

Tailored Intra-oral Reconstruction with Free Tissue Transfer ; Surgical Tips & Functional Outcomes

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Oral cavity including tongue, tonsil, and hypopharynx has various functions such as swallowing, mastication, speech, and taste, and hypopharynx allows swallowing of food and prevent aspiration to the trachea. Therefore, returning oropharyngeal functions such as mastication and swallowing by reconstruction with flaps after resection of the intraoral and laryngopharyngeal cancer is very important. Factors for consideration in selection of the adequate flap and safe, functional intraoral reconstruction include size and volume, size and morphology of the defect, length of the pedicle, postoperative sensate need and postoperative radiotherapy.

Therefore, the authors in this article tried to discuss the factors (design of the flap, selection of adequate pedicle, suture of the flap) for consideration in intraoral reconstruction tongue, tonsil, hypopharynx and points for reflection in effective and functional reconstruction.

Defect Classification & Flap Design (Fig. 1)

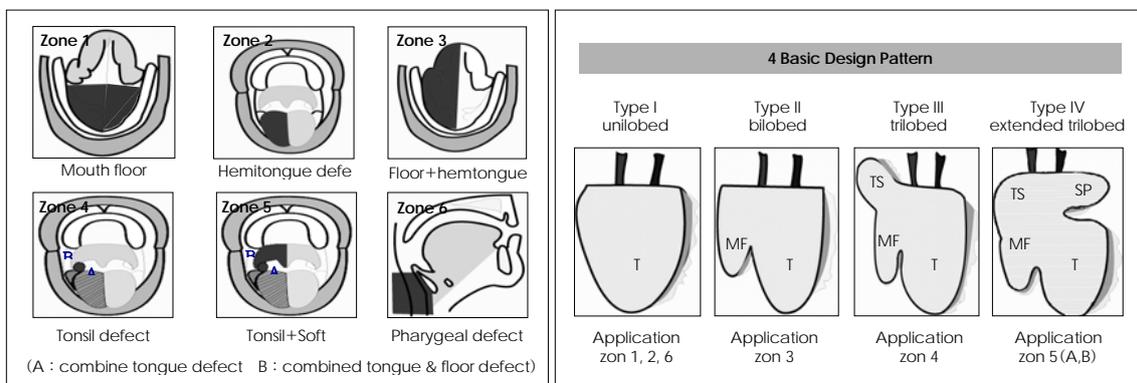


Fig. 1. Left : Oral and pharyngeal defects were classified into six zones. Zone 1 is a defect of the mouth floor only. A defect involving only the tongue was classified as zone 2. A combined mouth floor and hemitage defect was classified as zone 3. Tonsillar defect was classified as zone 4. and any zone 4 defect that extended into the soft palate was defined as zone 5. Finally, a pharyngeal wall defect was defined as zone 6. Right : Four basic flap designs and their application. This drawing is for right side defects. Mirror image design can be applied for left side defects (T, Tongue : MF, Mouth Floor : TS, Tonsil : SP, Soft Palate).

Total Tongue

In total tongue reconstruction, wide and thick flaps such as the rectus abdominis musculocutaneous flap had better outcomes. Overcorrection with a sufficient flap volume is recommended for adequate oral intake owing to volume loss caused by radiation therapy, and functional muscle transfer should also be considered to prevent muscle atrophy. Lastly, static suspension procedures are emphasized to prevent airway aspiration for larynx preservation (Fig. 2).

Soft Palate(Partial & Total)

We applied the radial forearm tenocutaneous free flap including the palmaris longus tendon in postoncologic soft palate reconstruction. The method allowed functional reconstruction and restoration of the levator sling mechanism in a patients in whom moderate-sized defects imposed equivocal reconstructive options and total soft palate defect (Fig. 3).

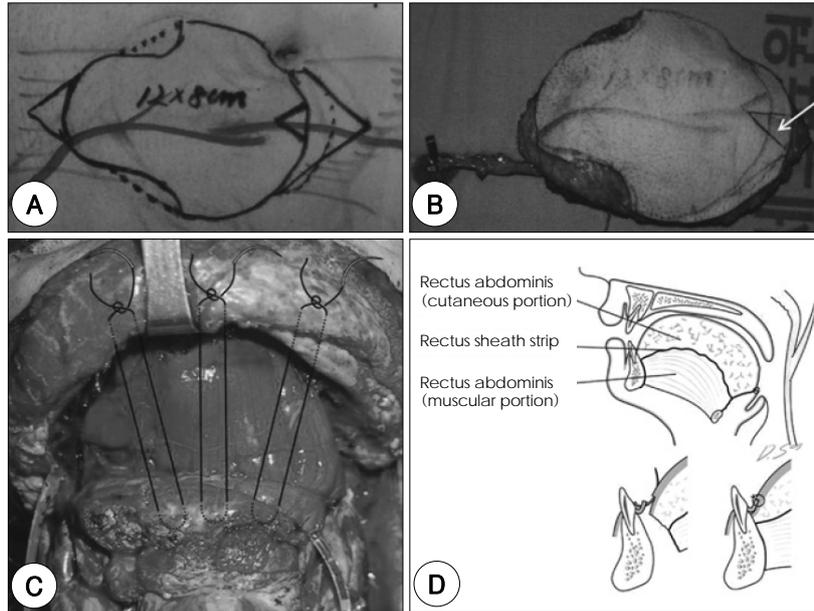


Fig. 2. Surgical tips for maintaining neotongue volume. A : Flap designed 20% to 30% larger than defect. B : Overcorrection of the defect was intended with de-epithelization of the flap margin and distal end (arrow to triangular dart shape). C : Laryngeal suspension; No. 0 Prolene suture between the lower margin of the mandible and hyoid bone suspended larynx. D : Location of flap ; the rectus muscle sheath was located to the upper margin of the mandible for protrusion of the tongue.

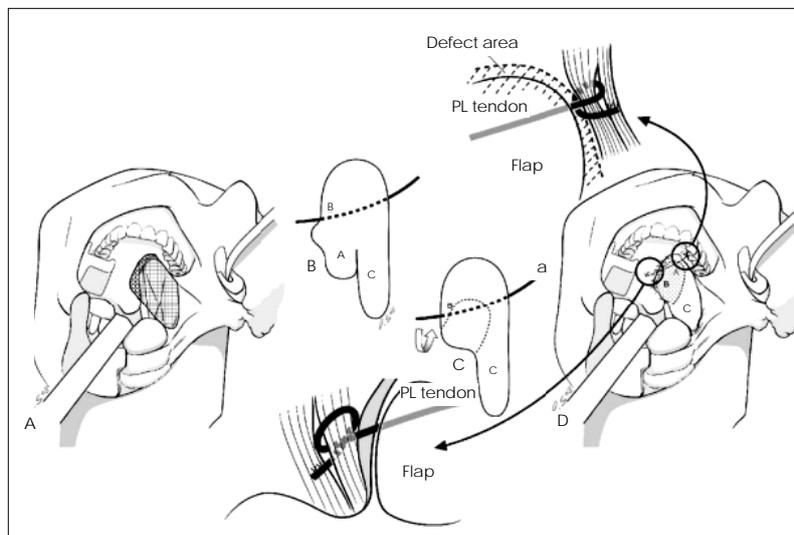


Fig. 3. Schematic illustration of surgical procedure. A : Partial soft palate defect (involves up to one-half of the soft palate and ipsilateral lateral pharyngeal wall whether or not including the uvula). B and C Design of tenocutaneous radial forearm flap. (A : nasal side of soft palate, B : oral side of soft palate, C : a portion of lateral pharyngeal wall, a : palmaris longus tendon). D : Palmaris longus tendon (PL) was sutured to both remnant palatini muscle and uvulus muscle as illustrated.

Hypopharynx

First, for the reconstruction of the hypopharynx and cervical portion of the esophagus, jejunal flap can be an option after complete resection of remnant mucosa. Nevertheless, it is associated with several complications, including vulnerability to ischemia, possibility of developing swallowing diffi-

culty on the bowl anastomotic site, risk of abnormal swallowing movements, and problems with reconstructing phonation (wet voice). Second, when reconstructing with tube type using fasciocutaneous flap, the fistula rate can be higher than with patch type. We performed all surgeries taking care not to transgress the wide excision principle with the remnant hypopharyngeal wall. For remnant lesions greater than 3 cm, patch-type RFFF was performed, whereas for those less

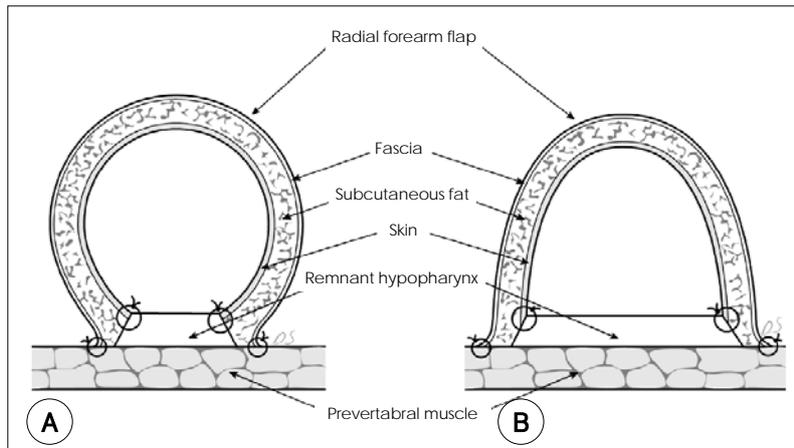


Fig. 4.

Table 1.

| | Group 1(Omega-shaped RFFF) | Tubed RFFF | Tubed pectoralis major flap | Jejunal free flap |
|--------------------|----------------------------|------------|-----------------------------|-------------------|
| No. patients | 12 | 13 | 7 | 18 |
| Flap survival, % | 100 | 100 | 86 (6/7) | 83 (15/18) |
| Stricture rate, % | 0 (0/12) | 15 (2/13) | 43 (3/7) | 33 (6/18) |
| Fistula rate, % | 8 (1/12) | 46 (6/13) | 57 (4/7) | 5 (1/18) |
| Diet grade, median | 6 | * | | |

* : Impossible to completely evaluate

than 3cm, omegashaped RFFF was done. We achieved fairly good results in both groups without total resection of the narrow remnant hypopharyngeal wall (Fig. 4, Table 1).