



A Rare Case of Oral Cavity Squamous Cell Carcinoma with Intracranial Extension and Pneumocephalus

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A 32-year-old male patient with a history of chronic tobacco chewing habit for the last 10 years with no known comorbidities, hailing from Bandigram, Madhya Pradesh, India, presented to our institution in May 2022 with a new onset ulcer over the right cheek for 20 days. He gave a history of painful ulcer in the oral cavity for the last 9 months that was managed with over-the-counter medications. On clinical examination, there was a large ulcer overlying the right angle of mandible with bone fragment protruding through it. The patient had restricted mouth opening (up to 2 mm) limiting intraoral evaluation. There were no palpable neck nodes. Patient was conscious and alert and did not have any neurological deficits.

Biopsy had been performed outside which showed moderately differentiated squamous cell carcinoma (SCC). It was confirmed on slide review at our institute.

Contrast-enhanced computed tomography (CECT) scan of head and neck region was performed in our department to delineate locoregional disease extent, using a multidetector CT machine in thin axial sections of 0.625 mm. Iohexol (300) was used as contrast medium, injected at 2 mL/kg body weight. Reconstruction was performed in soft tissue, brain, and bone windows in coronal and sagittal plains.

The imaging revealed an ill-defined, extensive, enhancing ulceroinfiltrative lesion on the right side of face and neck. The disease was eroding the mandible that was protruding through the defect (►Fig. 1A). There was orocutaneous fistula formation. Further, there was involvement of the right masticator space and infratemporal fossa with disease extending along the soft tissue reaching up to the skull base. Gross involvement and erosion of multiple bones were noted including maxilla, sphenoid, and right petrous temporal bone (►Fig. 1B). There was obvious intracranial

parasellar and middle cranial fossa extension across the eroded greater wing of sphenoid (►Fig. 1C). There were no significantly enlarged cervical nodes.

Surprisingly, the air along the fistulous tract was seen lining the entire disease extent from oral cavity to intracranial compartment. Further, it was seen directly communicating with the temporal horn of the right lateral ventricle across a focal defect (►Fig. 1D). It was seen tracking superiorly to the frontal horns of both lateral ventricles (►Fig. 1E). Multiple air foci were also noted in the subarachnoid spaces. The intracranial vessels and cortical venous sinuses showed normal postcontrast opacification without any obvious hypodensity in the brain parenchyma.

Based on the imaging findings, the family was counselled regarding the guarded prognosis and the patient was started on palliative chemotherapy.

Oral cancers form nearly 30% of the cancers presenting at tertiary referral institutes among which SCCs form the bulk (more than 90%) with tobacco chewing and alcohol being the dominant causes.¹ Important issues in gingivobuccal and retromolar trigone (RMT) SCC that have an impact on management and prognosis are soft tissue spread, bone erosion, and nodal involvement.^{2,3} Oral cavity SCC presenting with neuroparenchymal invasion and fistulous communication with the lateral ventricle resulting in pneumocephalus is extremely rare and to our knowledge is yet unreported.

Pneumocephalus is defined as an intracranial gas collection in the extradural, subdural, subarachnoid, intraventricular, or intracerebral compartments. CT can demonstrate as little as 0.5 cc of air. The most common cause of pneumocephalus is neurotrauma, especially those involving skull base fracture. The majority of tumors implicated in pneumocephalus are sinus osteomas, with epidermoid and pituitary

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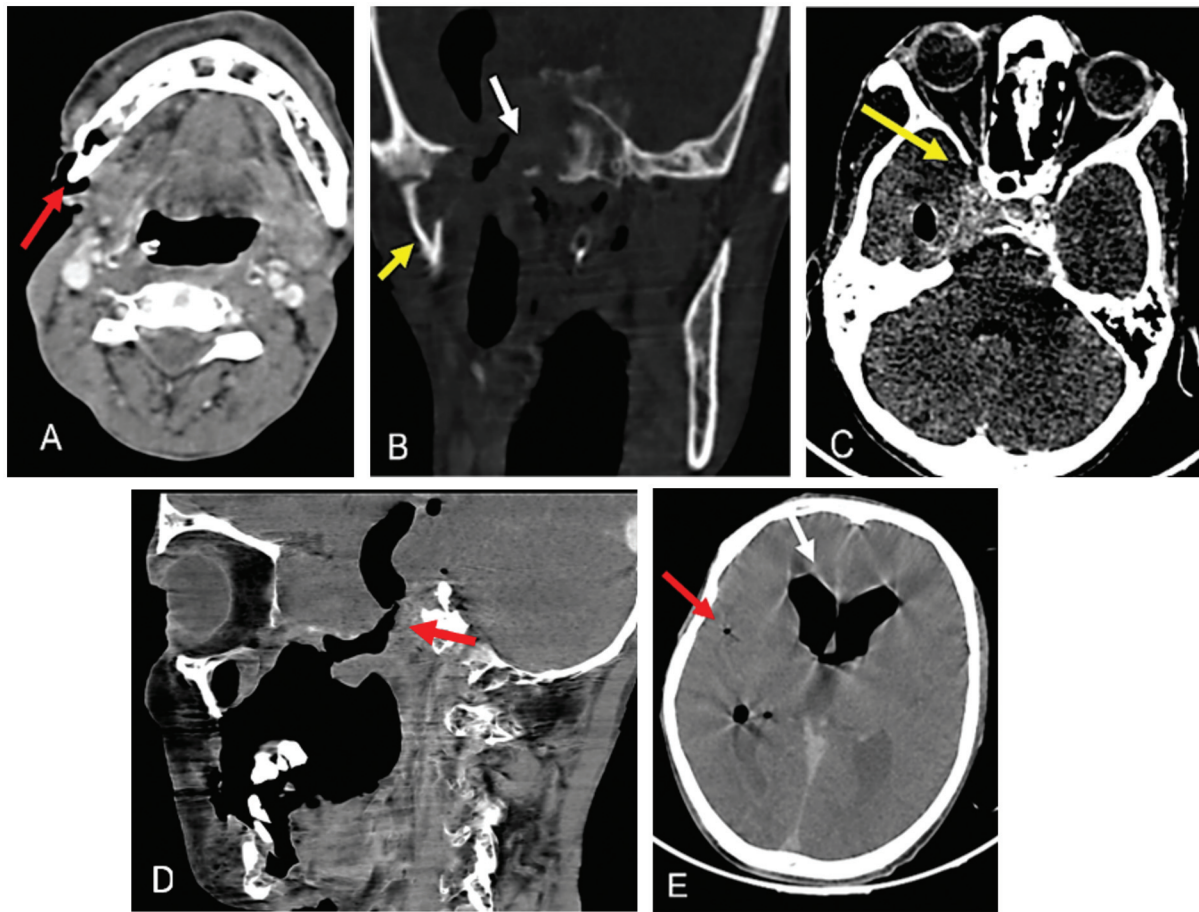


Fig. 1 Contrast-enhanced computed tomography paranasal sinus and brain. (A) Axial section (soft tissue window) at the level of angle of mandible showing fistula at the angle of mandible with bone seen exposed through it (red arrow). (B) Coronal section (bone window) at the level of skull base showing extensive erosion of right hemimandible (yellow arrow) and sphenoid bone (white arrow). (C) Axial section (brain window) at the level of sella showing parasellar extension of lesion (yellow arrow). (D) Curved multiplanar reformation reformat sagittal image (soft tissue window) showing air along the fistulous tract lining the entire disease extent from oral cavity to intracranial compartment and communicating directly with the temporal horn of the right lateral ventricle across a focal defect (red arrow). (E) Axial section brain (soft tissue window) showing pneumocephalus as air within both lateral ventricles (white arrow) and subarachnoid space (red arrow).

adenomas being fewer common causes. It is a known but rare complication of head and neck malignancies, having been described as isolated case reports previously.^{4,5} These patients presented with neurological symptoms—most prominently acute headache. Our patient did not have any neurological symptoms or deficit—possibly as the volume of pneumocephalus was small and did not cause any parenchymal displacement.

To conclude, pneumocephalus may present as a complication of untreated oral cavity carcinoma with large locoregional disease extent due to erosion of skull base and intracranial disease extension. Acute headache in such patients should be considered as an emergency as pneumocephalus can be a complication of skull base erosion in extensive disease such as this.

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Conflict of Interest
None declared.

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