Calciﬁcation Patterns of the Larynx: Historical and Current Clinical Importance.

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ABSTRACT

The larynx develops during the 5th – 8th week of intrauterine life (embryonal period). It is mainly of branchial origin, except for the vocal cords which originate in the endoderm of the foregut. Although the arytenoids, thyroid and cricoid cartilages are chondriﬁed by the end of this period, the only part of the laryngeal framework that is calciﬁed at birth is the hyoid bone. The epiglottis is an elastic cartilage that does not calciﬁc. If calciﬁcation of the epiglottis occurs, it may be reportable. The rest of the larynx is composed of hyaline cartilage which is subject to calciﬁcation of various degrees and patterns. Sometimes these calciﬁed sites can ossify. According to most studies, calciﬁcation in the larynx begins at about age 18 years in females and 21 years in males and may continue up to the sixth decade. The process of calciﬁcation begins in the posterior superior aspect of the cricoid and the posterior inferior aspect of the thyroid cartilages. The reason for this preferential deposition of calciﬁcation in the posterior larynx is unknown. This phenomenon has often been a source of erroneous readings by radiologists of a “foreign body” at the cricopharyngeal level, particularly in cases of ingested chicken and radio-opaque ﬁsh bones. Historically, in Forensic Medicine, when personal records were not available, calciﬁcation of the larynx was used to estimate the age of individuals, such as in homicide victims. The laryngeal ligaments may undergo calciﬁcation, especially the stylohyoid and thyrohyoid ligaments, causing symptoms of foreign body sensation, pain and dysphagia. In some patients, a calciﬁed stylohyoid ligament can give rise to the stylohyoid syndrome (Eagle’s), consisting of unilateral odynophagia, ipsilateral otalgia and tenderness to palpation posterior to the tonsil. In addition, a calciﬁed thyrohyoid ligament in combination with severe cervical osteophytes may lead to severe dysphagia and possibly a traumatic intubation. In other patients, laryngoscopy and images of the neck may suggest tumors in the larynx.

We present a sample from amongst several hundred cases of adult patients seen by the senior author (Z.E.D.) with head and neck symptoms and heavy calciﬁcation in different sites of the laryngeal skeleton.

INTRODUCTION

Case One. A sixty-three year old non-smoker female presented with cough and persistent feeling of a lump in her throat. Barium pharyngoesophagogram showed a lobulated deforming defect in the hypopharynx. Flexible laryngoscopy revealed an irregular hard submucosal mass that moved with external manipulation of the larynx. In light of the flexible laryngoscopy and consistent x-ray ﬁndings, no further investigation was necessary. The patient was reassured that no further investigation was necessary.

Case Two. A seventy year old female complained of a mass in her throat with dysphagia. On ﬂexible laryngoscopy an irregular mass was noted in the right pyriform sinus. Plain neck radiograms showed a heavily calciﬁed thyrohyoid ligament. Direct laryngoscopy showed a 1.5 cm irregular rock hard mass in the lateral wall of the pyriform sinus. The mass moved with external manipulation of the larynx. Planned biopsy was aborted. A computed tomography (CT scan) later conﬁrmed extensive calciﬁcation of the thyrohyoid junction.

Case Three. A young woman presented with unilateral neck pain radiating to the ipsilateral ear and aggravated with swallowing. A CT scan of her neck at another facility was reportedly normal. A plain lateral soft tissue view of the neck clearly showed a calciﬁed stylohyoid ligament on the side of her symptoms. She declined surgery.

DISCUSSION

As shown in these cases, symptoms from calciﬁcation of the laryngeal framework typically begin after the fourth decade of life. Patterns of calciﬁcation vary in extent and location causing variable symptoms on initial patient intake. The presenting symptoms include otalgia, globus sensation, dysphagia, and odynophagia. Initial evaluation must include a thorough physical examination in the ofﬁce with palpation of the oral cavity and oropharynx. During ﬂexible laryngoscopy the laryngeal mass will move with external palpation of the larynx.

Plain radiography of the neck allows good visualization of the laryngeal skeleton. In our clinical experience, it was not unusual for the pathology to be overlooked on CT scan readings while it was clearly obvious on the plain ﬁlm. If the patient is at high risk for cancer, then a CT scan may provide additional information in the initial work-up. In view of the current ongoing national campaign to change practice habits and “choose wisely”, the order in which diagnostic studies are requested plays an important role in reduction of risks and costs to patients and the health care system as a whole.

CONCLUSION

In conclusion, calciﬁcations of the larynx and its ligaments can cause chronic symptoms such as throat pain and dysphagia, depending on the location and extent of calciﬁcation. Fortunately, they can be easily identiﬁed on plain radiographs of the neck during the ﬁrst encounter with the patient. In order to expand our knowledge about the process of calciﬁcation of the larynx and its clinical implications future studies should be dedicated to detailed analysis of gross laryngeal anatomy.

REFERENCES