



Management Outcomes of Post-Thyroidectomy Bilateral Recurrent Laryngeal Nerve Paralysis at National Hospital Abuja



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Abstract

Bilateral recurrent laryngeal paralysis is an uncommon complication of total or subtotal thyroidectomy, observed in approximately 0.4 per cent of cases. This paralysis could be temporary or permanent. An audit of 5 cases referred to the ENT Department of National Hospital Abuja, between January 2010 and July 2017 is presented. All cases were referred already on tracheostomy tubes and were females aged 11 to 59 years. 4 of the cases had external arytenoidectomy, bilateral in 2 cases, and unilateral in 2 cases. 4 out of the 5 cases were successfully decannulated. The preferred approach to cases of post-thyroidectomy bilateral recurrent laryngeal nerve paralysis referred to ENT Specialists in resource-poor economy like ours is not very clear from existing literature and we discuss our adopted protocol for management of such cases in this case series.

Keywords: Post-thyroidectomy; Recurrent laryngeal nerve palsy; Arytenoidectomy

Introduction

Bilateral recurrent laryngeal nerve (RLN) paralysis is an uncommon complication of thyroidectomy (seen in 0.4%), the commonest operation that places normally functioning laryngeal nerves at risk of injury [1,2]. Injury to the RLN could be temporary or permanent, unilateral or bilateral. Recent study showed that the likelihood of temporary RLN paralysis is higher in bilateral near total thyroidectomy compared to bilateral total thyroidectomy [3]. Bilateral RLN paralysis is a major risk factor for airway obstruction and dysphonia, and significant association exists between post-thyroidectomy vocal paralysis and long term risks of hospital readmission, dysphagia, hospitalization for lower respiratory tract infection and tracheostomy/gastrostomy tube placement [1,3].

The overall effect of bilateral RLN paralysis is bilateral vocal fold paralysis (BVFP) clinically presenting as inspiratory dyspnoea (due to narrowing of the airway at the glottic level) and endoscopically with both vocal folds assuming a paramedian position [4].

The primary goals for management of BVFP is to relieve the distressing dyspnoea, and endotracheal intubation followed by tracheostomy are usually the first options. However, tracheostomy significantly affects the patient's quality of life and tracheostomized patients are medically complex and highly vulnerable [5]. Endoscopic management of BVFP includes cordotomy and arytenoidectomy have become alternative options to tracheostomy [6]. In resource-constrained settings like Africa, alternative cheaper options

include external arytenoidectomy via lateral neck approach, or via laryngofissure. There is currently paucity of available literature on outcomes of post-thyroidectomy bilateral RLN paralysis in Africa managed by arytenoidectomy.

Methodology

This is a retrospective review of cases of post-thyroidectomy recurrent laryngeal nerve paralysis managed at the ENT department of National Hospital Abuja between May 2006 and April 2017. Cases were analyzed based on the type of thyroidectomy performed, the duration of RLN paralysis prior to presentation, the presence or absence of tracheostomy at presentation, the type of arytenoidectomy if any (whether unilateral or bilateral) and the approach (lateral neck or laryngofissure), the outcome including duration of post-arytenoidectomy tracheostomy, and duration of follow-up. All patients were given the options of initial attempted decannulation under inhalation anesthesia, after tube down-sizing, and only those that failed decannulation were offered surgery.

Results

A total of 5 cases were referred to the department during the study period. All were females, age ranged 11 to 59 years. One patient had bilateral total thyroidectomy for thyroid malignancy and the remaining 4 had bilateral near-total thyroidectomy for benign thyroid diseases. All thyroidectomies were carried out at private facilities and all had tracheostomy in place at time of

presentation to National Hospital. Duration of RLN paralysis prior to presentation ranged from one week to 16 months. Table 1 shows the 5 cases managed based on age, surgery carried out prior to RLN paralysis, and duration at presentation.

Table 1: Age, Duration of presentation and Surgery carried out before presentation in 5 cases with bilateral vocal fold palsy.

| Age | Surgery Carried out Before | Indication | *Duration |
|-----|----------------------------|---------------------------|-----------|
| 11 | Total thyroidectomy | Thyroid Malignancy | 28 months |
| 35 | Near-Total Thyroidectomy | Multinodular goitre | 14 months |
| 54 | Near-Total Thyroidectomy | Multinodular goitre | 22 months |
| 27 | Near-Total Thyroidectomy | Benign Thyroid Disease | 4 days |
| 59 | Near-Total Thyroidectomy | Unknown Thyroid Histology | 13 months |

*Duration = time between the surgery leading to vocal fold paralysis and presentation at the hospital.

A total of 6 arytenoidectomies were performed. 2 patients had bilateral sequential arytenoidectomy and 2 patients had unilateral arytenoidectomy. One patient was successfully decannulated after

Table 2: Duration of Vocal Fold Paralysis, Surgical Intervention and Outcomes in 5 patients with bilateral post-thyroidectomy abductor vocal fold palsy.

| Patient | Duration of VC Palsy | Intervention | Approach | Outcome |
|---------|----------------------|---|--------------------------|---------------------------|
| 1 | 28 months | Bilateral Sequential Open Arytenoidectomy | Lateral | Failed |
| 2 | 14 months | Unilateral Open Arytenoidectomy | Lateral | Successfully Decannulated |
| 3 | 22 months | Bilateral Sequential Open Arytenoidectomy | Lateral / Laryngofissure | Successfully Decannulated |
| 4 | 14 weeks | Unilateral Open Arytenoidectomy | Laryngofissure | Successfully Decannulated |
| *5 | 13 months | None | Nil | Successfully Decannulated |

*Patient 5 had no surgical intervention, as she was successfully decannulated on the table, prior to carrying out arytenoidectomy.

Both temporary and permanent BVCP present as acute respiratory distress which could be noticed immediate following extubation or be delayed. Tracheostomy is often warranted as an emergency measure. All our cases in this series already had tracheostomy at presentation.

Tracheostomy however greatly influences patient's quality of life. Definitive surgical options for BVCP that is not temporary include open arytenoidectomy, bilateral posterior cordectomy, laser arytenoidectomy with posterior cordectomy, and endolaryngeal suture laterofixation.

When confronted with BVCP, which is usually abductor paralysis, the challenge is to determine whether it is temporary or permanent and to determine the appropriate time for surgical intervention. Only one out of our series presented within 4 days of BVCP, and we have to observe watchful waiting for 14 weeks before surgical intervention. Chen et al. [7] recommended, based on review and meta analysis of available literature, that surgical intervention should be carried out after 12 months if no spontaneous recovery [7]. It has also been recommended that laryngeal electromyography data can be used to prognosticate recovery of vocal fold motion [8].

Since it was first popularized by Woodman [9], and subsequently popularized by Sessions, Ogura et al. [10], open arytenoidectomy

has remained a reliable option for surgical treatment of bilateral abductor paralysis. Advances in endoscopic procedures and laser have resulted in wide adoption of endoscopic approach to management of BVCP. However open approach is still applicable in resource-constrained setting like ours, as shown in the current series. We employed the technique of Sessions, Ogura, and Heeneman of sequential arytenoidectomy, employing the second arytenoidectomy only if the first fails.

Discussion

Unexpected bilateral vocal fold paralysis (BVCP) is a worrisome complication following thyroidectomy, and it often distresses the patient, his family and the healthcare personnel involved in the management [6]. It could be temporary or permanent. Temporary BVCP could be due to branching recurrent laryngeal nerve, endotracheal intubation, laryngeal mask anesthesia, and other risk factors including age above 50, and co-morbid hypertension or diabetes mellitus [6]. Our patient number 5, aged 59 years with a history of hypertension most likely had temporary BVCP.

Only one of our cases failed bilateral arytenoidectomy. She was successfully decannulated initially after the second arytenoidectomy, but gradually became dyspneic after 4 days of decantation, and had to be re-intubated. We subsequently sent her to facility where laser equipments were available. Perhaps she is a candidate for laser cordectomy.

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Summary

Our series of 5 cases of post-thyroidectomy bilateral vocal cord paralysis of abductor type showed the management outcomes employing open arytenoidectomy. Clinician should be on look-out for temporary palsy irrespective of duration of tracheostomy. The exact timing of intervention in permanent BVCP is not certain and patients often want the tracheostomy out at earliest possible time. We recommend at least 3 months of watchful waiting for cases presenting acutely.



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