

Clinical Utility of ⁶⁸Ga-DOTANOC Positron Emission Tomography-Computed Tomography Scan on Postoperative Assessment of Juvenile Nasal Angiofibroma

Abstract

Somatostatin cell surface receptors are expressed on the peritumoral vessels of various benign and malignant neoplasms including angiofibromas. Positive initial uptake on positron emission tomography-computed tomography (PET/CT) imaging with ⁶⁸Ga-labeled DOTANOC is noted in a patient with juvenile nasal angiofibroma (JNA), and the same is noted to be absent following complete surgical excision. Functional ⁶⁸Ga-DOTANOC PET/CT may be an early useful tool for JNA residual/recurrence identification and precise postoperative surveillance.

Keywords: Angiofibroma, DOTANOC positron emission tomography-computed tomography, juvenile nasopharyngeal angiofibroma

We recently published the case of a patient with primary juvenile nasal angiofibroma (JNA), in whom ⁶⁸Ga-DOTANOC positron emission tomography-computed tomography (PET/CT) showed avid DOTANOC uptake in primary tumor along with intracranial extension.^[1] The 19-year-old adolescent boy underwent right transmaxillary approach and gross total excision of the tumor (clinical image depicting scar of lateral rhinotomy [arrow in Figure 1a], excised specimen [Figure 1b]). On 4-month follow-up, the patient was asymptomatic, and nasal endoscopy was normal. We performed ⁶⁸Ga-DOTANOC PET/CT scan for postoperative disease surveillance after 4 months. To limit the radiation exposure, only head-and-neck spot imaging was obtained as the disease is benign. The scan revealed no abnormal uptake in the postoperative site. There was intense uptake only in the pituitary gland (maximum standardized uptake value [SUV_{max}] = 6.24). On comparison with preoperative and postoperative scans, it was clearly visualized that there was no residual disease in our patient (preoperative maximum intensity projection [MIP], axial, coronal, and sagittal fused PET/CT images [Figure 1c-f] and postoperative

MIP, axial, coronal, and sagittal fused PET/CT images [Figure 1g-j], respectively). The patient is currently asymptomatic at 9 months post surgery and will be in yearly follow-up for 3 years.

Somatostatin (SST) (also known as growth hormone-inhibiting hormone or somatotropin release-inhibiting factor) is a short-peptide hormone with numerous autocrine, paracrine, and neurotransmitter regulatory functions.^[2] SST cell surface receptors (SSTRs) are expressed in many different malignant, benign, and neuroendocrine tumors. SSTRs are also expressed in the endothelium of human vessels during angiogenesis and not in nonproliferating vessels.^[3,4] Kukwa *et al.* performed immunohistochemical evaluation in nine patients of JNA and proved the overexpression of SSTRs in them.^[5] Furthermore, in a study by Gronkiewicz *et al.*, the ⁶⁸Ga-DOTANOC PET data correlated with immunohistochemistry for SSTRs in six cases of JNA.^[6]

JNA is a rare, benign, locally aggressive, fibrovascular neoplasm arising from the posterior part of the nasal cavity, exclusively seen in adolescent males. Radical surgery remains the treatment of choice. Due to propensity for notorious massive intraoperative bleeding and the

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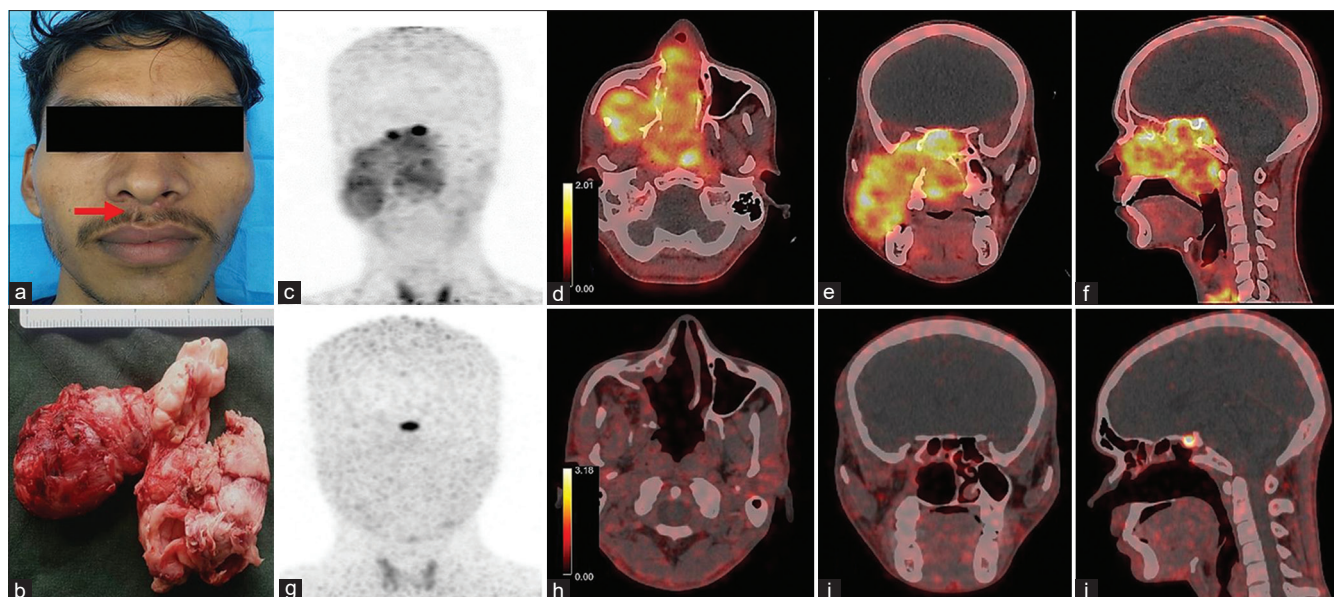


Figure 1: Clinical image depicting scar of lateral rhinotomy (arrow in a), excised specimen (b), preoperative maximum intensity projection, axial, coronal, and sagittal fused positron emission tomography-computed tomography images (c-f) and postoperative maximum intensity projection, axial, coronal, and sagittal fused positron emission tomography-computed tomography images (g-j), respectively

difficulty in extirpating the disease completely, the rate of residual disease even after surgical treatment varies from 13% to 50%.^[7,8] Hence, postoperative assessment of residual/recurrent disease remains a major determinant during follow-up. The performance of postoperative ⁶⁸Ga-DOTANOC PET/CT to assess SSTR expression may assist in early functional residual/recurrent disease identification compared to conventional structural imaging (CT and magnetic resonance imaging), which might be affected by postoperative changes.^[4,9-13] Compared to PSMA PET, DOTANOC PET may be superior for postoperative functional surveillance in JNA as there is no uptake in the salivary glands and nasopharynx, making interpretation straightforward.^[10-13]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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