

Rare Case of Undifferentiated Pleomorphic Sarcoma of the Right Parotid Gland Correlatively Demonstrated by ¹⁸F Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography and Contrast-Enhanced Magnetic Resonance Imaging

Abstract

Malignant fibrous histiocytoma (MFH)/undifferentiated pleomorphic sarcoma (UPS) is an uncommon malignancy in the head-and-neck region. UPS is a malignant neoplasm of uncertain origin that arises both in soft tissue and bone. We bring forth a 65-year-old female who presented with an ulceroproliferative growth in the right upper neck. Contrast-enhanced magnetic resonance imaging and ¹⁸F-fluorodeoxyglucose positron emission tomography-computed tomography revealed a large exophytic, solid-cystic growth in the right parotid region with locoregional extension and few ipsilateral lymph nodes. Biopsy of the lesion revealed UPS, which was previously called MFH. She was considered for chemoradiotherapy. Correlative imaging helps in adequate staging of large tumors with assessment of response to chemoradiotherapy.

Keywords: Fluorodeoxyglucose positron emission tomography-computed tomography in undifferentiated pleomorphic sarcoma, magnetic resonance imaging in pleomorphic sarcoma, positron emission tomography-computed tomography in malignant fibrous histiocytoma, positron emission tomography-computed tomography in parotid sarcoma, positron emission tomography-computed tomography in parotid tumors

A 65-year-old female presented with a history of a slow-growing ulceroproliferative lesion in the upper part of the right side of the neck, which was painful with restricted mouth opening.

Local examination revealed a baseball-sized mass, which was tender and had ulcerative changes with restricted mouth opening. Otolaryngologic examination and cranial nerve examinations revealed no focal defect. She underwent contrast-enhanced magnetic resonance imaging (CE-MRI) and ¹⁸F-fluorodeoxyglucose positron emission tomography-computed tomography (¹⁸F-FDG PET-CT) on the same day for local extension and distant metastatic evaluation. MRI revealed a large exophytic T2 hyperintense, enhancing solid-cystic lesion epicentered in the right parotid space with involvement of the superficial and deep lobes of the right parotid gland, extending into the right masticator space and parapharyngeal space and abutting the cortex of the

mandible [Figure 1]. ¹⁸F-FDG PET-CT revealed that a heterogeneously tracer-avid tumor in the right parotid space with local extension as described in MRI with no distant metastasis was seen [Figure 2]. Biopsy of the tumor led to the diagnosis of undifferentiated pleomorphic sarcoma (UPS). In view of the elderly age of the patient and multicompartmental extension of the tumor, surgery was deferred and concurrent chemoradiotherapy was considered. Vincristine- and ifosfamide-based chemotherapy was given. The patient succumbed after 1 month due to cardiovascular event.

Malignant fibrous histiocytoma (MFH) is an uncommon malignancy in the head-and-neck region.^[1] MFH is a malignant neoplasm of uncertain origin that arises both in soft tissue and bone.^[2] In 2002, the World Health Organization renamed MFH as UPS not otherwise specified.^[3] UPS commonly occurs in the metaphysis of long bones of extremities, trunk, and retroperitoneum.^[4]

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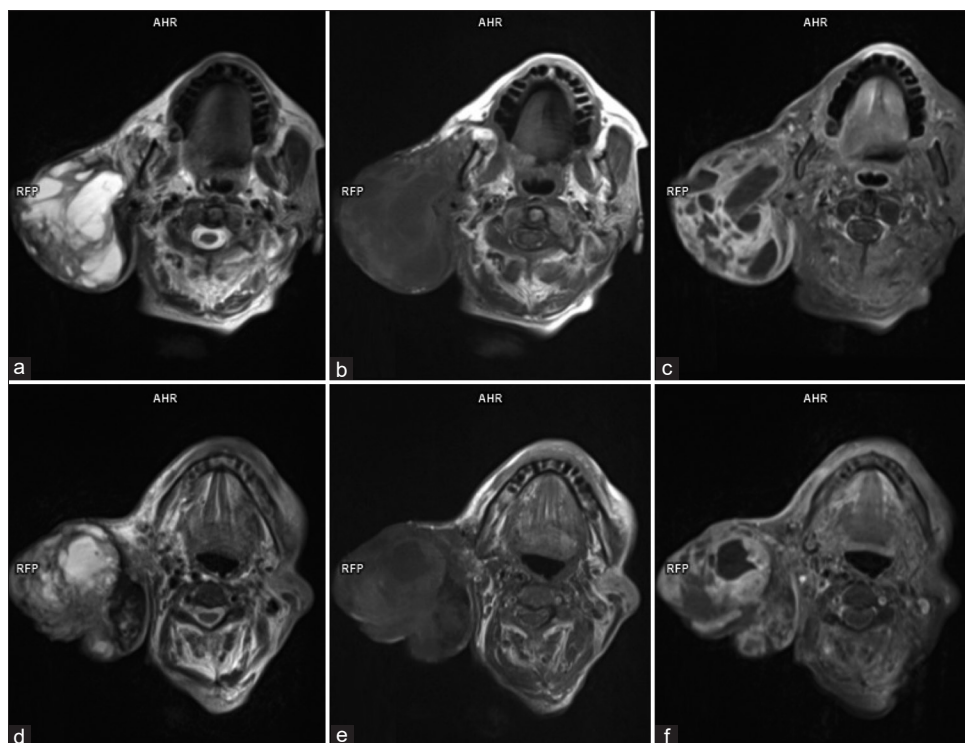


Figure 1: (a and d) Axial T2-weighted magnetic resonance imaging. (b and e) Axial T1-weighted magnetic resonance imaging. (c and f) Postcontrast axial T1 fat-saturated magnetic resonance imaging images. Hypo- to isointense large exophytic lesion on T1-weighted images with hyperintense solid-cystic lesion in T2-weighted images. On contrast administration, intense contrast enhancement noted in the solid component of the lesion with multiple intervening cystic areas suggestive of necrosis. Superficially, the lesion is involving the overlying skin and subcutaneous tissue with ulcerative changes. Anteromedially, it is infiltrating into the right masseter and abutting the outer cortex of the right ramus and the angle of the mandible. Medially, the lesion is involving the deep lobe of the right parotid gland, right parapharyngeal space, and right lateral pterygoid muscle. Few enhancing right cervical level II lymph nodes are noted

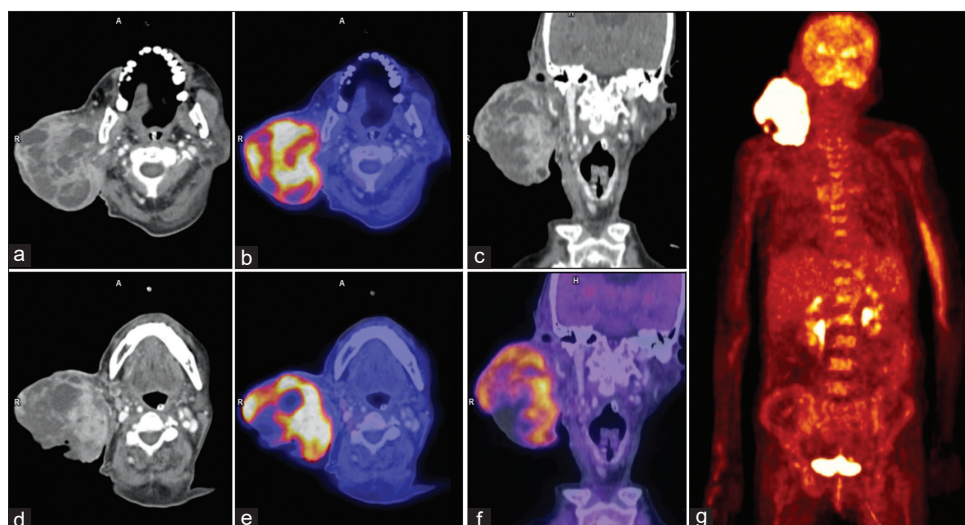


Figure 2: (a and d) Axial contrast-enhanced computed tomography. (b and e) Axial fused ^{18}F -fluorodeoxyglucose positron emission tomography-computed tomography. (c and f) Coronal fused ^{18}F -fluorodeoxyglucose positron emission tomography-computed tomography. (g) Maximum intensity projection image. A heterogeneously fluorodeoxyglucose-avid and heterogeneously enhancing, large, exophytic, solid-cystic mass (~9.0 AP \times 8.4 TR \times 9.77 CC cm, SUVmax: 11.24) is seen in the right parotid space involving the right parotid gland with areas of internal necrosis. Superficially, the lesion is involving the overlying skin and subcutaneous tissue with ulcerative changes. Medially, it is involving the deep lobe of the parotid, the right masticator space, and the right parapharyngeal space and abutting the ipsilateral cortex of the mandible. The right carotid artery and the internal jugular vein were distinctly visualized. Furthermore, faint fluorodeoxyglucose-avid, enhancing right cervical level II lymph nodes are noted (1.3 cm \times 1 cm, SUVmax: 4.35). Maximum intensity projection image reveals the primary mass in the right parotid region, with no other metabolically active lesion elsewhere in the body

Head-and-neck localizations are relatively rare and can be seen in 1%–3% of all UPSs.^[5]

MRI is the investigation of choice for diagnosing head and neck sarcomas, however role of bone scan and PET-CT

scan is still not very clear.^[6,7] ¹⁸F-FDG PET-CT has been extensively studied in sarcomas, but the literature for UPS is limited. Thus, a definitive role of ¹⁸F-FDG PET-CT is still under investigation.

Treatment of choice for parotid UPS is surgical resection with or without lymph node dissection. Due to the high rate of recurrence after surgery, postoperative radiotherapy is useful for local control of the disease. As this tumor has a propensity to spread to lungs, lymph nodes, liver, and brain, hence the use of PET-CT is extremely important for metastatic workup.^[8] The use of chemotherapy and/or radiation therapy as a primary treatment modality is still under investigation. Overall survival rates for MFH can range from 30% to 74%, with male gender, advanced age, primary bone involvement, and increased depth of invasion being the poor prognostic indicators.^[9] In conclusion, PET-CT can be a cornerstone for predicting the survival and monitoring the therapy response of UPS.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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