

Optimal dose of basic fibroblast growth factor for long-segment orthotopic tracheal autografts.

Authors: Nakanishi R., Nagaya N., Yoshimatsu T., Hanagiri T., Yasumoto K.

Publication Date: 1997

Abstract:

When a primary anastomosis of the trachea is not feasible, extensive grafting is required. However, despite the use of omental wrapping for revascularization, long-segment tracheal grafts frequently do not maintain structural integrity because of insufficient blood supply. We examined the use of basic fibroblast growth factor for preservation of long-segment tracheal autografts after orthotopic transplantation with omental wrapping in 23 dogs. All animals received orthotopic tracheal transplantation, with 14- ring autografts that occupied a major part of the thoracic trachea, and omental wrapping. The 23 animals were classified randomly into six groups as follows: no treatment (group 1, n = 3), topical administration of fibrin glue alone (group II, n = 4), fibrin glue enriched with 1 $\mu\text{g}/\text{cm}^2$ basic fibroblast growth factor (group III, n = 4), fibrin glue enriched with 5 $\mu\text{g}/\text{cm}^2$ basic fibroblast growth factor (group IV, n = 4), and fibrin glue enriched with 10 $\mu\text{g}/\text{cm}^2$ basic fibroblast growth factor (groups V and VI, each n = 4). The omentum that was used to wrap the autografts was fed by the right gastroepiploic artery in groups I to V and by both the right gastroepiploic artery and splenic artery in group VI. All autografts in groups I and II showed dissolution. Ten of 12 autografts in groups III, V, and VI did not maintain long-term structural integrity. By contrast, all autografts in group IV showed long-term viability, as demonstrated by graft patency, epithelialization, cartilage morphology, and vascularity. We conclude that treatment with fibrin glue enriched with 5 $\mu\text{g}/\text{cm}^2$ basic fibroblast growth factor in combination with omental wrapping may prolong the viability of long-segment tracheal autografts.