Z stenting is a safe ancillary endovascular technique in the treatment of acute aortic dissection. Z stenting allows rapid support and immediate expansion of the aortic true lumen without the necessity to resort to extensive endograft implantation, while facilitation of thrombosis and obliteration of the false lumen often effectively eliminates residual aortic dissection.

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Fracture of silicone tracheal T-tube: A rare complication

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Silicone tracheal T-tubes can be used as satisfactory stents, with little or no tissue reaction and providing sufficient support to the stenotic segment of the trachea. Fractures in silicone T-tube are uncommon. Here, we describe a silicone tracheal T-tube fracture as a very uncommon complication in a patient with tracheal stenosis after a tracheostomy.

Clinical Summary

A 70-year-old man underwent a pancreaticoduodenectomy and an anterior resection of the rectum for the simultaneous treatment of an intraductal papillary neoplasm of the pancreas and a rectal carcinoma. After the operation, the patient had respiratory failure requiring a tracheostomy followed by 3 months of mechanical ventilation. The patient was referred to our department because of difficulty in removing the tracheostomy tube. Examination with a flexible bronchoscope showed a tracheostomal stenosis of the anterior wall above the tracheostomy with granulation at the site. The tracheal stenosis was located 0.7 cm below the vocal cords and its length was 2.1 cm. The patient underwent fiberoptic bronchoscopic dilation. A 10-mm T-tube (Koken Laboratories, Tokyo, Japan; proximal portion of the vertical limb, 2 cm; distal portion

of the vertical limb, 4 cm; horizontal limb, 5.5 cm) was inserted with difficulty via the tracheal stoma according to a previously described method¹ and with the help of the bronchofiberscope. The proximal portion of the vertical limb of the silicone T-tube was positioned across the stenotic segment, and only a slight kink (less than 90°) between the proximal portion of the vertical limb and the horizontal limb was observed using the bronchofiberscope. The tracheal T-tube was straightened after several insertions of the bronchofiberscope into the endotracheal T-tube to remove the kink. The patient had no further respiratory symptoms and was discharged. A bronchoscopic examination was performed once a month for 3 months to check the stent airway and to confirm the absence of new granulation tissue at the T-tube.

Nine months after the insertion of the silicone T-tube, the patient came to our hospital after vomiting a piece of the broken T-tube and coughing. On examination, his vital signs were stable and no evidence of cyanosis was seen. An emergency bronchofiberscopic examination was performed via his mouth, and the fracture and loss of the proximal portion of the vertical limb of the silicone T-tube was confirmed. No abnormalities were found in the remaining part of the silicone T-tube, and the remainder of the T-tube was removed through a tracheostome; a new tracheostomy tube (Portex; Smith's Medical, London, United Kingdom) was then inserted. The tracheal T-tube was fractured at the junction of the proximal portion of the vertical limb and the horizontal limb (Figure 1). We ordered the T-tube company to modify a new 12-mm T-tube with the same long vertical and horizontal limbs but with a 60° angle between the horizontal limb and the proximal portion of the vertical limb (Figure 2). A month later, the customized silicone T-tube was inserted through the tracheostome. This time, kinking between the horizontal and vertical limbs was not observed by bronchofiberscopy. The patient remains well and continues to be followed up 6 months after the insertion of the new silicone tracheal T-tube.

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Figure 1. Fractured T-tube at the junction of the proximal portion of the vertical and horizontal limbs.

Discussion

Surgical reconstruction is very difficult in subglottic stenosis. The T-tube is the preferred tracheal stent of the upper airway when surgical reconstruction cannot be accomplished. Stent fractures are a rarely encountered complication. Tracheostomy tube fractures² have been reported, but fractures of silicone T-tubes are very uncommon, possibly because tracheal T-tubes might be used less frequently than tracheostomy tubes. Only one report of a fractured silicone T-tube has been made, and that fracture occurred when the patient, a child, pulled on the tube.³ Our case is the first report of a spontaneous fracture or a fatigue fracture in a silicone tracheal T-tube. In our case, the break occurred at the junction of two limbs. Before the insertion of the silicone tracheal T-tube, severe granulation was observed at the anterior wall above the tracheostomal site. The silicone tracheal T-tube was inserted, and a kink in the T-tube was resolved by inserting the bronchofiberscope, enabling the proximal portion of the vertical limb of the silicone tracheal T-tube to be straightened in the tracheal lumen. However, the proximal portion of the vertical limb may have been pushed in from the anterior wall of the trachea by the granulation. Mechanical stress from the kink may also have been present

Figure 2. Design for a modified tracheal T-tube with a 60° angle between the horizontal limb and the proximal portion of the vertical limb.

between the horizontal and vertical limbs of the T-tube. No reason for the fracture other than the mechanical stress produced by the kink was found. Trimming of the T-tube may be necessary to avoid T-tube fractures. If a special modified T-tube is needed, companies can make the needed modifications. We ordered a larger, more powerful stent with a 60° angle between the horizontal limb and the proximal portion of the vertical limb. The patient has remained well since the insertion of the new modified T-tube. The possibility of fractures in silicone T-tubes should be kept in mind.

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