

## Case Report

# Tonsillolith: an enormous monolith

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### ABSTRACT

Dystrophic calcifications are pathological mineral precipitates which occur in degenerative or dead tissue, despite normal serum calcium and phosphate levels, mostly seen in subcutaneous tissues secondary to infection or trauma. Chronic inflammation of the tonsils may lead to the formation of calcifications called tonsilloliths. The prevalence amongst the population is 2% to 16%, in age groups ranging from 10 years to 77 years of age, with a male/female ratio of 1:1. These calcifications display radiopaque images that are single or multiple, round or irregular, unilateral or bilateral and are superimposed upon the mandibular ramus. Computed tomography (CT) can be the investigation of choice for definitive diagnosis. The treatment of tonsilloliths is dependent on the size and presence of symptoms. It's preferable to remove a single, large tonsillolith, as they can cause recurrent episodes of tonsillitis. Usually manual compression, curettage or a simple incision to release the calcified body should suffice for the relief. In case of numerous tonsilloliths, an attempt to remove them individually is not a feasible approach. Hence, bilateral tonsillectomy is opted.

**Keywords:** Tonsillolith, Dystrophic calcification, Halitosis, Fourier transform infrared spectrometry

## INTRODUCTION

Tonsillolith are calcified deposits formed in the tonsillar crypts. These dystrophic calcifications are pathological mineral precipitates which occur in degenerative or dead tissue, despite normal serum calcium and phosphate levels, mostly seen in subcutaneous tissues secondary to infection or trauma.<sup>1</sup> Most predominately made up of calcium carbonate. This study deals with a case of a large hard mass in the right tonsillar fossa region deduced to be a tonsillolith.

Further analysis of the specimen using fourier transform infrared spectrometry (FTIR) spectroscopy. Mainstay treatment for this condition being removal of the stone followed by tonsillectomy if selected cases, also emphasizing on the possible preventive precautionary measures.

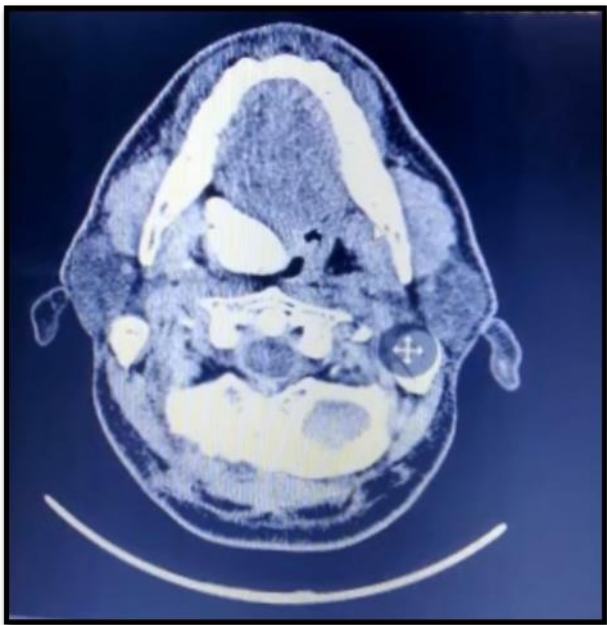
## CASE REPORT

A 32-year-old male reported to our department of otorhinolaryngology, with chief complaints of pain, discomfort and foreign body sensation in the throat associated with dysphagia and halitosis. On general physical examination it was observed that the patient was moderately built and nourished. Upon performing intra oral examination- poor oral hygiene, all teeth intact, a whitish-yellow mass in the right tonsillar fossa, in region superior pole region, slightly pushing the right palatoglossus muscle anteriorly was observed (Figure 1). On palpation and probing, the mass was stony hard, gritty in consistency, non-tender, firmly attached to the underlying surface. Completing the clinical examination of nose and ear did not reveal any abnormality. There was no cervical lymphadenopathy, trismus or complaints of difficulty in breathing. Hence a provisional clinical diagnosis of right palatine tonsillolith was made.

For definitive diagnosis, the preferred investigation of CT scan was opted, revealed a large hyperdense calcified structure measuring 3.4×2.6×2.7 cm (AP×TR×CC) is noted involving the right tonsil in the right tonsillar fossa. With no significant soft tissue component adjacent to the mass. The mass is seen partially crossing the midline and causing approximately 50% of oropharyngeal airway compromise (Figure 2).



**Figure 1: Clinical oral examination, right tonsillolith, whitish-yellow hard mass.**



**Figure 2: Computed tomography, axial view, showing hyperdense calcified structure in right tonsillar fossa.**

The patient consented for the proposed surgery, i.e excision of right tonsillolith with bilateral tonsillectomy under general anesthesia. The tonsillolith was firmly

adherent to the underlying mucosa, was dissected, dislodged and excised as a whole from the tonsillar fossa. Remaining tonsillar tissue was dissected and contralateral tonsillectomy was performed. The post-operative period of the patient was uneventful. With a complete course of antibiotic coverage, analgesics, anti-inflammatory, antiseptic mouth gargle, a good recovery was achieved and the patient was discharged. The patient was symptomatically better with the consecutive week and post 3 months of follow up.

The gross examination of tonsillolith specimen roughly measured 2.9×2.8 cm, dusky white in colour, convex on one side and irregular on the other, roughly pitted surface (Figures 3 and 4). The stone was sent for further evaluation- analysis by automated FTIR spectrometry, reported with the following- measurement 28×28 mm, weighing 2.011 gms, composition- calcium oxalate (10%), carbonate apatite (80%), sodium urate (10%).



**Figure 3: Gross specimen of right tonsillolith and surrounding tonsillar tissue and left tonsillectomy specimen.**



**Figure 4: Right tonsillolith specimen.**

## DISCUSSION

The palatine tonsils are paired structures consisting of lymphoid tissue. They are located in the tonsillar fossa between the anterior and posterior tonsillar pillars formed by palatoglossus and palatopharyngeus muscles respectively. Both T- and B-lymphocytes are present though B-lymphocytes predominate. Tonsil serves both the cell-mediated and humoral immunity. Histologically the tonsils consist of aggregates of lymphocytes arranged in a follicular manner and embedded in a stroma of the connective tissue. It is lined by stratified squamous epithelium, which invaginates into the parenchyma forming crypts.<sup>4</sup> Acute tonsillar inflammations may be a localized episode, in association with an upper respiratory illness or as a part of generalized systemic infection such as infectious mononucleosis. The causative organism usually is group A beta haemolytic streptococci (GABHS), although a range of other organisms including viruses and anaerobes may be implicated.<sup>1</sup> Chronic tonsillitis is termed as a persistent inflammation of the tonsillar tissue that maybe due to recurrent, acute or subclinical infection. The tissues may get hypertrophied due to recurrent and chronic inflammation.<sup>5</sup>

One of the complications of chronic tonsillitis is tonsillolith (calculus of the tonsil). Inorganic salts of calcium and magnesium are then deposited leading to formation of a stone. As observed in this case scenario, patients may present with symptoms of chronic throat discomfort associated with halitosis. Sometimes production of smelly white debris from tonsillar crypts is a possibility and these debris get retained in the crypts and block it. Occasionally, these debris may become inspissated, calcify and form a tonsillolith.<sup>4</sup>

The main components of oral malodour in humans are volatile sulphur compounds (VSC), including H<sub>2</sub>S, CH<sub>3</sub>SH and (CH<sub>3</sub>)<sub>2</sub>S. These volatile sulphur compounds and sulphur derived gases are produced during bacterial metabolism.<sup>6,7</sup>

Tonsilloliths can present with irritability, pain and discomfort while swallowing or at rest. Patient may experience referred pain to the ipsilateral ear due to the shared nerve pathway through the tympanic branch of glossopharyngeal nerve (Jacobson's nerve).

Clinically, tonsilloliths are easily diagnosed by palpation, stony hard, gritty feeling on probing.

Treatment is removal of the stone or tonsillectomy if it is associated with sepsis or deeply set stone which cannot be removed.<sup>8</sup>

Usually tonsilloliths are present as a single stone, but there are possibilities of multiple small calculi, unilateral or bilateral. There is no definitive shape and surface. May have a friable consistency and the stones may be irregular

or present in an inverted pyramidal shape. In our patient, the stone was partially convex on one side and irregular in shape on the other.

These calculi are mainly composed of calcium salts. This can be found as a separate entity or in combination with other mineral salts. The composition of the tonsilloliths can be interpreted through chemical analysis, possible components being calcium salts and presence of other chemical components such as calcium carbonate (CaCO<sub>3</sub>), magnesium, chloride, sodium, potassium, sulphates as SO<sub>4</sub>, nitrates as NO<sub>3</sub>, silica as SiO<sub>2</sub>, iron, fluoride and other unidentified components. Measurement of turbidity indicates total solids present in tonsillolith whereas measurement of electrical conductivity indicated concentration of salts and other chemical ions present in tonsillolith.<sup>6</sup>

Another possible evaluation of the tonsillolith is the microbiological analysis of tonsillolith which reveals presence of both aerobic and anaerobic microorganisms.<sup>6</sup> Tsuneishi et al (2006) in their study established the presence of wide spectrum of microorganisms such as *Eubacterium* and *Trannerella*.<sup>9</sup>

The choice of treatment for the removal of tonsillolith can be by curettage provided it is easily accessible and small. If suppose it is a larger lesion, may require local excision. If there are recurrent episodes of chronic tonsillolith, tonsillectomy can be opted for as definitive treatment.<sup>10</sup>

Tonsillolith should be distinguished from prominent pterygoid hamulus, large maxillary tuberosity, displaced teeth, foreign bodies, and intraosseous abnormalities of the mandibular ramus.<sup>2</sup>

Methods of prevention of tonsilloliths include practicing healthy oral hygiene, i.e. regular brushing or flossing teeth and gargling post meals to prevent food accumulation.

## CONCLUSION

All the patients presenting with complaints of long standing halitosis, foreign body sensation in throat, odynophagia or dysphagia should undergo a thorough examination of the oropharynx including intra oral digital palpation to rule out any mass in the tonsillar region. Further evaluation and treatment of the condition by excision of the stone should be done. Follow up is essential as there is a possibility of recurrence of tonsilloliths due to the sac like deformity in the region post excision and tonsillectomy. Patients should be encouraged and counselled to practice regular adequate and healthy oral hygiene techniques to avoid and prevent such complications.

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