

Formation of an intestine–cartilage composite graft for tracheal reconstruction

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Purpose; Tracheal transplantation is necessary in patients with extensive tracheal stenosis, congenital lesions and many oncologic conditions but bears many critical problems compared with other organ transplantations. The purpose of this study was to make an intestine–cartilage composite graft for potential application for tracheal reconstruction by free intestinal graft.

Methods; Hyaline cartilage was harvested from trachea of 2 weeks old New Zealand White Rabbits. Chondrocytes were isolated and cultured for 8 weeks. Cultured chondrocytes were seeded in the PLGA scaffolds and mixed in pluronic gel. Chondrocyte bearing scaffolds and gel mixture were embedded in submucosal area of stomach and colon of 3Kg weighted New Zealand White Rabbits under general anesthesia. 10 weeks after implantation, bowels were harvested for evaluation.

Results; We could identify implantation site by gross examination and palpation. Developed cartilage made a good frame for shape memory. Microscopic examinations include special stain showed absorption of scaffold and cartilage formation even though not fully matured.

Conclusion; Intestine–cartilage composite graft could be applicable to future tracheal substitute and needs further investigations.