

Laser arytenoidectomy for bilateral vocal fold palsy in Parkinson's disease

A QAYYUM, FRCS, AFRCs, DLO, K MIERZWA, MD, M SEE, MRCS, A SHARMA, FRCS,
P Q MONTGOMMERY, FRCS

Abstract

We report a case of laser arytenoidectomy for bilateral abductor palsy of the vocal fold in a patient with Parkinson's disease.¹ Parkinson's disease is known to be a rare cause for bilateral vocal fold palsy and this is the second case reported in the English literature. Majority of the reports to date are in the non-English literature.^{2–6} Tracheostomy has been the classic treatment option offered to these patients. To date no report has been found in the literature about a laser arytenoidectomy being performed in a patient suffering from bilateral vocal fold palsy in Parkinson's disease. We have suggested this option as it improves the quality of life of the individual and avoids the difficulty faced by a Parkinson's patient in managing tracheostomy care due to bradykinesia, rigidity and tremor.

Key words: Parkinson's Disease; Vocal Cord Paralysis; Arytenoid Cartilage; Laser Surgery

Introduction

In 1817 James Parkinson described this condition of shaking palsy. Parkinson's disease is common with a global prevalence of 150/100 000.⁸ The combination of tremor, rigidity and akinesia develops slowly, over months or several years, together with changes in posture.³ Parkinson's disease has been described rarely as a cause for a bilateral vocal fold paralysis. Laryngeal paralyses due to Parkinson's disease are categorized by Palesse *et al.*⁵ as central and chronic. It has been suggested that bilateral vocal fold paralysis in Parkinson's disease may become more prevalent in the future, as advances in therapy increases life expectancy in these patients.⁶

Case report

A 78-year-old lady was referred from the Elderly Care Physicians to ENT with gradual onset hoarseness of the voice and shortness of breath on exertion. This was noted during an admission into hospital following an incidental fall. She had previously been diagnosed with Parkinson's disease some four years earlier and was on Levodopa (62.5 mcg tds) and Ropinirole (0.25 mcg od). There was no other history of ENT problems. The patient was a non-smoker with no history of alcohol consumption. Her past medical history included a nephrectomy for hydronephrosis, Bowen's disease and cataract surgery.

Flexible nasal endolaryngoscopy revealed both folds to be in a paramedian position, with active adduction on phonation, but bilateral abduction paresis. The rest of the ENT examination was unremarkable.

Routine blood tests, including thyroid function tests, were normal. A computed tomography (CT) scan performed from the skull base to diaphragm to exclude any chest or upper mediastinal pathology, was found to be normal. The cause of the bilateral vocal fold palsy in the

absence of any other pathology was diagnosed as being secondary to her advanced Parkinson's disease.

Initially the lady declined tracheostomy, as she felt her symptoms did not require any surgical intervention. She was kept under regular review, however almost one year after her original referral she was again admitted under the Elderly Care Physicians, with acute shortness of breath. This episode initially responded to conservative treatment of intravenous antibiotics (cefuroxime and metronidazole) and dexamethasone allowing discharge, only to have the patient return a few days later with worsening stridor and breathing difficulties. With deteriorating symptoms and the patient's consent, a tracheostomy was performed later that day.

Post-tracheostomy care was found to be extremely difficult for the patient because of the decreased mobility and tremor of the hands; and the decision was made to undertake a laser cordectomy to allow the eventual decannulation of the tracheostomy (Figure 1).

Direct laryngoscopy was performed to confirm that this was not a fixation of the folds. Both the arytenoids were manipulated and found to be fully mobile. During the procedure CO₂ laser was used and the left arytenoid cartilage (vocal and muscular processes) along with the posterior one-third of the left vocal was removed (Figure 2).

The patient was successfully decannulated six weeks later, allowing discharge from the hospital with no need for further nursing care of her airway or previous tracheostomy. Regular out-patient review reveals no further complications to date (Figure 3).

The patient has been followed up for more than 12 months post-operatively and so far no complication has been noted. The voice following the procedure was weaker, but no aspiration was noted and this was confirmed by Flexible Endoscopic Assessment of Swallow (FEAS).

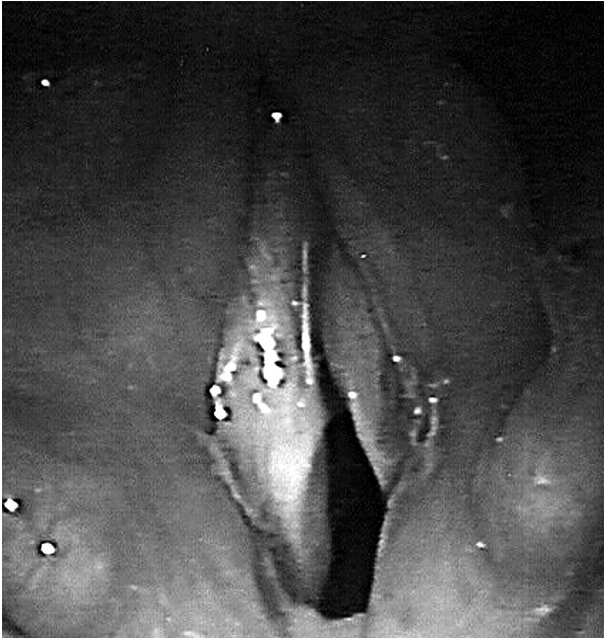


FIG. 1
Pre-operative image.

The patient was satisfied with this procedure as it allowed her to return home without a tracheostomy.

Discussion

Bilateral vocal paralysis due to Parkinson's disease has been described very rarely without any other underlying pathology. Most of the reports are from the non-English literature.²⁻⁶ Plasse *et al.* in 1981 suggested that more cases with this problem will be seen in future as patients with Parkinson's disease will live longer because of improved medical treatment.⁶

The pathogenesis of bilateral vocal fold paralysis in



FIG. 2
Image after operation.



FIG. 3
Three months post surgery.

Parkinson's disease is not understood and hence cannot explain why abduction is affected more than adduction. There are two theories⁷ to explain this concept to a certain extent.

- *Semon's law* states that in all progressive organic lesions of the centres and trunks the fibres supplying the abductors of the vocal folds are affected much earlier than the adductors.

- *Wagner and Grossman's* theory states that a high lesion of the vagus nerve will leave the paralysed fold further away from the midline than a paralysis of the recurrent laryngeal nerve.

Parkinson's disease⁸ is a degenerative disorder in the dopamine-producing cells in the pars compacta part of the substantia nigra. Dopamine is a neurotransmitter that controls voluntary movement initiation and co-ordination. Lack of this transmitter leads to a combination of symptoms characterized by bradykinesia, rigidity, tremor and loss of postural reflexes. Speech is known to become monotonous and may in certain cases be lost.

Bilateral vocal fold palsy may often be treated conservatively depending on the patient's symptoms. Surgical treatment in the form of tracheostomy has been the traditional treatment offered to rescue patient's airway.

Though tracheostomy secures a good airway, to maintain the tract patent and the surrounding area free of infection require good nursing care and regular cleaning. This is an inherent management problem in tracheostomy patients. In the elderly this is more difficult because of generalized dexterity problems. However in a patient with Parkinson's this is almost impossible with the continuous tremor, dyskinesia and loss of co-ordination, hence the decision was taken to perform laser arytenoidectomy instead of offering a different type of tube.

Even where a tracheostomy is required as an emergency, this case demonstrates the obvious benefits for the patient, both for the purpose of rehabilitation and less requirement of nursing care, in performing a laser arytenoidectomy. This allows decannulation and the removal of the tracheostomy tube. The patient should be informed that the arytenoidectomy procedure will give the individual a weaker voice and the treatment should then be tailored according to the patient's needs.

- **Parkinson's disease is a rare cause of bilateral abductor vocal cord paralysis. Tracheostomy has been the usual method of treating airway obstruction in this condition**
- **This paper describes a case treated with laser arytenoidectomy, thereby avoiding tracheostomy**

Conclusion

In benign bilateral vocal fold palsy, laser arytenoidectomy must be considered as a long-term option, to allow the decannulation of the tracheostomy in patients who will be unable to or find it difficult to care for their tracheostomy tubes. The arytenoidectomy treatment should not be hurried as it is irreversible and in certain cases recovery is possible.⁹ This simple procedure will greatly decrease the morbidity and nursing care required by these patients, facilitating self care or their care in the community.

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Address for correspondence:

Mr A Qayyum,
61 Abington House,
Adrian Way,
Cambridge CB2 2SA, UK.

E-mail: asadqayyum@doctors.org.uk

Mr A Qayyum takes responsibility for the integrity of the content of the paper.

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