

Bamboo nodes – two cases with literature review

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Bamboo nodes are benign lesions of the true vocal cords related to autoimmune diseases. The endoscopic characteristics of these lesions led to their name. These lesions are located within the lamina propria of the true vocal cords, disrupting the normal oscillation during phonation, which results in dysphonia. We present two female patients with distinctive presentation: the first is a patient with known autoimmune disease, and the second, undiagnosed. We find that videostroboscopy is the most useful tool to diagnose bamboo nodes. Surgery with postoperative intralesional steroid injection was performed in the first patient, showing promising voice outcome.

Keywords:

autoimmune disorders, bamboo nodes, dysphonia, rheumatoid nodules

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Introduction

It is not rare to have laryngeal abnormalities in patients with autoimmune disease, and it can be the first sign of the disease [1–4]. One-third of the patients with systemic lupus erythematosus show laryngeal manifestations [3,4]. Vocal cord lesions that have been reported in autoimmune diseases include cricoarytenoid arthritis, rheumatoid nodules, and bamboo nodes [5,6]. Bamboo nodes were first described in 1993 as transversal cream-yellow band lesions deposited at the mid upper surface of the vocal fold, resembling the appearance of a bamboo [3]. These vocal cord involvements are seen more frequently in acute exacerbations of autoimmune diseases rather than in inactive states [7] and may correlate with antibody deposits [8]. Here we present two cases of bamboo nodes, with two distinctive presentations.

Case report

Case 1

A 50-year-old woman was referred for 10-year history of hoarseness, which was worsening for the past few months. She had productive cough and loss of appetite. She did not have a history of voice abuse. She was diagnosed and treated as having mixed connective tissue disease many years ago, and ~10 years ago, she was surgically and oncologically treated for colon carcinoma in a different center. Clinical assessment revealed voice handicap index (VHI) was 30; (Grade, roughness, breathiness, asthenia, strain) scale (GRBAS) was 3, with main component of roughness; and maximum phonation time shortened at 4 s.

Flexible nasopharyngolaryngoscopy (FNPLS) showed a polypoidal and edematous mucosa over anterior 2/3 of both true vocal cords. She was initially treated as

having Reinke's edema before videostroboscopy was performed. Videostroboscopy revealed multiple bamboo nodes in the anterior and middle third of the bilateral vocal cords. Blood parameters showed raised erythrocyte sedimentation rate, positive anti-nuclear antibody (1 : 640 titer), and negative for rheumatoid factor. Screening for tuberculosis was negative.

She underwent endolaryngeal microsurgery, which found there were two nodes in the right vocal cord and three nodes in the left vocal cord, attached to the deep lamina propria. The two nodes from the right vocal cord were excised using microsurgery, and triamcinolone injections were given to the nodes at the left vocal cord. Postoperative voice quality improved, and at 4-month follow-up, there is no sign of recurrence.

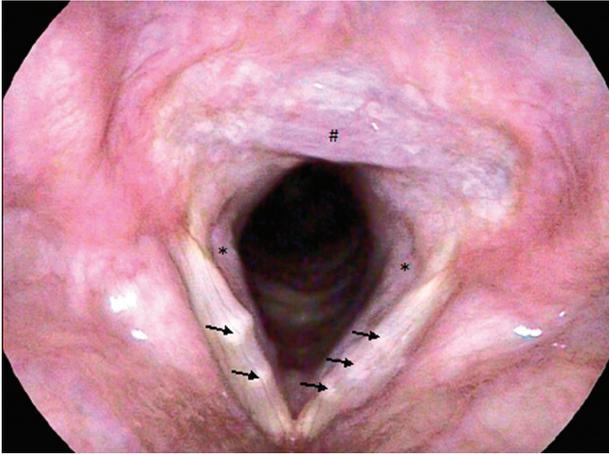
Case 2

A 52-year-old woman was referred for 5-month history of hoarseness associated with intermittent dry cough and throat pain especially after prolonged conversation. She too had heart burn and occasional epigastric pain. She works as a quantity surveyor, and her work involves a lot of talking. This patient was not known to have connective tissue disease before this.

Clinically her GRBAS was 2 with main component of roughness and shortened maximum phonation time of

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Figure 1



Yellowish, nodular masses on the vocal cords (black arrow), typical of bamboo nodes as seen on videostroboscopy. These masses may be subtle and are often missed during flexible laryngoscopy. Subchordal edema (*) with posterior commissure hypertrophy (#) suggestive of reflux was also seen here.

Figure 2



Irregular glottal closure seen on phonation owing to presence of these subepithelial bamboo nodes.

6 s. FNPLS showed irregular surface of bilateral true vocal cords with normal vocal fold mobility. Videostroboscopy revealed multiple bamboo-like appearance of bilateral true vocal cords (Fig. 1), with reduced amplitude and lateral excursion. She also had endoscopic signs of reflux disease with posterior commissure hypertrophy and subchordal edema. The glottal closure was irregular (Fig. 2). The only positive autoimmune disease screening was anti-nuclear antibody, 1 : 160 titer. This patient was referred to

the rheumatologist for further assessment and combined management. She is undergoing intensive speech with pharmacotherapy for laryngopharyngeal reflux and has reported clinical improvements in dysphonia as well as vocal pain.

Discussion

Bamboo nodes are benign lesions located in the middle third of the vocal cord and typically exhibit a yellowish appearance. These lesions may disrupt the normal oscillations of the vocal cords, resulting in dysphonia. It has been reported in patients with systemic lupus erythematosus, rheumatoid arthritis, Sjögren's syndrome, Hashimoto's thyroiditis, and progressive systemic sclerosis [9]. However, it may be the only clinical manifestation of a connective tissue disease for years [10]. The exact incidence is unclear, but these lesions are found in almost 80–100% of the patients examined [4]. Two reported theories of pathophysiology of this condition are (a) an organ-specific autoimmune process with antibody deposits or (b) repeated micro phono-trauma, as the lesion is located at the midpoint of the vocal folds, the site of maximal aerodynamic and muscular forces [11].

From our encounters, the second patient had an undiagnosed connective tissue disease. The hoarseness of voice has led to serial examinations and investigations, revealing the causative underlying disease. In both cases, the more conventional FNPLS was not sensitive enough to detect these bamboo-like lesions, until a videostroboscopy was performed. The yellowish appearance of the bamboo nodes is most frequently missed during a flexible laryngoscopy. Videostroboscopy has the advantages of video chip technology, enabling high-definition images to visualize these subtle appearances of the bamboo nodes. Furthermore, the video processing allows frame-to-frame analysis enabling clinicians to observe the irregular glottal closure and reduced amplitude during phonation which supports its diagnosis.

Treatment may be conservative or surgery. Conservative treatment includes oral systemic corticosteroids or local injection of corticosteroids with speech therapy and voice rest. Speech therapy plays an important role and should be the first line of management for patients with bamboo nodes [4]. In a series of 15 cases by Natalie *et al.* [12], 40% clinical voice improvement was achieved by exclusive speech therapy alone and 20% by voice rest. Speech therapy helps to alleviate the vocal strain and is effective in

reducing potential muscle tension during vocalization. In 33% of the patients, improvement was seen by exclusive maximization of autoimmune disease treatment [12]. Schwemmle *et al.* [2] suggest local corticosteroid injections have a precise effect and advocated to be tried first. In their report, weekly prednisolone 5 mg was applied four times in both vocal folds. After the second injection, there were improvements in the voice, but after the third and fourth injections, the voice worsened, which led to surgery. As a comparison, we found that single steroid injection was sufficient to improve the quality of voice. Steroid injection may also be useful to reduce the recurrence of bamboo nodule after surgical resection [2].

Perouse *et al.* [5] reported 19 cases treated by phonosurgery with a favorable outcome. No description on the extent of surgery was described. Hosako-Naito discussed a successful treatment with complete microsurgical excision of the lesion. However, they encountered recurrence of these lesions after surgery. Administration of oral steroid helped to reduce recurrence [3]. Careful surgery without harming the vocal ligament is recommended. This is done using a microscope and fine microsurgical instruments with careful dissection of the lesion away from the vocal ligament and preserving the mucosa as much as possible. Incomplete disappearance of the lesion may signify an active underlying disease. Surgical excision is considered following failure of speech therapy, persistent dysphonia despite a stable underlying disease, or the patient has an urgent reason to improve voice quality [13].

Conclusion

Bamboo nodes of the true vocal can be the sole presenting symptom in patients with connective tissue disease. Videostroboscopy is both sensitive and diagnostic in this condition. Treatment of bamboo

nodes varies; therefore, adequate patient counseling, focusing on possible risks and benefits of any treatment options, should be done before embarking on any treatment.

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Conflicts of interest

None declared.

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