Transoral Sonographic Diagnosis of Tonsilloliths
Report of 3 Cases

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Tonsilloliths are calcified concretions that develop in tonsillar crypts. They are usually asymptomatic; however, they may cause problems such as halitosis, dysphagia, a globus sensation, and otalgia. Tonsilloliths may be diagnosed by a simple inspection or palpation of tonsillar crypts, which can be confirmed by panoramic radiography, computed tomography, or magnetic resonance imaging. We report 3 cases of tonsilloliths diagnosed by transoral sonography that was performed easily and comfortably in an office-based setting.

Key Words—diagnosis; sonography; tonsillolith

onsilloliths have been diagnosed from simple inspection, panoramic or lateral pharyngeal radiography, computed tomography (CT), and magnetic resonance imaging (MRI). Superimposed hard and soft tissue structures on radiographs are common in this anatomic region and create challenges in interpretation. A prominent hamulus and elongated styloid process, calcification of the stylohyoid ligament, and unusual prominence of the maxillary tuberosity and mandibular ramus may simulate tonsillar calculi. This difficulty may be overcome by the use of CT or MRI; however, CT has potential side effects such as radiation exposure, and MRI is expensive. Office-based head-and-neck sonography allows for an effective physical examination that improves diagnostic accuracy and often removes the need for additional tests, studies, and procedures that are often more invasive or expensive. We diagnosed 3 cases of previously undiagnosed tonsilloliths by conventional methods with the use of an intraoral transducer (Figure 1; 3–12 MHz, linear array, 18-mm footprint; Alpinion, Seoul, Korea) designed for transoral sonography. Transoral sonography can be performed in an office-based setting without additional preparation such as local anesthesia (except for patients who have a moderate gag reflex symptom). To the best of our knowledge, the use of transoral sonography for imaging tonsilloliths has not been reported previously in the literature.
Case Descriptions

Case 1
A 32-year-old male patient presented to our institution with a several-year history of a sore throat and right-side otalgia that was aggravated by opening his mouth or yawning. He was examined at another general hospital, which failed to diagnose the cause of the pain; subsequently, he was referred to our institution for further evaluation and treatment. A clinical intraoral examination (including inspection and palpation) did not show any abnormal findings other than palatine tonsillar hypertrophy (Figure 2A). Direct laryngoscopic findings were normal. Plain lateral neck radiography and CT of the neck did not reveal the presence of a mass or lesion in the pharynx or larynx, such as Eagle syndrome (Figure 2B). Transoral sonography with the intraoral transducer revealed a 0.5-cm hyperechoic calcified ovoid lesion, which did not show posterior acoustic shadowing in the left tonsillar parenchyma (Figure 2C). A tonsillectomy was performed under general anesthesia. The specimens were removed from both tonsillar fossae, and then a meticulous examination with micro forceps revealed soft and yellowish white multiple tonsilloliths in the right tonsillar crypt (Figure 2D). Postoperative recovery was uneventful, and the symptoms subsided.

Case 2
A 17-year-old female patient came to our institution with a several-year history of tiny yellowish material in her throat. She had a foreign body sensation and halitosis. An oral examination showed no dental caries, and her periodontal tissue condition was good. The bilateral palatine tonsils were hypertrophied with multiple large crypts; however, direct laryngoscopy did not reveal tonsilloliths in the tonsillar crypts (Figure 3A). On her first visit to the outpatient clinic, transoral sonography was performed with the intraoral transducer, which revealed multiple hyperechoic foci in the parenchyma of both tonsils (Figure 3B). Both tonsils were removed under general anesthesia. The specimen had tonsilloliths in multiple crypts (Figure 3C). The patient recovered without complications and had no complaints on subsequent follow-ups.
Case 3
A 22-year-old male patient presented with periodic throat discomfort on his left side. His medical history was uneventful except for having received intermittent analgesics such as nonsteroidal anti-inflammatory drugs. Systemic examination findings were normal. An intraoral examination including palpation and direct laryngoscopy did not reveal any lesions such as masses or inflammation (Figure 4A). Plain lateral neck radiography showed normal findings. Transoral sonography revealed a 0.3-cm hyperechoic lesion in the left tonsillar parenchyma (Figure 4B). A tonsillectomy was performed under general anesthesia. The lesion found on sonography was confirmed as a tonsillolith (Figure 4C). There were no complications in the postoperative period, and the patient had no complaints on subsequent follow-ups.

Figure 2. Images from a 32-year-old male patient with right-side otalgia. A, Oral examination showing bilateral hypertrophied tonsils with redundant peritonsillar mucosa. B, Axial CT scan showing no abnormal findings in the right tonsillar parenchyma (arrowhead). C, Transoral sonogram showing a 0.5-cm hyperechoic calcified ovoid lesion (arrow) in the right tonsillar parenchyma. D, Soft and yellowish white multiple tonsilloliths in the right tonsillar crypt.
Discussion

The earliest known description of concretions in the oropharynx is thought to have been recorded in 1560. The exact etiology and pathogenesis are unknown. The calcifications develop within a mass of desquamated epithelium, serum, food debris, and bacterial colonies. Recurrent tonsillar inflammation may promote the development of tonsillar concretions. Consequently, they occur most commonly in young adults with long histories of recurrent sore throats. They occur twice as often in male than in female patients and predominantly affect the right tonsil.

Many patients have small and noncalcified tonsilloliths. Tonsilloliths may be diagnosed by simple inspection of both tonsillar crypts and can be confirmed by panoramic radiography or CT without contrast. Small and noncalcified tonsilloliths located in embedded tonsillar crypts are difficult to diagnosis by conventional methods. Most cases reported in the literature were related to symptomatic patients with large or moderately calcified tonsilloliths diagnosed by radiography or CT; however, tonsilloliths seldom occur as radiopaque objects on panoramic radiographs.

Applications of sonography in the oral cavity or oropharynx have been performed with existing transducers (transvaginal and hockey stick types); however, they have some limitations, such as handling, patient discomfort, and low image quality. The new type of intraoral transducer designed for transoral sonography enabled us to overcome the previous limitations. Transoral sonography can be performed in an office-based setting when a visual inspection fails to locate tonsilloliths in a suspected patient. Noncalcified tonsilloliths can be diagnosed with transoral sonography, which enables a physician to explain the status of a tonsil.

Figure 3. Images from a 17-year-old female patient with a several-year history of tiny yellowish material from the throat. A. Oral examination showing hypertrophied tonsils with multiple large crypts but no visible tonsilloliths. B. Transoral sonogram showing multiple hyperechoic foci (arrows) in the parenchyma of both tonsils. C. Specimen after tonsillectomy showing tonsilloliths in multiple crypts.
patient with a real-time image. Unlike radiography and CT, transoral sonography has no risk of exposure to radiation. In the diagnosis of calcified tonsilloliths with radiography or CT, it is sometimes difficult to determine whether the lesions are within the tonsil or the surrounding anatomic structures of the pharyngeal region, such as a prominent hamulus of the pterygoid, an elongated styloid process, or a large maxillary tuberosity, or pathologic calcifications of arteries, lymph nodes, and salivary glands. Transoral sonography can display the tonsil itself and enable the examiner to distinguish a lesion from the peritonsillar structures; in addition, its manipulation is similar to an endoscopic examination performed by ear, nose, and throat physicians. The 3 cases described above indicate that it could even detect lesions of deep crypts in the tonsillar parenchyma and embedded tonsils with redundant surrounding mucosa.

Small and asymptomatic tonsilloliths require no treatment. However, the above cases show that even small tonsilloliths create problems that can be treated after a proper diagnosis. In this situation, transoral sonography might be one diagnostic option. Transoral sonography can detect tonsilloliths that are not diagnosed by visual inspection and conventional radiologic methods.

In conclusion, transoral sonography using an intraoral transducer can be easily performed in outpatient clinics. Physicians can detect small or invisible lesions that are otherwise difficult to diagnose by a physical examination or conventional radiologic methods. In the diagnosis of tonsilloliths, transoral sonography represents a new diagnostic option that should be further evaluated in clinical studies.

Figure 4. Images from a 22-year-old male patient with periodic throat discomfort on the left side. A. Oral examination showing no specific findings. B. Transoral sonogram showing a 0.3-cm hyperechoic lesion (arrow) in the left tonsillar parenchyma. C. Meticulous examination of the specimen after tonsillectomy showing tonsilloliths in the left tonsil.
References