



SELF-EXPANDABLE METALLIC STENTING TO RELIEVE CENTRAL AIRWAY OBSTRUCTION DUE TO THYROID MALIGNANCY: AN EMERGENCY AND PALLIATIVE MEASURE

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ABSTRACT Advanced thyroid cancers with airway obstruction can be effectively managed with self expandable metallic stents in cases where surgery is not possible due to tumor metastasis and tracheostomy is technically not feasible due to large neck swelling. We report 2 such cases of thyroid cancer presenting with severe airway obstruction who were managed with emergency intubation followed by palliative stenting for a definitive airway.

KEYWORDS :

INTRODUCTION

Central airway obstruction (CAO) refers to the obstruction of airflow within the central airways, trachea and mainstem bronchi due to benign or malignant disease. Thyroid masses can lead to CAO as a result of extrinsic compression, airway invasion by tumour, tracheomalacia, vocal cord paralysis or a combination of these factors.¹ Maintenance of a patent airway is challenging in such cases. Surgical resection with reconstruction is the treatment of choice, but is sometimes precluded by extensive tumour spread. Tracheostomy is technically difficult due to intrathoracic tumour extension and tracheal invasion. Therapeutic rigid bronchoscopy with tracheobronchial stent insertion presents an effective alternate treatment modality to relieve respiratory embarrassment.^{2,3,4} We report two such cases of acute airway obstruction due to tracheal compression caused by thyroid malignancy, which were managed successfully by tracheal placement of self-expandable metallic stents (SEMS).

CASE REPORT

Case 1

A 53 years female, known case of anaplastic thyroid carcinoma (ATC) with bilateral lung metastases, presented with acute shortness of breath and a saturation of 74%. She had a painless neck swelling for 15 years, which had increased in size for past 15 days. A large multilobulated, firm swelling was present over the midline, extending till the sternal notch.

In view of impending respiratory arrest and anticipated difficult airway, anaesthesia and ENT teams were called for emergency airway access. Awake fiberoptic (FOB) nasal intubation was done with a 7.0 mm cuffed endotracheal tube (ETT), and the patient was shifted to the intensive care unit (ICU).



Fig. 1 Coronal section CECT Thorax

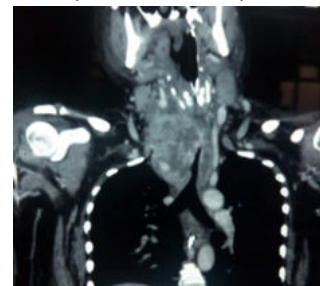
Contrast enhanced computed tomography (CECT) of the thorax revealed a large necrotic multinodular thyroid mass predominantly involving the left lobe, compressing and displacing the trachea to the right, with extensive bilateral lung metastases (Fig 1). The mass extended till the carina, involving the surrounding vascular structures and abutting the arch of aorta.

Case 2

A 48 years female presented with acute respiratory distress, with an oxygen saturation of 76% and failed attempt at tracheostomy in another centre. She was a known case of poorly differentiated thyroid carcinoma with history of dysphagia to solids, pain in neck and progressive breathlessness since last 2 months, with change in voice and anterior neck swelling for 10-15 days. On examination, a large multilobulated, firm swelling was visible and palpable over the right side of neck, extending till the midline. FOB guided intubation was unsuccessful as the patient was uncooperative. She was intubated using a McCoy laryngoscope with a 6.0 mm cuffed ETT and shifted to the ICU.

CECT thorax revealed a malignant thyroid mass extending till the supraglottis, infraglottis, superior mediastinum and right lobe of thyroid, displacing the trachea and esophagus posteriorly with luminal narrowing. There was evidence of vascular encasement, right internal jugular and left subclavian vein thrombosis and multiple nodules in both the lungs (likely metastatic) (Fig 2).

Fig. 2 Coronal section (tracheal deviation)



In both the cases, tracheostomy was adjudged to be technically difficult as the sternal notch could not be palpated. Oncosurgeons ruled out the possibility of surgery. An opinion was sought from the Interventional Pulmonology team to relieve respiratory obstruction

and formulate a definitive plan for improving the quality of life. They opined that the cases were amenable to Self Expandable Metallic Stenting (SEMS).

The patients were shifted for stent deployment under direct rigid bronchoscopy. They remained stable during and after the procedure and were shifted back to the ICU for elective ventilation. Both patients were extubated the following day under FOB guidance, and were transferred to the ward the next day, on minimal oxygen support.

DISCUSSION

The incidence of airway obstruction secondary to thyroid enlargement varies from 16% to 60%.⁵ Though anaplastic thyroid carcinoma (ATC) represents <2% of all thyroid cancers, it is associated with a high incidence of airway obstruction (20-30%).⁶ Rapid airway compromise is the main cause of death.⁷

Upper airway stenosis secondary to thyroid cancer has some distinguishing features. In the initial years, the slowly progressing nature of well-differentiated thyroid cancer tends to mask the symptoms, thus leading to an acute onset of severe airway obstruction. Despite stent placement, sufficient enlargement of the airway cannot be achieved as solid thyroid cancer tissue surrounds the trachea in the limited space of the thoracic inlet. In addition, thyroid cancer invasion may cause vocal cord paralysis, further worsening the dyspnea.¹⁰

Surgical resection with reconstruction, followed by chemotherapy or radiotherapy is the usual treatment of choice. However, surgery is often not feasible due to extensive local spread and metastasis, as was found in both our patients.¹¹ Tracheostomy is technically difficult and risky, due to the large anterior neck swelling. Both our patients had presented with acute airway compromise and underwent an emergency tracheal intubation. Interventional therapeutic rigid bronchoscopy and tracheal stenting was planned as it is the only efficacious and rapid treatment modality for maintaining airway patency and improving the quality of life.^{3,11,12,13}

Airway stents help to maintain airway patency and are commonly used for malignant obstruction. The choice of stent depends on the disease and patient characteristics, airway anatomy, physician/surgeon expertise and equipment available. Two types of stents are currently in use – silicone and metallic.^{14,15,16} Metallic stents are made up of bare metal or have a thin coating of silicone, nylon or polyurethane. They are of two types: balloon-dilated metal stents and self-expandable metal stents (SEMS). SEMS is most suitable for relieving CAO secondary to advanced thyroid cancer, and is used in terminal-stage disease.¹⁰ They are easy to insert, inert, radio-opaque and can be inserted using a rigid bronchoscope, as well as in an outpatient setting via flexible FOB. Complications of tracheal stents include granulation tissue formation, migration and fracture.

CONCLUSION

Self-expandable metallic stenting is an effective emergent measure in patients presenting with tracheobronchial obstruction secondary to advanced thyroid malignancy, when surgery and tracheostomy are not immediately feasible due to the advanced tumor. Emergency intubation followed by a palliative stent for maintaining a definitive airway is not only life saving, but also improves quality of life significantly.

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