

# 후두이식술(Laryngeal Transplantation)

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## 1. Brief History of Progress in Laryngeal Transplantation in the Literature

### 1) Phase I (1965-1974) : The Pioneer Era of Laryngeal Transplantation

- Work & Boles(1965) : Laryngeal Replantation in the dog
- Ogura, Kawasaki & Takenouchi(1966) : Replantation & transplantation of the canine larynx
- Kluyskens & Ringoir(1970) : Follow-up of a human laryngeal transplantation
- Daly(1970) : Is laryngeal transplantation justifiable?

→ Unsolved Problems

- (1) Ethical problem : transplantation of non-vital organ
- (2) Suitable Immunosuppression
- (3) Restoration of function of the transplanted larynx

### 2) Phase II (1975-1991) : Era for laryngeal reinnervation studies & for development of immunosuppressive agents

- Tucker(1976) : Nerve-muscle pedicle reinnervation
- Crumley(1980) : Reinnervation of abductor with phrenic n. and adductor with ansa cervicalis
- Cyclosporin(1978, Kahan) & FK506(1987) etc

### 3) Phase III (1992-) : Era for Reattempt

- Green, Berke et al(1992) : Physiologic motion after vocal cord reinnervation
- Berke, Ye et al(1993) : Orthotopic laryngeal transplantation : Is it time?

- Strome, Brodsky et al(1992) : Histopathologic correlates of acute laryngeal allograft rejection in a rat model

- Strome & Strome(1992) : Laryngeal transplantation : ethical consideration

- Strome M(1998) : 2nd Human Laryngeal transplantation(trunk of RLN anastomosis)

### 4) Laryngeal Transplantation Studies in Korea

- Choi HS(1995) : Problems and prospect of the laryngeal transplantation. In : Otolaryngology Head and Neck Surgery Seoul Symposium 5(canine laryngeal transplantation)

- Choi JO(1996) : Laryngeal transplantation in rat model

- Choi HS, Kim YH, Cho JI et al(1998) : Laryngeal transplantation in the canine by end-to-end anastomosis of the RLN branches

- Kim YC, Choi HS et al(1999) : Morphological and functional outcomes after vertical hemilaryngeal transplantation in the canine

## 2. Indispensable Conditions for Successful Laryngeal Transplantation

### 1) Successful vascular anastomosis

#### (1) Canine Laryngeal Transplantation

- artery : one cranial thyroid artery('C-type' by Ogura group)

- vein : bilateral hyoid venous arches

#### (2) Human Laryngeal Transplantation

- artery : one superior thyroid artery(Anthony JP, 1996)

- vein : bilateral thyroid veins

## 2) Restoration of functions

- (1) RLN : anterior branch(adductor) & posterior branch(abductor) anastomosis separately(at least on one side)
- (2) SLN : external & internal branch anastomosis separately

## 3) Prevention of rejection

- Drug of choice : combination of Cylosporine A + Immuran + Prednisolone
- other options : FK506 et al

## 4) Ethical consideration

- consensus from the society for non-vital organ

## 3. Experience of Canine Laryngeal Transplantation in this Department

### 1) Total Laryngeal Transplantation Series

- Canine model(End-to-end anastomosis of branches of RLN)
- a. Mongrel Dog Series : 18 cases
- b. Beagle Dog Series : 5 cases

## 2) Hemi-laryngeal Transplantation Series(Beagle) : 7 cases

- Hemilaryngeal transplantation canine model
- End-to-end anastomosis of branches of RLN

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