Case Report

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Office-Based Intralesional Steroid Injection for Treatment of Laryngeal Sarcoidosis

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Abstract

Objectives: To report preliminary outcomes of a case series of in-office intralesional steroid injections for treatment of laryngeal sarcoidosis.

Methods: After diagnosis of laryngeal sarcoidosis, 3 patients were offered in-office steroid injections for primary or adjunctive treatment. Triamcinolone 40 was injected into supraglottic sarcoidosis lesions in the office using a channel laryngoscope. Response to treatment and need for further injections was determined based on patient symptoms and repeat flexible laryngoscopy.

Results: In-office intralesional steroid injections provided rapid symptom relief within days that lasted for months, thus decreasing the frequency of operative interventions. For one of the patients in this series, these injections even eliminated the need for tracheostomy. No complications were observed.

Conclusions: In-office intralesional steroid injection is an emerging adjunctive treatment for laryngeal sarcoidosis. Prospective studies are required to determine efficacy and long-term risk profiles in relation to the current standard of operative management and systemic treatments.

Keywords

sarcoidosis, larynx, steroids, ambulatory surgical procedures, laryngoscopy, laryngostenosis

Introduction

Sarcoidosis is a multi-system, chronic granulomatous disease of idiopathic etiology often affecting the lungs, eyes, or skin. Laryngeal sarcoidosis, a rare manifestation of sarcoidosis, commonly presents with a unique supraglottic stenosis characterized by mucosal edema and submucosal fibrosis producing dysphagia, dyspnea, and hoarseness. Diagnosis of laryngeal sarcoidosis can be difficult, as tissue biopsy and laboratory workup can be unremarkable, and patients may have a range of non-specific constitutional symptoms. Laryngeal symptoms may be the only manifestations present for up to half of patients.[1]

Current treatments for laryngeal sarcoidosis include high-dose systemic steroids or other immunosuppressants, endoscopic laser ablation or sharp resection of scar and fibrosis, or intralesional steroid injection.[2] Corticosteroids are powerful inhibitors of inflammation and can be administered systemically, intravenously, or intralesionally. In one of the larger series of laryngeal sarcoidosis patients, 11 of 13 patients had symptomatic improvement while taking systemic corticosteroids.[3] However, unless there is concern for impending airway obstruction, use of systemic therapy in the absence of other systemic manifestations of the disease is a subject of deliberation due to the many complications associated with chronic immunosuppression.[2] Topical and intralesional treatments to active sarcoid lesions would seem to offer a prudent alternative treatment approach to avoid sequelae of systemic corticosteroids. Injection of corticosteroids in the operating room, often at the time of other surgical intervention, has been a long-standing treatment approach for laryngeal sarcoidosis.[4] In the last decade, in-office intralesional steroid injections have been trialed for a number of laryngeal pathologies, offering a decreased need for frequent surgery and systemic steroid therapy.[5] To our

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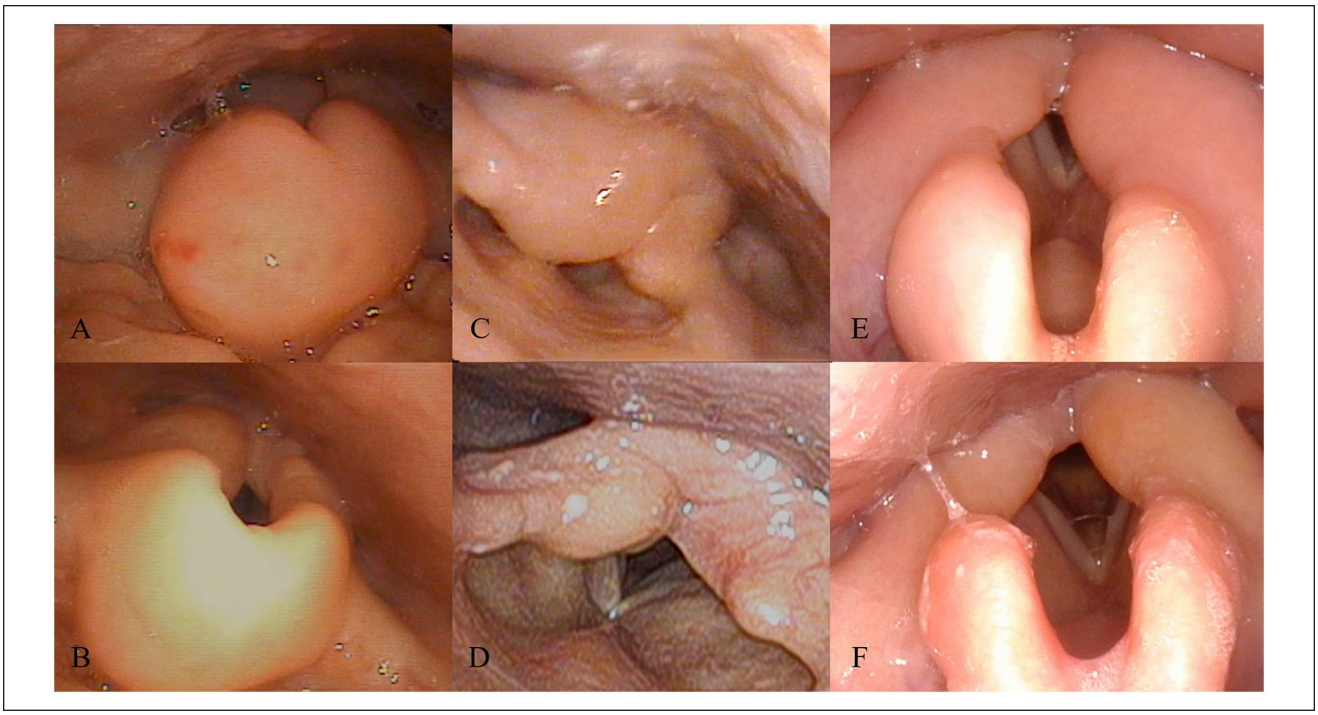

Figure 1. Pre- and post-injection laryngoscopic exams.
Patient 1 on (A) initial presentation to laryngologist and (B) following 5 monthly in-office steroid injections. Patient 2 (C) after initial operative debulking and biopsy and (D) following 2 monthly in-office steroid injections. Patient 3 (E) on symptomatic recurrence after initial operative debulking and (F) 1 month following in-office steroid injection. All images were taken during inspiration with maximal abduction of the vocal folds.

knowledge, the following case series is the first report of in-office intralesional steroid injections for treatment of laryngeal sarcoidosis.

Methods

In-office steroid injections were offered to patients after diagnosis of laryngeal sarcoidosis was made based on characteristic appearance and operative biopsy. Details of each patient's diagnostic evaluation are found in the results section. All patients were counseled on the risks, benefits, and alternatives to this treatment. All steroid injections were performed in the office without sedation following topical anesthesia of the nasal cavity with 2% tetracaine with phenylephrine and of the larynx with 4% lidocaine spray with a long curved atomizer tip or 4% lidocaine laryngeal gargle through the working port of a channel laryngoscope. Using flexible laryngoscopy for visualization, injections of triamcinolone 40 mg/mL directly into visualized lesions, totaling 1 to 3 mL per session, were performed through the working port of a channel laryngoscope using a 25-gauge sclerotherapy needle. Injections were distributed throughout the supraglottis, though often concentrated on the aryepiglottic folds, which were the most common source of airway obstruction.

Response to treatment was determined via patient description of severity and persistence of symptoms, as well as assessment of laryngeal abnormalities by the treating laryngologist via repeat flexible laryngoscopy. All patients were concurrently referred to rheumatology for evaluation of other systemic manifestations of sarcoidosis and consideration of systemic treatments, if appropriate. This study was deemed exempt by the University of Michigan Institutional Review Board (HUM00185651). Informed consent of subjects was not sought for this case series.

Results

Three patients diagnosed with laryngeal sarcoidosis were included in this case series. No immediate or delayed complications were identified. All patients experienced substantial improvement in patient-reported symptoms and laryngoscopic exam after the first injection (Figure 1).

Patient 1, a 16-year-old female with a history of anxiety, asthma, and hypertension, presented to clinic with dyspnea on exertion and fatigue. Flexible laryngoscopy in clinic revealed diffuse supraglottic edema causing partial airway obstruction. Direct laryngoscopy with biopsy was performed, which was complicated by airway obstruction, cardiorespiratory arrest, and emergent tracheostomy. Biopsy

indicated squamous mucosa, focal non-specific chronic inflammation, few dilated lymphatic channels, and few histiocytic aggregates with rare, poorly formed granulomas. Laboratory workup showed normal angiotensin converting enzyme (ACE) levels and negative routine autoimmune markers. Systemic therapy with prednisone and methotrexate was initiated without improvement in laryngeal examination or relief of airway obstruction. She discontinued prednisone due to side effects and was referred to a laryngologist for consideration of surgical intervention.

The patient and family strongly wished to avoid returning to the operating room and therefore a trial of in-office intralesional steroid injections was begun. After initial in-office injection of 3.5 mL triamcinolone 40 mg/mL, she reported modest symptomatic improvement and had decrease in supraglottic edema on flexible laryngoscopy 1 month later. Following a series of 5 monthly intralesional injections ranging from 1.5 to 3.5 mL of triamcinolone 40 mg/mL, she was successfully decannulated and weaned from her methotrexate. Her symptoms returned approximately 1 year later with moderate recurrence of supraglottic hypertrophy, which responded well to another series of 2 monthly injections (0.75-1.75 mL) and the initiation of hydroxychloroquine. She has since received 2 spaced injections (1.5-2 mL) for symptomatic recurrence, with notable improvement in laryngeal exam following each injection.

Patient 2 is a 58-year-old female with a history of obesity, type 2 diabetes, hypertension, gastroesophageal reflux, and asthma presenting with throat tightness and dysphagia. She was diagnosed with laryngeal sarcoidosis after an intraoperative biopsy of arytenoid edema showed chronic lymphoplasmacytic and non-necrotizing granulomatous inflammation. ACE levels were normal. She has thus far received 2 monthly in-office intralesional injections (1-1.75 mL triamcinolone 40 mg/mL) with significant symptomatic improvement and visible reduction in arytenoid edema (Figure 1). She is currently being evaluated for systemic treatment due to vestibulopathy also thought to be related to sarcoidosis, although she has no other systemic sarcoidosis symptoms.

Patient 3, a 27-year-old otherwise healthy female presented to clinic with exertional dyspnea and stridor, globus, and dysphonia and was found to have supraglottic stenosis. She was taken to the operating room for laryngoscopy, biopsy, and triamcinolone injection. Pathology revealed squamous mucosa with submucosal fibrosis and increased mast cells per high powered field. An autoimmune workup, including a normal ACE level, was negative. Cross-sectional imaging was obtained, and she was subsequently diagnosed with sarcoidosis due to hilar lymphadenopathy. The patient responded well to an initial intraoperative intralesional triamcinolone injection, but suffered recurrence of exertional dyspnea and stridor after 4 months. In-office laryngoscopy demonstrated interval worsening of degree of supraglottic stenosis, and she was treated with a single injection of 1.3 mL of triamcinolone 40 mg/mL. She experienced complete resolution of dyspnea and visible reduction in aryepiglottic fold and arytenoid edema on follow-up 6 weeks later. She was subsequently referred to pulmonology for assessment given her hilar adenopathy, started on low-dose oral corticosteroids, and then was lost to follow-up (Figure 1).

Discussion

The results of this case series posit that in-office intralesional steroid injections are a promising treatment for laryngeal sarcoidosis. We demonstrate that in-office intralesional steroid injections in this patient population can be delivered safely and provide rapid symptom relief within days that may last for months, thus decreasing the frequency of operative interventions. For one of the patients in this series, these injections even eliminated the need for tracheostomy. This compares favorably to previous reports of operative intralesional steroid injection alleviating symptoms as reviewed by Gallivan and Landis,[4] with the advantage of avoiding the need for general anesthetic.

Although we did not see complications in these patients, surgeons should always counsel patients on aspiration precautions after airway anesthetization and the risk of systemic side effects of corticosteroids such as hyperglycemia, ocular complications, weight gain, and acne. In-office injections should not be pursued if the degree of supraglottic obstruction may become critical with additional volume from injection or edema from in-office manipulation. If the airway narrows significantly after steroid injection or if significant bleeding or bronchospasm occurs, otolaryngologists should be prepared for alternative methods of airway management. For these reasons, it is advisable to perform these procedures in hospital-based outpatient clinics with nearby oxygen-support devices and the ability to call for intubation support if necessary. Otherwise, intolerance of awake laryngoscopy is likely the primary obstacle to successful performance of the procedure, and in our experience this is countered with careful topical anesthetic techniques. Larger prospective studies are required to assess the efficacy of in-office steroid injections for laryngeal sarcoidosis, and to identify long-term or rare complications. The follow-up of this case series is short and the duration of benefit or need for serial in-office injections for this chronic disease requires further study to define best practice.

Treating otolaryngologists should still pursue traditional workup and treatment paradigms when assessing laryngeal sarcoidosis. Diagnosis in particular can be quite difficult, as the diagnostic criteria for sarcoidosis was built around pulmonary disease. Histopathological analysis does not commonly demonstrate the classic non-caseating granulomas which are pathognomonic for sarcoidosis. Elevation of

ACE levels is considered a specific marker for sarcoidosis, but it is increased only in about 60% of laryngeal sarcoidosis cases[4] and was not elevated in our 3 cases. Thus, diagnosis of laryngeal sarcoidosis is typically based on clinical appearance and symptoms, which can range from vague exertional dyspnea to emergent obstructive events. Otolaryngologists should have a high suspicion for the disease process if supraglottic edema or fibrosis of unclear etiology is discovered, and obtain an appropriate tissue biopsy and baseline laboratory workup. Histopathology demonstrating elevated mast cell count can be suggestive in absence of other pathognomonic criteria.

Laryngeal sarcoidosis most often occurs independent of pulmonary involvement, yet the otolaryngologist should still obtain cross-sectional chest imaging to evaluate for pulmonary manifestations and hilar lymphadenopathy. The otolaryngologist may be the first clinician evaluating a sarcoidosis patient and thus the referring provider for multidisciplinary evaluation, and should remain a central figure in ongoing management of laryngeal sarcoidosis.

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Supplemental Material

Supplemental material for this article is available online.

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