

# Endoscopic palliative treatment of a post-radiation tracheoesophageal fistula

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**Abstract.** – Malignant Tracheoesophageal Fistula (TEF) is a life-threatening condition and conventional palliative surgical approach sometimes could be very dangerous or not suitable. We describe a case of a post-radiation TEF involving distal trachea and main carina treated by the placement of endotracheal silicon stent.

*Key Words:*

Bronchoscopy, Tracheoesophageal fistula, Endotracheal stent.

## Introduction

Tracheoesophageal fistula (TEF) is a rare pathological communication between esophagus and trachea. TEF can be divided in congenital and acquired. Congenital TEFs (e.g., notocorda aberrations) are not so unusual with a frequency of 1 case in 2000-4000 live births in USA<sup>1</sup>.

Acquired TEF (e.g., prolonged intubation, tumor necrosis by chemotherapy and radiotherapy, laser-therapy) can be divided in non-malignant and malignant with a percentage respectively of 0,5% and 4,5%<sup>1</sup>.

Surgical treatment in adults has a high mortality and is rarely successful, while, in case of congenital fistula, surgery (cervicotomic surgery in proximal fistula and toracotomic surgery in distal fistula) remains the gold standard<sup>2-6</sup>.

We describe the clinical case of a malignant tracheoesophageal fistula involving distal trachea and main carina.

The endoscopic approach by the placement of endobronchial prosthesis may be a successful choice for the palliative treatment of a post-radiation TEF.

## Case Report

On April 2009 a 55 age male with suspected lung cancer was addressed to our Center. The chest CT scan evidenced a large neoplastic mass surrounding trachea and esophagus.

A videobronchoscopy showed a mucosa infiltration of the pars membranacea involving the distal trachea and extending till the main carina. After bioptic diagnosis of squamous cell carcinoma the patient was subjected to 14 sessions of stereotactic radiotherapy.

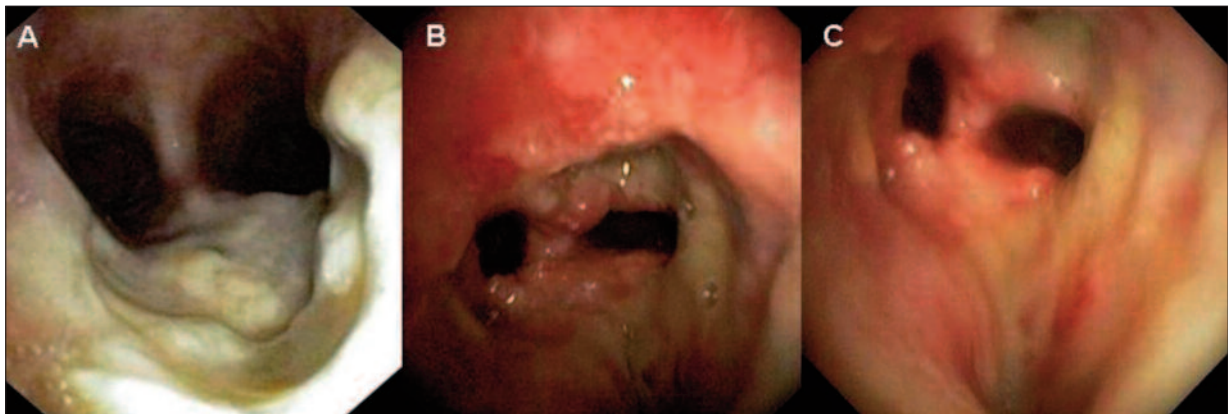
During the next months the patient underwent to routine follow-up endoscopic examinations that showed a wide necrosis of the mucosa, a progressive evolution of pseudo-cavities and a complete destruction of the back wall of distal trachea extended to the main carina. The presence of a large TEF (about 3 cm diameter) was evidenced close to the main carina with direct communication to the mediastinum, the margins of the lesion extended till the ostium of main bronchi (Figure 1).

It was also possible to visualize a self-expandable esophageal stent that has been previously inserted in order to resolve a severe dysphagia occurred in the last months due to the neoplastic esophageal involvement.

In consideration of the mucosa condition, the extension and localization of the lesion we opted for the palliative placement of a Y-shaped Hood stent (HOOD Labs, Pembroke, MA, USA) by the use of a rigid Dumon bronchoscope (EFER, La Ciotat, France).

No complications occurred during this procedure.

The prosthesis expanded well allowing a good ventilation and, mimicking the tracheo-bronchial wall, assured an adequate isolation from mediastinal structures (Figure 2).



**Figure 1.** Post-radiotherapy lesions: distal trachea and main carina wide necrosis of the mucosa (**A**), progression in pseudo-cavities (**B**), destruction of the back wall with evolution of TEF (**C**).

The patient is still proceeding the chemotherapeutic protocols and is monthly followed up by our Center for endoscopic controls and drainage of secretions.

### Discussion

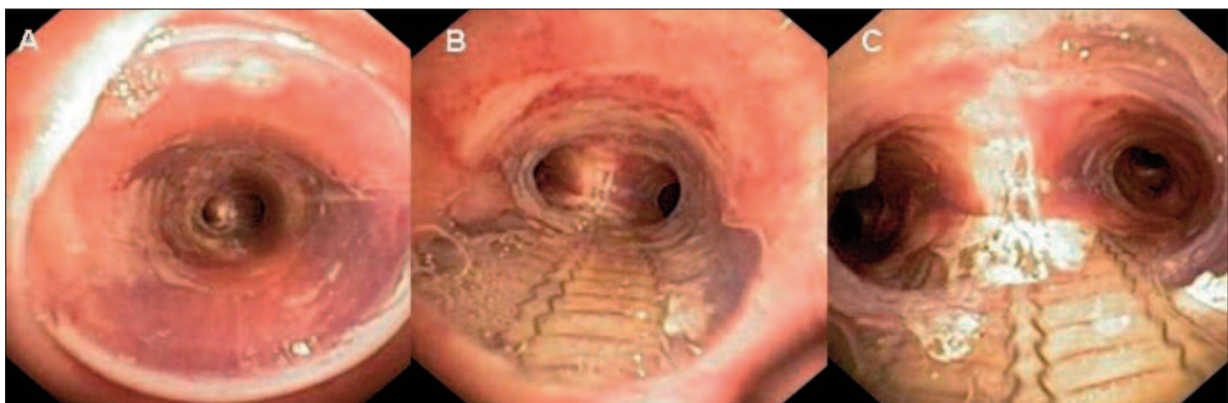
Small TEF can be occluded with sealing materials while large malignant TEF (post-chemotherapy and radiotherapy) are generally treated by surgical approach. However, in case of advanced stage carcinomas these palliative measures have a mortality rate close to 50%. Furthermore, the position of the lesions (e.g., carina and mainstem bronchial ostium) generally does not allow an easy surgery<sup>1-6</sup>.

Currently the silicon endoprosthesis have replaced metallic stents. The Montgomery T-tube needs as stoma and may cause inflammation either to peristomal and tracheal tissue. Moreover, is mobile during breathing acts, although it was employed successfully as esophageal stent<sup>7-10</sup>.

At present time the Dumon stent is considered the device of choice for the treatment of tracheo-bronchial stenosis either benign than neoplastic<sup>11</sup>.

In case of malignant TEF involving the carina and mainstem bronchial ostium we supposed that a Y-shaped silicon stent implant could be advantageous.

Considering the endoscopic conditions of mucosa on the site involved by neoplasm, with a complete destruction of tracheal structure, we decided to insert a Y-shaped Hood stent because its structure similar to a Dumon stent but without the external studs that could create further mucosal damages.



**Figure 2.** Various step of endoscopy surgery, from first placement of Y Hood prosthesis (**A**, **B**) to complete adesion at carina and main bronchial ostium (**C**).

In conclusion, the use of silicone stents in case of extended destruction of the tracheo-bronchial wall could be safe, effective and could be considered a valid alternative to surgery for the palliation of these lesions.

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