

## Case Report

# Paraplegia as a rare complication of tracheal resection anastomosis

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## ABSTRACT

Tracheal resection is the definitive surgical treatment whereby resection of stenotic segment with end-to-end anastomosis is performed. The procedure is indicated in a case of grade IV tracheal stenosis. Known complications include granulation tissue formation, restenosis of the trachea, anastomotic separation, tracheoesophageal fistula (TEF) and tracheoinnominate fistula (TIF), wound infection, laryngeal edema and laryngeal dysfunction. We present an 18-year-old gentleman whom previously ambulating, developed acute paraplegia following this surgery. In this report we discuss the possible causes that may lead to paraplegia in our case.

**Keywords:** Paraplegia, Tracheal stenosis, Resection, Anastomosis

## INTRODUCTION

Tracheal resection and anastomosis (TRA) is performed to treat the stenosis segment of the trachea which usually had failed with other intervention such as excision or dilatation. Common causes of tracheal stenosis includes intubation injury, tracheal tumor, idiopathic laryngotracheal stenosis and tracheoesophageal fistula.<sup>1</sup> Post intubation tracheal injuries or stenosis remain the most common indication for tracheal resection and reconstruction despite identification of the causes of these lesions and development of techniques for prevention.<sup>2</sup>

Complications of the procedure include granulation tissue formation, restenosis of the trachea, anastomotic separation, tracheoesophageal fistula (TEF) and tracheoinnominate fistula (TIF), wound infection, laryngeal edema, and laryngeal dysfunction. Neurological deficit such as paraplegia after tracheal resection is

extremely rare but it has been one of the recognized complications.

## CASE REPORT

An 18-year-old healthy gentleman suffered from left temporo-parietal contusion with extradural hemorrhage following road traffic accident two years prior to this presentation. He was successfully intubated by district hospital medical officer by endotracheal tube size 7.5 mm. There was no documentation regarding any difficulty during intubation. He was treated conservatively and extubated on day four after the incident. Subsequently the patient was discharged home well after a-week of hospitalization. A week later he presented to casualty with stridor and respiratory distress. Flexible scope examination noted a subglottic stenosis of more than 80% obstruction. An emergency tracheostomy was performed under local anesthesia (LA). Flexible

bronchoscopy at the same setting noted tracheal stenosis 2.4 cm below the vocal fold, circumferential stenosis Cotton Myer (CM) grade III. He underwent serial episodes of bronchoscopy and balloon dilatation over the duration of two years, however tracheal stenosis persisted.



**Figure 1: Arrow showed the stay suture from chin to anterior chest wall to keep the neck flexion.**

Tracheal resection anastomosis was carried out. Intraoperatively a grade IV tracheal stenosis was noted extending 2.8 cm from the true vocal cord with total cricotracheal resection segment is 3.5 cm length. Normal tracheal framework noted below the inferior border of stenosis. The neck was kept in flexion by suturing from the chin to the anterior chest wall (Figure 1). No episode of hypotensive throughout the operation and during ICU admission. He was extubated on 6 days later after flexible bronchoscopy noted a well healed anastomosis site and no gaping. After extubation, once fully conscious he complained of unable to move his right leg, numbness of all four limbs and unable to pass urine. Patient was immediately referred orthopedic and neurology team in which confirmed paralysis of the right lower limb with power of 1/5. Power over both upper limbs was 4/5 while left lower limb was 3/5. However sensation was intact and perianal tone normal.

Magnetic resonance imaging showed no evidence for acute cervical disk protrusion, no signs of spinal cord compression or other neurologic disease.

He was started on aggressive limb physiotherapy and oral Mecobalamin 500 mg for every 8 hourly for 2 months. Subsequent follow up over period of three month post-surgery, his symptoms progressively improved with power of 4/5 over right lower limb.

## DISCUSSION

Paraplegia post tracheal resection anastomosis for tracheal stenosis is an extremely rare complication. From

our search in English literature, only 3 cases have been reported. However in neurosurgical and cardio surgical procedures, it is a well-known complication especially in aortic reconstruction with prolonged cross clamping of the aorta or division of one or more intercostal arteries when the blood supply of spinal cord medulla is jeopardized.<sup>3</sup>

Head flexion is a common procedure done post trachea resection anastomosis to prevent skin breakdown and anastomotic dehiscence. Aydinyan et al study regarding option for neck flexion comparing chest to skin suture by Grillo, Aspen cervical collar and cervical thoracic orthosis.<sup>4</sup> Grillo suture was noted to hold the cervical spine in a flexed position but it is not adequate in preventing rotational and lateral cervical motion.

Dominguez et al reported that extreme flexion of the neck may disturb cervical spinal cord blood flow. The combination of both a sitting position and extreme neck flexion could result in ischemic spinal cord damage.<sup>5</sup>

Another reported case by Pitz et al stated that their patient develop hypotensive episode for several hours on the first post-operative day. This can be a result of maximal flexion that causing compression to the anterior spinal artery. Occlusion of the anterior artery leads to a loss of pain and temperature sensation below the level of the lesion in combination with a paralysis of motor function and a relative or absolute sparing of the proprioceptive sensation.<sup>3</sup>

In our patient, there is possibility of decreased blood flow in the anterior spinal artery, which caused by flexion of the neck resulting in an isolated paralysis of the muscles below the involved segment causing paraplegia of his right lower limb. Theoretically this isolated symptom can be explained by the localization of the pyramidal tract, which is vascularized by the end branches of the anterior spinal artery and in this way the most vulnerable structure in cases of decreased blood flow in the anterior spinal artery.<sup>3</sup>

## CONCLUSION

Paraplegia post tracheal resection anastomosis is an extremely rare complication. The possible cause of this condition could be explained by the static flexion position of the neck due to the suture from chin to anterior chest wall. Although the influence of the positional factor remains unclear, we would recommend avoidance of the sitting position after operation in patients undergoing tracheal resection anastomosis as well as minimization of postoperative cervical hyperflexion by using other methods to reduce tension on the tracheal suture line.

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