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Biodegradable stent in a patient with recurrent stenosis after lung transplantation

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TO THE EDITOR,

Airway complications occur after lung transplantation in 2-18% of cases, bronchial stenosis being particularly prevalent. The initial management of bronchial stenosis is via bronchoscopic dilatation, with or without stent placement.[1] Among the most popular types of stents used for this purpose are the silicone and metal models, which can be rigid or self-expanding. However, post-placement complications, including fistulas and inflammatory reactions, can occur. In this context, biodegradable stents appear as an alternative, offering benefits such as long-term maintenance of airway patency, as well as minimizing the complications related to fistulous formations and inflammatory reactions, which are more common when non-biodegradable stents are employed.

Although biodegradable stents have been used in the treatment of various gastrointestinal and vascular conditions, its use in the treatment of airway stenosis is recent and has been the object of research.[2] The case described here illustrates the successful use of biodegradable stent placement in the clinical management of central airway stenosis. This is the first report of such use of a biodegradable stent in Brazil.

A 23-year-old male patient with a history of bronchiolitis obliterans underwent bilateral lung transplantation. One month after the procedure, balloon dilatation was performed because there was stenosis in the anastomosis of the left main bronchus (Figure 1A). The patient eventually required five additional endoscopic dilatation procedures for the same reason. In one of those procedures, a small laceration was accidentally made in the posterior bronchial wall. An attempt was then made to install a silicone stent, which was unsuccessful because of the proximity of the stenosis to the secondary carina, which prevented the stent from remaining in the correct position. Consequently, a custom-made biodegradable stent (ELLA-CS, Hradec Králové, Czech Republic) was successfully implanted (Figure 1B). However, endoscopic dilatation was again required two months later. At 14 months after the last procedure (i.e., after 16 months of follow-up), the stenosis remained controlled (Figure 1C), with no recurrence. At this writing, the patient was clinically stable.

The incidence of central airway stenosis after lung transplantation has decreased. However, such stenosis continues to pose a challenge, with the potential to impair the quality of life, as well as to reduce the survival, of patients who undergo lung transplantation. There have been no randomized trials examining the management of this complication.[1] Various therapeutic methods are available, including endoscopic dilatation, surgical treatment, ablation techniques, and the use of various types of stents. There is no consensus, however, regarding the best method or timing of the treatment.[3] In this context, non-biodegradable stents play a crucial role in the management of benign tracheobronchial stenosis. However, they have been associated with several complications such as the formation of hyperplastic granulation tissue, erosion, and bleeding. For this reason, bioabsorbable stents—specifically biodegradable stents—have emerged as an important alternative. This modality has its widespread use for esophageal, intestinal, biliary, or vascular stenoses. Biodegradable stents are made of polydioxanone (PDO), a material that has shown an acceptable level of tolerance by the tracheal mucosa, preventing rejection due to immune-mediated reactions. However, the size and shape of PDO stents must be adapted to the anatomical characteristics of each patient.[4]

In the case described above, several unsuccessful attempts were made to manage the stenosis by endoscopic dilatation, one of which resulted in laceration of the bronchial wall. The attempt to put a silicone stent in place was unsuccessfully because the stent was incompatible with the bronchial anatomy of the patient. The placement of a biodegradable PDO stent, customized to the anatomical characteristics and needs of the patient, was successful, and the patient showed no complications during 16 months of follow-up. Our report suggests that biodegradable stents are a viable alternative for the management of tracheobronchial stenosis, with a safety profile that is more favorable than that of traditional stents.[5] Further studies are needed in order to clarify the precise recommendations for the use of biodegradable stents in cases of benign stenosis of the airways, especially in patients who have undergone lung transplantation.

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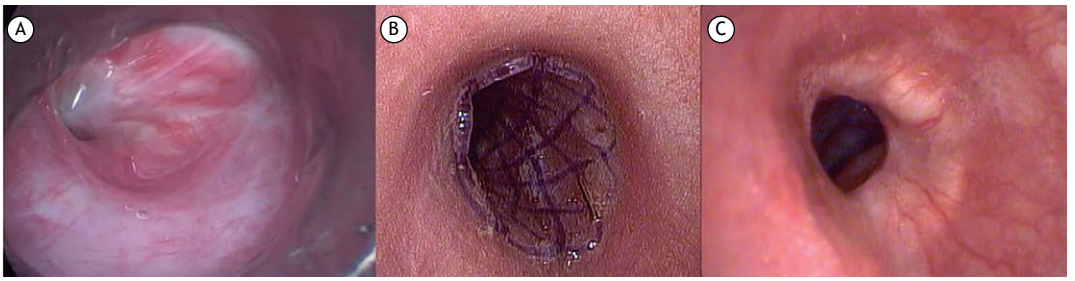

Figure 1. In A, stenosis of the left main bronchus. In B, the biodegradable stent after placement. In C, the site of bronchial stenosis after 16 months of follow-up.

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