Promotion of tracheal cartilage growth by intra-tracheal administration of basic fibroblast growth factor (b-FGF)

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**Purpose:** Basic fibroblast growth factor (b-FGF) is a very effective growth factor that induces the proliferation of chondrocytes. We found that placement of biodegradable gelatin hydrogel sheets incorporating b-FGF outside the cervical trachea enlarged the tracheal lumen and thickened the cartilage. This study aimed to investigate whether intra-tracheal administration of b-FGF solution promotes the growth of tracheal cartilage.

**Methods:** Group 1 (controls): No intervention was performed in mice. Group 2 (sham): Trachea intubation was performed for 5 days from 4 weeks of age. Group 3: Intra-tracheal administration of 25µl distilled water was performed for 5 days. Group 4: Trachea intubation with 2.5µg/25µl b-FGF administration was performed for 5 days. All animals were sacrificed at 8 weeks of age, and the outer diameter and the length of the tracheal rings at the cervical trachea were measured.

**Results:** The mean outer diameter of the cervical trachea in groups 1, 2, 3 and 4 was 1.34, 1.42, 1.38 and 1.56 mm, respectively. The mean outer diameter was significantly larger in group 4 than in the other three groups. (p < 0.05) The length of tracheal rings was 3.51, 3.54, 3.44 and 3.94 mm, respectively, and the length was significantly larger in group 4 than in the other three groups. (p < 0.05)

**Conclusion:** This study showed that intra-tracheal administration of b-FGF enlarges the tracheal lumen.