Am J Otolaryngol 40 (2019) 459–461

Contents lists available at ScienceDirect

Am J Otolaryngol

journal homepage: www.elsevier.com/locate/amjoto

Cricoarytenoid joint abscess associated with rheumatoid arthritis☆

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ARTICLE INFO

Keywords:
Cricoarytenoid arthritis
Cricoarytenoid abscess
Rheumatoid arthritis

ABSTRACT

Cricoarytenoid joint arthritis is an uncommon manifestation of rheumatoid arthritis. We encountered a 68-year-old woman with rheumatoid arthritis who presented with odynophagia, dysphagia, and progressive shortness of breath. Examination findings showed diminished mobility of the left vocal cord and right arytenoid swelling associated with an immobile right vocal cord. Computed tomography (CT) imaging identified a ring-enhancing lesion of the right lateral cricoarytenoid joint. Microdirect laryngoscopy with drainage of the cricoarytenoid abscess and tracheotomy were performed. Development of a laterally based cricoarytenoid joint abscess is identified as a complication of chronic rheumatoid arthritis with successful management described.

1. Introduction

A laterally located cricoarytenoid abscess occurring in a patient with rheumatoid arthritis has been reported with plain film imaging in the pre-computed tomography (CT) era [1]. A post-intubation septic cricoarytenoid with medial location of a cricoarytenoid abscess has been reported with CT imaging [2]. We present the first patient with rheumatoid arthritis and a laterally based abscess of the cricoarytenoid joint in the CT era.

2. Case report

A 68-year-old woman with a long-standing history of rheumatoid arthritis on chronic medical management with methotrexate, leflunomide, and intermittent steroids presented to her local otolaryngologist with hoarseness, mild stridor, and shortness of breath. Transnasal laryngoscopy showed inflammatory changes of the larynx and impaired abduction of the left vocal cord. She was treated for epiglottitis one month earlier with medical management and had an unremarkable laryngeal CT at that time.

She was evaluated in consultation in our voice clinic for hoarseness (University of Iowa Hospitals and Clinics at Iowa City, IA) and was noted to have bilateral vocal cord edema with hypomobility of the left vocal cord.

Four months after her consultation, she was admitted to her local hospital due to increased odynophagia, dysphagia, progressive shortness of breath, and a productive cough. A CT of her larynx showed a new ring-enhancing lesion in the right cricoarytenoid region (Fig. 1).

She was transferred to our hospital, where she was treated with an increased dose of steroids and antibiotics. Bedside transnasal laryngoscopy showed arytenoid swelling, an immobile right arytenoid, and impaired vocal cord mobility bilaterally. She underwent operative intervention with tracheotomy followed by microdirect laryngoscopy and drainage of a right cricoarytenoid abscess (Fig. 2). Cultures from initial aspiration of the abscess grew a mix of oral and upper respiratory flora, including *Fusobacterium nucleatum*, *Capnocytophaga* species, *Prevotella melaninogenica*, and *Staph aureus*. Her tracheostomy tube was removed after six months, and she required closure of a persistent tracheocutaneous fistula. At her most recent clinic visit, she was breathing without difficulty and examination of her larynx showed no evidence of recurrence of her abscess. She continued on her anti-rheumatic medications.

3. Discussion

The cricoarytenoid joint is a diarthrotic joint comprised of a joint cavity, synovial lining, and a fibrous capsule [3]. Like other diarthrotic joints, it is susceptible to the pathologic effects of rheumatoid arthritis. Rheumatoid arthritis affects approximately 1.3 million U.S. adults [4,5]. The reported prevalence of cricoarytenoid joint involvement up to 1986 has varied from 26% to 75% across different series, depending on the criteria used for diagnosis [3–10]. Advances in medical management of rheumatoid disease have made contemporary involvement of the larynx with rheumatoid changes less common [7].

Cricoarytenoid arthritis may be classified as acute, chronic, or acute

☆ This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. There are no conflicts of interest to disclose.

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https://doi.org/10.1016/j.amjoto.2019.03.013
Received 11 March 2019

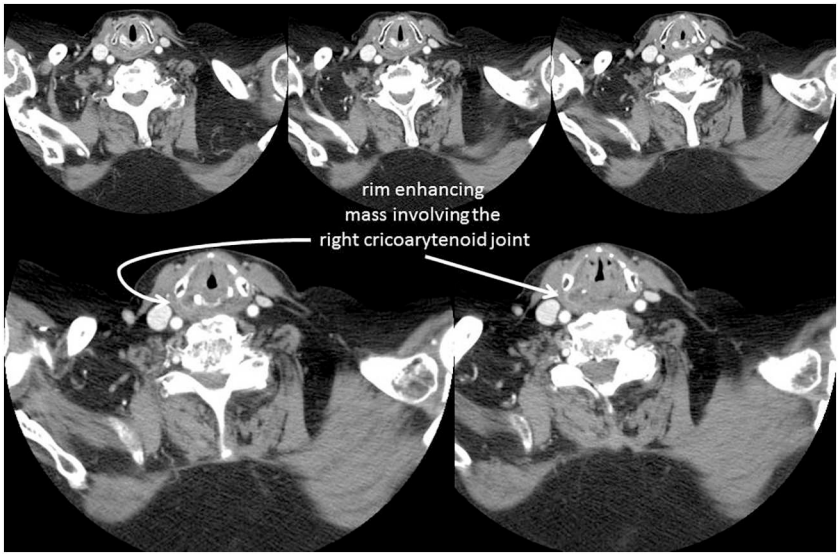

Fig. 1. Laryngeal CT scan depicting a ring-enhancing mass involving the right cricoarytenoid joint.

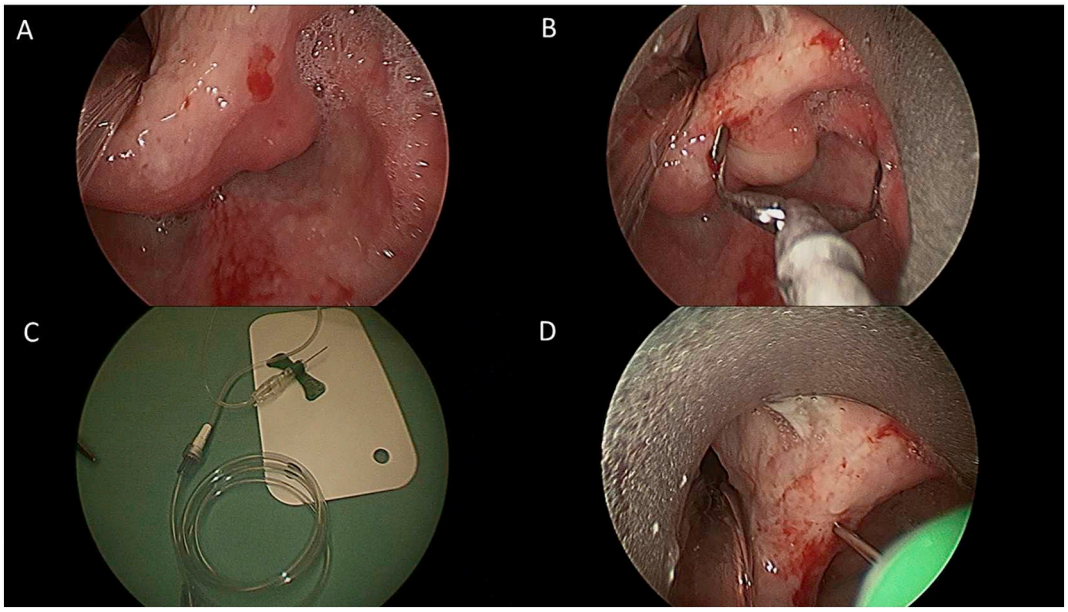

Fig. 2. A right lateral cricoarytenoid abscess was visualized on direct laryngoscopy (A, B) and drained with a spinal needle (C, D).

on chronic. In the acute stage, patients may present with dyspnea, stridor, dysphonia, dysphagia, odynophagia, pain radiating to the ears, or laryngeal tenderness [3]. Examination may identity erythema and edema of the arytenoid and aryepiglottic folds or impaired vocal cord mobility. Patients with chronic cricoarytenoid arthritis may be asymptomatic, or may present with slight hoarseness, dyspnea, or stridor [3,11]. Changes associated with chronic cricoarytenoid arthritis may include thickened arytenoid mucosa, bowing of the vocal cords during inspiration, or fixed arytenoid cartilage [3]. Alternatively, the larynx may appear normal in the chronic state of the disease, although it may demonstrate microscopic changes [3,11]. Rheumatoid arthritis can also cause rheumatoid nodules or bamboo nodules in the larynx [12–14].

The inflammatory changes seen in cricoarytenoid joint arthritis occur as fibrosis of the synovial membranes spreads to and destroys the surfaces of the articular cartilages. Chronic inflammation and fibrosis may ultimately lead to obliteration of the joint cavity, resulting in cricoarytenoid joint immobility and deformity [11].

In addition to rheumatoid arthritis, cricoarytenoid arthritis can be caused by other autoimmune and inflammatory diseases, such as gout, lupus, and Reiter's syndrome. Other causes of cricoarytenoid arthritis include severe laryngeal infections, laryngeal trauma, such as automobile accidents or trauma incurred during intubation, or cricoarytenoid joint immobility due to recurrent laryngeal nerve paralysis [3]. Cricoarytenoid arthritis can impair vocal cord mobility and therefore must be differentiated from vocal cord paralysis resulting from central and peripheral changes of the vagus and recurrent laryngeal nerves [3,11].

Direct or indirect laryngoscopy can be used in conjunction with high-resolution computed tomography (HRCT) to help establish a diagnosis of cricoarytenoid arthritis. Bayar et al. demonstrated that 80% of patients with rheumatoid arthritis had findings of cricoarytenoid arthritis that were detectable on HRCT [15]. Radiologic findings may include cricoarytenoid prominence, erosion, or subluxation, as well as soft tissue swelling near the cricoarytenoid or narrowing of the pyriform sinus [6,15]. Asymptomatic patients and patients with normal

laryngoscopy exams may have detectable abnormalities on HRCT [6,9].

Infectious cricoarytenoid arthritis occurs rarely and has been reported in association with laryngeal trauma [11]. Grossman et al. demonstrated suppurative cricoarytenoid arthritis in one autopsy patient with rheumatoid arthritis [11]. Another previous case report describes septic arthritis following intubation trauma [2]. A third case report from the 1980s describes a case of infectious cricoarytenoid arthritis following an upper respiratory infection in a patient with rheumatoid arthritis. The patient presented with a “necrotic membrane” over his left arytenoid with a sinus tract leading to the cricoarytenoid joint [1].

Cricoarytenoid arthritis may result in airway obstruction from laryngeal edema or compromised vocal cord abduction. Both acute and chronic presentations of the disease can lead to respiratory distress, requiring urgent tracheotomy [3]. As such, involvement of the cricoarytenoid joint represents a life-threatening manifestation of rheumatoid arthritis.

Medications to treat rheumatoid arthritis are the mainstay of treatment for cricoarytenoid arthritis. Anti-rheumatic medications may be coupled with surgical management including tracheotomy, arytenoidectomy, or vocal cord lateralization [11,16]. Options to enlarge a compromised airway require careful balance between improved breathing and worsened swallowing and voicing. Vocal cord lateralization has been reported to have an advantage over tracheostomy for patients with rheumatoid deformities of their fingers that are unable to provide adequate tracheostomy care [11].

This patient's case represents an unusual, but life-threatening complication of rheumatoid arthritis. Development of an abscess involving the cricoarytenoid joint is a rare presentation of infectious cricoarytenoid arthritis.

4. Conclusion

A case of a laterally based cricoarytenoid joint abscess in the setting of chronic rheumatoid arthritis has been presented with successful management through endoscopic drainage. This case is the first with documented CT findings tracking its development.

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