



UNDERSTANDING ADENO-TONSILLAR HYPERTROPHY AND ITS MANAGEMENT THROUGH AYURVEDA – A REVIEW ARTICLE

Dr. MD Shahid Musaib*¹ and Dr. Veena Shekar²

¹PG Scholar, Department of Shalakya Tantra, Sri Kalabyraveswaryaswamy Ayurvedic Medical College Hospital and Research Centre, Bengaluru.

²Professor, Department of Shalakya Tantra, Sri Kalabyraveswaryaswamy Ayurvedic Medical College Hospital and Research Centre, Bengaluru.



*Corresponding Author: Dr. MD Shahid Musaib

PG Scholar, Department of Shalakya Tantra, Sri Kalabyraveswaryaswamy Ayurvedic Medical College Hospital and Research Centre, Bengaluru.

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ABSTRACT

Tonsils and adenoids are the main components of the Waldeyer's ring along with Tubal and Lingual tonsils. The ring acts as a first line of defense against microbes that enter the body via the nasal and oral routes. Tonsillitis and Adenoiditis are the most common conditions encountered in otorhinolaryngology clinical practice, which predominantly occurs in school-aged children and young adults. Recurrent infections of adeno-tonsils lead to hypertrophy leading to upper airway obstruction and sleep apnoea necessitating surgery. In *Ayurveda* classics, there is detailed explanation regarding clinical features and management of the diseases similar to tonsillitis and adenoiditis and these can be compared to *Tundikeri* and *Kantashaluka* respectively. This article provides insights into Adeno-tonsillar hypertrophy and understanding it through *Ayurveda* along with its management.

KEYWORDS: Waldeyers ring, Tonsillitis, Adenoiditis, *Tundikeri*, *Kantashaluka*, *Kavala*, *Gandusha*, *Pratisarana*, *Shastra Karma*.

INTRODUCTION

The importance of the presence of lymphoid tissue in the human pharynx was recognized as long ago as 1884 by Waldeyer, who described its specific arrangement as a 'ring' of lymphoid tissue, which is termed as Waldeyer's ring. The ring comprises the nasopharyngeal tonsil (NT) or adenoid, attached to the roof of the pharynx; the paired tubal tonsils (TT) situated at the pharyngeal openings of the Eustachian tubes; the paired palatine tonsils (PT) positioned in the oropharynx; and the lingual tonsil (LT) on the posterior third of the tongue. The mucosae of the pharynx contain smaller, sub epithelial collections of lymphoid tissue, which complete the circular band.^[1]

The nasopharyngeal tonsil, commonly called "adenoids", is situated at the junction of the roof and posterior wall of the nasopharynx. It is composed of vertical ridges of lymphoid tissue separated by deep clefts. Unlike palatine tonsils, adenoids have no crypts and no capsule. Adenoid tissue is present at birth, shows physiological enlargement up to the age of 6 years, and then tends to atrophy at puberty and almost completely disappears by the age of 20.^[2] Palatine tonsils are ovoid masses of

lymphoid tissue situated in the lateral wall of oropharynx between the anterior and posterior pillars.

Functions of tonsils and adenoids include (1) Immunology and host defenses: T-lymphocytes in para-follicular region provide cell-mediated immunity against various viruses, bacteria and fungi. Once the pathogens enter into these lymphoid aggregations they are dealt by IgG and IgM antibodies, which are produced by plasma cells. (2) Sentinels at the portal of aero-digestive tract: oro-pharyngeal sub-epithelial masses of lymphoid tissues, which form the part of Waldeyers ring, act as protective sentinels against harmful intruders into the air and food passages. (3) Antibody production especially secretory IgA: B-lymphocytes in the germinal centers of these lymphoid follicles produce antibodies IgA.^[3]

Tonsillitis refers to inflammation of the palatine tonsils. Adenoiditis is the inflammation of the adenoid tissue resulting from infection and allergy of upper respiratory tract. Adeno-tonsillar hypertrophy (ATH) is a combined term used for Chronic adenoiditis and Chronic tonsillitis. ATH is a common pediatric disorder in Otorhinolaryngological practice worldwide predominantly occurring in school-aged children to

young adults. It leads to development of snoring, abnormal and sleep-disordered breathing, obstructive sleep apnoea, speaking, smelling, tasting, swallowing difficulties, mouth breathing and oro-facial problems necessitating surgery.^[4] It can cause intermittent airway obstruction, chronic alveolar hypoventilation and even lead to severe cardiopulmonary complications such as right ventricular failure and cor-pulmonale. About 75 lakh children in India develop tonsillitis per year among which, around 2 lakh children get their tonsils removed.^[5] About 34.5% children in India develop Adenoid hypertrophy per year.^[6] Tonsillectomy and adenoidectomy are typical strategies for patients with ATH. Although these procedures have an important role in relieving obstructive symptoms in patients with OSA, they may lead to some serious complications such as bleeding (4-5%) and postoperative respiratory compromise (27%) especially among younger children. Thus, regarding this potency, non-surgical therapies have attracted a lot of attention as the alternatives.^[7] Thus there is a scope for safe and simple non-surgical treatment modalities found in alternative system of medicine. Such treatment modalities which include internal medications, nasal drops, local applications and procedures are found in Indian system of medicine.

In *Ayurveda*, this condition (ATH) can be incorporated into two of the diseases i.e., *kanthashaluka*^[8] and *tundikeri*^[9] mentioned under diseases of throat, wherein both the conditions present with the similar clinical features. An attempt has been made in this article to review ATH and to understand and correlate ATH to diseases of throat (*kantha*) mentioned in *Ayurveda* and to overview the management in *Ayurveda*.

METHODOLOGY

A systematic literature review was done from *Ayurvedic* Classics, Contemporary text books and Modern literatures including the Websites and Journals to gather information about the Disease, treatment procedures and formulations.

UNDERSTANDING ADENOIDITIS AS KANTHASHALUKA

Adenoiditis or inflammation of adenoids rarely occurs on its own and is typically involved in a more extensive disease process such as adeno-tonsillitis, pharyngitis, rhino-sinusitis etc. Continued irritation may lead to adenoid hypertrophy which is responsible for many of the complications. A viral URTI often precedes acute adenoiditis, bacterial pathogens can infect the tissues and proliferate during this stage.^[10] Viral pathogens associated with adenoid hypertrophy include Adenovirus, Coronavirus, Coxsackievirus, Cytomegalovirus, Epstein-barr virus, Herpes-simplex virus, Para-influenza virus and Rhinovirus. Many aerobic bacterial species have been implicated in contributing to infectious adenoid hypertrophy including alpha, beta and gamma-Hemolytic Streptococcus species, Haemophilus influenzae, Moraxella catarrhalis, Staphylococcus

aureus, Neisseria gonorrhoeae, Corynebacterium diphtheriae, Chlamydomphila pneumoniae, and Mycoplasma pneumoniae. Fusobacterium, Peptostreptococcus, and Prevotella species have also been identified as anaerobic organisms involved in infectious adenoid hypertrophy. Multiple non-infectious causes of adenoid hypertrophy have also been suggested including gastro-esophageal reflux, allergies, and exposure to cigarette smoke. In adults, adenoid hypertrophy can also be a sign of a more serious condition such as HIV infection, lymphoma, or sino-nasal malignancy.^[11]

The increase in size of the germinal centers of the lymphoid tissue and lymphoid follicles is the pathological and anatomical basis of hypertrophy. A vicious cycle consisting of inflammation, hypertrophy and/or hyperplasia, retention of secretions, and recurrent inflammation is assumed to be the underlying cause.^[12]

Although patients with adenoid hypertrophy may not complain of symptoms, they typically have chronic mouth breathing, snoring, sleep disturbances, halitosis, recurrent acute otitis media, conductive hearing loss (secondary to recurrent otitis media or persistent middle ear effusions), and a hyponasal voice quality. Chronic adenoiditis can also cause chronic or recurrent nasopharyngitis, rhinosinusitis, epistaxis, and cough.^[13]

Adenoids causing airway obstruction can lead to Obstructive sleep apnoea syndrome, chronic sinusitis, OME, Formation of malocclusions and developmental anomalies in the craniofacial area, Speech disturbances and articulation errors and disorders in physical and intellectual development.^[14]

Examination should include rhinoscopy (if possible and tolerated), an inspection of the nasopharynx (using a flexible endoscope, if possible), an evaluation of the palatine tonsils, an assessment of lymph nodes for enlargement, and bilateral otomicroscopy. Malocclusion, dental malposition, and a high palate can be indicative of adenoid hyperplasia. Marked palatine tonsil hyperplasia and incomplete choanal atresia can be associated with similar signs and symptoms.^[12]

When symptoms are not marked, breathing exercises, decongestant nasal drops, anti-histamines, antibiotics and steroids are advised. When symptoms are severe, Adenoidectomy is advised if the Adenoid hypertrophy causes snoring, mouth breathing, and sleep apnoea syndrome or speech abnormalities.^[15]

When *Kanthagata rogas* are reviewed in *Ayurvedic* classics, clinical features similar to Adenoids are found under the disease *Kanthashaluka*. According to *Acharya Sushruta*, vitiated *Kapha dosha* produces *Sthira* (immobile) and *Khara* (rough) *Granthi* (hard cyst) resembling the seed of *Kola* or *Badara phala* (plum or jujube fruit) in the throat.^[16] According to *Acharya*

Vagbhata, *Kapha pradhana tridosha dushti* produces *Grathita unnata shopha* (elevated knotty swelling) like a seed of *Kola* in throat. It induces irritation similar to that caused by *Shukakanthaka* (thorny spikes) and produces *Margavarodha* (obstruction) in the throat.^[8]

The general etiological factors mentioned under *Mukha rogas* i.e., diseases of oral cavity and oropharynx have to be considered for *Kantha* or throat disorders also, as separate etiology has not been mentioned for *Kanthagata rogas* which includes excessive consumption of fish, beef, pork, radish, black gram, curd, milk, fermented sugarcane juice, sleeping in prone position, improper dental hygiene, improper inhalation of medicated fumes, improper advocacy of medicated emesis, gargling and venesection.^[17]

The etiological factors cause indigestion leading to *Ama* which causes *Kapha pradhana tridosha prakopa*. The vitiated *Doshas* move upwards and get localised in *Kantha* further vitiating *Rasa*, *Rakta* (mainly) and later *Mamsa*. This results in *Sthira*, *Khara granthi* resembling the seed of *Kola phala*.

Acharya Sushruta advised treatment similar to *Galashundika* for *Kanthashaluka*. *Rakta visravana* or bloodletting is the line of treatment i.e., *Jaloukavacharana* (leech therapy) in *Kanthashaluka* and if it doesn't get relieved by *Raktamokshana*, surgical procedure similar to *galashundika* has to be adopted wherein only 1/3rd of the structure is excised. *Dalhana* opines complete excision without leaving any remnant.^[18] Excision is followed by *Gharshana* or rubbing with *Marichadi churna* (*Piper nigrum*, *Aconitum heterophyllum*, *Cissampelos pareira*, *Acorus calamus*, *Saussurea lappa*, *Oroxylum indicum*, Salt and Honey), *Kavala* (Gargling) with *Vachadi kashaya* (*Acorus calamus*, *Aconitum heterophyllum*, *Cissampelos pareira*, *Pluchea lanceolata* and *Picrorhiza kurroa*), *Dhoomapana* (Medicated smoke inhalation) with *Ingudadi varti* (*Balanites aegyptiaca*, *Achyranthus aspera*, *Baliospermum montanum*, *Pinus roxburghii* and *Cedrus deodara*) and intake of *Kshara siddha mudga yusha*.^[19] *Acharya Vagbhata* has advised treatment protocol similar to *Kaphaja rohini* i.e., *Swedana* (fomentation), *Lekhana* (scraping), *Pratisarana* (gentle rubbing of tissues with medicated powders), *Gandusha* (holding of medicated liquids in mouth) and *Nasya* (nasal drops).^[20] *Pratisarana* with *Aquilaria malaccensis* and *Picrorhiza kurroa*, *Nasya* and *Gandusha* with oil prepared out of *Achyranthus aspera*, *Clitoria ternatea*, *Baliospermum montanum*, *Embelia ribes* with Salt have been advocated.^[21]

UNDERSTANDING CHRONIC TONSILLITIS AS TUNDIKERI

Tonsillitis is inflammation of the tonsils, a common clinical condition caused by either bacterial or viral infection. It affects a significant percentage of the population, especially children. Chronic tonsillitis is

described as when an individual suffers from seven or more attacks of acute tonsillitis per year.^[22]

The most common and most important cause of recurrent tonsils is persistent or recurrent infection of the nose and paranasal sinuses. This leads to postnasal discharge which then infects the tonsils as well.^[23] Exogenous predisposing factors include ingestion of cold drinks or cold foods, contagion, embedded foreign body, polluted and crowded ill-ventilated environment. Usual respiratory gram positive cocci like streptococcus, staphylococcus, pneumococcus and diphtheroid organisms are responsible. Of these, Haemolytic streptococcus has a special predilection for the tonsils.^[24]

Clinico-pathological types include (a) Chronic follicular tonsillitis- tonsillar crypts are full of infected cheesy material that shows on the surface as yellowish spots. This is more common in adults and results from repeated attacks of acute tonsillitis. (b) Chronic parenchymatous tonsillitis- following repeated attacks of acute tonsillitis the lymphoid follicles of tonsillar parenchyma undergo hyperplasia leading to uniform enlargement of the tonsil. The tonsils may be grossly enlarged causing obstruction to food and air passages. These patients may also have adenoid hypertrophy causing snoring and sleep apnoea and later cor pulmonale. Tonsils are enlarged and may interfere with speech, deglutition or respiration. (c) Chronic fibrotic tonsillitis- here the tonsils are small due to atrophy, but the remnants may get infected leading to recurrent attacks.^[25]

Patients most often complain on the frequent inflammation of the throat and purulent angina, recurrent peritonsillar abscess, tingling, burning, and a constant feeling of a foreign body in the throat, bad breath, difficulty breathing and/or swallowing, persistent chronic infection of the nose, paranasal cavities, etc. The symptoms are especially pronounced in children, where often lead to chronic snoring or even suffocation during sleep. These symptoms are accompanied by poor nutrition and development of the child.^[26]

Examination of the tonsils shows erythematous tonsils with pus in the crypts. Usually there is tender enlargement of the cervical lymph nodes, particularly the jugulo-digastric nodes on each side.^[27]

There are three approaches to the management of Chronic tonsillitis: conservative, use of antibiotics, or by tonsillectomy. Surgical removal of the tonsils provides the definitive treatment.^[21] Tonsillectomy is one of the oldest surgical procedures still in existence. A description of partial removal of the tonsils first appears in texts from ancient India in 1000 BC, with the author exhorting the practitioner to refrain from removing the entire tonsil for fear of fatal hemorrhage. Celsus described a technique for the complete removal of tonsils as early as 50 AD. However, partial tonsillectomy remained the more widely used procedure until the latter

part of the 19th century.^[28] The ancient technique was followed by the use of instrumentation which includes snare, guillotines, tonsillotomes, ligatures etc. In the 19th century cold steel dissection and recently hot techniques were introduced to ENT practice. Modern hot techniques were introduced in 1973 with the use of CO₂ laser. Later came the YAG laser and KTP laser, diathermy, plasma excision or coblation, radiofrequency ablation and harmonic scalpel thermal welding.^[29]

When Ayurvedic classics are reviewed, clinical features similar to Chronic tonsillitis are found under the disease *Tundikeri*. Acharya Charaka explains it under *Mukhagata rogas*^[30] while Acharya Sushruta considers it under *Talugata roga*^[31] and Acharya Vagbhata in *Kantagata roga*.^[9] It is characterised by a big cystic swelling occurring at the *Hanusandhi* (base of temporo-mandibular joint) resembling the *Karpasa phala* (cotton fruit).

The general etiological factors mentioned under *Mukha rogas* have to be considered for the etiology of *Tundikeri* as well, as highlighted under *Kanthashaluka* earlier. These etiological factors cause *Agni-mandya* leading to *Ama* which causes *Kapha pradhana tridosha prakopa*. The vitiated *Doshas* move upwards and get localised in *Kantha* at the root of *Hanu* further vitiating *Rasa, Rakta* (mainly) and *Mamsa*. This results in a swelling resembling *Karpasa phala* in *Kantha* at *Hanusandhi* causing *Mandaruk* (mild pain) with exudations. When there is *Vata-pittanubandha*, symptoms like *Toda* (pain), *Daha* (burning sensation) and *Paka* (suppuration) are seen.^[32]

Even in *Tundikeri*, Acharya Sushruta has advocated treatment similar to *Galashundika chikitsa* i.e., *chedana* or excision.^[33] Acharya Vagbhata has advised treatment protocol similar to *kaphaja rohini chikitsa*.^[20]

ADENO-TONSILAR HYPERTROPHY AND AYURVEDA

When the adenoiditis and chronic tonsillitis coexist with each other it is called as Adeno-tonsillar hypertrophy. Adeno-tonsillar disease usually presents in children with either recurrent throat infections or sleep disorder breathing (SDB). It leads to obstruction of Nasopharynx and Oropharynx respectively. This condition has resemblance with *Kanthashaluka* and *Tundikeri* as they possess similar clinical features with Adenoiditis and Tonsillitis respectively.

Acharya Vagbhata highlighted the importance of treating *Kanthagata rogas* at its earliest as the site of these diseases includes the pathway of *Pranavayu*. It may prove fatal if *Shwasa* or breath gets obstructed.^[34]

According to Acharya Sushruta, both the diseases are surgically manageable which include excision. According to Acharya Vagbhata, treatment similar to *Kaphaja rohini*, which includes non-surgical techniques

like *Swedana, Lekhana, Pratisarana, Gandusha* and *Nasya* should be given. Drugs having properties such as *Lekhana, Shothahara, Rakta shamaka, Ropana* and *Kapha pitta shamaka* are ideal for the treatment.

General line of treatment for all *kantharogas* can be advised in *kanthashaluka* and *tundikeri* also, which include *Raktamokshana, tikshna nasya* and intake of *Darvyadi kwatha* (*kwatha* prepared out of *Berberis aristata, Azadirachta indica* and *Holarrhena antidysenterica*) or *Haritaki kwatha* mixed with Honey. *Kavala* with decoction made up of *Piper nigrum, Piper longum, Zingiber officinalis, Hordeum vulgare, Berberis aristata, Cissampelos pareira, Zanthoxylum alatum* and *Azadirachta indica* processed in urine of cow and *Pratisarana* with the *churnas* of the same drugs can be done. Application of *lepa* with *churnas* of *Barringtonia acutangula, Celestrus paniculata, Cyperus rotundus, Cedrus deodara, Zingiber officinalis, Acorus calamus, Baliospermum montanum* and *Marsdenia tenacissima* in painful and inflammatory conditions.^[35] *Kaalaka churna* (*Soot, Berberis aristata, Cissampelos pareira, Piper nigrum, Piper longum, Zingiber officinalis, Plumbago zeylanica, Emblica officinalis, Terminalia bellerica, Terminalia chebula, Zanthoxylum alatum* and Honey), *Peetaka churna* (*Berberis aristata, Cinnamomum zeylanicum, Salt, Realgar, Hordeum vulgare, Orpiment, Honey and Ghee*) and *Dwiksharadi rasakriya* (*Hordeum vulgare, Fagonia cretica, Soot, Emblica officinalis, Terminalia bellerica, Terminalia chebula, Five salts, Piper nigrum, Piper longum, Zingiber officinalis, Embelia ribes* and *Clitoria ternatea*) have been advocated for application to lesions in the throat.^[36] *Chakradatta* mentions *Pippalyadi churna*^[37], chewing of *Kshara gutika*^[38], *Ksharadi gutika* and intake of *katukadi kwatha, Dashamoola kwatha, Mulaka* and *Kulattha yusha*.^[39] In addition to these, *Bhaishajya ratnavali*^[40] advocates the usage of *Sahakara vati* and *Brihat khadira vati* for chewing and *Yogaratanakara*^[41] advocates application of *Pathadi churna* and chewing of *Yavagrajadi vati*.

DISCUSSION

Tonsils and Adenoids are histologically similar since both are lymphatic organs. They share common physiological functions and hence their pathology is also similar requiring similar management.

Infection of the nose and para-nasal sinuses is mentioned as the most common cause for tonsillitis and Adenoiditis is also usually associated with rhino-sinusitis. Some of the etiological factors like poor oro-dental hygiene mentioned for tonsillitis^[42] and gastro-oesophageal reflux mentioned under adenoiditis are also found under the etiology of throat disorders in Ayurveda.

Clinical features mentioned by Vagbhatacharya such as site of the lesion (Temporo-mandibular joint) in *Tundikeri* and obstruction of pathway in *Kanthashaluka* resemble with those of tonsillitis and adenoiditis

respectively. *Acharyas* have emphasized importance of early treatment in *kantagata rogas* to prevent *marga-avarodha* and acute-airway obstruction is one of the complications in ATH.

Common treatment protocol is given to *Tundikeri* and *Kanthshaluka* as the doshas involved in both the conditions are same i.e., *kapha* and *rakta*. The Prime line of treatment of these diseases includes *Nidana parivarjana* i.e., abstinence from causative factors which provoke *kapha*.

Management of ATH include treatment of the most common cause i.e., Rhino-sinusitis to prevent enlargement and subsequent complications like snoring and sleep apnoea. Analgesics and antibiotics are the first line of treatment in ATH and frequent episodes indicate surgical management. Adeno-tonsillectomy is the combined surgery to remove both adenoids and tonsils which are frequently associated with complications. Tonsillectomy is ranked among the top 25 procedures with highest pain intensities. It is more painful than a number of so-called major abdominal surgeries.^[43] Chronic tonsillitis is a global health issue which can impair patient's quality of life and has an important socio-economic impact due to the non-rational use of antibiotics, increased antimicrobial resistance and frequent need for surgical treatment.^[44]

Both *Tundikeri* and *kanthashaluka* can be managed by surgical as per *Sushrutacharya* or by non-surgical treatment methods as per *Vagbhatacharya*. Tonsillectomy and Adenoidectomy are nothing but modified versions of surgical procedures mentioned in ancient texts. Partial tonsillectomy practiced by some of the surgeons to reduce post-op pain and bleeding is similar to *Acharya sushruta's shastra chikitsa* (surgical management) mentioned for *Tundikeri* and *Kanthashaluka* similar to *galashundika* in which partial excision is advised. Selective removal of obstructive part of adenoids at Eustachian orifice and choana is also done in cases of palatine incompetence.^[45]

CONCLUSION

Adeno-tonsillar hypertrophy, although a common problem in children, may lead to complications if neglected, hence early treatment is advised to prevent the same. There are many conservative treatment methods explained in *Ayurveda* classics which are safe and non-invasive. Improvement of general health through *Rasayana* or immune-modulators, timely administration of *Nasya*, *Sthanika upakramas* like *Kavala*, *Gandusha*, and *Pratisarana along with Nidana parivarjana* prevent recurrent infections, complications and need for surgery.

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