

Re: Tracheal Allotransplantation–Lessons Learned

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We read with interest the article “Tracheal Allotransplantation–Lessons Learned” by Iyer et al.¹ Authors should be commended for a formidable undertaking of successful vascularized, decellularized tracheal allotransplantation for malignancy for the first time. Though the end result was not favorable, they have very meticulously analyzed the causes leading to failure, such as the size of the tracheal allograft and most importantly the anastomosis, which has been considered the Achilles’ heel causing major complications, rejection, and even mortality.

Vascularized allografts are currently the most preferred way and provide structural and mechanical support but require a donor, short-term immunosuppression, and several weeks for heterotopic revascularization.² Aortic auto/homograft or tubularized autologous vascularized tissue supported either by a stent or costal cartilage has the advantage of single-stage procedure without immunosuppression. However, it is technically difficult due to donor-site morbidity and lacks mucociliary clearance.^{3,4} Tissue-engineered biodegradable scaffold or decellularized trachea seeded with autologous stem cells has the possibility of growth potential and can be used without immunosuppression, but it is avascular. Avascular graft exposed to exterior toxins, microorganisms, desiccation, and continuous movements during respiration/swallowing/ coughing leads to infection and anastomosis failure and may cause disastrous complications such as arterial erosion, dehiscence, stenosis, or migration.⁵ It is surprising that in spite of many failure of prosthetic trachea or tissue-engineered tracheal allograft, reports of its use are still afloat.

Creation of a tracheal substitute is a life-saving procedure to restore severely damaged airway in critically ill patients. Theoretically, precise technique, minimizing anastomotic tension, preserve blood supply, release maneuvers covering the anastomosis and/or innominate artery with a

strap muscle, and low threshold for tracheostomy (in cases of doubt) will reduce the chances of anastomotic failure. However, tracheal transplantation has had very limited success owing to issues of ischemia and immune rejection.

Ideal tracheal substitute still eludes us, and its successful clinical use remains the ultimate challenge. The authors have used the most promising solution for a reliable tracheal substitute, but questions like when, how, and which patient remain. But one thing is sure that plastic surgeons have a unique opportunity to significantly contribute to the science and technique of tracheal reconstruction due to abundant experience of microsurgery and tissue transplantation.

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Conflict of Interest

None declared.

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