Case Report

PRIMARY INSERTION OF IMPLANTS IN THE ZYGOMATIC BONE FOLLOWING SUBTOTAL MAXILLECTOMY

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Abstract

A case of maxillary carcinoma treated with primary insertion of Brånemark implants into the zygomatic bone following subtotal maxillectomy is reported. This method has several advantages. First, early detection of postoperative recurrence is easier than with closing the flap. Second, when the implant is inserted into the midfacial region, zygomatic bone can be useful because of thickness. In addition, applying a maxillary prosthesis in the early stages avoids contracture of facial soft tissue. This primary reconstructive method is effective in cases of preserved zygoma after total maxillectomy.

Key words: Maxillary carcinoma—Brånemark implants—Zygomatic bone—Subtotal maxillectomy—Maxillary prosthesis

CASE REPORT

In October of 1996, a 62-year-old man visited us with the chief complaint of dull pain in the hard palate.

Clinical examination showed an ulcer on the middle of the hard palate, 16×14 mm in size. Swelling was recognized around the ulcer, making the total size 35×34 mm (Fig. 1). CT findings revealed that the tumor was centered in the hard palate at the level of the upper first molars and extended beyond the floors of the bilateral maxillary sinuses. Bone destruction was found in the nasal septum and the inner walls of the bilateral maxillary sinuses (Fig. 2). As shown in the schema, the tumor was situated below Öhngren’s plane and in planes I & II of Sebileau’s three planes (Infrastructure & Mesosstructure) (Fig. 3).

This histopathological diagnosis was moderately differentiated squamous cell carcinoma. There were no findings of the metastases in the clinical examinations by RI and other methods. T2, N0, M0, stage II was diagnosed finally.

Subtotal maxillectomy was performed in November of 1996. After frozen sectional examination confirmed that the margins of the resected maxilla were free of cancer, a total of 4 Brånemark implant fixtures measuring 3.75×9 mm were inserted in the body of the zygomatic bone on the left side (two fixtures) and in the pterygoid process on the right side (two fixtures) (Fig. 4).
Because lymph node metastases were suspected in the middle and anterior portions of the submandibular region on the right side in July of 1997, right functional radical neck dissection was performed in August. Metastases were recognized in two of 45 resected lymph nodes. After abutments measuring 10 mm were attached to the fixtures on August 27, a maxillofacial prosthesis was applied to reconstructed maxilla, and a mandibular denture was fabricated at same time. However, tumor recurrence was detected in the lateral wall of the maxillary sinus on the right side in December of 1997, so tumor resection was performed in January of 1998.

As chemotherapy, he received intramuscular administration of peplomycin (20 mg) as well as intraarterial administration of tegafur (200 mg × 5) and cisplatin (20 mg × 5) prior to the first surgery and intravenous administration of carboplatin (450 mg × 5) as well as oral administration of tegafur-uracil(600 mg/day) following the first surgery. There was no recurrence or marked change by July of 1999.

This maxillary prosthesis has a weight of 26.4 g and a total volume of 34 cm³ with some parts are hollow (Fig. 5). The superstructures of these implants are connected to each other by a bridge, and magnetic attachments were used to retain the prosthesis (Fig. 6). Bite force was 308 N by dental prescale® (Fujifilm Co., Japan) when wearing the prosthesis. A word test and a sentence test designed by the Japanese Journal of Logopedics and Phonetics were performed and evaluated by five doctors. Result of the word test without and with
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Maxillary prosthesis

Intraoral status wearing the prosthesis

Intraoral status without maxillary prosthesis
the prosthesis were 42% and 96%, respectively. Result of the sentence test were 48% and 92%. This maxillary prosthesis improved the aesthetics and facilitated the rehabilitation of oral functions such as mastication and phonation (Figs. 7, 8).

**DISCUSSION**

Various methods of primary reconstruction of maxillary defects have been advocated\(^{1,2,4,5}\). However, because the resected region is covered by a flap during such reconstructive surgery, early detection of local recurrence is difficult because of direct observation of the surgical wound is impossible. Since the osseointegrated implant was developed by Brånemark, wider excisional surgery have been applied to malignant tumors. We inserted Brånemark implants in the zygomatic bones as part of primary reconstruction following subtotal maxillectomy. Such application of implants in a maxillofacial prosthesis has a number of advantages. First of all, early detection of postoperative recurrence is easier. In the present case, local recurrence was detected 1 year and 2 months after surgery. Owing to the early detection, only limited excision was necessary. Second, when inserting implants in the midfacial region, the thick bone substance of the zygomatic bone can be easily used. In addition, because the maxillary prosthesis can be applied in the early stages of the postoperative period, not only satisfactory aesthetic rehabilitation is expected due to the limited scar contraction of the lips and buccal region, but functional rehabilitation can also be achieved in the early stages. However, this method is not indicated in cases where the zygomatic body can not be preserved after tumor resection or in cases with the risk of radiation osteonecrosis or osteomyelitis. Although the indications for this technique are somehow limited, this primary reconstructive method can be applied effectively in cases where the zygomatic body can be preserved after total maxillectomy.

**REFERENCES**


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