



# Intraparotid facial nerve schwannomas

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Schwannoma is a benign tumor rarely found in the head and neck and much less commonly found in the intraparotid facial nerve. It is a slow-growing encapsulated tumor originating from the Schwann cells or axonal nerve sheath. It can occur anywhere along the course of the facial nerve. Patients may present with symptoms of facial palsy, but the most common presenting symptom is an asymptomatic swelling. Diagnosis is usually difficult before surgical removal and histopathological examination. We report a rare case of intraparotid facial nerve schwannoma in a 57-year-old female who had sustained a mass of the right preauricular area for 3 years. She reported no pain or facial muscle weakness. Enhanced computed tomography findings revealed the impression of pleomorphic adenoma. However, intraoperative gross findings were not characteristic of pleomorphic adenoma, and a frozen biopsy was performed resulting in the impression of a nerve sheath tumor. We performed an extracapsular surgical excision without parotidectomy. Permanent histopathology and immunohistochemistry reports diagnosed the mass as schwannoma. There were no complications including facial palsy after surgery. No recurrence was found at 6 months after surgery.

**Keywords:** Facial nerve / Neurilemmoma / Parotid gland / Schwann cell tumor

Case Report

## INTRODUCTION

The parotid gland is a rare location for schwannoma, a benign, encapsulated tumor of neuroectodermal origin, to occur. Intraparotid schwannoma is usually based on the intraparotid segment of the facial nerve. Patients usually present with an asymptomatic slow-growing parotid mass without any distinctly different pathognomonic visual findings compared with most common benign tumors of the parotid gland, such as the pleomorphic adenoma [1,2]. Although the tumor originates from the facial nerve, facial nerve dysfunction, hemifacial paresis, or paralysis is present in only 20% of all patients. Therefore, it is very difficult to diagnose intraparotid facial nerve schwannoma

(FNS) based on preoperative evaluation. Fine needle aspiration cytology (FNAC) is inaccurate and still debatable, and it is difficult to distinguish between this entity and benign parotid gland tumors using imaging studies such as computed tomography (CT) and magnetic resonance imaging (MRI), especially pleomorphic adenomas [3,4]. We report a rare case of intraparotid FNS diagnosed by surgical excision and immunohistochemistry. Extracapsular excision without parotidectomy was successfully performed with identification of facial nerve branches adjacent to the mass. Postoperative facial palsy or other complications were not observed.

## CASE REPORT

A 57-year-old female patient presented with a 3-year history of a slow-growing firm mass over the right parotid gland area. It had increased progressively in size. Physical examination revealed a 3 × 3-cm-sized, non-tender, partially mobile mass. The

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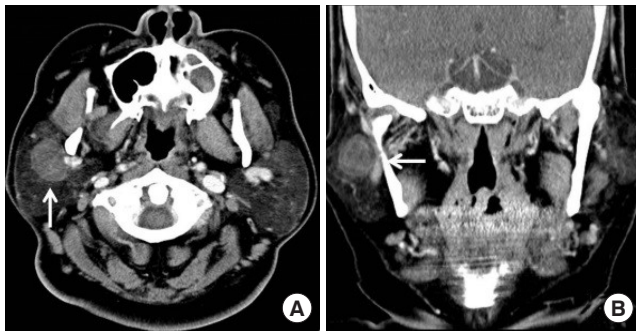
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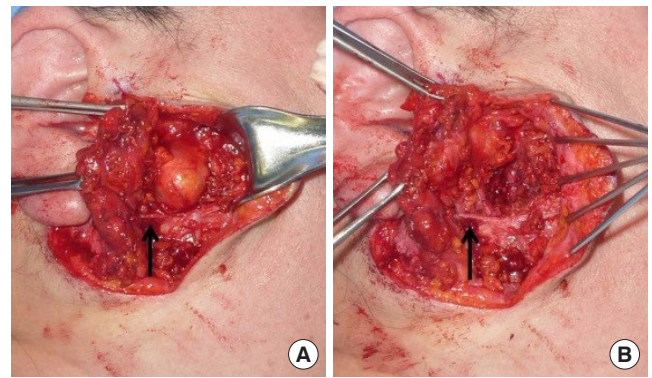
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patient did not complain of other symptoms, such as facial weakness or pain. There were no other underlying diseases other than diabetes and hypertension. CT images showed a 2.3×3.0-cm-sized well defined ovoid slightly enhancing mass at upper pole of the right parotid gland superficial lobe (Fig. 1). Surgical removal was planned under the impression of pleomorphic adenoma or Warthin's tumor. Intraoperatively, a cystic, well-encapsulated yellowish tumor was found in the superficial lobe of the parotid gland. The mass was adjacent to a nerve branch suspected to be the buccal branch of the facial nerve (Fig. 2A). We performed a frozen biopsy and obtained the results of a tumor of nerve sheath origin. Mass removal without parotidectomy was performed with routine precautions to preserve the facial nerve (Fig. 2B) and the parotid duct. The surrounding parotid gland tissue was grossly normal. His-

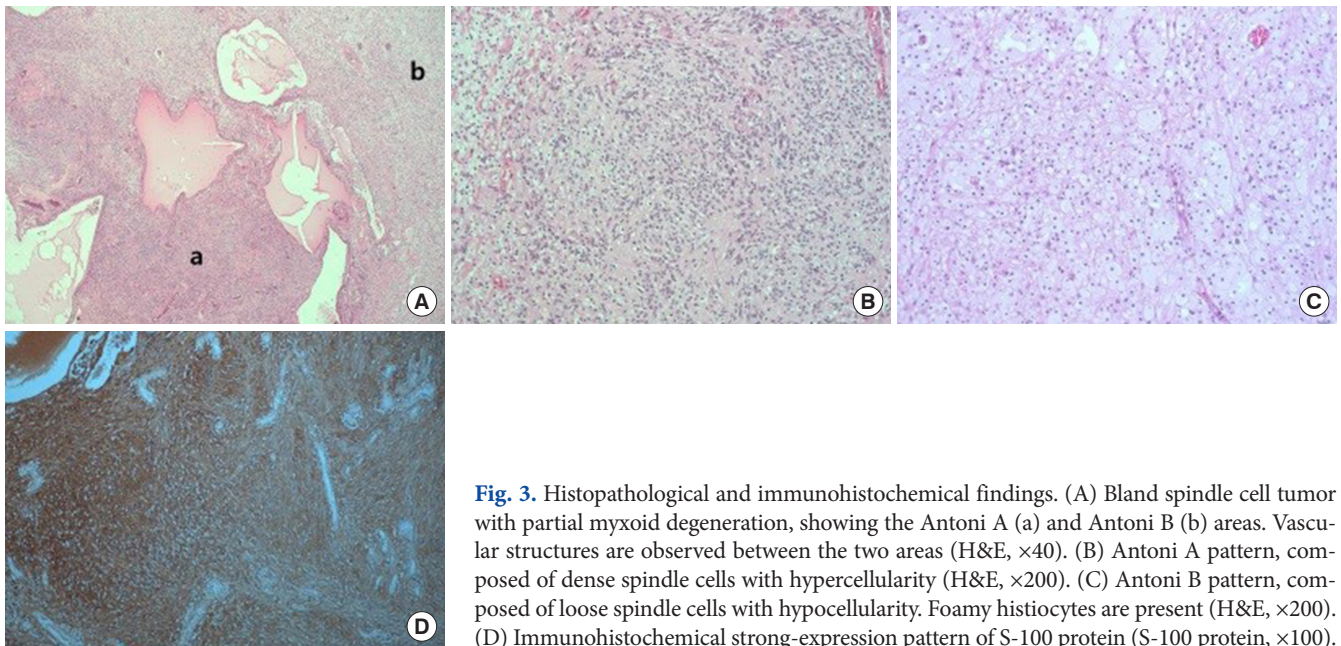
topathologically, routine hematoxylin and eosin stain showed spindle-type cells. Both Antoni A (hypercellularity) and B patterns (hypocellularity) were observed (Fig. 3A-C). On gross and histopathological findings, schwannoma was suspected. Additional immunohistochemical analysis, including S-100, Ki-67, actin, desmin, and epithelial membrane antigen were done. Expression of S-100 protein from the tumor cells showed strong positivity (Fig. 3D), confirming the diagnosis of schwannoma. All other markers showed negative findings. The patient did not show any signs of facial palsy postoperatively. There was no evidence of recurrence until her latest follow-up 6 months after surgery.



**Fig. 1.** Preoperative computed tomography (CT) scan. CT showed a 2.3×3.0-cm-sized well defined cystic slightly enhancing mass (arrows) within the right parotid gland superficial lobe. (A) Axial view. (B) Coronal view.



**Fig. 2.** Intraoperative clinical photograph. A yellowish cystic mass, measuring 2.3×2.1×1.5 cm in the right parotid gland superficial lobe. (A) The mass was adjacent to a nerve suspected to be a branch of the facial nerve. (B) The nerve branch of the buccal branch of the facial nerve (arrow) was identified from the mass and the mass was completely resected.



**Fig. 3.** Histopathological and immunohistochemical findings. (A) Bland spindle cell tumor with partial myxoid degeneration, showing the Antoni A (a) and Antoni B (b) areas. Vascular structures are observed between the two areas (H&E, ×40). (B) Antoni A pattern, composed of dense spindle cells with hypercellularity (H&E, ×200). (C) Antoni B pattern, composed of loose spindle cells with hypocellularity. Foamy histiocytes are present (H&E, ×200). (D) Immunohistochemical strong-expression pattern of S-100 protein (S-100 protein, ×100).

## DISCUSSION

Schwannomas, otherwise known as neurilemmomas and neurolemmas, are benign tumors that arise from the nerve sheath. These benign encapsulated tumors may be found in most areas of the body. When located in the head and neck area, most schwannomas involve the facial nerve [1,4]. FNS can originate from any site along the nerve, from the glial-Schwann cell transition site at the cerebellopontine angle to the terminal branches of the facial nerve [2,5]. Of the schwannomas originating from the facial nerve, only about 9% occur in the intraparotid area. Intraparotid FNS accounts for 0.2%–1.5% of all facial nerve tumors in the parotid gland [4]. Caughey et al. [6] reported a 38-year retrospective study of 3,722 patients diagnosed with schwannoma, in which they found only 29 cases associated with the facial nerve and eight cases involving the parotid region of the facial nerve.

FNSs are almost always slow-growing, well-defined tumors and most patients present with a painless swelling on the preauricular area [1,2]. Even in intraparotid FNSs, only 20% of patients present with symptoms [2,3]. Therefore, FNS is difficult to diagnose based on clinical findings. It is also difficult to distinguish from other benign parotid tumors by radiological examinations, such as CT and MRI. FNAC is also inaccurate and still debatable. Thus, definite diagnosis is only possible after surgical removal and evaluation of microscopic findings [1,7]. On macroscopic examination, schwannoma usually appears as a well-defined cystic mass with a smooth surface and variety of colors (yellowish, reddish, pinkish, whitish-grey, and dark purple). In some cases, the mass is lobulated. Histopathologically, FNS is composed of spindle cells and can reveal cell growth in two different patterns. In the Antoni A pattern, elongated cells and cytoplasmic processes are arranged in hypercellular areas with little stromal matrix and Verocay bodies (acellular cores between nuclear palisading). The Antoni B pattern is composed of loose elongated cells with lower cellularity [2-4].

Basic treatment consists of excision of the tumor. However, depending on its type, facial nerve resection may be inevitable. Marchioni et al. [4] classified the intraparotid FNSs into four types through anatomical and pathological evaluation. This was proposed in order to aid the clinician in evaluating therapeutic and prognostic factors. Type A tumors are those resectable without damaging the facial nerve. This type of tumor almost never causes a preoperative facial paralysis. Type B tumors require a partial sacrifice of the facial nerve, involving a peripheral branch or distal division. Immediate reconstruction using either a nerve graft or neurolysis is usually performed, and outcome is more dependent on the branch affected than the type of reconstruction. Type C tumors require resection of the

main trunk of the facial nerve, and type D tumors require sacrifice of the main trunk and at least one of the temporo-facial or cervico-facial branches [4,8].

Although there is some controversy on the exact boundary between choosing conservative treatment and surgical excision, the surgeon must weigh the detrimental functional loss that facial palsy will elicit against the risk of leaving the schwannoma as it is. We would argue that in cases which there are no symptoms, and where cytological or radiologic evidence points at high suspicion of schwannoma, short term monitoring may be a possibility. However, because definitive diagnosis is made via surgical excision, it would be much more realistic to converse with the patient about the possibility of facial nerve sacrifice and subsequent reconstruction. If the patient is unwilling to undergo such resection, the option of partial resection, intraoperative diagnosis to rule out malignancy, and conservative care may be taken. The limitation of this method is that frozen intraoperative biopsies are not final diagnoses, permanent studies with the aid of immunohistochemistry may change the impression, and lead to additional surgery. On the other hand, a false positive frozen biopsy indicating malignancy may lead to unnecessary radical surgery.

Therefore, we would suggest that after an in-depth discussion with the patient, total excision when preservation of the nerve should be done when possible, and in cases where dissection from the nerve is difficult, an subtotal or partial excision should be done, with radiological follow-ups at annual intervals. Intraparotid FNSs are rare, and clinically impossible to distinguish from other benign parotid gland tumors. Therefore, a high degree of suspicion should be incorporated when encountering an asymptomatic mass of the parotid gland. Patients should be informed of the possibility of a schwannoma, and the rare but difficult consequences of facial nerve resection.

## NOTES

### Conflict of interest

No potential conflict of interest relevant to this article was reported.

### Ethical approval

The study was performed in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained.

### Patient consent

The patient provided written informed consent for the publication and the use of her images.

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