located between the divergent palatopharyngeal as well as palatoglossal folds in the tonsillar fossa. It is 20-25 mm length, 15-20 mm breadth, 12 mm thickness, and 1.5 g weight. Tonsils grow rapidly over the first 5 to 6 years of life. Puberty is typically when they achieve their peak. After puberty, as the reactive immune system cells begins to atrophy, tonsillar involution sets in, leaving just a small amount of tonsillar lymphoid tissue.[10]

Lateral Surface

The capsule of the tonsil is clearly visible. Loose areolar tissue lies between the tonsil capsule and the bed, making tonsillectomy easier by allowing the tonsil to be dissected in the plane. It is also where pus from a peritonsillar abscess collects. The tonsil capsule is lined with palatoglossus as well as palatopharyngeus muscle fibres. As a result of its proximity to the tonsil's parenchyma and deep contact with the tonsil's deep surface, the capsule helps form tonsil nerve supply and vessels, as well as connective tissue septa.[10]

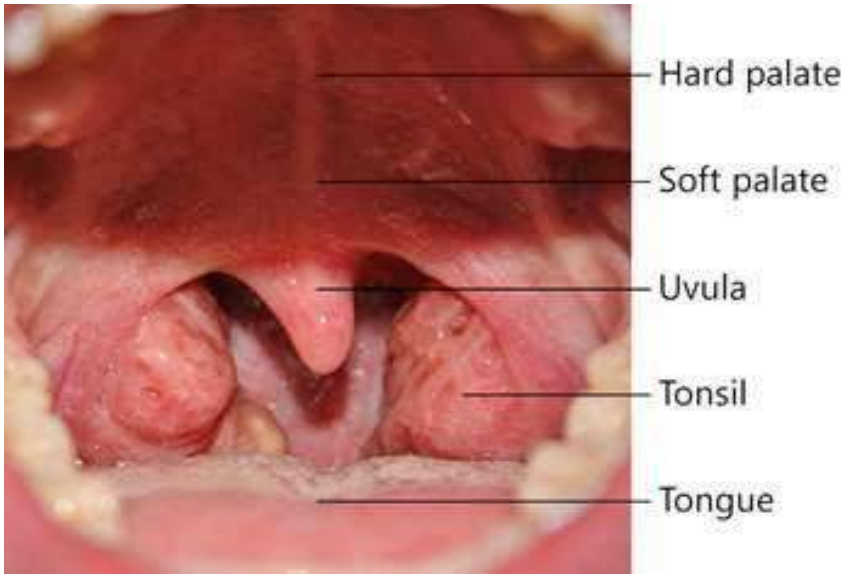


Figure 3.3. Anatomy of Tonsil.

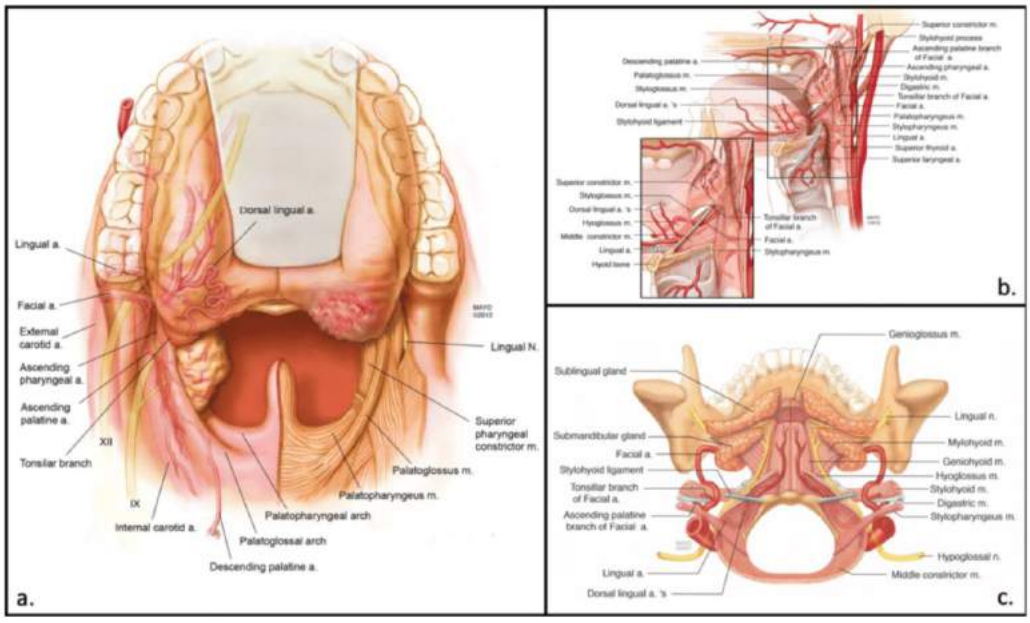


Figure 3.4. Relations of Tonsil.

Medial Surface

There is a non-keratinizing stratified squamous epithelium covering the tonsil's medial surface, and this epithelium dips into the tonsil's parenchyma as crypts. On the tonsil's medial surface, there are 12-15 crypt openings visible. The crypta magna also known as intratonsillar cleft is a large and deep crypt located close to the upper pole of the tonsil. The ventral section of the second pharyngeal pouch is represented by this structure. The secondary crypts in the tonsil's material develop from the major crypts. The tonsil's free medial surface confronts the oropharynx's cavity. During swallowing, the palatopharyngeus muscle contracts, which pushes the tonsil medially toward the buccal cavity.[13]

Anterior Pillar

The palatoglossal muscle helps form it. To produce an arch with palatopharyngeus, it develops out from inferior part of the tongue and is inserted into the palatal aponeurosis.[13]

Posterior Pillar

A muscle called the palatopharyngeus attaches to the soft palate after growing from the palatine aponeurosis and the hard palate.[13]

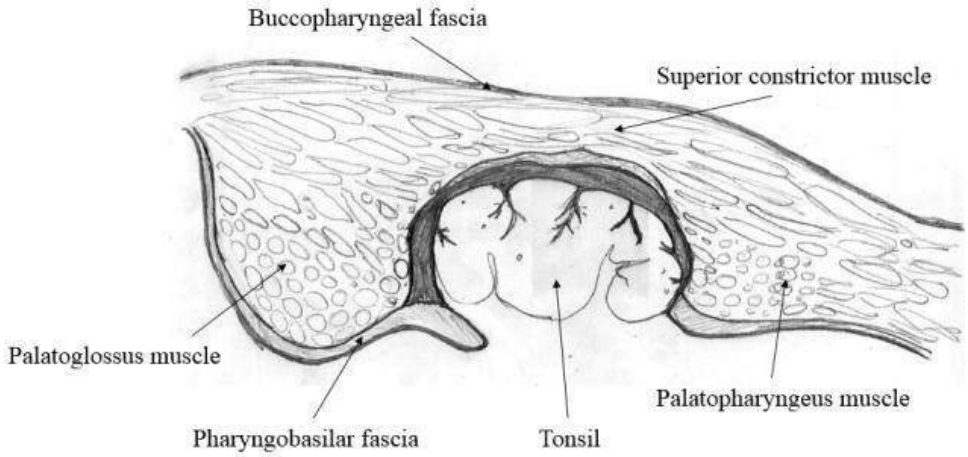


Figure 3.5. Fascia and Muscles Surrounding Tonsil.

Plica Triangularis

The anterior tonsillar gap is enclosed by a triangular flap of mucous membrane that stretches from the anterior pillar towards the antero inferior section of the tonsil. A sulcus called the tonsillo lingual sulcus separates the tonsil from the tongue and may be the site of cancer and foreign body lodgement ususally.[15]

Plica Semilunaris

A mucous membrane semi-lunar fold runs from the palatopharyngeal arch to the tonsil's upper pole, separating it from the uvula's base. Tonsil prominence determines how much of this fold is visible.[15]

Tonsillar Crypts

These show tubular invagination of the surface epithelium within the tonsil substance. Lymphoid nodules surround and spread into the depths of the tonsillar parenchyma around the irregularly shaped growths. Keratin and foreign particles, as well as exfoliated epithelium, can all be seen while looking at crypts. Tonsil crypts are home to mucous glands that drain into them.[15] Following are the structures in medial-lateral order that make up the tonsillar bed.

a) Paratonsillar vein is found in loose areolar tissue.
b) Pharyngo-basilar fascia.
c) Superior constrictor
d) Bucco-pharyngea fascia.
e) Styloglossus muscle.
f) Medial pterygoid muscle.
g) Glossopharyngeal nerve.
h) Facial artery.
i) Salivary gland in the submandibular region.[16]

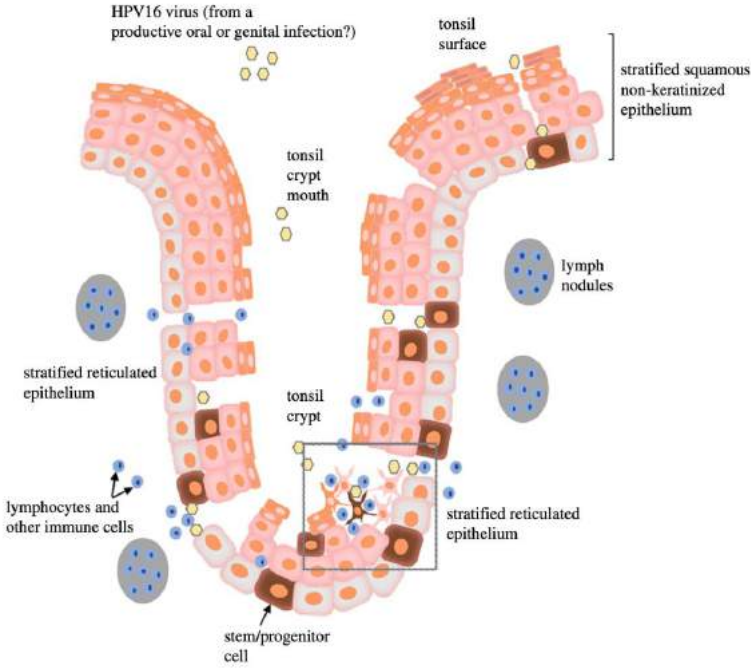


Figure 3.6. Tonsillar Crypt Schematic.

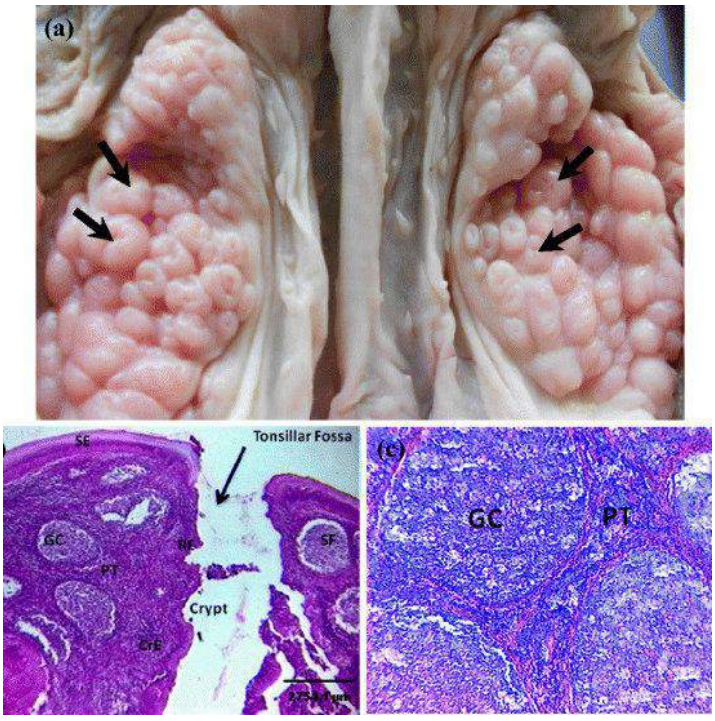


Figure 3.7. Macroscopic and Histologic image of Tonsillar Crypt.

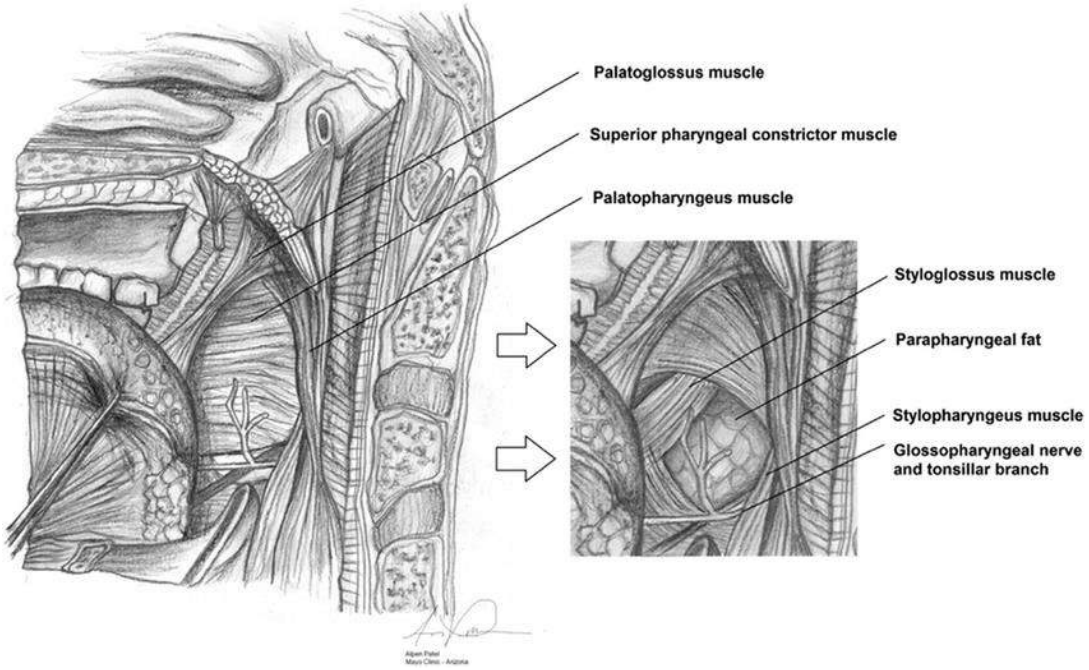


Figure 3.8. Tonsillar Bed.

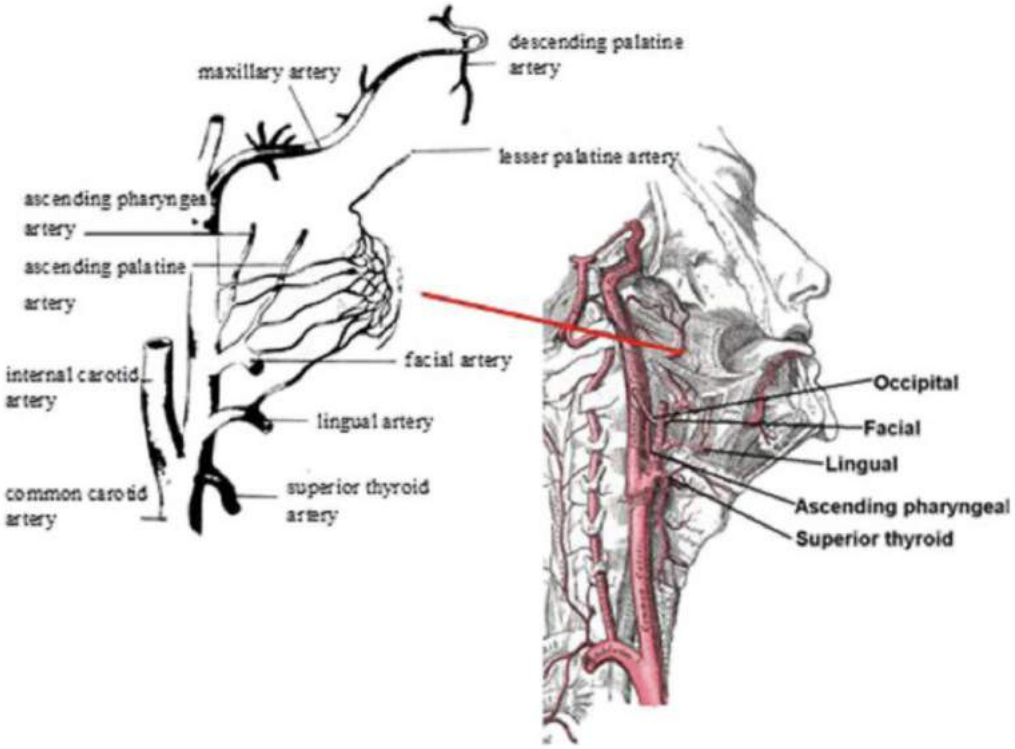


Figure 3.9. Tonsil Blood Supply.

Blood Supply

Branches of the External Carotid Artery supply blood to the tonsils.

a) Tonsillar artery(from Facial Artery).
b) Ascending Palatine artery (from Facial Artery).
c) Ascending Pharyngeal artery (from External Carotid).
d) Descending Palatine artery (from Maxillary artery).
e) The lingual Dorsalis artery (from Lingual artery).[13]

Venous Drainage

The tonsils drain into the paratonsillar veins, which drain to the pharyngeal plexus or facial vein. With the pterygoid plexus, and the common facial vein as well as internal jugular vein, connection is established.[13]

Lymphatic System

The palatine tonsils, in contrast to lymph nodes, lack afferent lymphatics and lymph sinuses. As a result, extensive networks of small lymphatic veins line the inside of each follicle, and these efferent lymphatics travel to the hemicapsule, where they puncture the superior constrictor and drain to the deepest lymph nodes of the neck, including the jugulodigastric node. Tonsillitis usually causes the jugulodigastric nodes to

swell to the point where they extend above the sternocleidomastoid's anterior border and can be felt externally 1–2 cm under the angle of the jaw.[13]

Nerve Supply

Tonsillar branch of the maxillary as well as glossopharyngeal nerves supply sensation to the tonsillar area. Maxillary nerve fibres travel via the pterygopalatine ganglion without making a connection. The tonsilar branch of the glossopharyngeal nerve are connected to the lesser palatine nerves which constitute a plexus (a circulustonsillaris) surrounding the tonsil. The oropharyngeal isthmus and the soft palate are both served by nerve fibres out of this plexus. The mucous membrane of the tympanic cavity is supplied by the tympanic branch from the glossopharyngeal nerve. Tonsil or tonsillar fossa infection, cancer, and surgical inflammation may all result in ear pain that is referred otalgia.[21]

Histology

Tonsils are made up of a dense mass of lymphoid follicles enclosed in a thin layer of connective tissue. In the germinal centre of each nodule, the lymphocytes are less tightly packed due to the fact that lymphocyte multiplication occurs here.[22]

There are 15-20 perforations on the tonsil's medial surface that face the lumen. The tonsillar crypts can be reached through a series of irregularly spaced apertures along the surface of the tonsil. These are capable of penetrating nearly the entire thickness of the tonsil, making them distinct from those other lymphoid organs histologically.[22]

A non-keratinizing stratified squamous type mucus membrane covers the luminal surface, and it lowers into the crypts to line them. Desquamated epithelium debris and cells have been discovered in the crypts.[22]

Functions

It's a part of inner Waldeyer's ring. In addition to acting as a sentinal at the air and food passage gateway. Crypts enhance the amount of space that foreign substances can come into touch with. This ring of lymphoid tissue, also known as Waldeyer's ring, goes around the pharynx. The adenoids make up the top portion of the ring in the nasopharynx. The ring is completed by the palatine tonsils, which are located to the side, and the lingual tonsils, which are located to the front.[23]

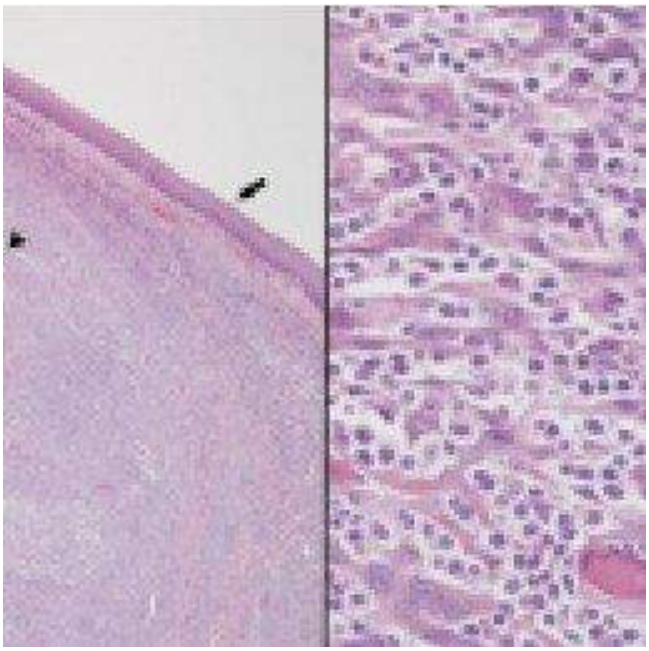


Figure 3.10. Tonsil Histology.

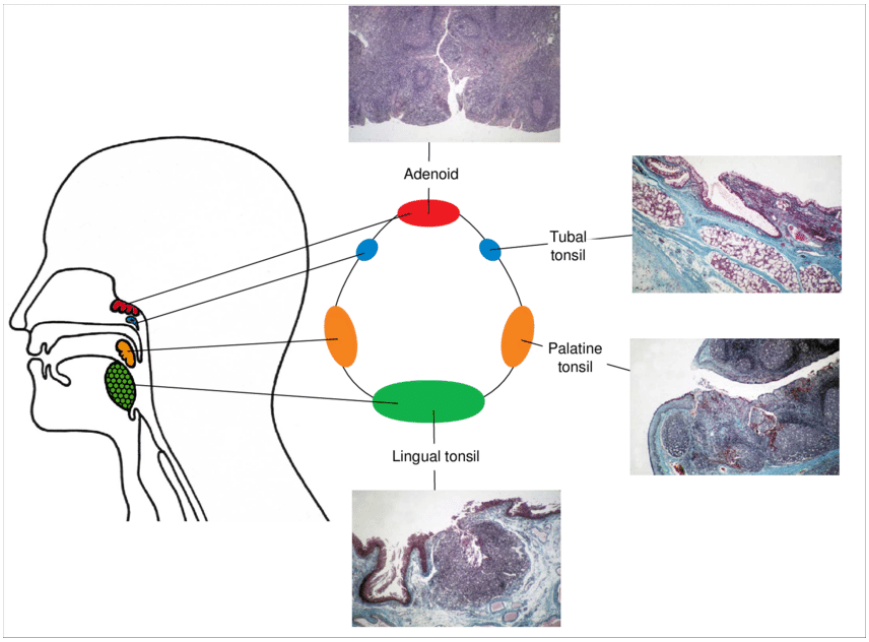


Figure 3.11. Waldeyers Ring.

Tonsil epithelium differs depending on where they are located. However, the palatine as well as lingual tonsils are lined by stratified, non-keratinized squamous cells while the nasopharyngeal tonsil is lined by numerous rows of ciliated epithelium. After birth, the primary follicles differentiate into secondary follicles, which are created during embryonic development. B lymphocytes in various stages of development, as well as a few T lymphocytes, are seen in secondary follicles. Tumors or infections of the tonsils can cause ear pain as a result of cranial nerve IX-mediated transferred pain. Upper respiratory tract MALT refers to tonsillar lymphatic tissue that is also known as mucosa-associated lymphatic tissue.[26]

This feature should not change the recommendation for a tonsillectomy if it is indicated. Triggering secretory immunity and controlling secretory immunoglobulin synthesis are both functions of the tonsils. A similar system of channels and epithelium to that found in Peyer's patches can regulate antigen uptake in these cells. The secondary lymphatic structures are the tonsils and adenoids. Immunological activity in the tonsils peaks between the ages of 4 and 10 years. Immunologically active cells are shed and antigen transport function is decreased as a result of inflammation of the reticular crypt epithelium, which is replaced by stratified squamous epithelium. Decreased stimulation of the local B-cell

system, reduced antibody production, and decreased B-cell and germinal centre density in extrafollicular areas can all result from these alterations.[26]

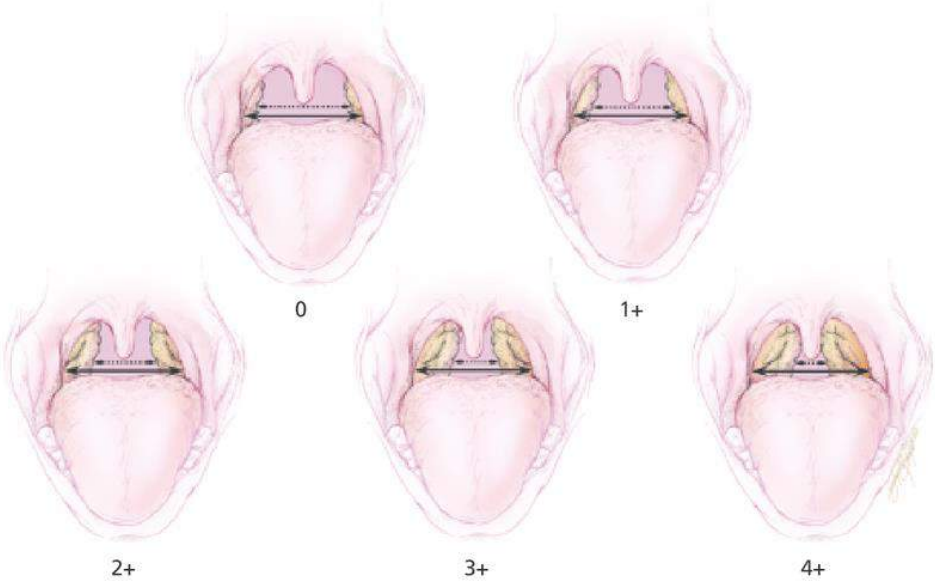


Figure 3.12. Tonsil Grading.

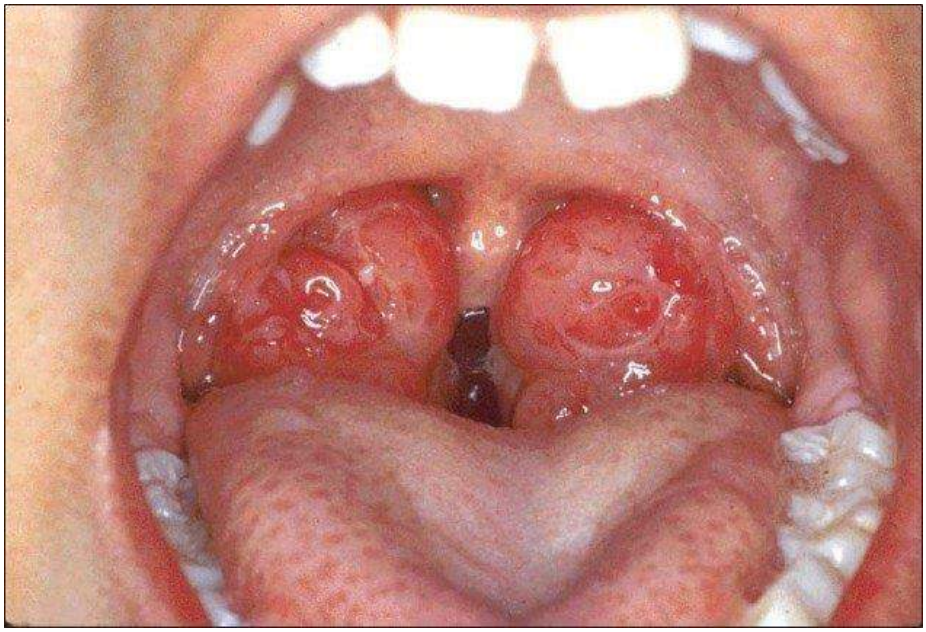


Figure 3.13. Grade 4 Tonsillar Enlargement.

Tonsil Grading

A scale for evaluating tonsillar hypertrophy was developed by Brodsky and colleagues.

- Grade 0 : Post Tonsillectomy status
- Grade 1 : suggests below 25% blockage;
- Grade 2 : suggests 25% to 50% blockage;
- Grade 3 : suggests 50% to 75% blockage;
- Grade 4 : suggests greater than 75% blockage.[29]

Acute Tonsillitis

Inflammatory diseases of the tonsils, such as acute tonsillitis, are common.

Linked with upper respiratory disease, such as pharyngitis or systemic illnesses such infectious mononucleosis, or as a solitary episode.[30]

Cause

H. influenza, Herpes Simplex Virus, Respiratory Syncytial virus and Coxsackie virus are examples of anaerobes and viruses found in Group A Beta Hemolytic Streptococcal cultures.[31]

Acute tonsillitis can affect anyone of any gender or age. It's more common in kids and in the fall and winter. History of flu - like illness, sore throat, difficulty swallowing, and pharyngeal or tonsillar exudates were all used in the clinical evaluation. Multiple tiny spots on the medial surface of the tonsil indicate follicular [lacunar] tonsillitis, causing painful cervical adenopathy.[31]

Diagnosis

Group A Beta hemolytic streptococci were found during clinical examination, bacterial culture, and rapid antigen testing (RAT). Supportive care, analgesics, and enough hydration were the mainstays of treatment.[32]

Management

A specific treatment for individuals who do not improve within 48-72 hours or whose symptoms are so severe that there is clinical concern. For seven days, the preferred medication is Benzyl Penicillin. Adjuvant therapy with a single injection of dexamethasone reduces pain in patients with acute pharyngotonsillitis without increasing the risk of an abscess. Peritonsillitis and systemic sepsis, especially septicemia and septic arthritis, were side effects. Exanthematous reaction occurs when scarlet fever is caused by Group A Beta Hemolytic Streptococci. Immunological complex

condition included non-infectious sequelae, Rheumatic fever, and glomerulo-nephritis.[33]

Subacute Tonsillitis

There is slight soreness in the throat for the patients. Tonsils that appear inflamed upon inspection are found. It could be minor or severe depending on the individual.[33]

Chronic Tonsillitis

Patients suffer from long-term, mild symptoms such as sore throats and excessive foul smelling. Tonsillar crypt material that is white or yellow under the microscope. It causes low-grade illness in youngsters and recurrent throat pain when it's accompanied by acute sepsis.[34]

Differential Diagnosis

Diphtheria

The onset occurs over time. It's common to get some kind of adenopathy of the cervical region Stridor, croupy coughing and hoarseness are common symptoms. An intact diphtheric membrane is created over the tonsil and pharyngeal mucosal tissue that is strong, healthy, grey, and securely attached. Diphtheria is diagnosed by the presence of this

pathognomic characteristic. Any attempt at removing it could result in bleeding. Severe cases can also result in airway blockage. Klebs-Loffler bacilli were demonstrated using Gram stain or culture to confirm the diagnosis.[35]

Scarlet Fever

The clinical findings include thick layer over tonsil with considerable oropharyngeal mucosal erythema, straw berry tongue, large lingual papilla, and a generalised erythematous skin rash. Immunotesting was done by Dicks testing or Shultz – Charlton blanching Phenomena, in which convalescent serum makes the skin rash to diminish, and it was confirmed by B-Hemolytic streptococci in throat cultures and immune testing.[36]

Vincents Angina

In the presence of inadequate dental and oral hygiene, a spirochete and bacteriodes bacterium (fusobacterus fusiform) can infect the oral cavity simultaneously. The tonsillar as well as pharyngeal mucosa are covered in grey necrotic pseudomembrane, which causes necrosis of the surface mucosa when infected. Bleeding could be caused by a slough or membrane from the underlying tissue. Clinical examination, chronic oral ulceration,

and methylene blue staining of smears or cultures are all used to make the diagnosis.[37]

Infectious Mononucleosis

Teenagers and young adults are susceptible to acute pharyngotonsillitis. Epstein Barr Virus is the pathogen responsible for the illness. Throat discomfort and severe systemic distress are common clinical symptoms. Disturbances of the blood and liver. For a month after the onset of symptoms, patients with splenomegaly and a susceptible spleen are vulnerable to abdominal trauma. In children, the sensitivity of the diagnosis is about 50%, whereas in adults it ranges from 70% to 90%. Testing for particular EBV antibodies confirm the results obtained during the primary investigation. Dysphagia and dehydration are common side effects due to insufficient oral intake. Up to 30% of people will have secondary bacterial infections.[38]

Beta Hemolytic streptococci are the most often seen. High dose penicillin, Metronidazole, second or third generation cephalosporins are the most commonly administered antibiotics. Because of the risk of an allergic reaction, patients should not be given ampicillin during this time period. Symptoms like airway compromise as well as severe difficulty swallowing can occur if the tonsils are extremely swollen. As an adjuvant, a short

course of high dose corticosteroids should be given. Because of the disorders linked to lymphoproliferative disease, it is not recommended that steroids be used on a regular basis. For diseases including agranulocytosis, leukoplakia, pemphigus, leukaemia, syphilis with a punched-out ulcer and tuberculosis, steroids should only be used in conjunction with antibiotics.[38]

Chronic Tonsillitis: Differential Diagnosis

There are a variety of diseases that can affect the body's collagen, including: tuberculosis, syphilis, mycosis, collagen disorder, systemic lupus erythematous, pharyngeal syphilitic gummas, and leprosy. Other diseases include: actinomycosis, blastomycosis, as well as leishmaniasis.[39]

Peritonsillar Abscess

Collection of pus between tonsil capsule and the bed in the available gap between them. Peritonsillar infection without abscess formation is common prior to pus production.[40]

Clinical Features

Progressive, generally unilateral sore throat for three or four days, painful swallowing, dysphagia for solids and subsequently liquids, saliva

drooling and headache coupled with fever and lethargy, as well as ipsilateral lymphadenopathy; trismus; and otalgia on the affected side.[40]

On examination, the patient frequently has a hot potato voice due to oropharyngeal swelling, and trismus is almost always present. In addition, the tonsil is shifted medially by the hyperaemic, protruding mucosa in the anterior pillar, and there are also tenderness and swelling in the jugulodigastric nodes. Infectious mononucleosis has been linked to bilateral quinsies.[40]

Both local and systemic disease are possible outcomes of exposure. Ignorance can lead to pus discharge if not addressed. There is a chance that antibiotic therapy will alter the course of the disease. Aspiration by needle or incision and drainage can be done.[40]

B-Hemolytic streptococci, Streptococci Viridans, Staphylococcus aureus, Hemophillus Influenza, and Anaerobes are among the pathogens suspected of being responsible. Dehydration and the inability to swallow can impair the airways in extreme situations.[40]

Investigations

Aspiration of pus with a needle is often therapeutic, and it can also offer important bacteriology in quinsies that are recurrent or unresponsive, and it can help distinguish between peritonsillar cellulitis as well as peritonsillar abscess.. Some countries employ noninvasive transoral ultrasonography to distinguish pus from cellulitis. When there is concurrent dental disease, dental x - rays or an orthopantomogram could be beneficial. When there are concerns about consequences like cancer spreading to the parapharynx, retropharynx, or mediastinum, computed tomography (CT) has been employed. For suspected vascular abnormalities, MRI angiography may be the best option.

Previously, interval tonsillectomy was considered a medical necessity regardless of other considerations, such as a history of repeated tonsillitis. Tonsillectomy is always required if a patient has Second quinsy. Aspiration is a concern when substantial amounts of pus are released either spontaneously or therapeutically into the posterior part of the mouth cavity. The use of local anaesthetic raises the hazard even further.. Anaerobes are treated with high dose intravenous penicillin and perhaps cephalosporin and metronidazole and aspiration of the abscess using a wire-bore needle or syringe.[41]

Tonsillectomy Indications

The following clinical indications were recommended by the American Academy of Otolaryngology–Head and Neck Surgery36 (AAO-HNS):

Absolute Indications

- Increased tonsils that impede the upper airway, induce severe dysphagia, disrupt sleep, or result in cardiopulmonary problems.
- Surgeon-documented abscess drainage or peritonsillar abscess that does not respond to medical treatment.
- Febrile convulsions as a result of tonsillitis Tonsils that need to be biopsied to determine the extent of the disease.[42]

Relative Indications

- Three tonsil infections a year or more in spite of appropriate medical treatment
- Chronic bad breath or bad taste in the mouth due to tonsillitis that does not improve with medical treatment.
- Tonsillitis caused by streptococcal bacteria that does not respond to beta-lactamase-resistant medicines in a streptococcal carrier
- Neoplastic unilateral tonsil hypertrophy on one side.[42]

Critical Criteria of Pittsburgh

- 3 or more occurrences of tonsillitis in a 3-year period
- Five occurrences of tonsillitis every year for the past two years, on average.
- Seven occurences of tonsillitis that lasts more than a year.
- Raised temperature must have been a defining feature of each incident.
- An anterior cervical lymph node that is larger than 2 cm in diameter or that is tender
- Secretions from the tonsils.
- Viable group-A beta hemolytic streptococcal culture.
- Adequate antibiotic therapy for confirmed or suspected streptococcal infections must have been provided.
- Every incidence must have been documented by evaluation and its specific features recorded in a clinical file at the time of occurrence.
- Peritonsillar abscess
- Chronic tonsillitis that has persisted for at least six months despite receiving proper antimicrobial therapy.
- When tonsils are extremely large, non-urgent obstructive symptoms may occur. Obstructive sleep apnea episodes with or without

snoring, muted hot potato voice if kid is at least 6 years old. Stretous breathing

- Anterior cervical lymphnode enlargement or pain that persists despite proper antimicrobial therapy for at least six months (>2cm).[43]

Within the Context of another Surgery

- Sleep apnoea condition treated with palatopharyngoplasty.
- Neurectomy of the glossopharyngeal nerve. After the tonsil is removed, the IX nerve is cut in the tonsil bed.
- Styloid process is removed in Eagles syndrome.
- Fistula in the branchial tract
- Excision of a parapharyngeal tumour.[44,45]

Contraindications

- Hb below 10 g percent.
- Acute tonsillitis. When there is an acute infection, bleeding is more common. Infants and toddlers under the age of 3.
- Cleft palate that is visible or one that is hidden beneath the mucous membrane.
- Aplastic anaemia, haemophilia, and other blood illnesses, such as leukaemia, purpura.

- During the polio outbreak.
- Systemic diseases such as diabetes, heart disease, hypertension, and asthma that are uncontrolled.
- Tonsillectomy should be avoided if possible while a woman is menstruating.[46]

It's important to address patients who've had tonsillitis and are known coagulopathies, or who have such a history in their family, with extreme caution because it's a serious problem. These people can have tonsillectomy without complications, but bleeding can occur at any moment during the treatment and for several weeks afterward, even if it is minor. These individuals should be scheduled for tonsillectomy only if they are willing to go through with it, and a consultant haematologist should be involved in the process. One study found no correlation between the amount of intraoperative bleeding and the patient's history of bleeding or abnormal laboratory results when performing preoperative assessments.[47]

Preoperative autologous blood storage and the use of authorised donors may help to ensure a good result. A tonsillectomy should not be performed in a community hospital setting on patients with bleeding dyscrasias who belong to religious groups that forbid the use of blood or

blood products. Instead, these patients must be referred to higher education institutions prepared to deal with medical-ethical dilemmas of this type.[47]

Tonsillectomy Methods

Dissection and Snare

The dissection technique is the most commonly used 'cold steel' tonsillectomy approach. A plane of loose areolar tissue exists between the tonsil as well as the pharyngeal musculature, which is dissected using steel dissectors, gauze, or cotton wool till the tonsil is fully mobilised. The tonsil is then retracted medially and incised over the tonsil capsule. Depending on the situation, blood vessels that cross the plane of dissection are either ligatured or heated. The most common procedure is still traditional dissection.[48]

Tonsillectomy using Diathermy

After tonsils have been delivered, the diathermy approach is now used to aid in hemostasis. It is the most common alternative to classical tonsillectomy, with an intraoperative blood loss of only 43 cc. Secondary haemorrhage and increased discomfort are major concerns. When it comes to electrical equipment, both bipolar as well as monopolar options are available. Most studies agree that electrocautery dissection takes less time

to perform and causes less blood loss during surgery than sharp procedures. This procedure, on the other hand, has the potential to enhance postoperative morbidity by delaying the return to a regular diet and activity level due to pain. About half of all otolaryngologists use monopolar cautery during tonsillectomy, according to research conducted both in print and online.[49]

Harmonic Scalpel

Tonsillectomy has also made use of the harmonic scalpel. Tissue is sliced and coagulated using ultrasonic technology, which operates at temperatures that are far lower than electrocautery and lasers. Otolaryngologists and other surgeons have utilised this scalpel in the past. Cutting as well as coagulation proceed at temperatures three to four times lower than with regular electro cautery or laser dissection. Reduced heat damage may lead to less postoperative discomfort.[50]

The harmonic scalpel has only been the subject of a few research. Even though some reports suggest a decrease in the amount of postoperative discomfort, others show an increase. There was no difference in intraoperative or postoperative haemorrhage between the standard electro cautery as well as the harmonic scalpel techniques, according to

other research. Tonsillectomy with a harmonic scalpel could be a potential future approach.[50]

Tonsillectomy using LASER

Tonsillectomy blood loss can be minimised by using laser technology. As a result, many laser wavelengths have been investigated for their potential use in tonsillectomy, such as APC lasers, neodymium: Yttrium aluminium- garnet lasers, and CO2 lasers. The use of the laser as a surgical tool has been promoted as having benefits in terms of reduced bleeding, postoperative complications and faster healing when it comes to tonsillectomies. However, research suggests that because of the high costs, morbidity, and safety risks involved, this procedure cannot be suggested as a substitute for a standard tonsillectomy.[51]

Techniques of Capsulotomy

A procedure that removes only the outer layer of the tonsil while leaving the inner capsule intact. A tailored probe or surface laser surgery are two of the 'tonsillotomy' procedures used. They're frequently utilised, but no well-designed randomised controlled trials have been done on them. For young patients undergoing tonsillectomy, they might explore this option if it's desirable to keep some healthy lymphoid tissue.[52]

Tonsillectomy-Intracapsular

Otolaryngology treatments including sinus surgery as well as adenoidectomy are now commonly performed with power instruments. They've also been employed in tonsillectomy procedures, like this one. Partial tonsillectomies or intracapsular tonsillectomies are the most common surgical procedures described in research. After intracapsular tonsillectomy with powered instruments, there have been reports of decreased postoperative bleeding rates and faster recovery in young children. Complete tonsillectomy may not be possible using this procedure.[53]

Ablation technique using Plasma

Protons are energised to disrupt tissue molecular connections in this ablation technique. It's a cold approach, so there's no risk of heat damage.[54]

Cryosurgery

Cryoprobe is used to freeze the tonsils, and subsequently they are allowed to defrost. There are two applications, each taking about three to four minutes to complete. A granulating surface is left after the necrosis of tonsillar tissue. There is less bleeding as a result of vascular thrombosis produced by carbon dioxide freezing at -82 degrees centigrade and liquid nitrogen freezing at -196 degrees centigrade.[55]

Coblation Tonsillectomy

Arthoscopy pioneered the technique of controlled ablation known as coblation, first commercially available in 1997. Coblation is a novel technique for rapidly and precisely removing tissue at low temperatures (usually 40^{o}-70^{o}C) while preserving the structural integrity of the healthy tissue or structures. "Coblation" is a composite phrase that literally translates as "cold" and "removal."

To create a tiny plasma field, Coblation uses radio frequency throughout a bipolar mode in combination with a conductive medium, such as sodium chloride.[56]

Free radicals, electrons, and ionized vapour layers are among the high-energy particles that make up the new field. It has the power to create an ablative path by dissolving the molecular connections in the tissue. At temperatures between 40°C and 70°C, the charged plasma particles can disintegrate tissue because they have the energy to disrupt molecular bonds. In the end, target tissue is removed in large volume while causing minimal injury to the surrounding healthy tissue. It can also be utilised for hemostasis if the electrodes and power settings are just right.[56]

In comparison to electro cautery, plasma removes large amounts of tissue at a lower temperature (40-70 degrees celsius) and a shallow depth of injury (50-150 micrometres). Cobalation is a good way to get good hemostasis. The 'wands' or probes are only good for one use. The Arthro Care 2 aided Evac-70 coblator wand was used to execute the conventional surgery. You can use it since it has the following features: a low-frequency delivery system, a reduced depth of penetration, less collateral tissue damage, surface temperatures ranging from 40 to 70 degrees Celsius, and an electrically-controlled energy delivery system. Initial investigations found substantial rates of postoperative bleeding. Some of these bleeds may be due to inexperience with the method; nonetheless, some studies have found bleed rates to be comparable to those of cold-steel dissection. Although it has been suggested that coblation dissection causes less postoperative discomfort than conventional dissection, one study has put doubt on this claim and demonstrated that morbidity is lower with cold steel dissection.[57,58]

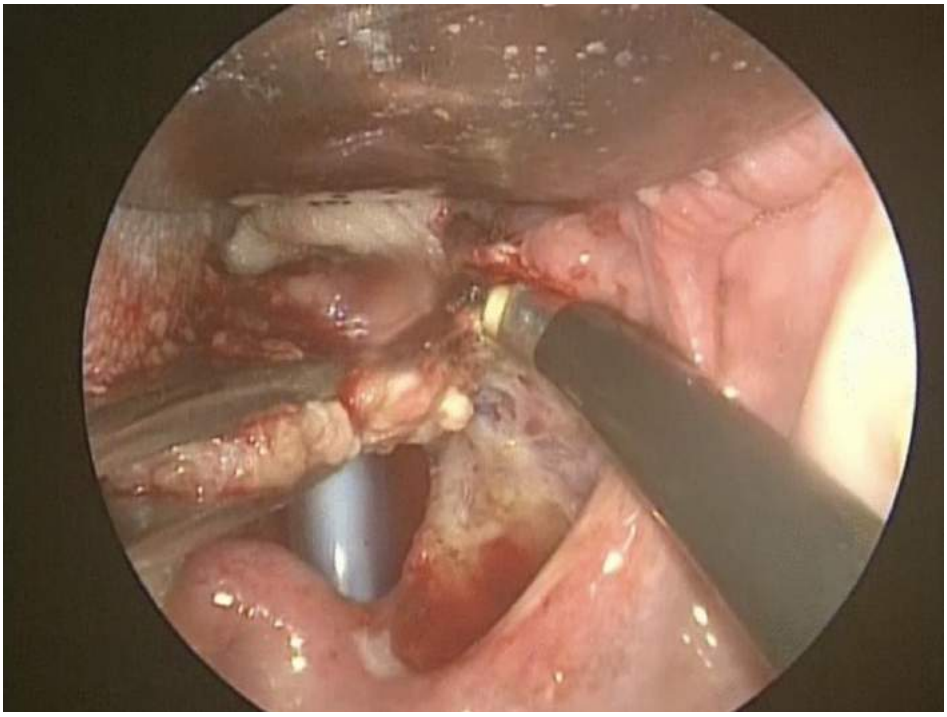


Figure 3.14. Coblation Tonsillectomy Dissection.

Figure 3.15. Coblation Tonsillectomy.

Current evidence does not support the use of coblation in place of cold steel dissection using ties and/or packs over well-controlled studies comparing the two procedures without diathermy. Although the present evidence supports the use of electrosurgery (diathermy and coblation) for tonsillectomy, the National Institute for Health and Clinical Excellence (NICE) advises surgeons to make sure they are properly trained and inform patients and parents.[60]

Radio Frequency Abalation

Tonsillectomy can also be performed using a radiofrequency approach, which is somewhat comparable to the coblation procedure. Children with tonsil hypertrophy may benefit from partial tonsillar excision or tonsil downsizing using radiofrequency technology.[61]

A submucosal electrode heats the target tissue using a temperature-controlled radiofrequency method. For a precise lesion, the radiofrequency generator controls the energy flow. Slowly but surely, the body will absorb this lesion again, reducing tissue volume while maintaining the integrity of the mucous membrane above. Tonsil reduction can be accomplished with an electrode that is readily available. The postoperative morbidity for patients who have tonsillotomy as well as ablation rather than total removal

appears to be lower when compared to the standard tonsillectomy approach.[62]

Temple et al. in 2001 observed that children who had their tonsils removed via tissue coblation experienced much less post-operative pain (P<0.0001). People who received coblation therapy experienced faster recovery of their tonsillar fossae. A coblation to remove tonsils allowed children to resume a normal diet more faster than bipolar dissection did. Neither group experienced primary or secondary haemorrhage.[63]

Belloso et al. in 2003 found that there was a significant difference in secondary bleeding rates between the coblation-assisted tonsillectomy group (P .05) and the control group (6.19 percent). Coblation tonsillectomy resulted in 0.95 percent subsequent bleeding in children; in the control group, the rate was 4.77 percent. In the adult population, the difference was similarly statistically significant (P< .05). (4.40 percent vs. 8.81 percent , respectively). The amount of reactive bleeding did not differ between the groups.[64]

Philpot et al. in 2005 in a double blind RCT observed that primary outcomes were not significantly different between the two arms (P <0.1), other from swallowing at 6–8 hours post-operatively in which the cold

steel dissection arm reported reduced pain. This group also resumed normal eating sooner (P = 0.03) than the other group.[65]

Chang et al. in 2005observed in their RCT comparing coblation and electrocautery that on the first three days after a coblation procedure, patients reported less pain and more oral intake. In Coblation patients, the percentage of everyday activities restored to >70 percent sooner and more consistently. Postoperative day 5 analgesia use was lower in the Coblation arm.[66]

Windfuhr et al. in 2005 found that the incidence of postoperative bleeding was significantly enhanced following a coblation tonsillectomy. With coblation tonsillectomy, a higher risk of secondary bleeding than with conventional procedures, such as cold dissection or suture ligation was observed. These methods have been shown to achieve hemostasis at a lower rate.[67]

Chang et al. in 2008 observed that day 1 and day 2 pain levels were comparable across intracapsular and subcapsular tonsillectomy patients. There was much less discomfort in the intracapsular tonsillectomy group by day five than in the subcapsular tonsillectomy group. Patients who

received intracapsular treatment ate more and exercised more than those who received standard chemotherapy.[68]

Omrani et al. in 2012 in their study noted that in terms of operation duration, blood loss, discomfort after surgery, and time to get back to normal eating and exercising habits, there were statistically significant variations between the groups. There was no significant difference in postoperative bleeding between the two groups ($p > 0.5$). This research found that compared to the usual procedure, coblation tonsillectomy had significantly less intraoperative and postoperative problems and morbidities. Coblation was linked to decreased discomfort and a quicker return to regular eating and activity patterns.[69]

El-Taher et al. in 2019 found that while the dissection procedure requires more time and blood loss during surgery, the coblation tonsillectomy allows patients to return to normal activities and diet sooner. But tonsillectomy with coblation leads to a greater risk of bleeding in the postoperative period.[70]

Lieberg et al. in 2019 noted that coblation tonsillectomy outperforms cold steel tonsillectomy in early postoperative pain as well as tissue damage when comparing to the cold steel approach. Reduced mast

cell degranulation following coblation tonsillectomy may help with pain control.[71]

Li et al. in 2021 observed that postoperative discomfort was significantly reduced in individuals who had coblation tonsillectomy with preservation of the inferior pole capsule on days three and five after surgery. Coblation tonsillectomy involving inferior pole capsule retention resulted in a significantly decreased overall postoperative bleeding rate, secondary bleeding rate, and bleeding in the inferior pole when compared to standard coblation tonsillectomy, the study concluded.[72]

MATERIALS AND METHODS

4. MATERIALS AND METHODS

Study Design : Cohort Study

Study Setting : Department of Otorhinolaryngology, Thanjavur Medical College, Thanjavur.

Study Duration : January 2021 –September 2021

Study Subjects : The patients who are attending the OPD of Otorhinolaryngology with features of Chronic Tonsillitis .

Inclusion Criteria

- Chronic Tonsillitis Patients with Age more than 5 years.
- Chronic Tonsillitis Patients with Weight more than 20 kilograms.

Exclusion criteria

- Chronic Tonsillitis Patients with Age less than 5 years.
- Chronic Tonsillitis Patients with Weight less than 20 kilograms.
- Patients with Acute Tonsillitis
- Patients with Unilateral Tonsillar Enlargement.
- Patients with Bleeding or Clotting Disorders, Cervical Spine Pathology.

SAMPLE SIZE

The sample size is calculated based on the study done by Sarode et al in the year 2012. Considering prevalence of Chronic Tonsillitis as 10%, with a 95% confidence and an absolute precision of 10%, with 10% excess sampling to account for non- response, sample size is derived.

Sample size is calculated using the formula: $\mathbf{N = Z^2 \times pq / d^2}$

N = Sample size

Z value for α at 0.05=1.96

p = prevalence =10%

q = 100-p=100-10=90%

d = Absolute precision of 100%

Sample size $\mathbf{N = 3.84*pq / d^2}$ **3.84*10*90 / 10*10 = 35**

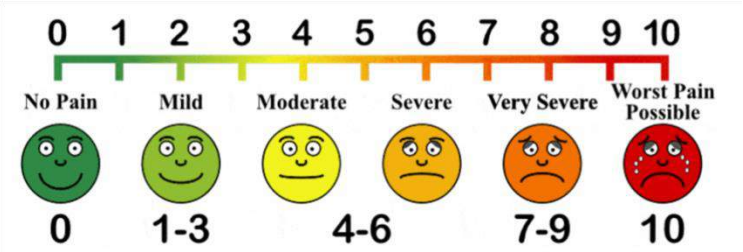
Considering 10% non response rate, Sample Size, **N= 40.**

Sampling Method **:** Simple Random Sampling

METHODOLOGY

It is a prospective cohort study analyzing 40 patients who were divided into 2 groups each group comprising of 20 patients each. Group I underwent Coblation tonsillectomy and group II underwent Conventional tonsillectomy. Results were analysed with regards to intraoperative bleeding, intraoperative time ,post operative pain, and return to normalcy and duration of hospital stay. Each patient was admitted and underwent a series of routine blood tests, including a full blood count, a Renal function test, a bleeding and clotting time test, a urine routine analysis, an X-ray of the soft tissue neck, and a diagnostic nasal endoscopy to diagnose adenoids and serology. Every patient was given pre-operative antibiotics the day before surgery and was put under general anaesthesia for the procedure. On the table per operative time and amount of bleeding were noted. Post operatively all patients were given I.V. antibiotics on 1st day and oral antibiotics from next day for subsequent 3 days. Post operative pain using visual analogue scale, early diet intake, and return to normalcy and duration of hospital stay were recorded into statistical data and analysed.

Visual Analogue Scale



Parameters Analyzed

1. Intra Operative Time of Coblation and Conventional Tonsillectomy.
2. Intra Operative Bleeding of Coblation and Conventional Tonsillectomy.
3. Post Operative Pain using Visual Analogue Score of Coblation and Conventional Tonsillectomy.
4. Duration of Hospital Stay of Coblation and Conventional Tonsillectomy.

STATISCAL ANALYSIS

Data were entered in MS Excel and analysed using SPSS version 16. Appropriate descriptive and inferential statistics were used. P Value <0.05 was considered statistically significant.

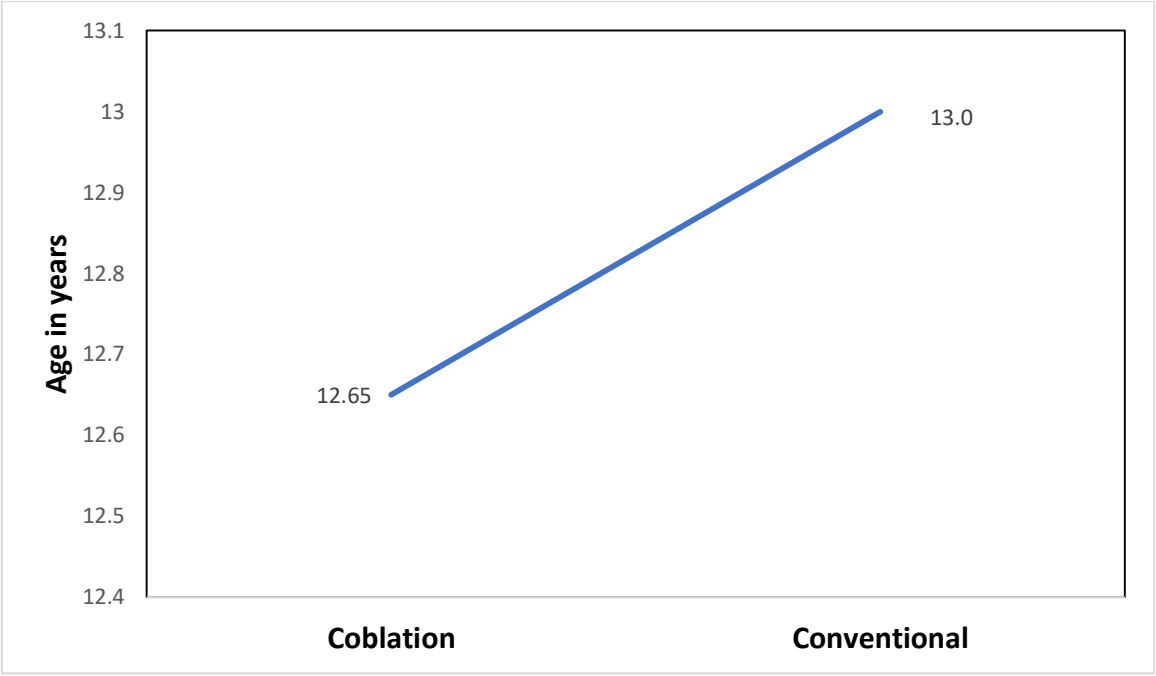
RESULTS

5. RESULTS

Table 5.1: Distribution of age among the study participants (N=40)

Sl.No	Variable	Coblation (n=20)	Conventional (n=20)	p
1	Age	12.65±2.64	13.00±2.97	0.69

Figure 5.1: Distribution of age among the study participants (N=40)

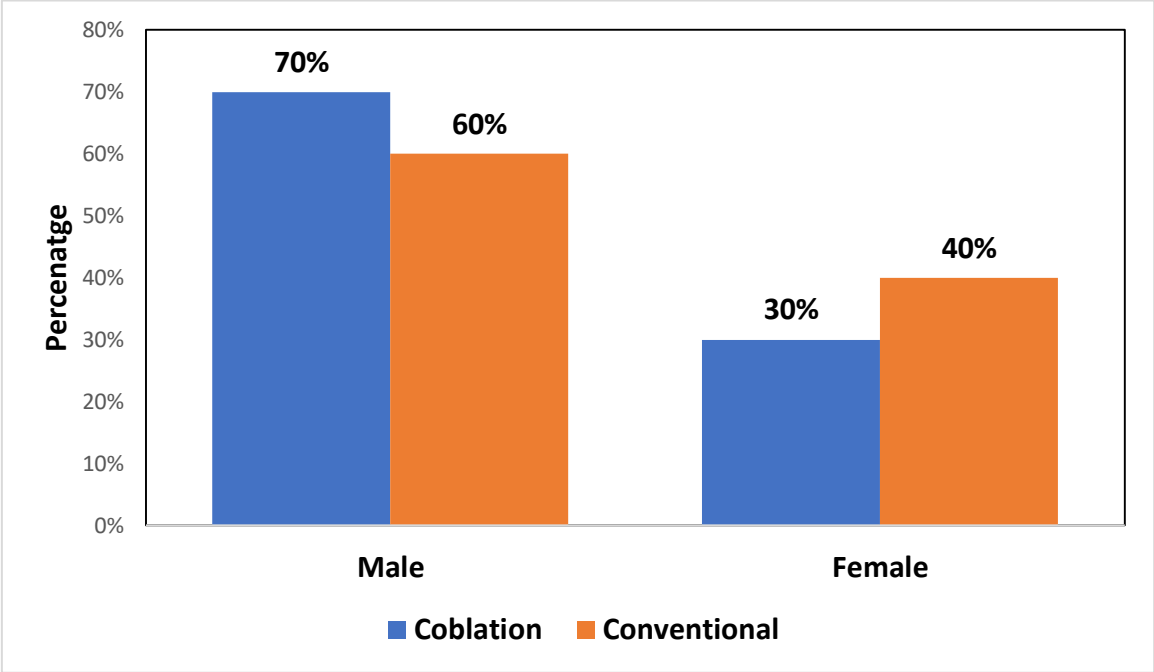


The mean age of the study participants in coblation are 12.65±2.64 years and conventional are 13.00±2.97 years and the p value is 0.69.

Table 5.2: Distribution of gender among the study participants (N=40)

Sl.No	Gender	Coblation (n=20)	Conventional (n=20)	X^2 (df), p
1	Male	14 (70)	12 (60)	0.440 (1) 0.51
2	Female	6 (30)	8 (40)	

Figure 5.2: Distribution of gender among the study participants (N=40)

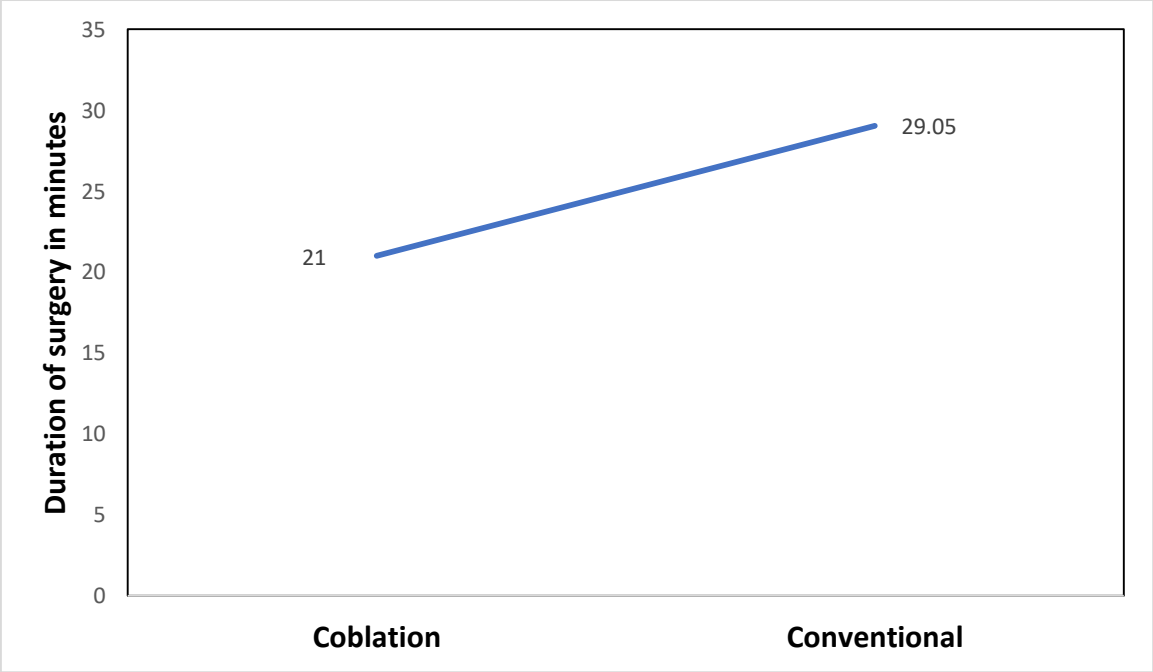


There was male preponderance among the study participants. Around 70% were males in coblation group, similarly 60% in conventional group. 30% were females in coblation group, similarly 40% in conventional group.

Table 5.3: Distribution of duration of surgery among the study participants (N=40)

Sl.No	Variable	Coblation (n=20)	Conventional (n=20)	p
1	Duration of surgery	21.00±4.66	29.05±4.88	<0.001

Figure 5.3: Distribution of duration of surgery among the study participants (N=40)

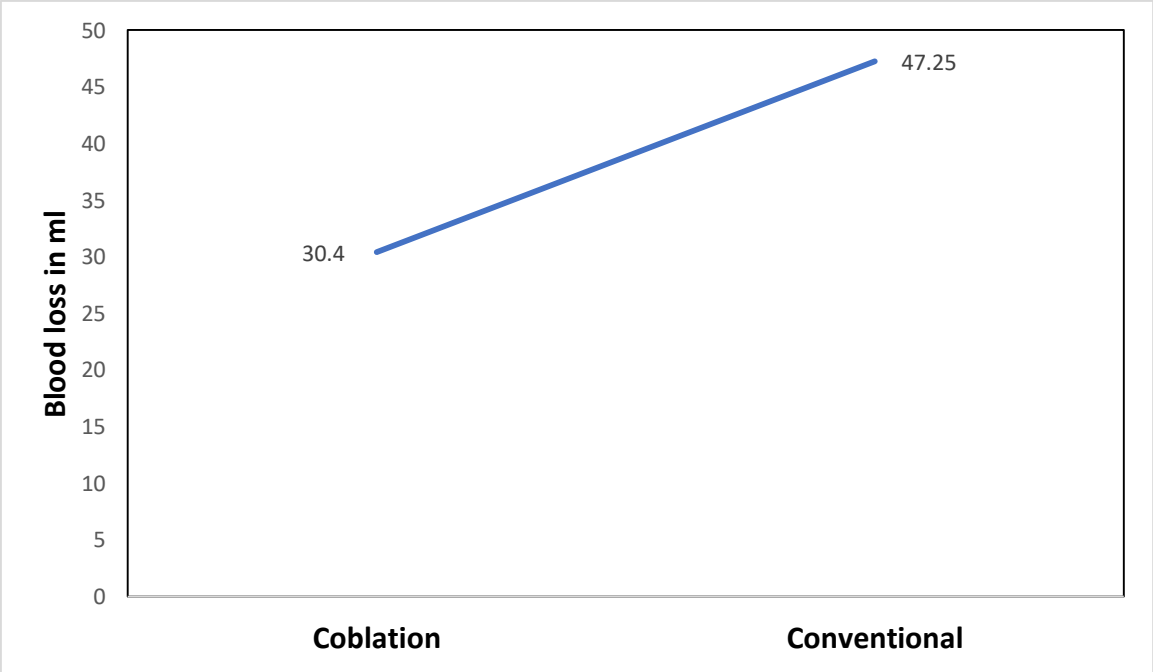


The mean duration of surgery of the study participants in coblation are 21.00±4.66 minutes and conventional are 29.05±4.88 minutes and p value is <0.001.

Table 5.4: Distribution of intra operative blood loss among the study participants (N=40)

Sl.No	Variable	Coblation (n=20)	Conventional (n=20)	p
1	Intra operative blood loss (ml)	30.40±6.61	47.25±7.52	<0.001

Figure 5.4: Distribution of intra operative blood loss among the study participants (N=40)

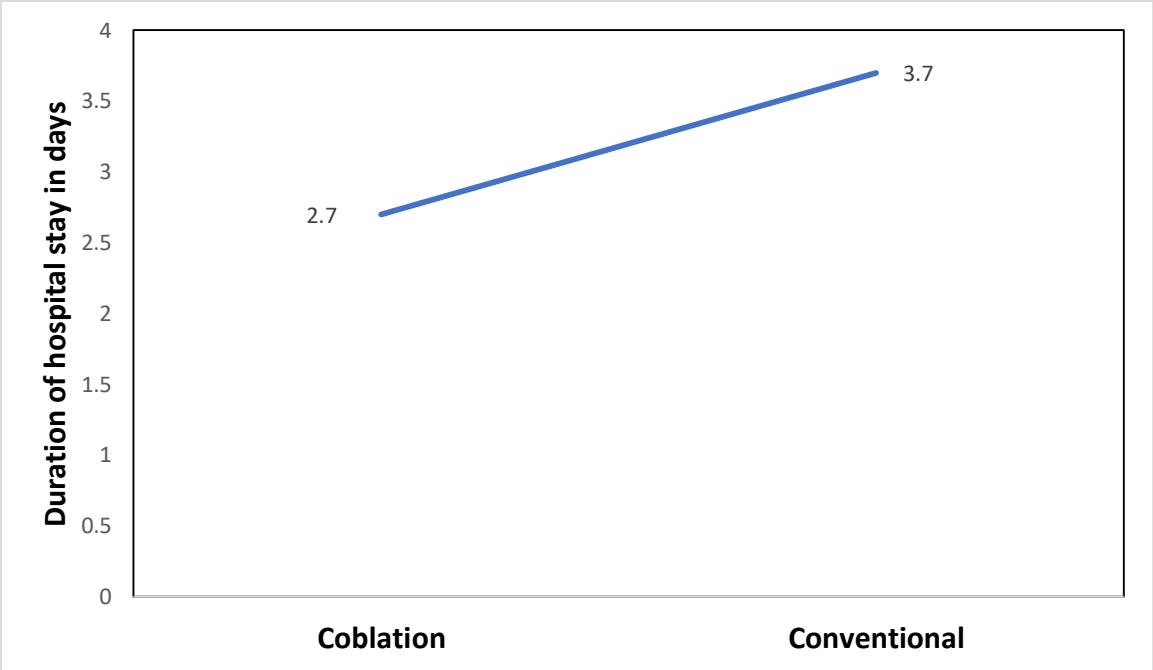


The mean intraoperative blood loss of the study participants in coblation are 30.40±6.61ml and conventional are 47.25±7.52 ml and p value is <0.001.

Table 5.5: Distribution of duration of hospital stay among the study participants (N=40)

Sl.No	Variable	Coblation (n=20)	Conventional (n=20)	p
1	Duration of hospital stay	2.70±0.73	3.70±0.80	<0.001

Figure 5.5: Distribution of duration of hospital stay among the study participants (N=40)

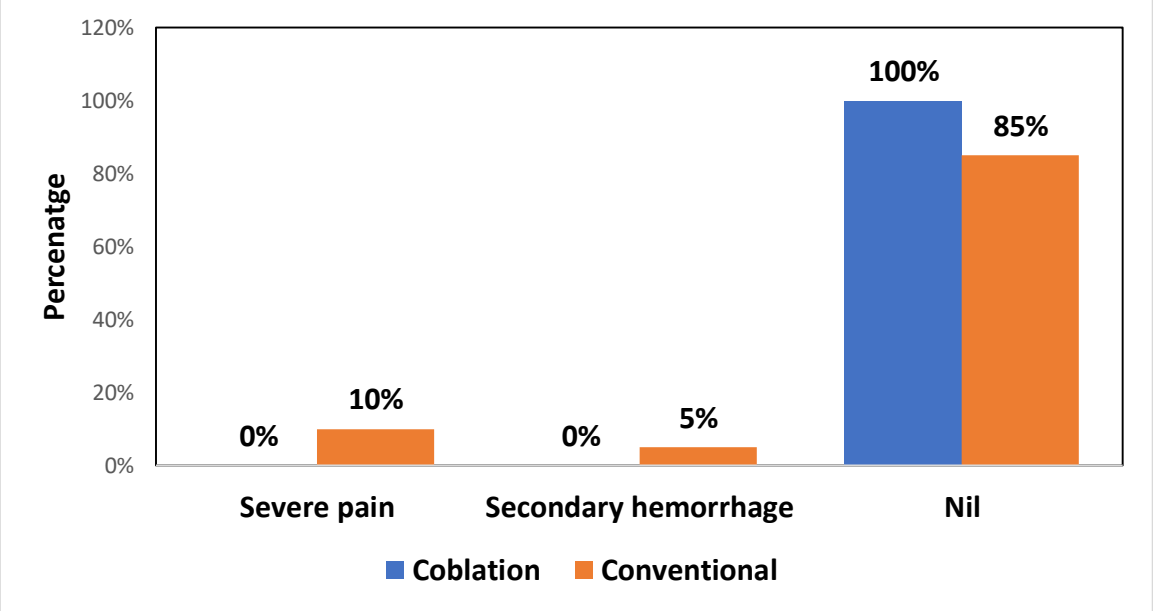


The mean duration of hospital stay of the study participants in coblation are 2.70±0.73 days and conventional are 3.70±0.80 days and p value is <0.001.

Table 5.6: Distribution of complications among the study participants (N=40)

Sl. No	Complications	Coblation (n=20)	Conventional (n=20)	X^2 (df), p
1	Severe pain	0	2 (10)	2.362 (2) 0.31
2	Secondary hemorrhage	0	1 (5)	
3	Nil	20 (100)	17 (85)	

Figure 5.6: Distribution of complications among the study participants (N=40)

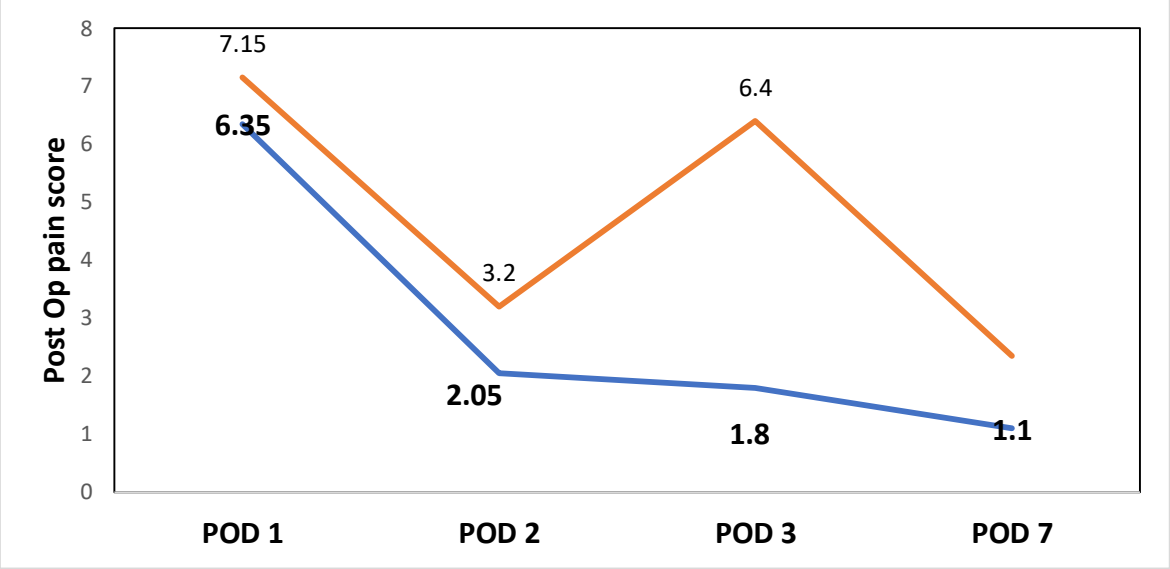


There was 10% severe pain, 5% secondary hemorrhage and 85% no complications among conventional group. No complications were observed in Coblation group.

Table 5.7: Distribution of Post op pain score among the study participants (N=40)

Sl.No	Post op pain score	Coblation (n=20)	Conventional (n=20)	p
1	POD 1	6.35±1.18	7.15±1.56	0.07
2	POD 2	2.05±1.43	3.20±2.22	0.06
3	POD 3	1.80±1.70	6.40±2.11	<0.001
4	POD 7	1.10±0.91	2.35±1.18	0.04

Figure 5.7: Distribution of Post op pain score among the study participants (N=40)



There was significant drop in pain scores on POD 3 and POD 7 in coblation group compared to conventional group and p value is <0.01 and <0.04 in POD 3 and POD 7 respectively.

DISCUSSION

6. DISCUSSION

Tonsillectomy is one of the most common procedures performed by ENT surgeons all over the world. Most ENT surgeons prefer the dissection and snare method over the other tonsillectomy techniques. Study participants will be given either a coblation method or a conventional tonsillectomy to see which is more effective.

Table 6.1 Age comparison among various studies

Sl. No	Study	Coblation	Conventional
1	Agarwal et al[73]	17.18	16.50
2	Rakesh et al[74]	21.56	20.19
3	Omrani et al[75]	11.20	11.80
4	Present Study	12.65±2.64	13.00±2.97

The age distribution was comparable across all studies.

Table 6.2 Gender comparison among various studies

Sl. No	Study	Coblation (M/F)	Conventional (M/F)
1	Agarwal et al[73]	12/13	18/7
2	Rakesh et al[74]	16/14	16/14
3	Omrani et al[75]		
4	Present Study	70%/30%	60%/40%

The gender distribution was comparable across all studies.

Table 6.3 Duration of surgery comparison among various studies

Sl.No	Study	Coblation	Conventional
1	Agarwal et al[73]	52.8 min	36.16 min
2	Rakesh et al[74]	15 min	11 min
3	Omrani et al[75]	27.3 ± 4.8 min	31.0 ± 5.4 min
4	Present Study	21.00±4.66	29.05±4.88

Our study showed comparatively less time for coblation compared to conventional tonsillectomy which was similar to Omrani et al[75]. In Agarwal et al[73] and Rakesh et al[74] the time was comparatively higher among coblation compared to conventional tonsillectomy.

Table 6.4 Intraoperative blood loss comparison among various studies

Sl.No	Study	Coblation	Conventional
1	Agarwal et al[73]	30 ml	48 ml
2	Rakesh et al[74]	11 ml	34 ml
3	Paramasivan et al[76]	7.4 ml	56.3 ml
4	Present Study	30.40±6.61	47.25±7.52

The intraoperative blood loss in ml distribution was comparable across all studies.

Table 6.5 Complications comparison among various studies

Sl.No	Study	Severe pain Coblation/Conventional	Hemorrhage Coblation/Conventional
1	Paramasivan et al[76]	NR	1/1
2	Omrani et al[75]	2.12%/4.26%	2.12%/10.64%
3	Present Study	0%/10%	0%/5%

Complications were comparable across all studies.

Compared to the conventional method, early studies on coblation showed significant reductions in postoperative pain scores. Coblation surgery, on the other hand, has not been shown to significantly reduce pain

in studies. On the 1st, 2nd, 3rd, and 7th post-operative days, we measured VAS scale post-operative pain and compared the results between the two methods. There was less pain with the coblation method in Aggarwal et al[73], compared to the conventional method group, where the mean post-operative pain scores were 7.64, 6.04, and 4.08, respectively. Previous studies, such as this one, back up my assertion. Tonsillectomy using the coblation method was found to be significantly less painful by Polites et al[77], and Timms et al[78] found that post-operative pain was significantly reduced by the coblation method. On the third and 7th post-operative day, the coblation method had significantly less pain than the conventional method, according to our research (P 0.001).

Coblation has advantages in the post-operative period, according to Temple et al[79]. Coblation has a significantly higher haemorrhage rate than diathermy, according to Noon et al[80]. There was no statistical difference in haemorrhage rates between coblation and non-coblation tonsillectomy techniques, according to Divi et al[81] in a retrospective study. Ten percent of conventional patients had severe pain, and five percent had secondary haemorrhage.

CONCLUSION

7. CONCLUSION

Coblation tonsillectomy, as opposed to Conventional tonsillectomy, is a safe and effective procedure. According to our findings, patients who underwent coblation tonsillectomy experienced significantly fewer postoperative discomfort and complications than those who underwent conventional tonsillectomy. Coblation tonsillectomy minimised the operating time, bleeding during surgery and discomfort following it. As an effective tonsillectomy technique, we endorse this technique.

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PROFORMA

PROFORMA

Name :

Age/Sex :

History :

Investigations :

Diagnosis :

Group :

Surgical Technique :

Outcome :

Duration of Surgery :

1. Volume of Intra Operative Blood Loss :

2. Post Operative Pain :

1^{st} POD :

2^{nd} POD :

3^{rd} POD :

7^{th} POD :

Mild -VAS 0-4

Moderate -VAS4-8

Severe -VAS8-10

3. Duration of Hospital Stay following Surgical Intervention:

4. Post Operative Complications :

ANNEXURES

ANNEXURE - 1

CONSENT FORM PART-1

PATIENT INFORMATION SHEET

A. Title of the project:

"**A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY".**

B. Name of the investigator/guide with mobile number

Investigator : Dr.Nagoor Mohideen,MBBS.,DLO.,
MS (ENT)Post Graduate,
Department of Otorhinolaryngology,
Thanjavur Medical College,
Mobile No: 9442723784.

Guide : Prof. Dr.C.Balasubramanian, MS(ENT).
Professor and HOD,
Department of Otorhinolaryngology,
Thanjavur Medical College,
Mobile No: 9486686690.

C. Purpose of this project/study

1. To systematically analyze and compare the advantages and Disadvantages of Coblation Tonsillectomy and Conventional Tonsillectomy.

D. Procedure/methods of the study

It is a prospective cohort study analyzing 40 patients who will be divided into 2 groups each group comprising of 20 patients each. Group I who will undergo Coblation tonsillectomy and group II who will undergo Conventional tonsillectomy will be analysed with regards to per operative bleeding, per operative time ,post operative pain, and return to normalcy. Every patients will be admitted on day1, will undergo basic blood investigations including complete blood count, renal function test, bleeding time, clotting time, urine routine, X-ray soft tissue skull ,Diagnostic nasal endoscopy to rule out adenoids, HIV, VDRL and With prior pre operative anesthetic assessment. Every patients on the day of operation will be given pre operative antibiotics and will undergo the respective surgery under General anesthesia. On the table per operative time and amount of bleeding will benoted. Post operatively all patients will be given I.V. antibiotics on 1st day and oral antibiotics from next day for subsequent 3 days. Post

operative pain using visual analogue scale, early diet intake, and return to normalcy will be recorded into statistical data and analysed.

E. Expected duration of the subject participation

7 – 15 days.

F. The benefits to be expected from the research to the participant

Reduces Intra operative time, Intra operative Blood Loss and Post Operative Pain and Early Healing and Return to Normal Activities.

G. Any risks expected from the study to the participant

More than minimal risk

H. Maintenance of confidentiality of records

Yes

I. Provision of free treatment for research related injury

Yes

J. Compensation for participating in the study

No.

K. Compensation to the participants for foreseeable risks and unforeseeable risks related to research study leading to disability or death

Yes.

L. Freedom to withdraw from the study at any time during the study period without the loss of benefits that the participant would otherwise be entitled

Yes

M. Possible current and future uses of the biological material and of the data to be generated from the research and if the material is likely to be used for secondary purposes or would be share with others, this should be mentioned

No

N. Address and telephone number of the investigator and co-investigator/guide

Investigator

Dr.NagoorMohideen,MBBS.,DLO.,

MS(ENT) Post Graduate.

Department of Otorhinolaryngology,

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Guide

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Thanjavur Medical College,Thanjavur.

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Dr.NagoorMohideen,MBBS.,DLO.,

MS(ENT) Post Graduate

Investigator of the Study

ANNEXURE - 2

ஒப்புதல் படிவம் – பாகம் -1

பங்கேற்பாளருக்கான தகவல் படிவம்

மருத்துவர் நாகூர் முகைதீன், காது மூக்கு தொண்டை பேராசிரியர் மரு. சி. பாலசுப்பிரமணியன் எம்.எஸ் ,அவர்கள் உதவியுடன் "தொண்டை சதை அகற்றும் (டாண்ஸிலக்டமி) அறுவைசிகிச்சையின் இருவேறு அறுவை சிகிச்சை முறைகள் ஒரு ஒப்பீட்டு ஆய்வு" என்னும் ஆராய்ச்சியை மருத்துவ பட்ட மேற்படிப்புக்காக நடத்த உள்ளனர்.

தஞ்சாவூர் மருத்துவக் கல்லூரியின் காது, மூக்கு, தொண்டை பிரிவின் வெளி மற்றும் உள்நோயாளி சிகிச்சைப் பிரிவில் உள்ளவர்களுக்கு தொண்டையில் சதை வளர்ச்சியால் பாதிக்கப்பட்டவர்களுக்கு இருவேறு அறுவை சிகிச்சை (Tonsillectomy) செய்ய உள்ளோம்.

1. எப்பொழுதும் போல் வெட்டி எடுத்தல் (Dissection & Snare Method - Conventional) முறை.

2. நவீன கருவி (Coblation) மூலம் எடுத்தல் முறை.

இரு முறையில் உள்ளவர்கள் மருத்துவ பரிசோதனைக்கு பிறகு அறுவை சிகிச்சை செய்யப்படுவார்கள். அறுவை சிகிச்சையின் நேரம், மற்றும் இரத்தப் போக்கு அறுவை சிகிச்சைக்குப் பின் உள்ள வலியின் தன்மை கணக்கில் எடுத்து ஆய்வு மேற்கொள்ளப்படும்.

மேற்சொன்ன ஆய்வு ஒன்று முதல் இரண்டு வாரம் நடைபெறும். இந்த ஆய்வினால் பங்கேற்பாளர்களுக்கு எவ்வித பாதிப்பும் இல்லை. மாறாக அறுவை சிகிச்சையின் போது ஏற்படும் இரத்தப்போக்கு மற்றும் அறுவை சிகிச்சைக்கு பின் ஏற்படும் வலி வெகுவாகக் குறைவதற்கு வாய்ப்புள்ளது. எந்த காலத்திலும் ஆய்விற்காக மேற்கொள்ளும் அறுவை சிகிச்சையினால் ஏற்படும் பக்கவிளைவு உடனடியாக இலவசமாக

சரிசெய்யப்படும் மற்றும் தேவையெனில் உரிய இழப்பீடு வழங்கப்படும் என்று உறுதி அளிக்கிறோம்.

இந்த ஆராய்ச்சியின் பங்களிப்பை எந்த நேரத்திலும் சுதந்திரமாக விலக்கிக் கொள்ள பங்கேற்பாளர்களுக்கு முழு உரிமையும் உண்டு. இந்த ஆய்வுகட்டுரையின் பரிசோதனை முடிவுகள் பங்கேற்பாளர்களின் முழு சம்மதத்துடன் வெளியிடப்படும் மற்றும் பரிமாற்றப்படும்.

தேதி : ஆராய்ச்சியாளர் கையொப்பம்.

ANNEXURE – 3

CONSENT FORM PART - 2

Participant consent form

Participant's Name: Address:

Title of the project: "**A PROSPECTIVE COMPARATIVE STUDY OF COBLATION TONSILLECTOMY AND CONVENTIONAL TONSILLECTOMY"**

The details of the study have been provided to me in writing and explained to me in my own language. I confirm that I have understood the above study and had the opportunity to ask questions. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without the medical care that will normally be provided by the hospital being affected. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have been given an information sheet giving details of the study. I fully consent to participate in the above study.

(I also consent / do not consent to use my stored biological samples for future scientific purposes) – if applicable

Signature of the participant : _____ Date: _____

Signature of the witness : _____ Date: _____

Signature of the investigator : _____ Date: _____

ANNEXURE – 4

ஒப்புதல் படிவம் – பாகம் -2

தஞ்சாவூர் மருத்துவ கல்லூரியின் காது மூக்கு தொண்டை பிரிவின் முதுகலைபட்ட மேற்படிப்பு மாணவர் மருத்துவர் நாகூர் முகைதீன், காது மூக்கு தொண்டை பிரிவு துறைத் தலைவர் பேராசிரியர். மரு. சி. பாலசுப்ரமணியன் எம்.எஸ் , அவர்கள் உதவியுடன் நடத்தப்படும் "தொண்டை சதை அகற்றும் (டாண்ஸிலக்டமி) அறுவை சிகிச்சையின் இருவேறு அறுவை சிகிச்சை முறைகள் ஒரு ஒப்பீட்டு ஆய்வு" என்னும் ஆராய்ச்சியை பற்றி எனக்கு முழு விவரம் எழுத்து பூர்வமாக வழங்கி, எனது தாய் மொழியில் தெளிவாக விளக்கப்பட்டது. நான் மேற்கண்ட ஆராய்ச்சியைப் பற்றி முழுமையாக புரிந்துகொண்டேன் என உறுதி அளிக்கிறேன். மேலும் எந்தவித நிர்பந்தமும் இல்லாமல் முழு சம்மதத்துடன் இந்த ஆராய்ச்சியில் நான் பங்கேற்கிறேன். எந்த நேரத்திலும், எந்த வித காரணங்களையும் தெரிவிக்காமல் இந்த ஆராய்ச்சியில் இருந்து விலகிக்கொள்ள எனக்கு முழு உரிமை உள்ளது என்பதை அறிந்து கொண்டேன். இதனால் மருத்துவமனையின் மூலம் எனக்கு கிடைக்கும் சிகிச்சைகள் எதுவும் பாதிக்கப்படாது என்பதை அறிந்து

கொண்டேன். மேலும் இந்த ஆராய்ச்சியைப்பற்றி முழுவிவரம் அடங்கிய படிவம் எனக்கு வழங்கப்பட்டது. மேலும் இந்த ஆராய்ச்சியில் எனக்கு மேற்கொள்ளப்படும் பரிசோதனை முடிவுகள் , விவரங்கள் , ஆகியவற்றை அறிவியல் பூர்வமான வளர்ச்சிக்கு மட்டும் பயன்படுத்திக்கொள்ள அனுமதிக்கிறேன். மேற்கண்ட ஆராய்ச்சியில் பங்கேற்பதில் முழுமனதுடன், சுயநிணைவுடன் சம்மதிக்கிறேன். மேலும் எனது உயிரியல் மாதிரியை (இரத்தம், உடல்திசு) சேமித்துக் கொள்ள சம்மதிக்கிறேன்.

தேதி : சாட்சி கையொப்பம்:

ஆராய்ச்சி மேற்கொள்ளும்
மருத்துவர் கையொப்பம் :

பங்கேற்பாளர் கையொப்பம் :

ABBREVIATIONS

ABBREVIATIONS

PT	-	Parenchyma of Tonsil
GC	-	Germinal Centre
SF	-	Secondary Follicle
SE	-	Squamous Epithelium
MALT	-	Mucosa Associated Lymphatic Tissue
RAT	-	Rapid Antigen Testing
EBV	-	Ebstein Barr Virus
HSV	-	Herpes Simplex Virus
RSV	-	Respiratory Syncytial Virus
POD	-	Post Operative Day
VAS	-	Visual Analogue Scale

MASTER CHART

Master Chart

S No	Name	Age	Sex	Type Of Surgery	Duration OF Surgery(Minutes)	Intra OP Blood Loss (ML)	Post OP Pain				Duration of Hospital Stay	Post OP Complications
							POD 1	POD 2	POD 3	POD 7		
1	Shakthigopal	16	Male	Conventional	20	37	6	2	7	0	3	Nil
2	Nalini	28	Female	Conventional	32	47	6	1	2	1	5	Nil
3	Vengadesan	9	Male	Conventional	22	44	8	1	1	3	3	Nil
4	Vinoth	14	Male	Conventional	29	45	6	4	8	1	4	Secondary Hemorrhage
5	Anitha	8	Female	Conventional	30	46	6	0	6	3	3	Nil
6	Angammal	13	Female	Conventional	31	57	7	4	5	2	3	Nil
7	Mahendiran	7	Male	Conventional	28	41	8	5	8	3	4	Nil
8	Nagammal	16	Female	Conventional	20	52	7	1	6	3	4	Nil
9	Sathish kumar	9	Male	Conventional	35	56	5	2	5	0	4	Nil
10	Loganathan	12	Male	Conventional	35	57	8	6	8	2	5	Nil
11	Suganthi	10	Female	Conventional	31	35	5	1	7	3	5	Nil
12	Ravi	15	Male	Conventional	33	48	7	5	8	0	4	Nil
13	Manickam	26	Male	Conventional	34	40	9	7	7	0	3	Nil
14	Sujithkumar	10	Male	Conventional	24	44	6	2	7	1	5	Nil
15	Sudha	32	Female	Conventional	28	58	10	6	10	1	3	Severe Pain
16	Naveen	11	Male	Conventional	33	43	7	1	5	1	3	Nil

17	Mahendran	8	Male	Conventional	32	53	10	7	8	0	4	Severe Pain
18	Vijaya	20	Female	Conventional	34	46	5	2	6	1	3	Nil
19	Selvi	15	Female	Conventional	24	37	9	4	8	0	3	Nil
20	Aldroy	10	Male	Conventional	26	59	8	3	6	2	3	Nil
21	Suresh Babu	17	Male	Coblation	27	37	6	0	0	2	2	Nil
22	Soniya	15	Female	Coblation	24	36	6	3	3	2	3	Nil
23	Ajith	7	Male	Coblation	19	36	5	1	1	2	2	Nil
24	Swaminathan	12	Male	Coblation	27	26	6	1	0	0	3	Nil
25	Manikam	17	Male	Coblation	24	20	4	3	2	0	3	Nil
26	Malliga	7	Female	Coblation	21	33	7	4	0	2	3	Nil
27	Gopinath	15	Male	Coblation	20	36	8	2	2	1	2	Nil
28	Kala	9	Female	Coblation	14	36	5	3	0	1	4	Nil
29	Gopi	24	Male	Coblation	20	22	6	2	3	0	3	Nil
30	Kasthuri	11	Female	Coblation	15	21	6	4	0	2	4	Nil
31	Babu	14	Male	Coblation	23	27	8	5	4	0	2	Nil
32	Mahesh	19	Male	Coblation	14	21	7	3	6	0	2	Nil
33	Pasupathy	12	Male	Coblation	17	28	5	0	4	1	2	Nil
34	Manikam	15	Male	Coblation	27	37	9	1	2	2	3	Nil
35	Yasmin	6	Female	Coblation	15	39	6	0	3	0	3	Nil
36	Lakshmi	9	Female	Coblation	16	30	7	2	1	2	2	Nil
37	Magesh	9	Male	Coblation	26	37	6	1	1	2	3	Nil
38	Shiva	18	Male	Coblation	20	31	7	3	0	2	2	Nil
39	Ganesan	14	Male	Coblation	26	21	6	2	3	1	2	Nil
40	Devendiran	12	Male	Coblation	25	34	7	1	1	0	4	Nil