A 15-year-old female patient developed facial nerve paralysis following surgical excision of a right parotid mass at another center. The histopathologic diagnosis of the lesion was mucoepidermoid carcinoma. On admission to our clinic, she underwent extended total parotidectomy and functional neck dissection. For facial nerve reanimation, cervical plexus nerve grafting was performed for frontal and buccal branches, and ansa hypoglossi anastomosis for the marginal mandibular branch. Postoperative radiotherapy was administered. Facial nerve functions returned to normal in the postoperative sixth month (House-Brackmann grade II). No locoregional recurrence or distant metastasis occurred in the follow-up period.

Key Words: Facial paralysis/surgery; salivary gland neoplasms/pathology.

Facial nerve paralysis is an unfavorable complication of otolaryngologic surgical interventions. This well-defined complication cannot always be avoided since recognition and preservation of the nerve is not always possible. Therefore, the patient should be informed about the possibility of this condition before surgery. In this report, we presented a patient whose surgical treatment of a parotid mass at another center included resection of the frontal and buccal branches and marginal mandibular branch of the facial nerve. The patient underwent a subsequent operation for repair of facial nerve functions. We aimed to emphasize how much important the correct algorithm is for surgical approach to a parotid mass.

CASE REPORT

A 15-year-old female patient presented to our clinic with right facial paralysis. She underwent an operation 15 days before for a right parotid mass existing for a year. Facial paralysis developed shortly after surgery. The histopathologic diagnosis of the lesion was mucoepidermoid carcinoma. On admission to our clinic, she underwent extended total parotidectomy and functional neck dissection. For facial nerve reanimation, cervical plexus nerve grafting was performed for frontal and buccal branches, and ansa hypoglossi anastomosis for the marginal mandibular branch. Postoperative radiotherapy was administered. Facial nerve functions returned to normal in the postoperative sixth month (House-Brackmann grade II). No locoregional recurrence or distant metastasis occurred in the follow-up period.

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after the operation. Histopathologically, the mass excised from the right parotid region was mucoepidermoid carcinoma (MEC). There was an incision scar at the right mandibular angle in the parotid region where the sutures were removed (Fig. 1a) and ipsilateral total peripheral facial nerve paralysis was noted (Fig. 1b). Cervical examination revealed multiple lymph nodes of about 1 cm in the right internal jugular chain. Other findings of otorhinolaryngologic examination were normal. Magnetic resonance imaging of the parapharyngeal space and neck showed remnants of the prior operation in the parotid region and reactive lymph nodes in the neck. Histopathological re-evaluation showed high-grade MEC with intermediate cells (Fig. 2a, b). The patient underwent reoperation for residual tumor, neck dissection, and facial nerve repair. A classical S incision was extended to involve the skin scar (Fig. 3). The facial nerve trunk (Fig. 4a), frontal, buccal, and marginal mandibular branches were identified under operation microscope. To refresh the cut edges and for frozen section analysis, small resections of 1-2 mm in size were made from the nerve trunk and branches. The residual parotid tissue and its ensheathing fascia were dissected for radical parotidectomy. Frozen section analysis of neurogenic and glandular tissues was reported as negative. Skin incision was extended along the sternocleidomastoid muscle and functional neck dissection was completed. Lymph nodes smaller than 1 cm, noted in both jugular and accessory chains were dissected. The cervical plexus and ansa nervi hypoglossi were used for facial nerve repair. Distances between the facial nerve trunk and frontal and buccal branches were 2 cm and 2.5 cm, respectively, and two nerves of the cervical plexus (lesser occipital and anterior cervical) whose proximal root diameters were the same as the facial nerve were cut from an appropriate distance.
Proximal edges were sutured to the facial nerve trunk using two 8/0 monofilament nylon sutures for each, passing through the epineurium (Fig. 4b). The marginal mandibular branch was anastomosed to the descending branch of the hypoglossus (ansa hypoglossi) with two sutures. After nerve repair, skin incisions were sutured and operation was ended. Pathologic examination revealed no signs of tumoral existence in the skin, soft tissue, and lymph nodes. Postoperative radiotherapy of 5,000 cGy was administered due to the high-grade nature of the tumor. Routine monthly controls were carried out and facial nerve functions returned to normal in the postoperative sixth month (House-Brackmann grade II) (Fig. 5). No locoregional recurrences or distant metastasis were encountered in the follow-up period.

DISCUSSION

Mucoepidermoid carcinoma is a malignant tumor originating from stem cells of excretory canals of the salivary glands and it can differentiate into squamous and mucous cells.[1] It accounts for less than 10% of all salivary gland tumors, and about 30% of malignant salivary gland tumors. Parotid gland involvement is about 80% to 90%.[2] Differences in cellular heterogeneity, histologic composition, biologic behavior, and clinical course have led the investigators to classify the tumor into low-grade, intermediate, and high-grade groups.[3,4] In our case, MEC was histopathologically diagnosed as high-grade due to the presence of intermediate cells and vascular invasion (Fig. 2a, b), and the treatment was tailored accordingly.

![Fig. 3. S-incision including the skin scar.](image)

![Fig. 4. (a) Stump of the facial nerve trunk. (b) Grafts between the facial nerve trunk and frontal and buccal branches (arrows).](image)

Treatment of MEC varies depending on its grade, because the risk for locoregional recurrence and distant metastasis is high and survival is low in high-grade tumors. Cumulative five-year survival rates are 70% and 47% in low- and high-grade tumors, respectively.[5] Low-grade MEC can be treated with superficial or total parotidectomy preserving the facial nerve, whereas high-grade tumors may require total parotidectomy and surrounding tissue dissection, neck dissection, and postoperative radiotherapy. If preoperative facial functions are normal, it is widely accepted that the nerve should be preserved during surgical intervention. Preoperative facial weakness or paralysis suggest nerve infiltration, in which case facial nerve can be sacrificed.[6] Even though facial functions are normal, intraoperative finding of infiltration may also indicate a sacrificial intervention. In our case, although facial nerve functions were normal
on her first presentation, the facial nerve was included in surgical excision. Possibly this was an inadvertent action and was not a part of treatment because the incision was not similar to those used for parotid surgery, and was solely directed to the mass.

For treatment of high-grade MECs, parotidectomy is widely accepted, but the need for neck dissection remains controversial. Armstrong et al.[7] reported histopathologic metastasis in 14% of lymph-node positive cases, and in 12% of lymph-node negative cases in 474 patients with salivary gland carcinoma. They found that the most important factors affecting metastasis in salivary gland tumors were tumor diameter and grade of the tumor. The rates of occult metastasis were 20% and 4% for tumors having a diameter of greater and smaller than 4 cm, respectively. The corresponding figures were 49% and 7% for high- and low/intermediate-grade tumors, respectively. In our case, we had no idea about the original size of the primary tumor. Re-evaluation of the histopathological material showed intermediate cell groups and the tumor was reported as high grade. The presence of lymph nodes in the ipsilateral jugular chain necessitated a functional neck dissection in addition to radical parotidectomy. However, no evidence for metastasis was observed in 32 lymph nodes dissected.

When the facial nerve is intraoperatively injured, immediate repair should be performed. The length of nerve injury between the proximal and distal edges determines the type of repair, namely either an end-to-end anastomosis or reconstruction with a graft harvested from another nerve. If tumor invasion is suspected or ascertained, perineural invasion to the proximal or distal ends of the nerve should be investigated.[9] In our case, frozen section analysis showed no perineural invasion to the proximal or distal ends. Another issue for facial nerve reconstruction at this level is that the proximal diameter of the graft should be almost the same size as that of the facial nerve trunk.

In our case, we used a Y-shape nerve graft containing the lesser occipital and anterior cervical branches of the cervical plexus, whose proximal root diameters were the same as those of the frontal and buccal branches of the facial nerve. Considering the distance of the marginal mandibular nerve to the trunk, cross-anastomosis was thought to be more appropriate for its repair. The hypoglossal nerve, spinal accessory nerve, glossopharyngeal nerve, and phrenic nerve may be used for this purpose. Because of closely resembling diameter size, the ansa hypoglossi (descending branch of hypoglossus) was preferred. Thus, hypoglossal nerve functions were preserved and a practical re-innervation was established for the marginal mandibular nerve.

Reddy et al.[8] used an interposition graft in 12 patients and investigated the factors (age, gender, graft source, and radiotherapy) that affected the return of facial nerve functions after radical parotidectomy. They found that postoperative radiotherapy had no adverse effect and young patients had better return of facial nerve functions. Similar findings were reported by Brown et al.[9] who found no significant difference between irradiated and non-irradiated patients in terms of return of facial nerve function. In our case, despite postoperative radiotherapy of 5,000 cGy, facial nerve functions recovered to House-Brackmann grade II.

Like other head and neck masses, preoperative assessment of parotid tumors should be made appropriately and incisions directed to the mass per se have limited role in the treatment of these tumors. Parotid gland surgery may involve facial nerve dissection, so preoperative facial functions, intraoperative tumor-nerve relationship, and postoperative course should be considered.

Simultaneous and urgent repair of the facial nerve should be performed if tumoral or iatrogenic trauma has caused discontinuity of the facial nerve. Such a risk should be preoperatively shared with the patient.
REFERENCES


