

Mandibular reconstruction with free fibula flaps in the elderly: a retrospective evaluation

Y. Sugiura¹, S. Sarukawa²,
 J. Hayasaka¹, H. Kamochi²,
 T. Noguchi¹, Y. Mori¹

¹Department of Dentistry, Oral and Maxillofacial Surgery, Jichi Medical University, Tochigi, Japan; ²Department of Plastic Surgery, Jichi Medical University, Tochigi, Japan

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Abstract. The purpose of this study was to evaluate surgical outcomes in elderly patients who had undergone free fibula flap transfer for malignant head and neck tumours. A retrospective chart review was performed to identify patients who had undergone free fibula flap transfer for mandibular reconstruction after malignant tumour resection at Jichi Medical University Hospital between May 2009 and April 2015. Enrolled patients were divided into an elderly group (≥ 80 years old) and a younger group (< 80 years old). Seventeen patients met the inclusion criteria and were included in the elderly group. Age at surgery ranged from 80 to 92 years. Thirteen patients (76.5%) experienced postoperative complications. Surgical site complications occurred in seven patients. The success rate of free fibula flap transfer was 100%. Systemic complications occurred in nine patients, most commonly delirium ($n = 6$). No perioperative mortality was encountered. The overall 1-year survival rate was 94.1% (16/17). No patient reported gait disturbance as a donor site complication or any other major complication. The incidence of postoperative complications did not differ significantly between the elderly and younger groups. Almost no difference in postoperative course was seen between the groups. Elderly patients appear to tolerate free fibula flap reconstruction just as well as younger patients.

Key words: mandibular reconstruction; elderly; free tissue flap; fibula.

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The number of elderly patients with malignant head and neck tumours has been increasing along with the overall increase in life expectancy, leading to greater numbers of aging patients facing complex reconstructive surgeries¹. With advances in microsurgery, free flap reconstruction has become the first-line reconstructive method for the repair of medium to large

defects after the resection of malignant head and neck tumours. Historically, elderly patients have been considered at high risk of complications with aggressive surgical therapy. However, the more recent literature has suggested that this cohort of patients is currently under-treated and can tolerate free flap surgery just as well as younger patient groups².

The fibula is the longest bone segment in the human body, and the free fibula flap has been used selectively for extensive oromandibular reconstructions^{3,4}. Previous investigators have reported that the immediate restoration of mandibular defects with a free fibula flap has become widely accepted as the ideal treatment, and as experience has accumulated, failure and

morbidity rates of free fibula flap reconstruction have decreased⁵⁻⁷.

Kroll et al. stated that the risk of failure in reconstruction with vascularized bone flaps remains significantly higher than that associated with flaps using soft tissue alone⁸. This is because, in the case of vascularized bone flaps, flap orientation is determined by the alignment of the bone rather than the most favourable position of the pedicle⁸. Moreover, patients undergoing reconstruction with soft tissue alone experience less postoperative pain and recuperate more quickly, and in patients whose life expectancy is short, this is a significant consideration⁹. Ferrari et al. noted that the age of the patient influenced the choice of flap, with soft tissue alone preferred over vascularized bone-containing free flaps in older patients because of the lower operative times and reduced morbidity¹⁰.

The purpose of this study was to evaluate surgical outcomes in elderly patients ≥ 80 years old who had undergone immediate mandibular reconstruction using a free fibula flap following malignant tumour resection, and to compare the results between patients ≥ 80 and < 80 years old.

Materials and methods

A retrospective chart review was performed of patients who had undergone free fibula flap transfer for mandibular reconstruction after malignant tumour resection at Jichi Medical University Hospital between May 2009 and April 2015. Enrolled patients were divided into an elderly group (≥ 80 years old) and a younger group (< 80 years old), and were required to meet the following criteria: diagnosis of oral cancer and use of a free fibula flap after segmental mandibulectomy.

The following data were extracted from the medical charts: patient age, sex, tumour stage, node stage, presence of systemic disease, American Society of Anesthesiologists (ASA) status, surgical interventions, postoperative complications, length of stay in the intensive care unit (ICU) and hospital, 1-year survival, and presence of recurrence. Minor comorbidities (such as mild hypertension or hyperlipidemia) that could be controlled using two or fewer drugs were not considered for analysis. Postoperative complications that occurred during the first month were recorded.

Complications were divided into those related specifically to the surgical sites (recipient or donor site complications) and those affecting other organ systems

(systemic complications). A major complication was defined as potentially life-threatening or requiring significant care or additional surgery (requiring re-exploration or local surgery). Minor complications were those that resolved spontaneously or required minimal intervention, such as dressing or drug treatment. In addition, postoperative diet, residual teeth, and prosthodontics were also used for functional evaluation. Postoperative diet was classified as follows: tolerating a normal diet, taking a soft diet, or dependent on tube support. Patients were asked to specify the level of their postoperative diet.

Categorical variables were analyzed using the χ^2 test or Fisher's exact test. The χ^2 test was used to analyze systemic disease and recipient site complications, systemic complications, and natural occlusal contact. Other categorical variables were analyzed using Fisher's exact test because only small numbers were involved. For continuous outcomes, distributions of values were checked. All data appeared to be non-normally distributed, so the Mann-Whitney *U*-test was used to analyze operation time and blood loss, lengths of stays in the ICU and hospital, and the interval to resumption of eating. Statistical significance was defined at the level of $P < 0.05$.

Patient quality of life (QOL) was measured at least 6 months after surgery. Version 4 of the modified University of Washington Quality of Life assessment (UW-QOL) was used¹¹, with values closer to 100 representing greater health and well-being, and those closer to 0 indicating greater disability and poorer function. Patients were requested to return for follow-up evaluation at least 6 months after surgery and were asked to complete the modified UW-QOL questionnaire on this visit.

This study was approved by the Ethics Committee of Jichi Medical University Hospital.

Results

A total of 73 patients who underwent segmental mandibulectomy and microvascular free tissue transfer due to oral cancer were identified. Eighteen patients were ≥ 80 years old, of whom 17 underwent free fibula flap transfer. Of the 55 patients < 80 years old, 20 patients underwent free fibula flap transfer. The medical records of these 37 patients who underwent free fibula flap transfer and met all the inclusion criteria were reviewed.

The elderly group comprised 17 patients, with a median patient age at the time of free fibula flap transfer of 83 years (range 80–92 years). All patients had been diagnosed with squamous cell carcinoma. Of the 17 patients, nine had systemic disease (Table 1). ASA status was ASA II in 13 patients and ASA III in four patients. Four patients had cardiovascular disease, representing the most prevalent comorbidity. The next most prevalent comorbidity was dementia, in three patients (data not shown). The median age of the 20 patients in the younger group at the time of free fibula flap transfer was 72 years (range 15–78 years). The most common comorbidity was cardiovascular disease, in eight patients (data not shown). There was a statistically significant difference in ASA status between the elderly and younger groups ($P = 0.017$). The elderly patients were mostly ASA II. None of the elderly patients were ASA I, whereas approximately a third of the younger patients were ASA I.

In terms of the HCL classification¹², the L-type mandible dissection was the most frequent in both groups. Excision of additional parts beyond the mandible and gingiva was performed for 35.3% of the patients in the elderly group and 50% in the younger group. Neck dissection was performed in all patients. In the elderly group, the duration of surgery was .517.0 (range 390.0–685.0) min, with a median estimated blood loss of 250.0 (range 85.0–890.0) ml. In the younger group, the median duration of surgery was 669.0 (range 379.0–908.0) min, with a median estimated blood loss of 342.5 (range 50.0–125.0) ml. There was a statistically significant difference in duration of surgery between the elderly and younger groups ($P = 0.001$), and elderly groups were shorter (Table 2).

In the elderly group, postoperative complications were seen in 76.5% of patients (13/17). Recipient site complications occurred in seven patients, but no donor site complications were seen. Systemic complications occurred in nine patients. The most common complications at recipient sites were haematoma and infections, such as local abscess. Two of the patients with recipient site complications required debridement or split-thickness skin grafting. No cases of complete free flap failure were seen. The most common systemic complication was delirium, which was seen in six patients. No major complications or perioperative deaths occurred.

All patients stayed in the ICU for 2 days. The median duration of postoperative hospitalization was 32.0 days. Sixteen patients were discharged directly

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