LESSONS LEARNED IN TISSUE ENGINEERING OF THE TRACHEA: IS THERE A LIGHT AT THE END OF THE TUNNEL?
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Objectives: Resection of more than 50% of the length of the trachea is considered hazardous in terms of mortality and morbidity risk. A complete trachea replacement using a scaffold seeded by autologous stem cells has been proposed.

Methods: Between 2011 and 2015, a KKB №1 based study was carried out (www.clinicaltrials.gov) on the use of synthetic scaffolds seeded by patient’s stem cells for full replacement of the trachea in previously treated patients with lesions of more than 50% of the length of the trachea. We studied the safety, biocompatibility, stability of the graft and the patient’s quality of life.

Six transplants were performed, of which 2 re-transplantations in 4 patients with non-malignant stenosis of the trachea (3 of whom (75%) with sublaryngeal stenosis). All operations were performed via sternotomy access.

Results: The observation period ranged from 7 to 27 months. No intraoperative complications were observed. After surgery, the most significant complication was the retention of sputum and chronic infection, and the development of granulation tissue. Two months after transplantation, the leading problem was the absence of revascularization in the middle of the scaffold, although in the first month after transplantation a development of islet of epithelium was detected on the scaffold. Three patients died 7, 21 and 27 months after transplantation for various reasons.

Conclusion: The present technology needs to be improved, although at the moment we can guarantee up to two years life expectancy for patients with severe or end-life disease as salvage treatment. The use of a biological scaffold may be recommended.

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