Clinical Case Report

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Granular cell tumor of the trunk of the facial nerve
A case report

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Abstract

Rationale: Granular cell tumor (GCT) is a relatively uncommon, usually benign lesion that often presents as a solitary, painless cutaneous or submucosal nodule. GCTs of the head and neck are not uncommon; however, involvement of the trunk of the facial nerve is rare.

Patient concerns: A 55-year-old woman presented a lesion at the posterior border of the left parotid gland. Doppler ultrasound revealed a hypoechoic mass and magnetic resonance imaging disclosed an irregularly shaped lesion with unsharp borders in the posterior aspect of the left parotid gland that was hyperintense on T2-weighted images and enhancing with contrast on T1-weighted images. The remainder of the parotid gland was normal.

Diagnosis: Following excision of the mass, diagnosis of a GCT was established and confirmed by immunohistochemistry.

Interventions: The patient underwent surgical excision of the lesion.

Outcomes: The patient is currently asymptomatic and without recurrence after 10 months follow-up.

Lessons: GCT involvement of the trunk of the facial nerve is rare. Immunohistochemical staining is helpful for its diagnosis.

Abbreviations: GCT = granular cell tumor, MRI = magnetic resonance imaging.

Keywords: facial nerve, granular cell tumor, surgery

1. Introduction

Granular cell tumor (GCT) is a relatively uncommon, predominantly benign lesion that usually presents as a solitary, painless cutaneous or submucosal nodule. Abrikossoff first described it in 1926.[1] Most GCTs occur in the head and neck region. Approximately 50% occur in the tongue; other sites include the oral cavity, larynx, bronchus, gastrointestinal tract, and breast.[2–5] It has been suggested that it is of muscle or neural origin.[6] The presence of S-100 protein suggests a neurogenic origin. GCTs of the facial nerve are particularly rare.

We report the case of a 55-year-old woman presenting isolated postauricular GCT at the trunk of the facial nerve, which supports the idea of a neurogenic origin.

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2. Case report

This case report was approved by the Ethics Committee of the First Affiliated Hospital, College of Medicine, Zhe Jiang University (approval no. 2017517). Written informed consent was obtained from the patient for publication of this case report and accompanying images.

A 55-year-old woman was referred to our outpatient clinic with a 4-year history of a firm, painless mass at the posterior border of the left parotid gland. Facial nerve function was normal, and the tumor could easily be palpated as a solid mass with an asperous surface between the parotid gland and the sternocleidomastoid muscle. On Doppler ultrasound, a $24 \times 27 \times 29$ mm, irregularly-shaped, low echo-level and hypoechoic mass with unsharp margins. Blood flow signal in the mass was observed (Fig. 1). The mass was located in the posterior border of the left parotid gland; the parotid gland was normal.

Magnetic resonance imaging (MRI) showed the lesion in the posterior aspect of the left parotid gland. The lesion was hyperintense on T2-weighted images (T2WI) (Fig. 2) and hypointense on T1-weighted images (T1WI). It underwent enhancement with contrast administration on T1WI (Fig. 3).

Surgical removal was recommended. Using a "Y" incision, the tumor was located at the posterior edge of the deep lobe of parotid gland, which rooted in the trunk of facial nerve and adjoining foramina stylomastoideum. Under the operating microscope, the trunk and branches of the facial nerve were identified, and a firm mass was dissected out from between the parotid gland and the sternocleidomastoid muscle. Nerve transplantation was needed if the nerve was accidentally sacrificed. Postoperatively, the patient's facial nerve function was intact.

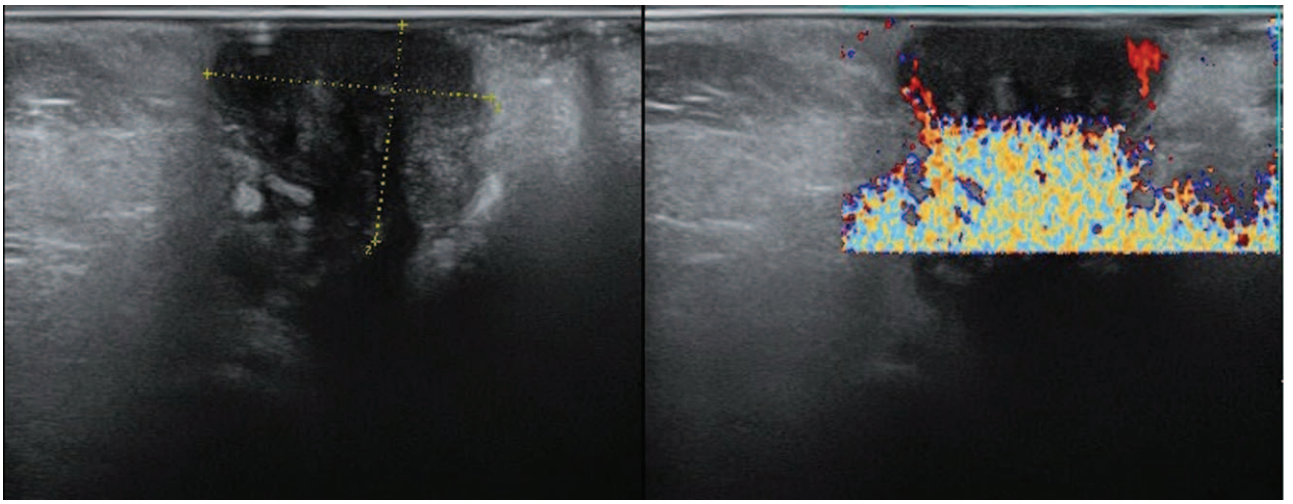

Figure 1. Doppler ultrasound showing a 24 × 27 × 29 mm, irregular shape, unclear boundary and low echo-level mass. The mass lied in the posterior border of the left parotid gland and the parotid gland was normal.

Histological examination of the resected mass revealed an unencapsulated, epithelioid tumor, with infiltration of a markedly fibrous stroma as well as of the resected striated muscle tissue. The tumor cells were quite uniformly shaped, with round-to-oval nuclei. No mitoses were observed. The tumor cells borders were overall rather poorly defined, and there was abundant cytoplasm containing fine granules that appeared eosinophilic with standard haematoxylin and eosin staining (Fig. 4).

Additional immunohistochemical staining revealed strong positivity for S-100 (Fig. 5) and negative staining for CD117 and desmin. Staining for Ki-67 (a nuclear protein associated with cellular proliferation) showed a low proliferation index of approximately 2%. Histological findings indicated the classic histomorphology of a GCT, confirmed by immunohistochemical analysis.

The patient is currently asymptomatic and without recurrence after a 10-month follow-up.

3. Discussion

Benign GCTs of the head and neck region usually growth extremely slowly, to a size rarely >3 cm. Patients are usually referred to outpatient facilities with pain, discolouration of the

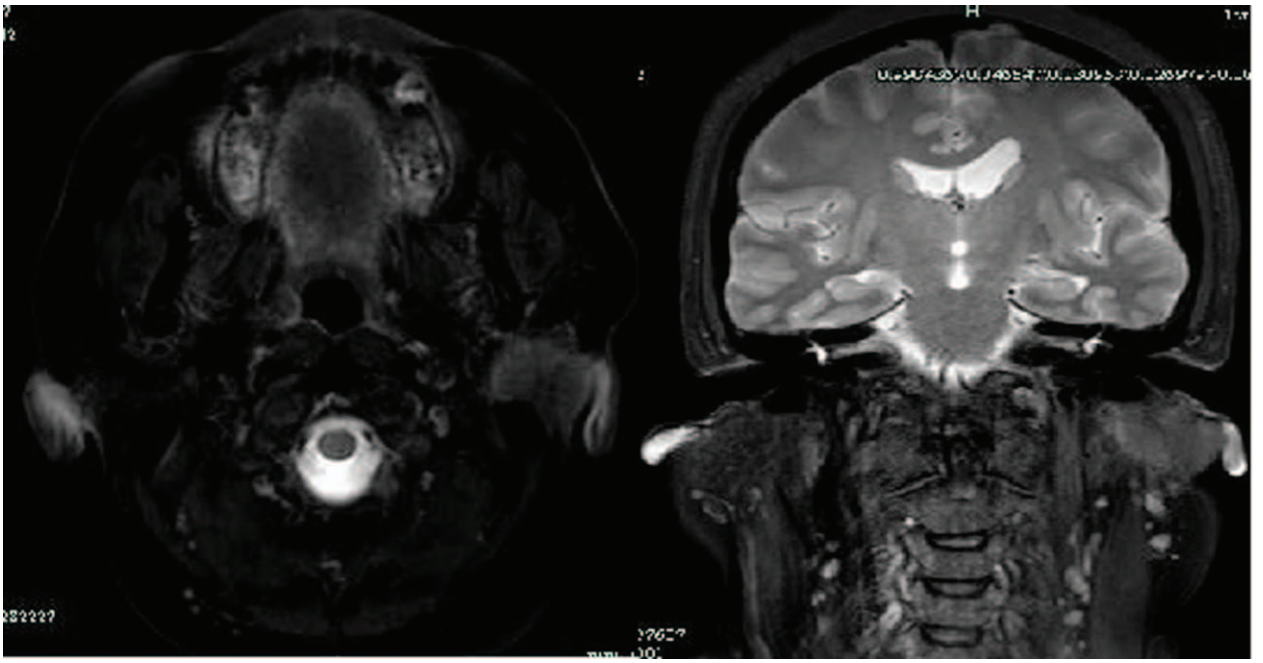

Figure 2. MRI scan showing the lesion lie in posterior border of the left parotid gland. The lesion showing hyperintensity on T2-weighted images. MRI = magnetic resonance imaging.

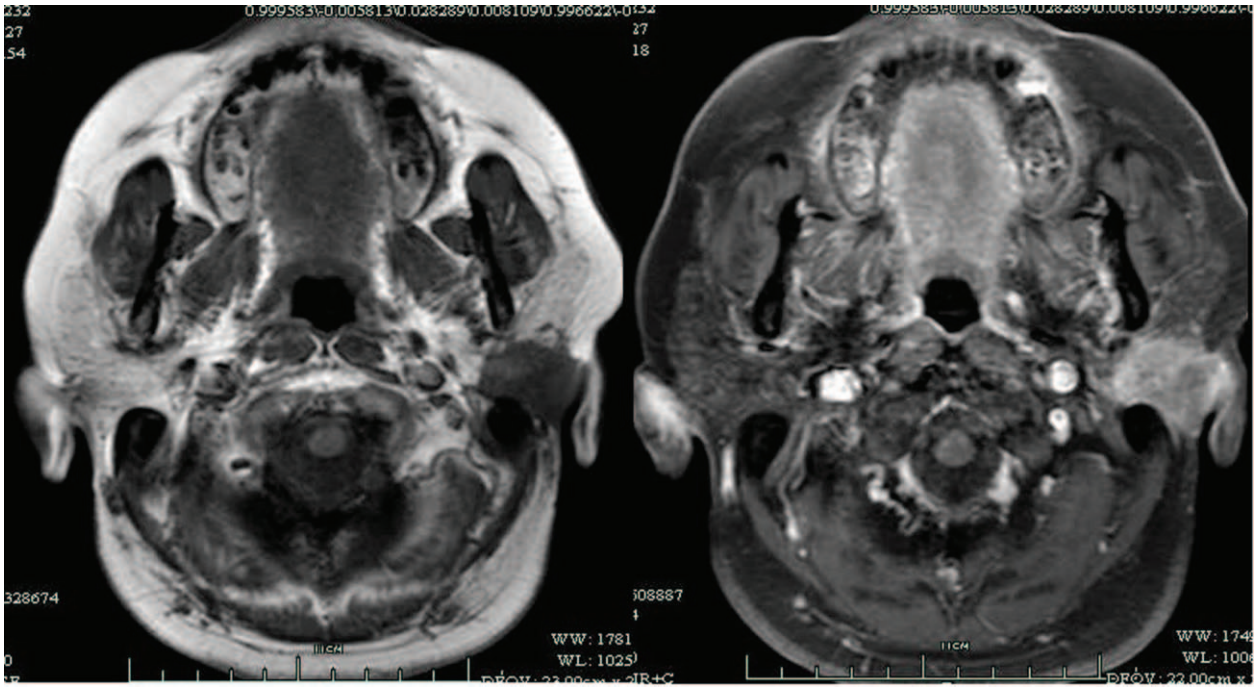

Figure 3. The lesion showing hypointense on T1-weighted images, that becomes hyperintensity on T1-weighted enhanced images.

skin, or facial paresis if the lesion involves the facial nerve. In the present case, the patient presented a lesion at the posterior border of the left parotid gland, which is painless proptosis and slowly progressive.

Preoperative assessment is difficult for available diagnosis. In the present case, Doppler ultrasound suggested an irregular shape, unclear boundaries, low echo-level mass, and blood flow signal of mass was observed. The mass was situated at the posterior border of the left parotid gland; the parotid gland itself was normal. On MRI, the lesion is usually in hyposignal on T1 and hypersignal on T2-weighted sequences, enhanced by contrast medium.[7] In the present case, it showed hyperintensity on T2WI and hypointensity on T1WI, enhancing with contrast administration.

The histological origin of GCT has long been debated. Some studies suggest it derives from muscle cells, but a neural origin has been supported by others. Electron Microscopy and the presence of immunoenzymatic reactions with neurogenic markers (S100 protein and NSE), however, argue for a Schwann cell origin.[8] Muscle tissue markers (smooth-muscle actin or desmin) are negative.[2] In the present case, S-100 protein was strongly positive, and desmin was negative. The location in the present case supports a neurogenic origin.

The distinction of benign or malignant of GCT is done through histopathological grounds. Main include Necrosis,

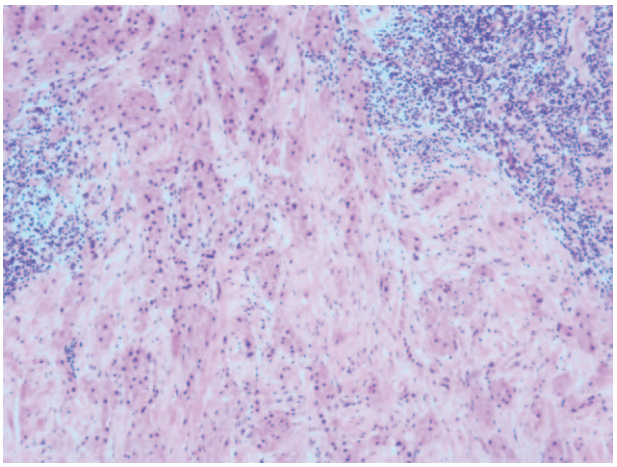

Figure 4. The resection specimen showing closely packed large cells with indistinct borders and granular cytoplasm and bland nuclei. (H and E stain, 50×).

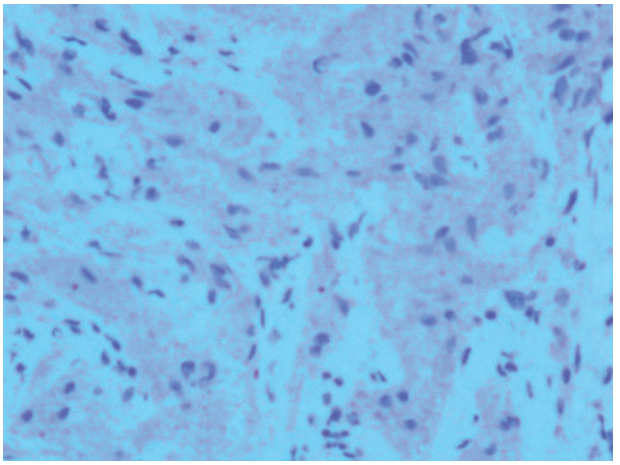

Figure 5. Photomicrograph showing granular cell tumour cells staining positively for S-100 (×200).

nuclei spindling, vesicular nuclei with large nucleoli, increased mitotic activity (>2 mitoses/10 HPF at 200×), high nuclear to cytoplasmic ratio and nuclear pleomorphism.[9] In the present case, the tumor cells showed quite uniformly-shaped, round-to-oval nuclei. No mitoses were observed. Staining for Ki-67 showed a low proliferation index of approximately 2%, so benign GCT was confirmed.

In all GCTs (malign/benign), sufficient local excision is effective for both diagnosis and treatment. Although this is not always possible because of lacking a surrounding capsule or proximity to structures such as nerves or vessels, surgical excision with a safe and clean margin is the treatment of choice for this tumor.[10,11]

Recurrence may be exceptional if resection is integrated. And cases of lymphatic metastasis or distant metastasis have been reported.[12] So, long-term followup is necessary for malignant GCT.

In a conclusion, GCT involvement of the trunk of the facial nerve is a rare entity. Immunohistochemical staining is helpful for its diagnosis.

Author contributions

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Supervision: Chen Haihong.
Validation: Qiang Qiyong.
Visualization: Chai Liang.
Writing – review & editing: Qiang Qiyong, Wang Qinying, Chen Haihong.

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