

Chondronecrosis versus recurrence: FDG PET/CT solves the dilemma in a case of locally advanced laryngeal cancer treated with definitive radiotherapy

Sir,

We report a case of a 64-year-old gentleman diagnosed with squamous cell cancer of right vocal cord 18 months back. Staging computed tomography (CT) revealed a stage III tumor. Patient was treated with definite radiotherapy (RT) to neck, 1.6 Grays (Gy) per fraction, 5-6 fractions per week, over 6 weeks. Patient was asymptomatic over next 3 months. Indirect laryngoscopy (IDL) was normal. Whole body positron emission tomography/computed tomography (PET/CT) study done 3 months after treatment completion was normal. A year later, he presented with odynophagia and dysphagia, which progressed over 15 days. On local examination, cartilage tenderness was felt. Direct laryngoscopy (DLS) showed right vocal cord edema and ulcerations in the right paraglottic space. With clinical suspicion of local site recurrence, whole body fluorodeoxyglucose (FDG) PET/CT study was done for restaging. Maximum intensity projection images shows diffuse pattern of tracer uptake in midline in neck region [Figure 1a - arrow]. Axial PET and fused PET/CT image showed low-grade FDG uptake in the right lamina of thyroid cartilage [Figure 1b - arrow]. Diffuse low-grade tracer uptake was seen in the region of strap muscles [Figure 1c - arrow], with maximum standardized uptake value of 3.2. Axial fused PET/CT showed osteolysis and fragmentation of lamina of right thyroid cartilage, with adjacent ill-defined soft tissue thickening [Figure d and e - arrow]. Importantly, few air pockets were noted in the ill-defined soft tissue [Figure d and e - arrow]. Vocal cords were oedematous. These findings were suggestive of chondronecrosis involving thyroid cartilage. Patient was conservatively managed with anti-inflammatory agents and antibiotics and followed up at 6 weeks. He had complete relief from pain and laryngeal tenderness. IDL showed complete regression of laryngeal swelling and redness, thus in retrospect, confirming the diagnosis of chondronecrosis on PET/CT. Persistent edema and necrosis of laryngeal cartilages are known

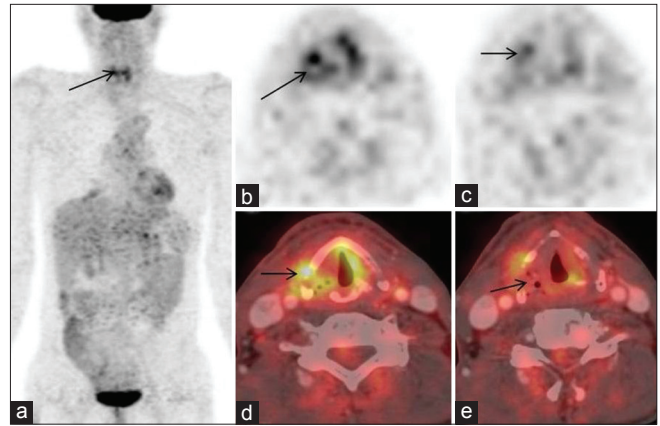


Figure 1: Maximum intensity projection image showing low grade linear tracer uptake in midline in neck region (a - arrow) Axial positron emission tomography (PET) (b and c - arrows) shows low grade fluorodeoxyglucose uptake in right lamina of thyroid cartilage and in the region of strap muscles, along with destruction of lamina (d - arrow) and air pockets (e - arrow) on axial fused PET/computed tomography images

late complications of definitive RT, which are sometimes life threatening and need urgent intervention. Though cartilage has no vasculature or lymphatics of its own, advanced laryngeal cancers, breach the perichondrium; and following irradiation, underlying cartilage is exposed to micro-organisms in the airway, leading to infectious perichondritis and necrosis.^[1] However, 50% of patients with these pathological findings have associated recurrence.^[2] In such scenario, patient is often symptomatic and a clinical dilemma of disease recurrence versus post-radiation sequelae arises. Both biopsy and DLS have high rate of false negativity^[3] and are not recommended upfront. On CT, classical findings like osteolysis and fragmentation of cartilages, with gas bubbles in surrounding soft tissue are seen. However, the soft tissue changes around the necrotic zone may harbor recurrent tumor which remains undetected.^[4] Fusion PET/CT overcomes this limitation of CT in distinguishing radionecrosis

from recurrence. Low grade tracer concentration is suggestive of reactive inflammation, which complements the characteristic CT findings of chondronecrosis, as seen in our case, helps to overcome the diagnostic dilemma. In addition, it serves as a gateway for selection of patients for DLS, increasing the accuracy and cost-effectiveness of DLS.^[5] Thus, FDG PET/CT has the potential to be a useful investigation for clinically symptomatic patients due to late post-RT sequelae, where conventional imaging fails to distinguish between recurrence and radionecrosis.

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