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Case Report

Intraparotid Facial Nerve Schwannoma

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Intraparotid facial nerve schwannoma is a rare benign neoplasm. Due to its rarity, it is not usually a prioritized diagnosis before surgery and may therefore lead to an unintentional treatment error. In this article, we report a single case of intraparotid facial nerve schwannoma. We were able to make a diagnosis with frozen biopsy. A complete resection of the mass while preserving the facial nerve was performed. Herein we present our clinical experience with regards to the treatment process of intraparotid facial nerve schwannoma.

Keywords: Facial nerve / Parotid gland / Schwannoma

INTRODUCTION

Schwannoma is a benign and encapsulated neoplasm arising from the nerve sheath. In head and neck schwannoma, facial nerve (FN) involvement is less likely and intraparotid localization of FN schwannoma is also rare. Less than 100 cases of FN schwannomas have been reported yet and of these, only 9 percent of FN schwannoma cases were involving intraparotid localization [1,2].

In parotid region, most tumors are not of neurogenic origin. The incidence of FN neoplasm is about 0.2 to 1.5 percent among parotid region tumors [3]. Thus, it is difficult to consider neurogenically originated FN schwannoma as preoperative diagnosis in a patient with an asymptomatic parotid mass. FN schwannoma is often confused with pleomorphic adenoma because of their similar appearances on facial computed tomography (CT) scan. Due to its rarity and radiologic ambiguity, there is a good chance of misdiagnosis and malpractice resulting from unexpected FN injury during surgery.

Marchioni et al. [1] proposed a classification of intraparotid FN schwannoma. The determination of involved branches of the FN is important in order to make therapeutic decision and to predict postoperative FN function.

It is crucial to take FN schwannoma into account when a patient is presented with parotid mass. In this report, we present one case followed by a discussion about the proper management strategy.

CASE REPORT

A 59-year-old man was presented to our clinic with a mass on the right cheek. It first appeared 5 years ago. He visited our clinic complaining of tingling sensation when the mass was touched. He had no specific past medical history or traumatic event on his right cheek. The physical exam showed a 3×1.5 cm sized non-tender and partially mobile mass on the right parotid area. No sign of infection was noted. Preoperative facial CT scan revealed a not definitely demarcated, heterogeneous, intraparotid mass that the radiologist described as a pleomorphic adenoma (Fig. 1). During the operation, a well encapsulated mass was noted that was connected with a small stalk to the zygomatic branch of FN (Fig. 2). The mass did not react if stimulated with a nerve stimulator.

FN trunk and branches were preserved and the mass was excised without an injury to the adjacent soft tissue. The specimen

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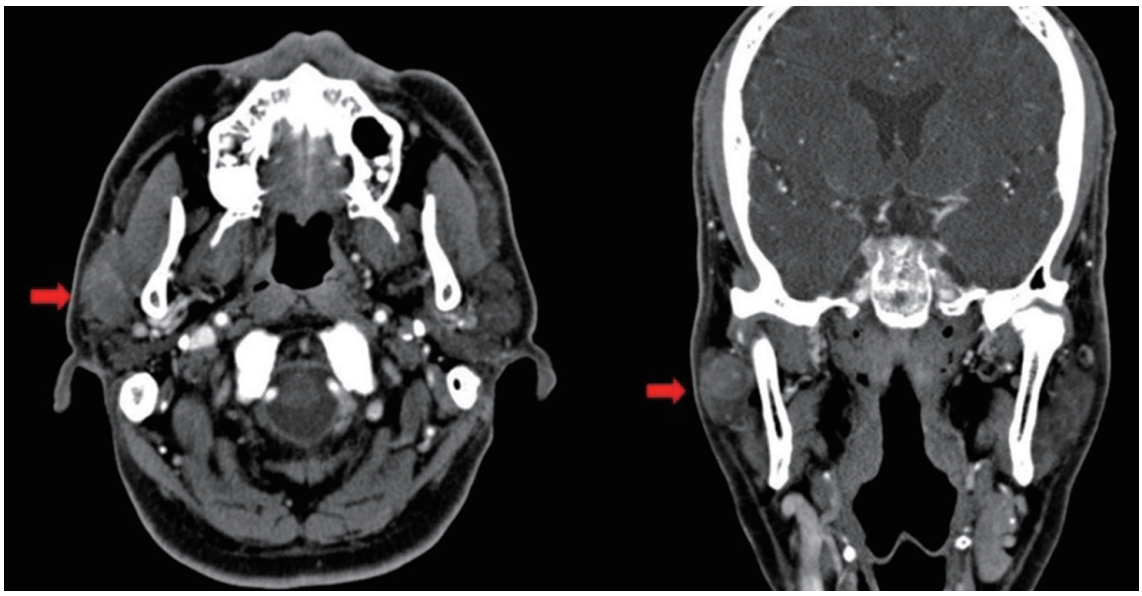

Fig. 1. Preoperative facial computed tomography scan axial view and coronal view. The imaging shows a 3×1.5 cm sized intraparotid mass on the right cheek (red arrows). Calcification or hemorrhage was not found.

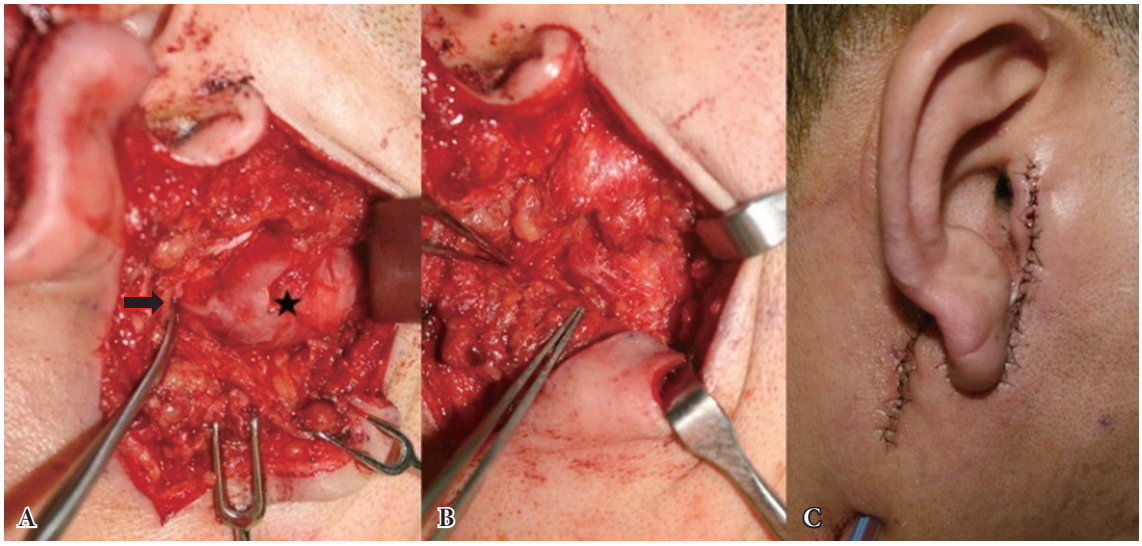

Fig. 2. Intraoperative photograph of surgical region. (A) An ovoid shaped tumor (star) arose from facial nerve with a small stalk (black arrow). (B) The tumor was removed without facial nerve injury. (C) Postoperative 1 day view.

was promptly sent to the pathology department for frozen biopsy. On the frozen section study, the mass was suggestive of schwannoma. An immediate postoperative FN function showed House-Brackmann grade I. The patient had no complications such as hematoma, wound dehiscence or infection. The definitive histological examination confirmed the previous intraoperative diagnosis of schwannoma that was made from frozen biopsy. On the pathology report, encapsulated spindle cell tumor showed short and slightly wavy nuclei and areas of hypercellular alternating hypocellular (Figs. 3, 4). Also, it was confirmed that the tumor cells are diffusely and strongly positive with S-100 protein immunohistchemical staining (Fig. 5). Follow-up visits to our out-patient clinic were done 2 weeks and 1 month after surgery. The patient recovered well and in good condition.

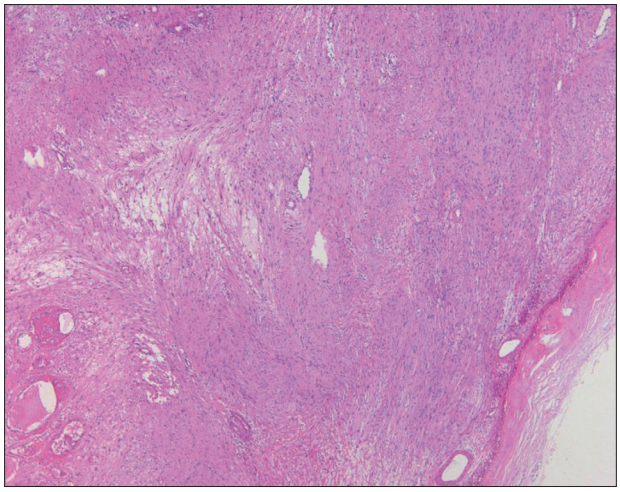

Fig. 3. H&E of frozen section of tumor (×12.5). Histological findings: encapsulated spindle cell tumor shows the areas of hypercellular alternating hypocellular.

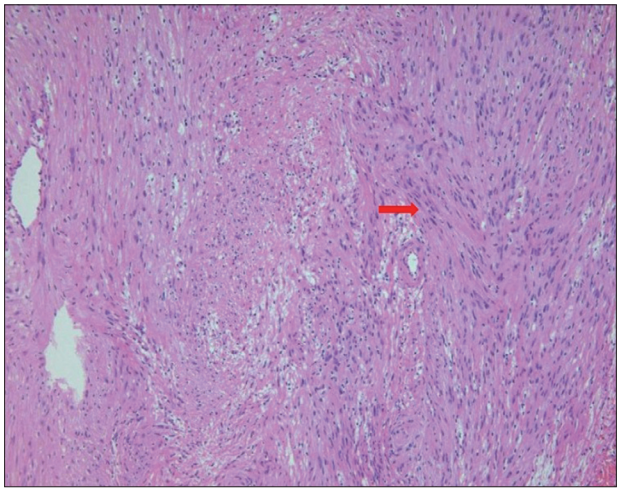

Fig. 4. H&E of frozen section of tumor (×100). Histological findings: tumor cells show short and wavy nuclei (red arrow).

DISCUSSION

The first report of intraparotid FN schwannoma was made by Ibarz in 1927. Since then, less than 100 cases of intraparotid FN schwannomas have been reported [2]. In Korea, Yu et al. [4] reported one case of intraparotid FN schwannoma and Lee et al. [5] retrospectively examined images and treatment outcomes of 15 cases from 2006 to 2011. Because of its rarity, FN schwannoma is not considered as a common preoperative diagnosis in a patient with asymptomatic parotid mass. Most intraparotid FN schwannomas grow slowly and are non-tender. Thus, these characteristics make the diagnosis of intraparotid FN schwannomas difficult, and they are often misdiagnosed as pleomorphic adenoma as the most common benign parotid tumor. No malignant transformation rate of intraparotid schwannoma was reported yet and an intraparotid mass with facial nerve palsy has the higher potential of malignancy than schwannoma [1]. In this case, a wide excision and a nerve graft should be performed.

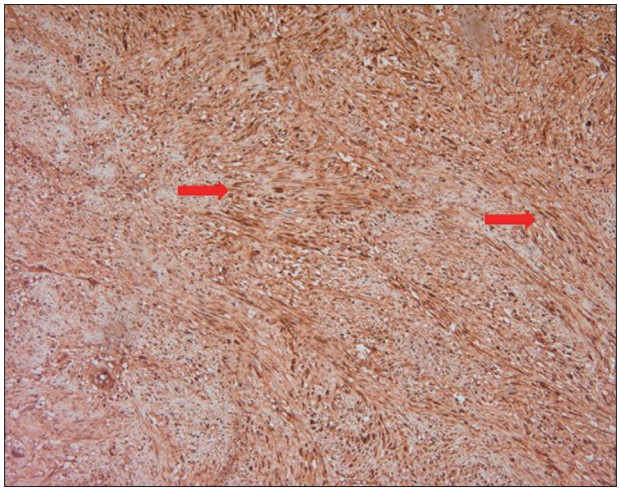

Fig. 5. S-100 staining of tumor section. Immunohistochemical study: tumor cells are diffusely and strongly positive with S-100 protein immunohistochemical stain. The brown stain in the nuclei means positive (red arrows).

A radiologic diagnosis of FN schwannoma is not conclusive. FN schwannoma is hardly distinguishable from other parotid neoplasms through CT scan, especially when compared with pleomorphic adenoma. Magnetic resonance imaging (MRI) could be useful to reveal the relationship between the facial nerve and its surrounding tissues. Some small FN schwannomas along the course of the facial nerve have been detected by MRI. However, MRI is not used in every parotid mass case and it is also difficult to diagnose the FN schwannoma with MRI only. In essence, there are no definitive radiological findings for intraparotid schwannomas [6].

Fine needle aspiration was used for diagnosis in many cases of parotid tumor. However, fine needle aspiration is unreliable in diagnosing an intraparotid FN schwannoma. Fine needle aspiration cytology may reveal spindle shaped cells with ill-defined cyto-

plasm, arranged in clusters (Verocay bodies). In most cases, results were inconclusive or suggestive of pleomorphic adenoma [7].

Therefore, the diagnosis of intraparotid FN schwannoma is often made intra-operatively or by a histological examination of the resected specimen. The FN schwannoma in our case was with a small stalk connected to the zygomatic branch of FN. The gross morphology of the intraparotid schwannomas is not distinguishable from other benign tumors. Electrical nerve stimulation may be helpful when a mobile parotid lump is subjected to a limited surgical procedure [8]. Also a frozen study of the lesion can be helpful to make the diagnosis. In our case, FN schwannoma was considered and diagnosed after frozen section study, not by radiological study. In some cases, biopsy has been reported to cause facial nerve palsy, but the histological confirmation is essential.

The management of an intraparotid FN schwannoma is still controversial. A conservative treatment is sometimes preferred in cases of intraparotid FN schwannoma without facial palsy due to the facial nerve injury. However, a huge mass by itself causes an aesthetic problem and can affect the FN function. Thus, an early surgical resection preserving FN function can be attempted.

According to Marchioni's classification, there are 4 types of intraparotid FN schwannoma [1]. In type A tumors, the facial nerve can be completely preserved and the tumor can be resectable. Other types of tumors need reconstructive treatment of the FN such as end-to-end anastomosis or nerve graft [1]. Furthermore, Alicandri-Ciufelli et al. [9] suggested that the preoperative FN function, localization and relation with FN should be considered as important factors of tumor resection. In our case, intraparotid FN schwannoma was connected to the FN with a small stalk and it can therefore be distinguished as type A. It was easily removed by cutting the stalk and dissecting adjacent tissues. Since the zygomatic branch of facial nerve has many collateral branches, it can maintain its function by compensation from other branches if one of its branches is injured.

With this report, we recommend that FN schwannoma should be considered in patients with parotid mass, especially when a preoperative radiologic study reveals the involvement of facial nerve. Intraoperatively, FN dissection should be made meticulously if possible and nerve stimulator may be helpful. Also a frozen study is recommended to confirm the diagnosis, as reported in this paper based on a literature review.

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