# Mucosal Bridge of the Vocal Fold: Difficulties in the Diagnosis and Treatment

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**Summary.** Mucosal bridges are rare laryngeal lesions probably of genetic origin. They may cause dysphonia of varying degrees, especially when associated with other laryngeal lesions such as vocal sulci and cysts. Reports on mucosal bridges are rare, and the better treatment is inconclusive.

**Aim.** To report the authors' experience in 14 cases of mucosal bridge showing details on endoscopic examinations and treatment.

**Study Design.** Retrospective study.

**Methods.** We reviewed the medical records of 14 patients with a diagnosis of mucosal bridge confirmed by videolaryngostroboscopy and direct laryngoscopy who attended the Outpatient Clinic of Voice Disorders of the Discipline of Otorhinolaryngology, Botucatu Medical School, São Paulo State University, São Paulo. Data collected included information on gender, age, symptoms, time of onset, history of intubation, smoking status, alcohol intake, associated laryngeal lesions, treatment, and GRBAS (grade of hoarseness, roughness, breathiness, asthenia, and stress) scale ratings.

**Results.** Of 14 patients, 10 were females and four were males. There was a prevalence of adults (n = 12), with only two of the patients being younger than 13 years (10 and 13 years). Mucosal bridges showed no correlations with smoking, alcohol intake, or gastroesophageal and sinonasal symptoms. Voice abuse was reported in 50% of the cases that consisted of patients who had high-voice demand occupations. In seven cases, mucosal bridges were associated with other laryngeal lesions, particularly vocal cysts and sulci. All patients who underwent surgery and phonotherapy showed improved vocal quality.

**Conclusions.** We documented 14 patients with dysphonia caused by mucosal bridge. Promising results were obtained with surgery.

**Key Words:** Mucosal bridge–Larynx–Dysphonia.

## INTRODUCTION

Mucosal bridges are rare laryngeal lesions of uncertain etiology. According to some authors, they are congenital anomalies of the group referred to as minimum structural lesions of the vocal fold that include sulci, cysts, microwebs, and capillary ectasias.[1,2] For others, mucosal bridges are iatrogenic complications of laryngeal microsurgeries.[3] Because they are usually associated with other laryngeal lesions, the congenital origin theory has been the most widely accepted.

Bouchayer et al,[2] in 1985, reported on 157 patients with minimum structural laryngeal lesions. Among these patients, isolated mucosal bridge was observed in seven cases and mucosal bridge associated with other lesions in 23. In addition, there was a predominance of sulcus vocalis (n = 72), followed by epidermoid cysts (n = 55).

Diagnosing mucosal bridges is not always easy; hence the description as occult. Today, with the advent of high-resolution endoscopic lenses and laryngostroboscopy, some of these lesions can be detected at endoscopic examination, especially during sustained vowel inspiratory phonation that causes the bridge to detach from the vocal fold surface. This rare image, when obtained, confirms the diagnosis. In some cases, the endoscopic image of a mucosal bridge is very similar to that of sulcus vocalis, making it difficult to reach a diagnosis (Figure 1). Indeed, diagnosis is more commonly established during surgical manipulation when the mucosal bridge is found on one or both vocal folds. Double and even triple bridges have been reported in the literature.[4,5]

The degree of vocal impairment varies depending on the thickness and location of the mucosal bridge. Thin bridges located in the most lateral portion of the vocal folds (Figure 2) do not greatly impact phonation. On the other hand, wide bridges on the medial surface may cause severe dysphonia (Figure 3). In these cases, the mucosal vibration is affected and the voice becomes poorly modulated with higher pitch, hoarse, and breathy with sound fluctuations. Pneumophonoarticulatory incoordination, fatigue, and effortful phonation are also observed.[6] Histologically, the lesion is covered by a nonkeratinized squamous epithelium that may be accompanied by thick basement membrane and vascularized dense connective tissue.

Surgical manipulation often reveals that the mucosal bridge is associated with another congenital laryngeal lesions, particularly sulcus vocalis. Other associated lesions include cysts and vascular ectasias.[1,2,7] Mucosal bridges may also give rise to other secondary lesions, such as vocal nodules, polyps, and granulomas.[8]

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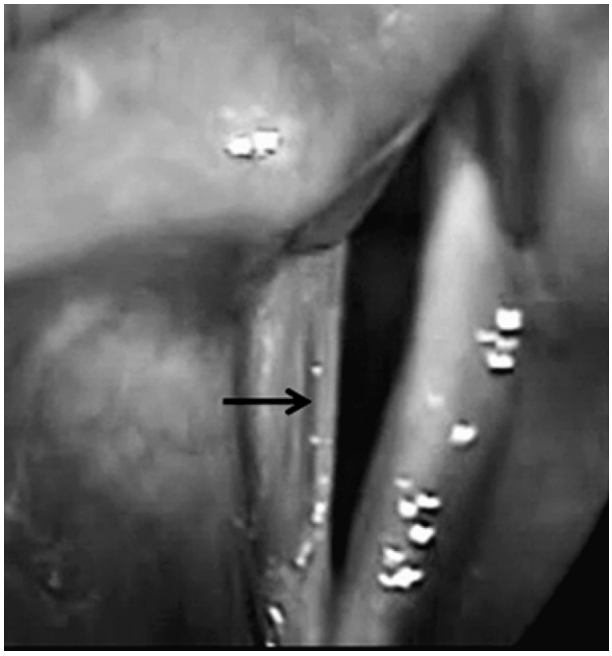

**FIGURE 1.** Mucosal bridge on right vocal fold during videolaryngoscopy.

Once the diagnosis is established, the challenge is choosing the optimal treatment for mucosal bridges. Studies of these lesions are scarce and very rarely address treatment. Therefore, this topic is worthy of attention and discussion.

## CASES AND METHODS

After approval of the institution's committee of research ethics (number 351/09), the medical records of patients with an endoscopic and intraoperative diagnosis of laryngeal mucosal bridge who attended the Outpatient Clinic of Voice Disorders of the Discipline of Otorhinolaryngology at Botucatu Medical School, São Paulo State University between 2000 and 2009 were reviewed. Fourteen patients were enrolled according to the following inclusion criteria: typical and clear videolaryngostroboscopic image of the lesion and diagnosis confirmation by direct laryngoscopy. Incomplete medical records or patients with doubtful diagnosis were excluded.

Endoscopic examinations were performed using an XE-30-ECOX-TFT/USB multifunction video system (Germany) coupled to either an 8-mm rigid telescope of 70° (*ASAP*) or a 3.3-mm fiberoptic nasolaryngoscopy (Olympus, Japan). Images were recorded on DVD.

Data collected from medical records included information on patient name, age, gender, occupation, vocal symptoms, time since symptom onset, smoking status, alcohol intake, gastroesophageal symptoms, voice abuse, history of laryngeal microsurgery or endotracheal intubation, videolaryngoscopic examinations, therapeutics, presence of associated laryngeal lesions, and pre- and postoperative GRBASI scale analyzed by three qualified speech pathologists. The vocal parameters analyzed by GRBASI scale were G (grade of hoarseness), R (roughness), B (breathiness), A (asthenia), S (stress), and I (instability). The vocal parameters were measured on a scale of 0–3 depending on the degree of voice alteration. The voice samples were obtained from sustained vowel /a/ emitted in comfortable intensity and frequency.

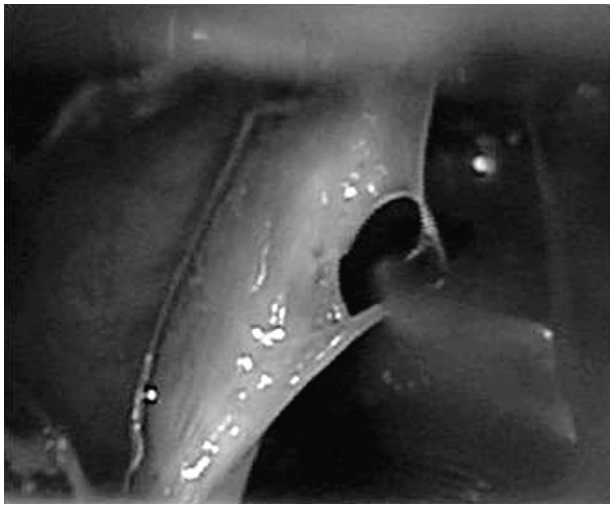

**FIGURE 2.** Thin mucosal bridge on left vocal fold during direct laryngoscopy.

Voice care advice was provided to all the patients. Eleven patients were submitted to surgical excision of the mucosal bridge, and three patients underwent phonotherapy only.

## RESULTS

A total of 14 patients (10 females and four males) with a confirmed diagnosis of mucosal bridge were assessed. Of these, 12 were adults (20–49 years) and two were younger than 13 years (10 and 13 years). Only one patient reported smoking but denied alcohol use. Vocal abuse was reported by five patients, and gastroesophageal and nasosinusal symptoms were reported by four of them.

Fifty percent reported high-voice demand occupations, such as teacher (n = 3), singer (n = 1), preacher (n = 1), salesclerk (n = 1), and secretary (n = 1). Other occupations of lower voice demand included students (n = 4) and homemakers (n = 3).

Most patients had reported voice symptoms since childhood (n = 12). No case of previous laryngeal surgery or endotracheal intubation was reported.

All patients with endoscopic examinations suggestive of mucosal bridge had this diagnosis confirmed by direct laryngoscopy. In seven cases, mucosal bridge was associated with other laryngeal lesions, such as sulcus vocalis (n = 5), cyst (n = 3), and anterior commissure micromembrane (n = 1). Of these patients, two showed more than one associated lesion (Figure 4). Table 1 shows a summary of the 14 clinical cases and the results of medical and phonoaudiological assessments, as well as treatment outcome in each one of them.

In all cases, histopathologic examination revealed a mucosal fragment covered by a nonkeratinized squamous epithelium, a thickened basement membrane, and lamina propria consisting of vascularized dense connective tissue (Figure 5).