

# Tracheal stenting: a better method of dealing with airway obstruction due to thyroid malignancies than tracheostomy

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## Abstract

Tracheostomy remains the primary method of treatment of acute airway obstruction due to malignant invasion and compression of the trachea. However, the development of tracheal stents has provided an alternative effective treatment modality. This case report and literature review highlights the benefits of intra-luminal stenting, including resolution of distressing obstructive symptoms, and subsequent improvement in quality of life.

**Key words:** Carcinoma; Thyroid gland; Stents; Trachea; Tracheostomy; Treatment Outcome

## Introduction

Acute airway obstruction secondary to malignant tracheal stenosis presents a considerable management challenge. Tracheostomy, whilst being a mainstay of treatment in acute airway obstruction, may not be appropriate for patients who have advanced malignancy and require palliation of obstructive symptoms. The use of tracheal stenting has been proved an effective and valuable method of treatment in this group of patients.<sup>1</sup> The authors describe their experience in a patient presenting with respiratory difficulty due to an extensive recurrent malignant thyroid tumour.

## Case report

A 68-year-old female presented with increasing breathing difficulties and intermittent stridor over a few days. She was a known case of recurrent follicular thyroid carcinoma awaiting palliative radiotherapy.

About 10 months previously, she had undergone an emergency total thyroidectomy for a rapidly enlarging thyroid tumour causing stridor. Histology revealed a poorly differentiated follicular carcinoma and subsequently she underwent radioiodine therapy. Within a short period she developed a recurrence, which was debulked.

On admission a large solid mass was noted beneath the old thyroidectomy scar obscuring the suprasternal notch. Flexible naso-endoscopy revealed normal movement of the vocal folds.

X-ray of the neck and chest (Figure 1) showed narrowing of the upper third of the trachea along with multiple cannon ball secondary deposits.

Rigid bronchoscopy under general anaesthesia showed narrowing of the upper trachea 3 cms distal to the vocal folds with invasion by tumour tissue (Figure 2). A Boston ultra flex uncovered metal stent was inserted (Figure 3). Post-operatively her breathing improved and palliative



FIG. 1

Chest radiograph, showing marked deviation and narrowing of the upper third of trachea along with multiple cannon ball secondary pulmonary deposits.

radiotherapy was started. She was able to return home, with a markedly improved quality of life and resolution of respiratory symptoms. Despite intensive palliative radiotherapy the patient died three weeks later without further airway compromise.

## Discussion

Tracheal wall stenosis and invasion due to recurrent thyroid malignancy is not an uncommon presentation. Tracheostomy may be technically difficult particularly in patients with large bulky thyroid tumours in the neck. Moreover, it is less than ideal in those who have advanced

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FIG. 2

Bronchoscope image showing narrowing of the upper trachea 3 cm distal to the vocal folds with invasion by tumour.

malignancy and require palliation alone. The insertion of a stent provides a simple yet effective adjuvant in palliative treatment.

Various types of tracheal stents have been described in the literature. Montgomery in 1965 described a 'T' tube silicon stent with one limb forming the tracheostomy.<sup>2</sup> Subsequent developments included shaped tubular silicon stents, which did not require concurrent tracheostomy. The main disadvantages of tubular silicon stents are interference with mucociliary clearance causing mucus retention, infolding of the inner silicone layer and dislodgement.<sup>3</sup>

In recent years, expandable metallic mesh tracheal stents have been found to be effective in overcoming the above problems.<sup>4</sup> Their integration with the tracheal wall allows epithelialization and prevents stent displacement. Since they become incorporated into the tracheal wall, they are often difficult or impossible to remove. Covered stents can prevent further ingrowth of tumour into the lumen.

The bronchoscope helps to control the airway during insertion and allows positioning of the stent under direct vision. Post-operatively, its position can be readily checked

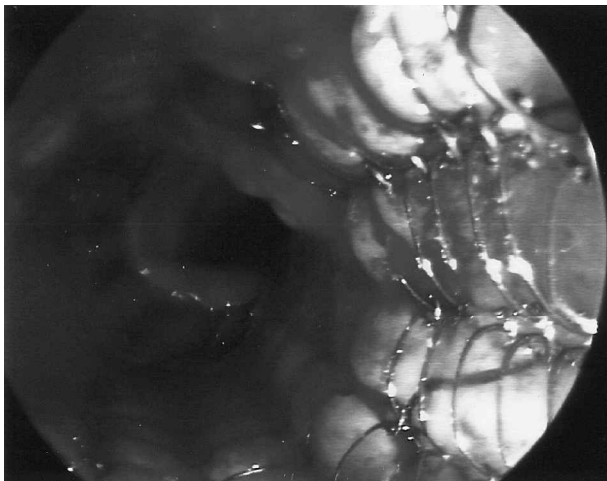


FIG. 3

Boston Ultraflex™ uncovered metal stent inserted under direct vision.

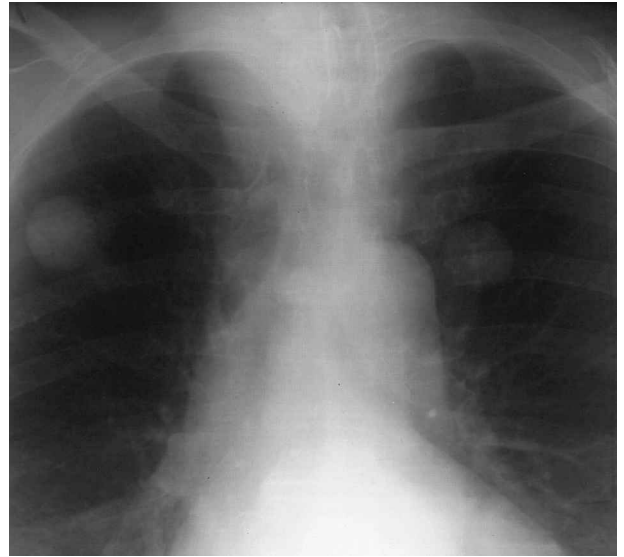


FIG. 4

Post-operative chest radiograph showing position of the stent, and improved airway diameter.

- **Tracheal compression and obstruction from malignant invasion poses a dilemma as tracheostomy may be difficult or inappropriate**
- **This paper presents a case treated with tracheal stent and provides a literature review of the subject**

with X-rays (Figure 4). Stenting allows the patient to undergo palliative radiotherapy without further fear of airway obstruction, and most importantly palliates the distressing symptom of suffocation and has been shown to improve pulmonary function.<sup>5</sup> The improvement in quality of life of patients with a short life expectancy with stenting has not been investigated, but it is envisaged that it would reduce the need for hospital stay and enable the patient to spend time with family and friends.

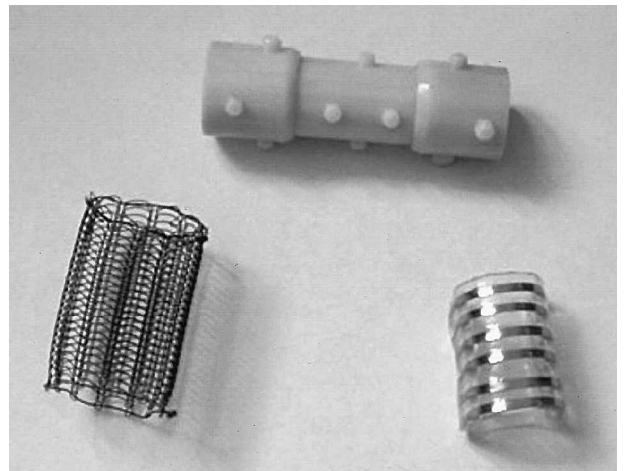


FIG. 5

Three different types of endotracheal stents. Clockwise from left to right: Boston Ultraflex™ stent, Dumon stent, and Frietax stent.

### Conclusion

The authors' positive experience encourages them to suggest that tracheal stenting is an effective and ideal method for relieving airway obstruction due to aggressive thyroid or other head and neck malignancies. Stenting appears to give an improvement in quality of life without the need for the intensive post-operative care with a tracheostomy. The authors suggest that the option of endotracheal stenting, and its relative benefit over tracheostomy, should be discussed with all such patients presenting with obstructive symptoms. Further studies comparing quality of life in terminally ill patients with obstructive symptoms receiving endo-tracheal stents and tracheostomy may be helpful.

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