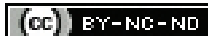


# Metastatic Prostate Carcinoma Masquerading as Primary Sphenoid Sinus Tumour: A Case Report

LINCY JOSEPH<sup>1</sup>, JASSAL MATHEW<sup>2</sup>, KP NABEELA<sup>3</sup>

## ABSTRACT

Metastasis from prostate adenocarcinoma to Paranasal Sinuses (PNS) is extremely rare. Usually, they metastasise to the pelvic lymph nodes and bones of the axial skeleton. Authors hereby, present a case of a 71-year-old male patient with diplopia on left lateral gaze and frontal headache since two months. On examination, he had left lateral rectus palsy. Computed Tomography (CT) Brain was normal. Computerised Tomography of Paranasal Sinuses (CT PNS) and Magnetic Resonance Imaging (MRI) brain revealed an ill-defined isodense lesion causing clival erosion and extending anteriorly to the sphenoid sinus. The patient underwent endoscopic endonasal trans-sphenoidal excision. The histopathological diagnosis was adenocarcinoma. Immunohistochemistry (IHC) was done for further evaluation which showed both CK7 and CK20 to be negative. Hence, sinonasal carcinoma was excluded and possibility of metastatic tumour was considered. Ultrasonography (USG) abdomen was normal and further IHC showed Prostate-Specific Antigen (PSA) positivity. Elevated serum PSA and Positron Emission Tomography (PET) scan confirmed primary carcinoma prostate with multiple skeletal metastases. The patient was treated with a Gonadotropin-Releasing Hormone (GnRH) antagonist and an antiandrogen which showed good response. So, the possibility of metastasis from an occult primary prostate carcinoma was considered as the differential diagnosis in an elderly patient presenting with sinonasal mass. Hence, proper screening and IHC studies are mandatory for accurate diagnosis and treatment.

**Keywords:** Adenocarcinoma, Diplopia, Immunohistochemistry, Paranasal

## CASE REPORT

A 71-year-old male patient presented with diplopia on left lateral gaze and frontal headache since two months. He had a history of postnasal drip. There was no history of vomiting, fever, tinnitus, epistaxis, vertigo, seizures and weakness of limb. He had a medical history of hypertension, diabetes mellitus type 2, coronary artery disease and was on oral hypoglycaemic agents and clopidogrel when reported with chief complaints. On examination his Glasgow Coma Scale score was E4 V5 M6 with left lateral rectus palsy. Pupils were equal, accommodating and reactive to light. He had neither ptosis nor facial asymmetry. All other systemic examination findings were within normal limits.

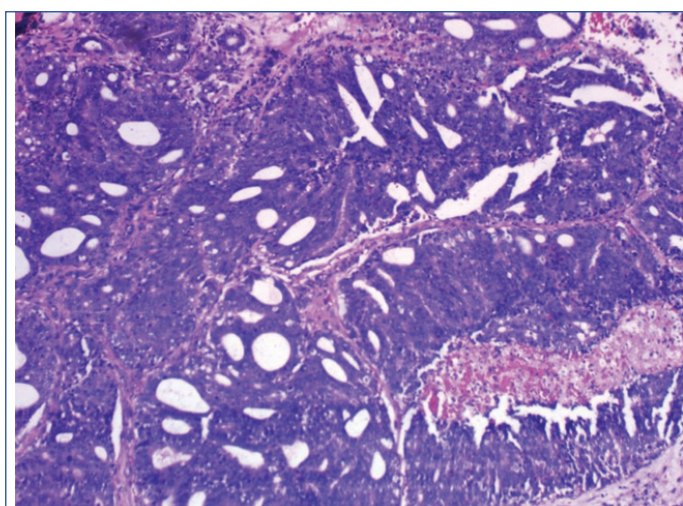
The CT brain showed normal neuroparenchyma. CT PNS and MRI brain revealed an ill-defined isodense lesion causing clival erosion and extending anteriorly to the sphenoid sinus [Table/Fig-1]. The radiological differential diagnosis was nasopharyngeal carcinoma, sinonasal adenocarcinoma, plasmacytoma and chordoma.



**[Table/Fig-1]:** CT PNS showing ill-defined isodense lesion arising from clivus and extending anteriorly to sphenoid sinus. (a) Sagittal view; (b) Axial view.

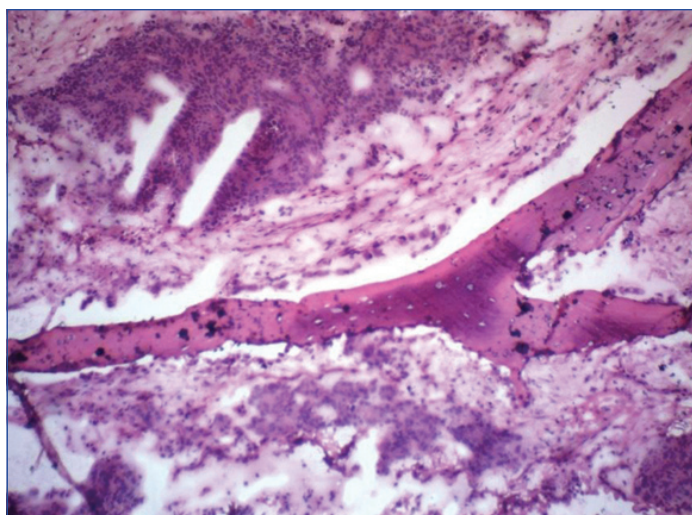
The patient underwent endoscopic endonasal trans-sphenoidal excision. On intraoperative consultation, the diagnosis was adenocarcinoma. Histopathology showed sinonasal mucosa with sub epithelium showing an infiltrating malignant neoplasm composed of cells arranged in glands, sheets and cribriform pattern [Table/Fig-2]. Round to oval irregular nucleus was present in the cells with

one to two nucleoli and moderate eosinophilic cytoplasm. Frequent mitosis and areas of necrosis were seen. Tumour was invading the bone [Table/Fig-3]. The diagnosis was adenocarcinoma. IHC showed double negativity for CK7 and CK20 [Table/Fig-4]. Hence, the possibility of metastasis was considered and the patient was further investigated. USG abdomen done was normal and further IHC panels showed positivity for PSA [Table/Fig-5].

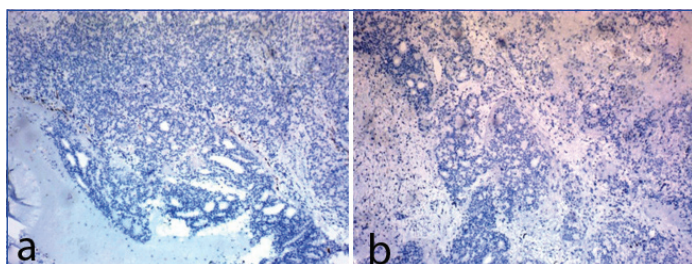


**[Table/Fig-2]:** Malignant neoplasm composed of cells arranged in glands, sheets and cribriform pattern (H&E staining, 10X).

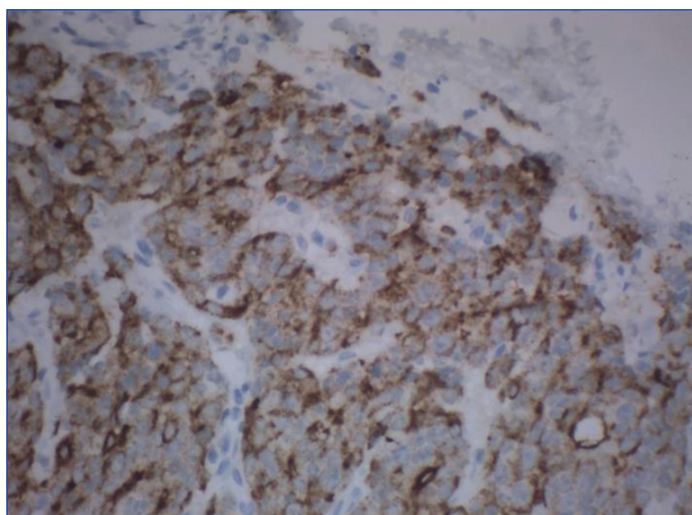
Elevated serum PSA of 284 ng/mL (normal value-4 ng/mL) and PET scan confirmed primary carcinoma prostate with left external iliac lymph node involvement and with multiple skeletal metastasis. The patient was treated with a Gonadotropin hormone-releasing hormone (GnRH) antagonist (degarelix 240 mg) and an antiandrogen (bicalutamide) for two months. He showed good response with decreased serum PSA (2.57 ng/mL) within two months and was advised for monthly follow-up with a repeat MRI brain after three months.



**[Table/Fig-3]:** Tumour invading the bone [Haematoxylin and Eosin (H&E) 10x].



**[Table/Fig-4]:** (a) CK7-ve; (b) CK20-ve.



**[Table/Fig-5]:** Tumour cells showing PSA positivity.

## DISCUSSION

Globally, the most common cause of cancer related death in men is prostate cancer [1]. Metastatic presentation of prostate carcinoma is not an uncommon event. The most frequent sites involved in prostate metastasis are the bone (90%), lung (46%), and liver (25%) [2]. The head and neck are rare sites for metastasis, and it occurs more frequently in the brain, dura, and lymph nodes. Metastasis to PNSs is exceedingly rare and the likely pathway is via the paravertebral venous plexus that connects the prostate gland to the skull base [3]. It has been postulated that the low-pressure, valveless paravertebral venous plexus provides a potential route of haematogenous spread by connecting the prostate gland to the skull base [3].

In a case report published in 2017, Barbosa EB et al., reported the 25<sup>th</sup> case of metastatic prostate adenocarcinoma in the PNS [4]. Among these, there were 12 reported cases of metastasis to the sphenoid sinus. On exploring the literature, authors found five more similar cases reported between the year 2018 to 2022. Hence, this is the 18<sup>th</sup> reported case of metastatic prostate carcinoma into the

sphenoid sinus. In [Table/Fig-6], the cases reported from 2018-2022 in full text, available online so far are described [5-9].

Authors, year and place	Age of the patient (in years)	Presenting complaints	Treatment and follow-up
George MV et al., [5] 2018 India	79	Recurrent bleeding from nose and nasopharynx	Unknown
Risbud A et al., [6], 2020 USA	65	Unilateral retro-orbital pain, cranial deficits and new onset seizure	Intra and extradural subtotal tumour resection done, lost to follow-up after the surgery.
Smith D et al., [7] 2021 Scotland	70	Left sided epiphora, worsening proptosis and declining vision	Managed with chemotherapy and hormone injections with good clinical response and reducing size of skull metastases on follow-up imaging.
Ostrowska M et al., [8] 2021 Poland	83	Clear watery nasal discharge, persistent headache	Hormonal therapy and symptomatic treatment was done under the palliative care teams' control. The patient was followed-up for six months- there was no CSF leak recurrence.
Ba'th F et al., [9] 2021 USA	58	Presyncope with worsening condition, left eye pain with discharge and headache	Left endoscopic sinus surgery with left maxillary antrostomy, left total ethmoidectomy, and sphenoidotomy was performed. Then the patient was medically managed on vancomycin and meropenem.
Present case 2023, India	71	Diplopia on left lateral gaze and frontal headache	Endoscopic endonasal trans-sphenoidal excision was done. The patient was treated with GnRH antagonist and an antiandrogen for two months which showed good response and was asked for monthly follow-up.

**[Table/Fig-6]:** Reported cases of metastatic prostate carcinoma into the sphenoid sinus (2018-2022) [5-9].

Metastatic tumours of PNSs are similar to primary tumours in the same location. Some of the most frequent symptoms are headache, loss of vision, diplopia, facial numbness, epistaxis, loss of hearing and other symptoms related to cranial nerve affection [3]. Ostrowska M et al., reported a similar case of an 83-year-old patient who was referred to the Otolaryngology Department with persistent clear, watery nasal discharge [8]. The patient was previously diagnosed with an advanced, poorly differentiated adenocarcinoma of the prostate. Here, CSF rhinorrhea was the first symptom of prostate cancer metastasis. Ba'th F et al., reported a case which illustrates the metastasis of prostate cancer to the PNSs and orbit [9]. In this case, a 58-year-old male with a history of prostate adenocarcinoma, chronic obstructive pulmonary disease, dialysis-dependent stage V chronic kidney disease, and insulin-dependent diabetes mellitus presented after an episode of presyncope with worsening confusion, left eye pain with discharge, and headaches. Histological and immunohistochemical examination helped to confirm metastasis of occult prostatic carcinoma to the sphenoid sinus. According to Jozsa F et al., largest number of metastatic lesions of clivus is attributed to prostate cancer [10]. Usually imaging is not able to differentiate a primary tumour from a metastasis; but, it is essential to determine the location and extension for surgical planning.

The histopathology and IHC panel has an essential role in the diagnosis. In our case, histopathological diagnosis of adenocarcinoma with cribriform pattern was given. IHC showed both CK7 and CK20 to be negative. As sinonasal adenocarcinomas are CK7 positive and

CK20 negative. As sinonasal adenocarcinomas are CK7 positive and CK20 negative, the possibility of sinonasal adenocarcinoma was ruled out. Hence, metastasis from CK7 and CK20 negative primary tumors from liver, kidney or prostate were considered. USG abdomen was normal and further IHC showed PSA positivity. High serum PSA levels of 284 ng/mL and PET scan had confirmed the diagnosis of primary carcinoma prostate with multiple skeletal metastasis. So this case shows that metastasis can occur in PNSs even before the diagnosis of prostate cancer is made.

The elective treatment depends on the stage of the disease and the general condition of the patient. Early start of the treatment seems to produce a better control of the symptoms. Management has not changed greatly over the years, and therapy options include radiotherapy, chemotherapy, immunotherapy, and, more recently, endoscopic surgery [11].

## CONCLUSION(S)

This case highlights that metastatic tumours should also be considered within the differential diagnosis of any case of an elderly male presenting with signs and symptoms of sphenoid mass (usually diplopia) with or without urological symptoms. The combination of histological features and immunohistochemistry with double negativity for CK7 and CK20 and positivity for PSA helped to confirm the diagnosis of metastatic prostate cancer. This case also

highlights the importance of immunohistochemistry as a diagnostic tool in tumours of unknown primary.

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