

## Swallowing dysfunction in patients with unilateral vocal fold paralysis: aetiology and outcomes

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### Abstract

Although unilateral vocal fold palsy (UVFP) is a common problem, data relating to swallowing dysfunction are sparse. We reviewed the clinical findings (method of presentation, underlying diagnosis and position of the vocal folds) of 30 patients and conducted a follow-up telephone survey. Outcome measures used were direct visualization of fold function, position and compensation. In addition, standardized speech and language assessments for swallowing dysfunction and dysphonia were noted and compared to presentation. Our study indicates that 56 per cent of patients with UVFP have associated dysphagia. Outcome with speech therapy is significant, with 73 per cent showing improvement. These data indicate a significant link between UVFP and swallowing dysfunction. There is a marked therapeutic benefit from voice therapy. Further work is required to evaluate the long-term outcomes and establish the mechanism of swallowing dysfunction in these patients.

**Key words: Recurrent Laryngeal Nerve; Vocal Cord Paralysis; Deglutition Disorders; Rehabilitation of Speech and Language Disorders**

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### Introduction

There are few published data on unilateral vocal fold paralysis (UVFP) and its association with swallowing dysfunction, and no outcome studies exist. Nayak *et al.*<sup>1</sup> describe swallowing dysfunction post vocal fold surgery, and Battacharya *et al.*<sup>2</sup> describe patterns of swallowing dysfunction in UVFP through video fluoroscopy. However, no symptomatic assessment was made and they found surgery to be unhelpful in treating UVFP. We therefore studied swallowing dysfunction using direct vision and symptomatic assessment, and then assessed the efficacy of speech therapy in cases of identified UVFP. Nearly 56 per cent of patients in this study were found to have swallowing difficulty, similar to the findings of Nayak *et al.*<sup>1</sup> who reported that 67 per cent of patients in their series suffered swallowing dysfunction. However, as noted by Bou-Malhab *et al.*,<sup>3</sup> the lack of published literature in this area makes further comparison impossible.

### Patients and methods

The case records of all patients presenting to the voice clinic at Basildon General Hospital between

May 2002 and May 2003 with a diagnosis of UVFP were reviewed. All patients underwent history and clinical examination, including assessment of vocal fold function with a flexible fibre-optic laryngoscope. All assessments were carried out by the same ENT surgeon and the same speech and language therapist (SLT). Digital video images were taken on each patient and later examined to note the function, position and side of the palsy. Vocal fold atrophy, compensation, dysphonia, weak voice, aspiration, sensation of dysphagia, shortness of breath and cough were also assessed and recorded. Patients were also followed up at a six-month interval by telephone interview and the SLT assessment was repeated. One patient was excluded because of incomplete data. Patients complaining of aspiration or other swallowing symptoms were assessed by the SLT team, and video fluoroscopy or functional endoscopic evaluation of swallowing was performed in 50 per cent of cases. Further investigations were undertaken, as clinically indicated, to establish an underlying aetiology. A comparison of vocal fold function and swallowing assessment at initial presentation to out-patients and on discharge from the clinic was made. A telephone follow up of

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TABLE I  
COMPARISON OF AETIOLOGY OF VOCAL FOLD PALSY ACROSS FIVE SERIES

	Willat & Stell <sup>4</sup>	Terris <i>et al.</i> <sup>5</sup>	Benninger <i>et al.</i> <sup>6</sup>	Loughran <i>et al.</i> <sup>7</sup>	Present study
Malignancy	30%	41%	25%	52%	17%
Surgical	30%	35%	24%	22%	50%
Trauma	2%	8%	19%	5%	3%
Idiopathic	27%	11%	20%	11%	13%
Other	11%	6%	13%	10%	16%
Country	UK	US	US	UK	UK
Year	?	1992	1998	2002	2004

all patients was undertaken nine months after consultation. The patients were questioned using standardized SLT assessment criteria. Of the 32 patients in the original cohort five were deceased, two were not contactable, and the remaining 25 were followed up successfully.

**Results**

A total of 32 patients with a diagnosis of UVFP were included in the study. Two went on to develop bilateral palsy and so were discounted. The left fold was affected in 23 patients (72 per cent) and the right in nine (28 per cent). (The sex distribution was 1.29:1 (F:M), and an age range of 24–91, mean 63.) The underlying aetiology (Figure 1) is similar to that in previous studies (Table I). The delay between onset of symptoms and presentation varied between one week and 20 years (Figure 2).

Swallowing difficulty of some kind was found in 56 per cent of patients. Symptoms of aspiration were assessed by the SLT and included chronic cough, throat clearing and choking. A further assessment was made of aspiration (by functional endoscopic evaluation of swallowing). Sixty-three per cent of patients complaining of altered swallow had symptoms of either aspiration or a weak cough. Of the group with swallowing symptoms, 65 per cent showed improvements in symptoms after voice therapy.

The high proportion of patients complaining of dysphonia is explained by the referral criteria for the clinic, which is a ‘voice clinic’, so patients must exhibit either a loss of power or a change in tone of their voice. Fifty-eight per cent of patients experienced an improvement of their dysphonic symptoms after speech therapy. Only three of the patients seen in the series were referred on for surgery, whereas 65 per cent received voice therapy. Ninety per cent of patients were eventually

discharged from the clinic, and 10 per cent are still receiving care in Basildon.

Vocal fold hyperadduction and compensation was found in 62 per cent of patients, predominantly in those who had had symptoms for months or years. However, there was no significant correlation between hyperadduction and symptoms (Table III). In this study all nasendoscopy was performed by a single surgeon and images were reviewed with the SLT team immediately after examination.

The patients contacted showed marked improvements in symptoms (Table II). Fifty-three per cent of patients with voice symptoms reported complete recovery at one year, and 69 per cent of those with swallowing dysfunction reported complete recovery from their symptoms.

**Discussion**

We have shown that patients with UVFP may suffer from dysphagia, microaspiration and sensations of altered swallowing. We have further shown that patients may be effectively treated with speech therapy for both dysphonia and swallowing dysfunction. Our figures demonstrate that the aetiology of UVFP in our series is in keeping with previous series. It is commonly thought that patients with UVFP complain of dysphonia as their primary symptom. However, our study suggests that, in the long term, swallowing dysfunction is at least as important to the patient as dysphonia. Although Heitmiller *et al.*<sup>8</sup> suggest that ‘dysphagia’ in UVFP is due to aspiration from a lack of airway protection, a more satisfactory explanation may be related to loss of sensation in the larynx, rather than inability to close the vocal folds, as both sensory and motor fibres are carried by the vagus. This may explain the high proportion of patients presenting with symptoms of aspiration. Furthermore, Nayak *et al.*<sup>1</sup> showed no improvement in aspiration following medialization surgery; there was similarly no correlation between

TABLE II  
SWALLOWING SYMPTOMS AS REPORTED BY PATIENTS

Symptom	Present	% improvement
Dysphonia	90%	58%
Weak voice	48%	90%
Weak cough	33%	29%
Aspiration	33%	100%
Swallowing symptoms	56%	73%

TABLE III  
VOCAL FOLD HYPERADDUCTION IN RELATION TO SWALLOWING SYMPTOMS

	Symptoms	No symptoms
Hyperadduction	33%	29%
Normal adduction	19%	19%

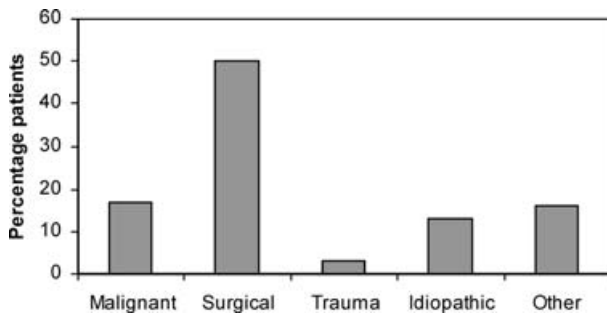


FIG. 1  
Aetiology of unilateral vocal fold paralysis.

contralateral vocal fold hyperadduction and the incidence of reported swallowing symptoms.

Despite the significant minority of patients with long-term symptoms, most (71 per cent) showed improvement of the initial symptoms after treatment. This improvement was seen with all symptoms and was distributed evenly across all age groups. All patients with symptoms of aspiration improved with speech therapy, and 73 per cent of those with swallowing dysfunction also reported improvements in their symptoms. This contrasts sharply with Nayak *et al.*,<sup>1</sup> who found that 44 per cent of patients still had demonstrable aspiration following medialization surgery. These results would indicate that symptoms of aspiration are not entirely attributable to a lack of airway protection through incomplete closure of the vocal fold. There was no correlation between vocal fold hyperadduction and symptoms of swallowing dysfunction, adding further weight to this argument.

The relatively low percentage of patients who could be followed up by telephone in a year probably reflects the high proportion of elderly patients and patients with malignant disease in the sample, as 15 per cent of the patients had died by the time follow up was initiated. It is possible to conclude that speech therapy provides a long-term positive benefit for voice, with 53 per cent of patients experiencing benefit at one year. Nearly 70 per cent of patients experienced long-term benefit with their swallowing problems from speech therapy. Our survey, however, showed that a further 8 per cent of the original sample had developed previously undetected

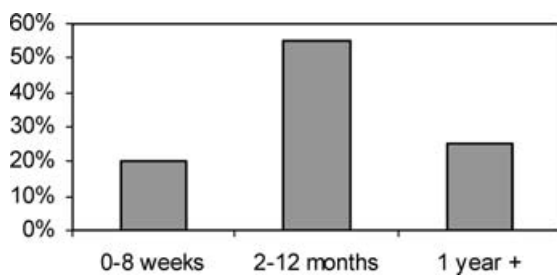


FIG. 2  
Duration symptoms prior to presentation.

swallowing dysfunction at one year. Unfortunately, as the selection criteria for this study were all patients presenting with UVFP to a voice clinic, it is impossible to make comparisons with a normal population, and in addition, because of the relatively small sample size, meaningful statistical analysis is not possible. Although swallowing was reassessed at a later stage no further video imaging was undertaken, and unfortunately, speech therapy does not easily lend itself to placebo-controlled trials. Extension of this work is planned, and a prospective comparison of surgery, voice therapy and conservative management is required.

## Conclusion

Our study shows a significant link between UVFP and swallowing dysfunction. When questioned, patients suffering from dysphagia or other swallowing dysfunction report this to be of greater concern than their dysphonia. These symptoms may improve with voice therapy. The current evidence and the conclusions of this study are that the swallowing problems reported in UVFP are probably due to reduced or altered sensation in the larynx. There is good evidence to show that swallowing disorders associated with UVFP can benefit both in the immediate and the longer term from voice therapy.

- **This study looks at dysphagia in patients with unilateral vocal fold palsy (UVFP)**
- **Fifty-six per cent of 30 patients with UVFP had associated dysphagia**
- **There was a marked benefit with voice therapy, with 73 per cent of patients showing improvement in symptoms of swallowing dysfunction**
- **Dysphagia following UVFP maybe due to reduced or altered laryngeal sensation**

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Dr B Ollivere takes responsibility for the integrity of the content of the paper.  
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