Treatment of a Fractured Ultraflex Stent Causing Tracheal Stenosis

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We report on a case of a fractured Ultraflex stent after placement for malignant tracheal stenosis. The patient was a 49-year-old female with adenoid cystic carcinoma of the trachea causing airway stenosis. She was treated by non-covered Ultraflex stent followed by chemoradiotherapy. Twenty months after stent placement, more than half of the distal end of the stent was fractured and caused airway stenosis, while there was no tumor regrowth. After dilation by balloon and bougienage using an endotracheal tube, an additional non-covered Ultraflex stent was placed within the first one, resulting in successful dilation. The patient is now well without any problem with the stent, 12 months after the second stent placement. (Ann Thorac Cardiovasc Surg 2007; 13: 195–197)

Key words: stent, Ultraflex, tracheal stenosis, balloon, bougienage

Introduction

The Ultraflex stent has been widely used for stenosis not only the tracheobronchus but also the digestive tract, e.g., the esophagus and colon.1,2 While there have been several reported cases in which the Gianturco type expandable metallic stent has fractured and caused airway stenosis,3) no fractures of the Ultraflex stent has been reported. We report a case with tracheal stenosis due to a fractured wire of an Ultraflex stent after placement for tracheal adenoid cystic carcinoma. We also present a treatment method for the problem and its outcome. As far as we know, this is the first reported case and treatment of this problem.

Case Report

A 49-year-old female patient was complaining of a dry cough and dyspnea on exertion in July 2003. Computed tomography (CT) revealed tracheal stenosis, and she was referred to our hospital. Bronchoscopy demonstrated stenosis of the lower trachea by tumor (Fig. 1), which was diagnosed as an adenoid cystic carcinoma on biopsy. As the tumor had spread to almost the entire length of the intrathoracic trachea, the patient was treated by stent placement followed by chemoradiotherapy. On August 19, 2003, a non-covered Ultraflex stent (Boston Scientific Co., Natick, MA) 18 mm in diameter and 60 mm in length was placed at the stenotic site. This resulted in a sufficient dilation of the stenosis and improvement in her symptoms. After chemoradiotherapy, CT and bronchoscopy revealed a significant decrease of the tumor. However, in January 2005, she began to complain of dyspnea and wheezing, which had been gradually worsening. In July 2005, CT and bronchoscopy revealed that over than half the distal stent had fractured, resulting in projection of the fractured wire into the tracheal lumen, causing tracheal stenosis (Fig. 2). No tumor regrowth was observed on CT and bronchoscopy. Because the fractured wire projecting into the lumen might interfere with an additional Ultraflex stent, causing insufficient dilation, the balloon dilation by means of a cuff of the endotracheal tube was performed for 15 min, which did not expand the fractured wire. Therefore, a continuous balloon dilation and bougienage method was performed before an additional
stent placement.

After tracheostomy, an endotracheal tube 9 mm in internal diameter (ID) was introduced. The cuff of the tube was inflated with air at the stenotic site, and the tube was fixed at the tracheostomy (Fig. 3). After two days, the endotracheal tube was changed to a larger one (10 mm in ID), on which the cuff was also dilated at the stenotic site. This balloon dilation and bougienage was continued for five days in total. After five days, the fractured wire projected into the tracheal lumen which had become pressed toward the tracheal wall (Fig. 4). An additional non-covered Ultraflex stent of the same size was placed within the same site of the first one, resulting in sufficient dilation of the trachea (Fig. 5). After the stent placement, the patient’s symptoms disappeared. She remains well without any problem with the stent twelve months after the second stent placement.

Discussion

As an Ultraflex stent is usually not removable after long term placement, a fractured stent causing airway stenosis needs an additional stent placement. While an Ultraflex stent and Dumon stent are both options, we recommend the former, because the Dumon stent could impede sputum drainage by complete blockade of ciliary movement, especially when a long stent is used.41 However, before placement of an additional Ultraflex stent within the fractured one, it was necessary to press the fractured wire toward the tracheal wall because it could catch on the additional stent and block sufficient expansion. There-
fore, the balloon dilation and bougienage using an endotracheal tube via tracheostomy were performed for a few days, as previously reported, which resulted in sufficient dilation of stenotic wire to enable additional stent placement. We believe this dilation method is not only effective but also safe, and should be carried out before additional stent placement for a fractured stent causing airway stenosis.

References