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Persistent Idiopathic Supraglottic Edema in a Young Woman: A Case Report

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ABSTRACT

A 35-year-old woman presented to the hospital with symptoms of throat pain, difficulty swallowing, dyspnea, and hoarseness. The complaints had started following a simple common cold. Flexible laryngoscopy revealed profound and diffuse swelling of the epiglottis and the arytenoids. Progressive swelling might block the airway and lead to difficulty breathing and death. The patient was treated with broad-spectrum intravenous antibiotics, intravenous corticosteroid taper, and adrenaline inhalation. The clinical finding of a swollen supraglottic area persisted. Upon review of the patient's medical history, it was noticed that the laryngeal edema had been identified in the past as well. In this case report, the medical findings, the differential diagnosis, and the possible medical examinations when encountering a patient with chronic laryngeal swelling are discussed.

Keywords: Chronic laryngeal edema, dysphagia, epiglottis, laryngeal swelling, respiratory distress

Introduction

Laryngeal swelling is a potentially life-threatening inflammation of the supraglottic structures, which can lead to sudden, fatal airway obstruction. Since the introduction of a vaccine against *Haemophilus influenzae* type B (Hib) the incidence has known a rapid decline in the Western world, especially in children. Two distinct clinical adult forms have been hypothesized: the classic form, which is caused by Hib, and a supraglottitis form, which is unrelated to Hib; the latter has a more insidious onset and is associated with a lower risk of acute airway obstruction.[1] Main symptoms are odynophagia, drooling, history of fever, respiratory difficulty, and muffled voice. Hoarseness is a more common presenting complaint than stridor.[2] The typical acute presentation includes high fever, severe sore throat, and difficulty in swallowing with the classical sitting up and leaning forward position to enhance airflow. There is usually drooling because of difficulty and pain on swallowing. Acute epiglottitis usually leads to generalized toxemia.[3] When clinically diagnosing laryngeal edema, it is a challenge to assess the airway, identify the cause, and provide proper treatment. After all, follow-up and repeated review of the degree of edema can also lead to more irritation and possibly even increase the edema.

Case Presentation

A 35-year-old female patient presented to the hospital with symptoms of a sore throat with dysphagia and mild respiratory distress, most prominent on exercise. She has a known allergy to house dust mite and grass pollens. She had appendicitis with resection under general anesthesia in 2011. In 2016, she was treated for a possible *Borrelia* infection with doxycycline.

Her symptoms had been worsening several days before her presentation to the clinic. The patient reported easily having respiratory distress on exercise and during common colds in the past. Physical examination showed normal vital signs without accelerated breathing. Tonsillar hypertrophy was prominent on oropharyngeal examination. Fiberoptic laryngoscopy revealed a prominent swelling of the epiglottis, the arytenoids, and the ary-epiglottic folds, significantly decreasing the tracheal inlet (Figure 1).

Computed tomography exposed an inflammatory distension of Waldeyer's ring, most pronounced of the palatine tonsils and a pronounced submucosal edema of the pharyngeal and laryngeal soft tissues, including the epiglottis. Multiple enlarged inflammatory infectious lymph nodes in the right

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Figure 1. Fiberoptic view on the supraglottic area.

submandibular region and high parajugular region were seen and an enlarged lymph node retropharyngeal paratonsillar on the right medial side to the processus styloideus showed a small focus of liquefaction (Figure 2).

Laboratory testing revealed a minimally elevated C-reactive protein (33 mg/L), a normal thyroid function (thryoid stimulating hormone, T4), and negative autoimmune function tests: rheumatoid factor, anti-neutrophil cytoplasmic antibody), antinuclear factor, and anti–thyroid peroxidase (Thyroid Peroxidaseantibodies. Complement factors C3 and C4 were present in the normal range. Allergic testing revealed a high immunoglobulin E count (180 kU/L). Serology testing was negative for *Treponema pallidum*, human immunodeficiency virus (HIV)-1 and HIV-2, cytomegalovirus, toxoplasmosis, and *Bartonella henselae*. She had gained immunity (immunoglobulin G) for hepatitis B, rubella, and varicella zoster. C1 esterase inhibitor activity was measured as 112% (70%-130%) and C1 esterase inhibitor antigen was normal (0.32 g/L). Tryptase was 3.7 µg/L (<13.5 µg/L).

Initially, high-dose intravenous antibiotics (ceftriaxone–Flagyl) were started, and high-dose intravenous corticosteroids were administered. Adrenaline inhalation aerosols were given up to 4 times a day. The patient was monitored with vital signs, electrocardiogram, and saturation measurements for 24 hours. She was discharged to a non-monitored clinical ward for further treatment. Improvement of throat pain and hoarseness was obtained after 72 hours. "Hot potato" voice and exercise dyspnea were still present at discharge. The patient reported that she had always had these complaints.

Main Points

- Laryngeal swelling can be life-threatening. It may cause sudden airway obstruction and requires urgent recognition. In adults, it presents either acutely (often Hib-related) or more gradually without Hib involvement.
- Diagnosis and treatment are challenging. Procedures like laryngoscopy or biopsy can worsen the swelling. Specialized centers are best equipped to manage these cases safely.
- Rare case of chronic IgG4 (immunoglobulin G4)-related supraglottitis : a 35-year-old woman was diagnosed with chronic supraglottic inflammation resembling IgG4-related disease. This rare condition can mimic other airway pathologies.
- Combined medical and surgical management is needed: treatment included corticosteroids and rituximab, with partial surgical resection. Long-term care should be multidisciplinary and take place in expert centers.

Discussion

Differential diagnosis of chronic laryngeal edema is

- Caustic ingestion, thermal injury, and local trauma—ruled out by clinical history.
- Hereditary angioedema due to C1 esterase inhibitor deficiency—ruled out by laboratory measurements.
- Isolated primary laryngeal amyloidosis—a rare condition accounting for only 1% of all benign laryngeal tumors.[4]
- Isolated laryngeal sarcoidosis—affects the head and neck region in only 10%-15%, and isolated laryngeal sarcoidosis is very uncommon; an epiglottis with turban-like thickening should raise suspicion.[5]
- Primary intralymphatic histiocytosis—histopathologic findings of intralymphatic histiocytes in the absence of an inflammatory or malignant disease.[6]
- Kimura disease—benign lymphoid proliferation of a reactive immunophenotype, accompanied by vascular proliferation, eosinophilic infiltration, and stromal sclerosis.[7]
- Iimmunoglobulin G4 (IgG4)-related disease—various presentations including serum eosinophilia, increased serum IgG4 level, organ swelling, and lymphadenopathy, usually leads to tracheal or supraglottic stenosis.[8]
- Laryngeal lymphoma—accounting for approximately 1% of all laryngeal tumors, primary epiglottic lymphoma is even rarer.[9]

Many patients with chronic laryngeal edema undergo direct laryngoscopy to obtain diagnosis. In the current patient, the risk of difficult intubation in the acute phase was too great. After recovery to the chronic state, the patient was referred to a tertiary center. Laser-assisted resection of a small laryngeal part of the epiglottis and a piece of the right arytenoid was performed. The histopathological report showed nonspecific lymphoplasmocytic inflammation with no etiological clues. Immunofluorescence exam was negative. In addition, there was an increased number of IgG4 positive cells (28/high-power field) and an IgG4/IgG ratio of 18%. This is insufficient for the definitive diagnosis of an IgG4-related disease, but the patient's disease process is very analogous to the chronic idiopathic subglottic stenosis that is also often based on an IgG4-related disease. Chronic IgG4-related disease-like lymphoplasmacytic supraglottitis was the diagnosis.

Medical therapy with glucocorticoid taper was initiated in the patient. Therapeutic options were discussed. Generally, glucocorticoids and a monoclonal anti–B lymphocyte cell-surface molecule antibody, rituximab, are valid treatment options.

Figure 2. Computed tomography graphic imaging of the head and neck area revealing tissue swelling of the epiglottis and multiple enlarged inflammatory lymph nodes.

After relapse following corticosteroid tapering, rituximab was initiated in the patient. The effect of this therapy still needs to be assessed.

Surgically, a debulking procedure can be performed; however, (temporary) tracheostomy and recovery can have a negative effect on quality of life. Detailed clinical examination and broad laboratory workup should be performed to rule out systemic diseases. In the case of localized disease, endoscopic carbon dioxide laser excision of the lesion can be the first modality of treatment, while using micro-laryngeal cold steel instruments is another approach to excision.[4]

Early recognition and treatment of laryngeal swelling is essential, owing to the potential life-threatening upper airway obstruction. In the clinic, a young woman with idiopathic chronic laryngeal edema—especially in the supraglottic area, limiting the airway in a subacute manner—was encountered. It is an ethical and medical challenge to find the cause of this disorder, since diagnostic exams and biopsy for histopathology might elicit a worse airway opening due to post-interventional edema and therefore might warrant the preventive pre-operative placement of a tracheal cannula with a subsequent high medical burden. It is recommended that patients with idiopathic laryngeal edema be evaluated and treated in tertiary centers with specific expertise in laryngotracheal surgery and expert anesthesia. Further research could be helpful in knowing which clinical diagnostic tools are helpful and if more minimally invasive diagnostic and therapeutic approaches are possible.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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Ethics Committee Approval: Ethical approval was not required for this case report as it describes retrospective, non-interventional clinical observation of a single patient and does not meet the institutional definition of human subjects research. .

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