Introduction

The causes of vocal cord palsy include various diseases that can affect the vagus nerve along any part of its anatomic course, from the brain stem to the recurrent laryngeal nerve supplying the involved side of the larynx. The most common cause is malignancy (non-laryngeal) (24.7%).\(^1\) Iatrogenic injury to the recurrent laryngeal nerve represents the second most common cause of unilateral vocal cord palsy (23.9%).\(^1\) Surgical procedures with the potential to cause damage to the recurrent laryngeal or vagus nerve include thyroidectomy/parathyroidectomy, anterior cervical disc surgery, esophagectomy, neck dissection, and cardiothoracic procedures.\(^2\) Patients with unilateral vocal fold paralysis usually complain of hoarseness of voice and hypophonia, but may also complain of dysphagia or aspiration.\(^3\) We report an unusual iatrogenic cause of vocal cord palsy.

Case Report

Herein, we present four patients diagnosed with malignancy who underwent chemo-port insertion with the open technique. All four patients presented with hoarseness of voice immediately after the procedure.

Case 1

A 50-year-old male with olfactory neuroblastoma presented to the ear, nose, and throat (ENT) clinic 5 days after chemo-port insertion with a history of hoarseness starting immediately after the procedure. Examination revealed right neck swelling, induration, and tenderness at the scar of the chemo-port insertion site. Flexible laryngoscopy revealed right vocal cord palsy.

Treatment was started with oral steroids for 2 weeks. Repeat flexible laryngoscopy during follow-up revealed that the right vocal cord palsy was unchanged. However, 9 months later the right vocal cord had fully recovered.

Case 2

A 39-year-old female was diagnosed with infiltrating ductal carcinoma of the right breast. The patient was referred to our clinic 5 days after chemo-port insertion when she developed hoarseness of her voice. On flexible laryngoscopy, the right vocal cord was in the paramedian position with normal mobility of the left side. Treatment was started with oral steroids for a period of 2 weeks. On follow-up visits the patient was showing progressive improvement of the voice, with full recovery after 1 month.

Case 3

A 53-year-old female, diagnosed with breast cancer, presented to the ENT clinic about 2 weeks after chemo-port insertion complaining of hoarseness and coughing after drinking water, which started after chemo-port insertion. Clinical examination and flexible laryngoscopy confirmed right vocal cord palsy. The patient was then treated as an outpatient with oral steroids for 2 weeks. The patient was followed up in the clinic after 1 month; there was improvement in her symptoms, and a flexible scope examination revealed recovery of vocal cord mobility.
Case 4

A 67-year-old female with known breast cancer, presented to the ENT clinic 4 days after chemo-port insertion with a chief complaint of hoarseness of voice. Examination revealed right vocal cord palsy. The patient was treated conservatively with oral steroids for 2 weeks. She recovered after 3 weeks.

DISCUSSION

A totally implantable venous access port, or chemo port, is one of the different types of central venous catheters. It is usually used when long-term intermittent access is required, mostly for chemotherapy. It requires less maintenance, because it is totally buried beneath the skin, allowing patients to do their regular daily activities. It also carries lower risks compared to other tunneled catheters (Hickman line).

Chemo-port insertion is a simple surgical procedure that takes about 30 minutes. It can be done under local or general anaesthesia. It is a relatively safe procedure, with main peri- and postoperative complications being pneumothorax 3.6%, hematoma 3.0%, and infection 0.6%.

In the cases presented above, the procedures were done under general anesthesia with the use of a laryngeal mask airway and with a single dose of prophylactic antibiotics at induction. The right internal jugular vein (IJV) is the preferred side, as it offers a direct route to the central veins. The left side is used only when an attempt on the right fails or when the right side for some reason is not suitable.

Dissection is performed in the neck in the region of the anterior carotid triangle using the sternal and clavicular heads of the sternocleidomastoid muscle as an anatomic landmark. In this region is the inferior part of the IJV within the carotid sheath. The sheath is opened, and the vein is identified and dissected. Dissection in this region is in close proximity to the vagus nerve, as it lies within the carotid sheath making it vulnerable to injury during the procedure. Proximal and distal control of the vein is gained by the use of vessel loops. A vein cut is made, and the catheter is inserted under direct vision and advanced down the vein to the sternal angle. The position of the catheter tip is adjusted to lie in the midatrial position under x-ray screening. Next, the port pocket is fashioned with the incision situated at the level of the second intercostal space.

In our cohort, the patients complained of hoarseness of voice immediately after chemo-port insertion, making the most likely cause related to the procedure. During the procedure, injury to the recurrent laryngeal nerve may occur during the dissection of the carotid sheath. In our center, there were a total of 185 open right IJV chemo-port insertion procedures done from 2009 to 2014. Out of these, four (2.1%) developed recurrent laryngeal nerve palsy. Injury to the recurrent laryngeal nerve while attempting to insert a central venous line can occur, particularly with difficult and/or repeated attempts.

Poorter et al. reviewed the complications of an implantable venous access device in 149 patients. They mentioned that one patient complained of paraesthesia of the left arm after PORT-A-CATH insertion by percutaneous route via the left subclavian vein, which could be due to an injury or irritation of the brachial plexus. After removal of the PORT-A-CATH, it disappeared completely.

Agarwal et al. reported a case in which a patient on maintenance chemotherapy with vincristine developed right vocal fold paralysis. The voice improved on withdrawal of the drug. Annino et al. reported three pediatric cases of vincristine-induced vocal cord paralysis. All resolved spontaneously upon discontinuation of vincristine. Both of these reports do not conform to our case, making the direct injury to the recurrent laryngeal nerve near the IJV as the most likely diagnosis.

In our cases, vocal cord palsy resolved spontaneously, although within variable times. The duration of recovery might be related to the severity of the injury, as was the case with one patient who took 9 months to fully recover. Therefore, this suggests that the potential for recovery is proportionate to the degree of injury.

CONCLUSION

Although chemo-port insertion is a safe procedure, care must be taken to avoid extremely rare complications. Understanding of the anatomical course of the vagus nerve and the recurrent laryngeal nerves gives the surgeon clues to avoid morbidity. Corrective procedures should be delayed and perhaps not even considered, as most of these injuries are transient and will recover over time. Thorough anatomical knowledge of the area of insertion is highly recommended.

BIBLIOGRAPHY