Clinical History:

Our patient, a 32-year-old trumpet player, was referred to our institution for an otolaryngologic consultation because he noticed bilateral protruding neck masses when he was playing his instrument.

Imaging Findings:

Multispiral CT of the head and neck was acquired during modified Valsalva manoeuvre. The study showed bilateral air collections through the pharyngeal wall at the location of the thyrohyoid membrane (see Figure 1).

Additionally, we reconstructed 3D volume rendered images that show the upper aerodigestive tract’s air-containing structures as a “cast”, plus coronal reformatted minimum intensity projection and virtual endoscopy images (see Figures 2, 3, 4, 5, 6, 7, 8).

These imaging findings led us to the diagnosis of bilateral hypopharyngeal pharyngoceles (lateral pharyngeal pouches).

Discussion:

Pharyngoceles are defined as lateral pharynx wall diverticula [1]. They are a rare condition that has been associated with muscle weakening with age, prior surgery and increased intrapharyngeal pressure [2] (excessive coughing, recurrent bronchitis or pneumonias, chronic throat clearing, excessive blowing or playing wind instruments). It has also been suggested that some pharyngoceles may actually be yet another manifestation of a branchial arch anomaly (specifically a small internal branchial sinus outpouching that dilates over time) [3]. Pharyngoceles can be asymptomatic or be associated with various symptoms, including dysphagia, hoarsness, cervical pain, regurgitation, dysphonia, cough, earache, and odynophagia [4]. Barium swallow roentgenogram has been considered relevant for diagnosis of pharyngoceles [1]. Hypopharyngeal pharyngoceles are usually not recognised or are mistaken for laryngoceles [5], as both protrude through the thyrohyoid membrane [3]. The frequency of this pathology is quite controversial. In 1979, Norris found 18 well documented cases of pharyngocele reported in the literature. He added 24 patients to this casuistic, all of them observed personally in a two years’ time period [2]. Besides, Ekberg and Nylander in 1982 after making a revision of 500 patients with dysphagia and 150 healthy volunteers studied with swallow cineradiography, stated that lateral pharynx diverticula are frequent (usually bilateral) and have no clinical significance [6]. Other authors [5, 7, 8] still consider pharyngocele as a rare condition.

There are two main locations where diverticula can protrude through the pharyngeal wall: between the superior and
medial pharyngeal constrictor muscles (suprahypoidal or oropharyngeal pharyngocele) and between the medial and inferior pharyngeal constrictor muscles (infrahypoidal or hypopharyngeal pharyngocele) [1].

The main differential diagnosis of this entity is with external or mixed laryngocele. Laryngocele is an abnormal dilatation of the saccule of the laryngeal ventricle. External and mixed (internal and external) laryngocele penetrate the thyrohyoid membrane as do hypopharyngeal pharyngoceles [9]. Barium swallow study was traditionally considered to be the best radiologic tool to differentiate laryngocele (which does not fill with contrast material) from pharyngocele [10]. Multislice CT allows us to perform fast CT acquisitions during modified Valsalva manoeuvre. Volume rendering technique provide us with radiologic images that resemble an homogeneneous double contrast static pharyngolaryngogram in which we can depict important anatomic landmarks for diagnosis of laterocervical diverticula (true vocal cord, false vocal cord, laryngeal ventricle, thyroid cartilage, hyoid bone) (Fig 2, Fig 3). Most of these structures are not really “seen” on these images, as the images “show” the airway. Rather, these structures impression on the air is shown. Axial and coronal view of plain CT (Fig 1) and minimum intensity projection (MinIP) (Fig 4) in the coronal plane can also help to identify such anatomic landmarks. Virtual endoscopy techniques complement clinical examination and can enhance our understanding of the precise spatial anatomy of lesions in the aero-digestive tract (Fig 5, Fig 6, Fig 7, Fig 8).

**Differential Diagnosis List:** Bilateral hypopharyngeal pharyngocele

**Final Diagnosis:** Bilateral hypopharyngeal pharyngocele

**References:**


Description: Coronal minimum intensity projection thick slice (7.4 mm, applying minimum intensity projection filter) showing bilateral pharyngocele and glottic anatomy (3. Left pharyngocele, 4. Right pharyngocele, 5. False vocal cord, 6. True vocal cord, 7. Laryngeal ventricle, 8. Subglottis, 14. Aryepiglottic fold.) Origin:
Figure 2


Origin:
Description: 3. Left pharyngocele, 13. Arytenoid cartilage, 14. Aryepiglottic fold Origin:
Description: Bilateral pharyngocele crossing both thyrohyoid membranes (between major hyoid horns and thyroid cartilage) 1. Major hyoid horn, 2. Thyroid cartilage, 3. Left pharyngocele, 4. Right pharyngocele, 12. Pharyngocele’s neck Origin:

**Origin:**