

Myopericytoma Involving the Parotid Gland as Depicted on Multidetector CT

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Myopericytoma is a newly proposed subgroup of perivascular tumors in the World Health Organization classification of soft tissue tumors. In this study, we report a case of a benign myopericytoma with detailed multidetector CT (MDCT) findings in the parotid gland, a location that has not been described for this type of tumor previously. The clinical presentation, imaging features, histopathological and immunohistochemical findings, and the differential diagnosis with other tumors in the parotid gland are described and reviewed.

Index terms:
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Myopericytoma is an uncommon soft-tissue neoplasm characterized by a perivascular proliferation of myoid differentiated pericytic cells (1). The tumor generally arises within the subcutaneous tissue of the extremities in middle-aged adults (2). Only a small number of cases of myopericytoma have been reported in the clinical literature. In this report, we illustrate the CT features of a case of a myopericytoma of the parotid gland. To the best of our knowledge, this is the first reported case of this rare tumor that arose in a rare location of the head and neck.

CASE REPORT

A 41-year-old woman presented with a three-year history of a painless mass in the region of the right parotid gland. A physical examination revealed a non-tender, firm and slightly mobile mass without clear borders that was palpable in the right parotid region. The overlying skin was indurated and warm. A clinical examination of the neck revealed no lymphadenopathy. Facial nerve function of the patient was normal on both sides.

CT of the maxillofacial region was performed using a 16-slice multidetector CT (MDCT) scanner (Sensation 16, Siemens Medical Systems, Erlangen, Germany) with unenhanced and enhanced scans. CT scanning was performed using parameters of 120 kV, 200 mAs and 5-mm collimation. An automatic injector was used to inject 90 mL of Iopamiro into the antecubital vein at a rate of 3 mL/s. An unenhanced CT image demonstrated the presence of a 5-cm round mass that was heterogeneous with central lower density and showed a poorly defined margin without calcification or invasion of the ambient structures in the superficial lobe of the right parotid gland (Fig. 1A). After intravenous injection of contrast material, the mass demonstrated heterogeneous attenuation with peripheral enhancement and central irregular non-enhancement. At the periparotid areas, multiple, smooth margins and well-defined nodules with similar CT features were demonstrated in the subcutaneous fat of the right cheek and parapharyngeal spaces (Fig. 1B). No evidence of an abnormality was found by the use

Myopericytoma Involving Parotid Gland

of chest radiograph and abdominal ultrasonography.

Surgical excision of the total right parotid gland and the nodules at the periparotid areas were performed. All facial nerve branches were preserved. The gross appearance of the resected specimen for the large mass showed a tan-colored, lobulated and solid tumor that measured $5.6 \times 5.5 \times 3$ cm (Fig. 1C). A histopathological examination of the mass showed many thin-walled branching vessels surrounded by proliferative, relatively monomorphic oval-to-spindle shaped myoid cells in the peripheral area, but hyaline degeneration in the central area had no vessels (Fig. 1D, E). There were not malignant features such as nuclear anaplasia, increased mitoses and infiltrative growth. Immunohistochemical staining was positive for smooth muscle actin (SMA) (Fig. 1F), but staining was negative for CD34 (cluster of differentiation 34) and desmin. Based on these findings, this tumor was diagnosed as a benign myopericytoma that arose from the parotid gland. A histopathological examination of the periparotid nodules showed increased folliculus lymphaticus and proliferative lymphocytes that did not contain tumor cells, which indicated the presence of reactive lymphadenopathies.

The patient was alive without any discomfort as examined during follow-up at nine months after surgical excision of the mass. A follow-up CT examination performed at nine months showed no evidence of any residual or recurrent tumor in the right parotid gland region.

DISCUSSION

Myopericytoma is a rare soft-tissue neoplasm with perivascular differentiation of myoid cells. The term was first proposed in 1996 by Requena et al. (4) and was adopted in 1998 by McMennamin (3) to describe a spectrum of tumors with striking concentric perivascular proliferation of spindle cells. Histological findings of myopericytoma are characterized by the presence of round or oval-shaped cells with eosinophilic cytoplasm arranged circumferentially around vascular lumina in a multilayered pattern. Immunohistochemically, the tumor cells express positive reactivity for SMA and muscle-specific actin. Myopericytomas are usually benign. However, malignant features such as necrosis, scattered pleomorphic tumors and undifferentiated round-to-oval cells with local recurrences and metastases have been also reported (1).

A benign myopericytoma can occur over a wide age range from 10 to 87 years, with middle-aged male patient predominance (2, 5). Benign myopericytomas are often found in the dermis, subcutaneous tissue of the distal extremities (hand, foot, ankle and leg) or neck (2). Infrequently, tumors occur in the spine, intracranial cavity, nose and nasal cavity, tongue and intravascular sites (6–10). There are no relevant reports regarding a tumor involving the parotid gland. A myopericytoma may be single or may have multiple slow-growing nodules. The lesions can exist for several years with or without pain, and patients may have a succeeding appearance or impairment

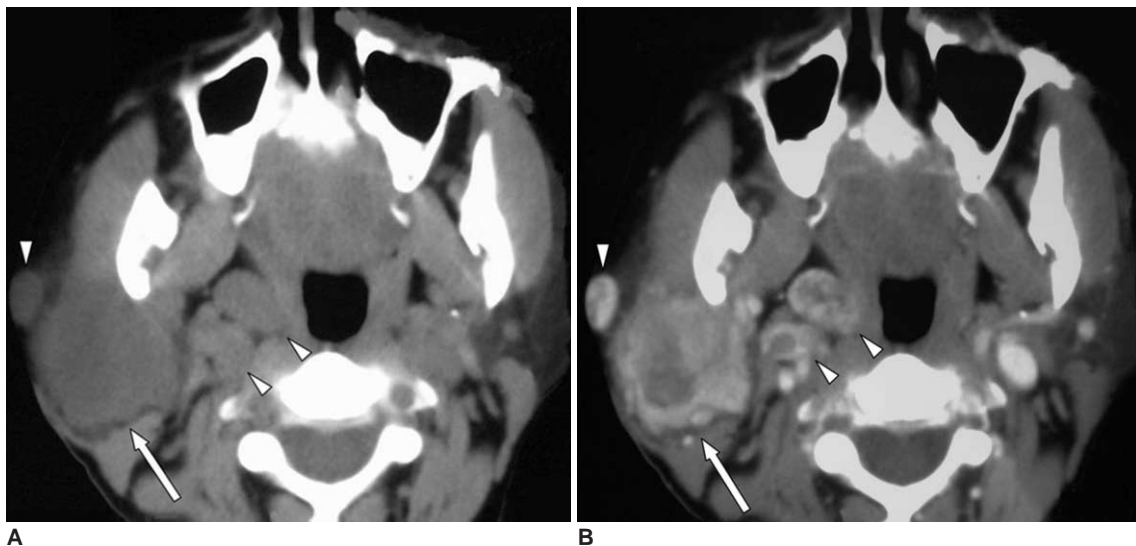


Fig. 1. Myopericytoma in parotid gland in 41-year-old woman.

A. Unenhanced CT scan shows 5-cm round mass with lower central density and poorly defined margin in superficial lobe of right parotid gland (white arrow). Also note enlarged lymph nodes (arrowheads).

B. Contrast-enhanced CT scan shows peripheral enhancement (white arrow) and irregular central non-enhanced attenuation of mass. Multiple reactive lymph nodes with similar CT features are also demonstrated in subcutaneous fat of right cheek and parapharyngeal spaces (arrowheads).

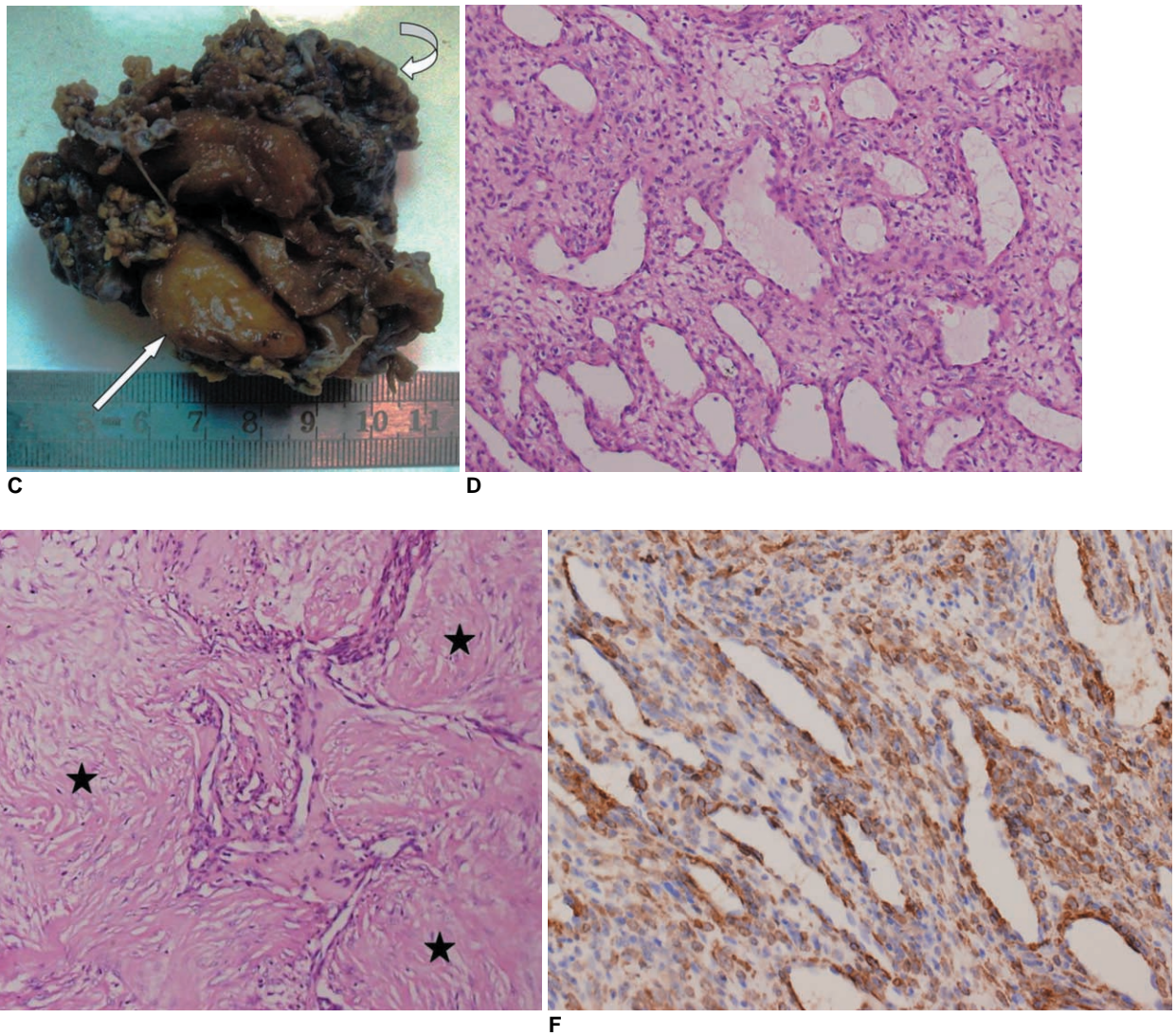


Fig. 1. Myopericytoma in parotid gland in 41-year-old woman.

C. Resected specimen contains encapsulated, tan-colored tumor mass (straight arrow) surrounded by parotid glandular tissue (curved arrow).

D, E. Photomicrograph of histology specimen shows numerous thin-walled vessels surrounded concentrically by proliferative spindle-shaped to oval-shaped myoid tumor cells in peripheral zone, as well as hyaline degeneration (**E** in black asterisks) in central zone (Hematoxylin & Eosin staining, original magnification, $\times 200$).

F. Immunohistochemical staining shows positive reactivity for smooth muscle actin in tumor cells smooth muscle actin marker (original magnification, $\times 400$).

caused by tumors. Patients with benign myopericytomas are usually treated with surgical complete excision. Follow-up shows a low incidence of local recurrence (2); the prognosis of this entity is good. A malignant myopericytoma is extremely rare, often with local recurrence and distant metastases in other organs or extensive metastases (1).

A previous CT examination is rarely performed as this type of tumor usually occurs in a superficial region. Harish et al. (11) reported that a case of myopericytoma that occurred in Kager's fat pad showed a heterogeneous signal with a small hyperintense focus as seen on a T1-weighted

image. After intravenous administration of gadolinium, the majority of lesions showed intense enhancement except for small hyperintense foci seen on unenhanced images, which correspond to a surgical finding of hemorrhage. For the present case, the peripheral hypervascular tissue had enhancement that resulted from the sufficient blood supply, whereas the central area within the mass showed no enhancement that presumably resulted from hyaline degenerated tissue without a blood supply.

The CT features of heterogeneous density, peripheral contrast enhancement and unsmoothed margins are nonspecific for a myopericytoma. The differential diagnosis

Myopericytoma Involving Parotid Gland

should include some common and rare tumors in the parotid gland, which have similar imaging manifestations. Hemangiomas typically show progressive enhancement as seen on dynamic contrast-enhanced CT images and occasionally punctuated calcifications.

Hemangiopericytomas are usually manifested as well-shaped soft tissue masses with homogeneous density or signal intensity, as well as strong and homogeneous enhancement as seen on CT or MRI. However, necrosis, hemorrhage or focal calcifications are uncommon (12, 13). For a mass in Kimura's disease, T1- and T2-weighted imaging usually shows a poorly defined outline, a heterogeneous internal structure (ranging from isointensity to hyperintensity) and varying degrees of enhancement. However, there are no characteristic findings on CT except for the presence of a solid mass (14). Solitary fibrous tumors are mostly well-defined and seen as isointense on T1-weighted images, hyperintense as seen on T2-weighted images and hypodense as seen on unenhanced CT images as compared to the muscle, with intense heterogeneously enhancement seen on CT and MRI (15, 16). Pleomorphic adenomas and Warthin tumors are often well-defined homogeneous masses, infrequently seen with cyst degeneration or necrosis. On a multi-phase enhanced CT scan, pleomorphic adenomas usually show increased enhancement on all phases. In contrast, Warthin tumors show peak enhancement at 30 seconds and rapid reduction of enhancement on delayed phases. However, malignant tumors in the parotid gland show peak enhancement at 90 seconds (17, 18). These relatively specific features demonstrated by CT and MR imaging may be useful in the differential diagnosis of parotid gland tumors.

In conclusion, we report here the first documented case of a myopericytoma involving the parotid gland, which presented with heterogeneous density, peripheral contrast enhancement and unsmoothed margins as seen on CT images. Although the imaging features are nonspecific and the diagnosis is still based on a pathological examination, CT imaging is often required to demonstrate better the margin and extent of the tumor.

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