

Initial swallowing function in those undergoing subtotal mobile tongue component resection and reconstruction with a myocutaneous pectoralis major flap

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Abstract

Purpose : The swallowing function was evaluated 2 months postoperatively in eight tongue cancer patients who had undergone subtotal resection of the mobile tongue component and reconstruction with a pectoralis major myocutaneous flap. The association between the form of the flap and initial postoperative swallowing function was also evaluated. **Materials and methods :** Video fluorography was used to evaluate swallowing function. The test food consisted of 10 ml liquid.

Results : The form of the flap was a bulge and flat in 6 and 2 patients, respectively. Contact between the flap and hard palate was favorable in 6 patients but poor in 2. The 6 patients with favorable flap and hard palate contact showed

neither residue of the test food in the recessus piriformis nor aspiration. The 2 patients with poor flap and hard palate contact showed marked test food residue in the recessus piriformis and aspiration.

Conclusion : It is suggested that decreased flap volume could reduce swallowing pressure, promoting aspiration, and so the mobile tongue component should be reconstructed with a bulge flap to facilitate flap and hard palate contact, considering initial postoperative swallowing function.

Key words : subtotal mobile tongue component resection, pectoralis major myocutaneous flap, form of flap, initial postoperative swallowing function

Introduction

Swallowing function was previously evaluated 12 months postoperatively in four tongue cancer patients who had undergone hemiglossectomy and reconstruction with the pectoralis major myocutaneous flap,¹ and it was reported that swallowing function in those patients was satisfactory, although the flap had moved downward.

In this study, Swallowing function was evaluated with video fluorography 2 months postoperatively in eight tongue cancer patients

who had undergone subtotal resection of the mobile tongue component and reconstruction with the pectoralis major myocutaneous flap. From the perspective of the initial postoperative swallowing function, the usefulness of the pectoralis major myocutaneous flap was examined for subtotal resection of the mobile tongue component and the association between the form of the flap and swallowing function was assessed.

Patients and Methods

Eight (male: 7, female: 1) tongue cancer patients who had undergone subtotal resection of the mobile tongue component (Fig. 1) and reconstruction with a pectoralis major myocutaneous flap² (Fig. 2) at Kinki University Hospital, Osaka, Japan, between March 2008 and August 2009, were studied. Table 1 shows a summary of the eight patients. Patients' ages ranged from 53 to 68 years old, with an average of 61.4 years old. With regard to radical neck dissection, all patients underwent bilateral conservative total neck dissection. Hyoid bone suspension was not performed in any patient. The pectoralis major myocutaneous flaps were 10×7-11×8 cm. Two patients received postoperative radiation of 60 Gy.

Video fluorography was performed 2 months postoperatively with the patients' consent. The test food consisted of 10 ml liquid.³ Evaluation items were: 1) Holding the test food in the oral cavity, 2) Contact between the flap and hard

palate, 3) Epiglottis turnover, 4) Widening of the esophageal entrance 5) Residual test food in the recessus piriformis, 6) Aspiration.



Fig. 2 Design of a pectoralis major myocutaneous flap

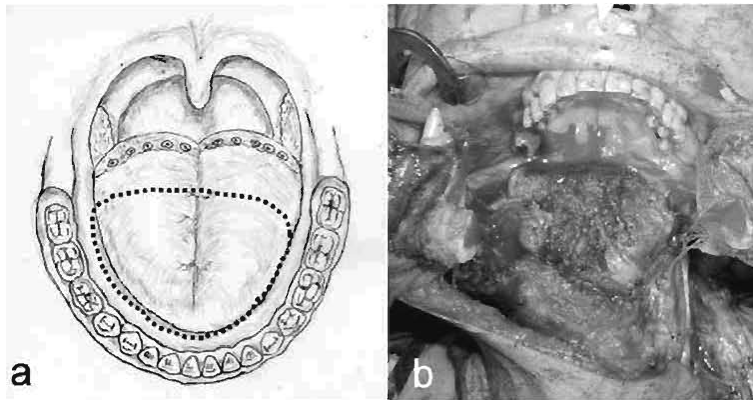


Fig. 1 Subtotal resection of the mobile tongue component
a : Schema of resection
b : Operative findings

Table 1 Summary of eight patients who underwent subtotal resection of the mobile tongue component and reconstruction with a pectoralis major myocutaneous flap

(Mar. 2008-Aug. 2009)

Case	Gender	Age	Neck dissection	Hyoid bone suspension	Size of flap (cm)	Postoperative radiation
1	Female	53	Bilateral	—	10×7	no
2	Male	68	Bilateral	—	11×6	no
3	Male	60	Bilateral	—	11×6	no
4	Male	66	Bilateral	—	10×8	no
5	Male	59	Bilateral	—	11×8	no
6	Male	67	Bilateral	—	10×7	no
7	Male	65	Bilateral	—	10×7	60 Gy
8	Male	53	Bilateral	—	10×7	60 Gy

— : no operation
no : no radiation

Table 2 Results of the form of the flap and swallowing function 2 months postoperatively

Case	Form of flap	Contact between the flap and hard palate	Holding in the oral cavity	Epiglottis turnover	Residuum in the recessus piriformis	Aspiration
1	flat	poor	possible	good	appearance	slight
2	bulge	good	possible	good	none	none
3	bulge	good	possible	good	none	none
4	flat	poor	difficult	insufficient	appearance	slight
5	bulge	good	possible	good	none	none
6	bulge	good	difficult	good	none	none
7	bulge	good	difficult	good	none	none
8	bulge	good	difficult	good	none	none

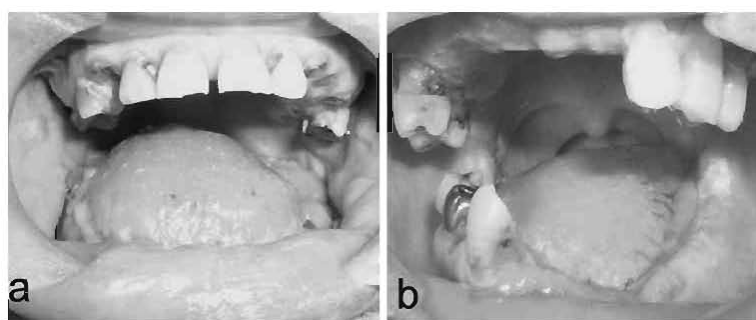


Fig. 3 Intraoral findings 2 months postoperatively
 a: The form of the flap was a bulge (case 7).
 b: The form of the flap was flat (case 4).

Results

Table 2 shows the results by the form of the flap and swallowing function 2 months postoperatively. With regard to the form of the flap, it was a bulge in 6 patients (Fig. 3a : case 7) but flat in 2 (Fig. 3b : case 4); Contact between the flap and hard palate was favorable in 6 patients but poor in 2. With regard to holding the test food in the oral cavity, 4 patients showed satisfactory results, while the other 4 patients were not able to hold the test food, and it ran into the pharynx. Epiglottis turnover was favorable in 7 patients but insufficient in 1. Widening of the esophageal entrance during swallowing was favorable in all patients. Slight aspiration was observed in 2 patients. The 6 patients with favorable flap and hard palate contact showed neither residual test food in the recessus piriformis nor aspiration. Figure 4 presents video fluorography findings in case 7 showing favorable flap and hard palate contact and no aspiration. The 2 patients (cases 1 and 4) with poor flap and hard palate contact showed marked test food residue in the recessus piriformis and slight aspiration. Figure 5 presents video fluorography findings in case 4, showing poor flap and hard palate contact (Fig. 5a) and slight aspiration (Fig. 5b).

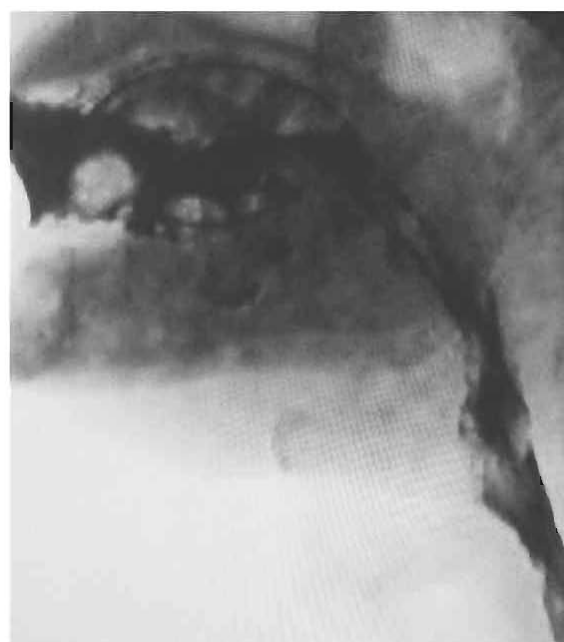


Fig. 4 Video fluorography in case 7
 Contact between the flap and hard palate was favorable. Aspiration was not shown.

Discussion

Swallowing function was evaluated 12 months postoperatively in four tongue cancer patients who had undergone hemiglossectomy and reconstruction with a pectoralis major myocutaneous

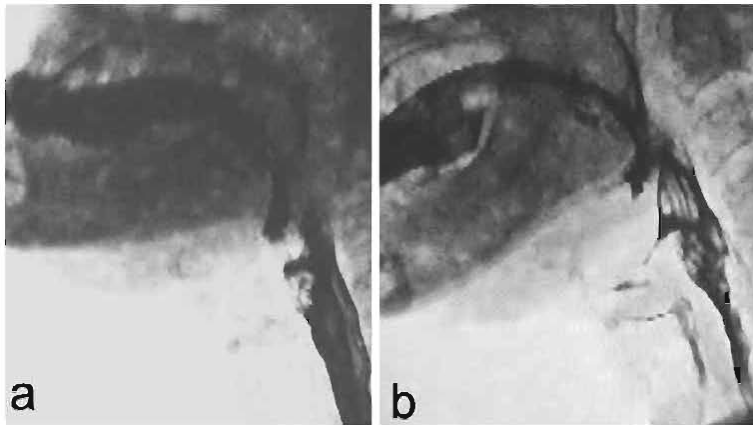


Fig. 5 Video fluorography in case 4
 a : Contact between the flap and hard palate was poor.
 b : Slight aspiration was shown.

flap,¹ and it was reported that all patients could shift the residual tongue to the flap side as a compensatory function, the residual tongue could form favorable contact with the hard palate, and swallowing function in all patients was satisfactory. In the present study, initial postoperative swallowing function was evaluated 2 months postoperatively in eight tongue cancer patients who had undergone subtotal resection of the mobile tongue component and reconstruction with a pectoralis major myocutaneous flap.

It was reported that subtotal resection of the mobile tongue component causes: 1) restriction of elevation of the hyoid bone⁴⁻⁶ and 2) decline in swallowing pressure.⁵⁻⁷

Firstly, restriction of the elevation of the hyoid bone is considered. Subtotal resection of the mobile tongue component is performed by bilateral resection of the anterior and posterior bellies of the digastric, mylohyoid, geniohyoid and hyoglossus muscles. Bilateral resection of muscles would bring about restriction of the elevation of the hyoid bone and then restriction of epiglottis turnover; as a result, a patient who underwent subtotal resection of the mobile tongue component would be at a risk of aspiration.⁴⁻⁶ In the present study, epiglottis turnover was favorable in seven (87.5%) of the eight patients. In some patients, part of the posterior mylohyoid or hyoglossus muscles could be conserved; however, the conserved suprahyoid muscles could not be recorded during the operation. In the future, the conserved suprahyoid muscles should be recorded during the operation to evaluate postoperative swallowing function.

Secondly, the decline in swallowing pressure is discussed. It has been reported that a decline in swallowing pressure causes test food residue in

the recessus piriformis, with a risk of aspiration.⁵⁻⁷ It is necessary to perform reconstruction for subtotal resection of the mobile tongue component to facilitate contact between the flap and hard palate using a bulge flap.^{5,8-10} In the present study, all patients with favorable flap and hard palate contact showed neither residual test food in the recessus piriformis nor aspiration, while all patients with poor flap and hard palate contact showed considerable residual test food in the recessus piriformis and slight aspiration. Therefore, it is suggested that patients with poor flap and hard palate contact might show a decline in swallowing pressure and subsequent aspiration. Reconstruction was attempted with a bulge flap using a pectoralis major myocutaneous flap in all patients; however, two patients who had little fat tissue demonstrated flat flaps. In consideration of the quantity of fat tissue under the flap, for a patient in whom we may not be able to reconstruct a defect with a bulge flap using a pectoralis major myocutaneous flap, a free anterolateral thigh or free abdominal myocutaneous flap could be used to achieve a bulge flap.

Initial postoperative swallowing function was evaluated. The volume of the flap tends to decrease gradually for six months postoperatively⁶; therefore, swallowing function and food intake ability tend to change gradually. In the present study, oral intake ability was favorable in all patients after leaving our hospital. In the future, we should evaluate changes in the flap and swallowing function more than six months postoperatively.

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