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Case Series

Radiology Section

Unusual Paediatric Nasal Masses Presenting with Nasal Obstruction: A Case Series Emphasising the Diagnostic Value of Radiological Imaging

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ABSTRACT

The most frequent causes of nasal obstruction in children are inflammatory conditions such as sinusitis and nasal polyps. Masses in the paediatric nasal cavity or nasopharynx may be identified incidentally during imaging or present with overt clinical signs. Because their initial symptoms often mimic common upper respiratory conditions, these lesions frequently go undiagnosed for extended periods. Given this non-specific clinical presentation, radiological evaluation is typically essential for a comprehensive diagnostic assessment. The present series reports five cases, first case was of Primitive Neuroectodermal Tumour (PNET), the imaging finding on Computed Tomography (CT) was that of a heterogeneously enhancing mass seen in the right maxillary sinus with destruction of the walls of the sinus and associated extension into the right nasal cavity and right orbit. Second case, child with pleomorphic Rhabdomyosarcoma (RMS) showed findings of an aggressive mass involving the bilateral nasal cavities, nasopharynx, and left orbit, with heterogeneous post-contrast enhancement. In the third case of sinonasal meningioma, Magnetic Resonance Imaging (MRI) showed a T2 isohyperintense mass in the nasal cavity, with destruction of the nasal septum and turbinates, extending into the maxillary sinuses and orbits, resulting in optic nerve displacement, and adjacent dural enhancement without brain parenchymal involvement. In fourth case of Syringocystadenoma Papilliferum (SCAP), there was malignant transformation into a heterogeneously enhancing soft-tissue mass centred in the right nasal cavity with destruction of the right nasal bone and mild erosion of the anterior wall of the right maxillary sinus, proven to be an adenoid cystic carcinoma on biopsy. Fifth case was of sinonasal yolk sac carcinoma presented on MRI as a lobulated T2 heterogeneously hyperintense, T1 hypointense mass with focal haemorrhagic areas displacing the nasal septum to the right and causing obstruction of the contralateral nasal cavity with mild heterogeneous post-contrast enhancement.

Keywords: Epistaxis, Nasal block, Nasal cavity, Nasal congestion

INTRODUCTION

Paediatric nasal masses encompass a wide spectrum of congenital, inflammatory, and neoplastic conditions. Clinical evaluation is guided by lesion location and imaging characteristics, with cross-sectional imaging playing a pivotal role in defining disease extent and informing management strategies [1]. The present series describes five cases of nasal obstruction in children.

CASE SERIES

Case 1

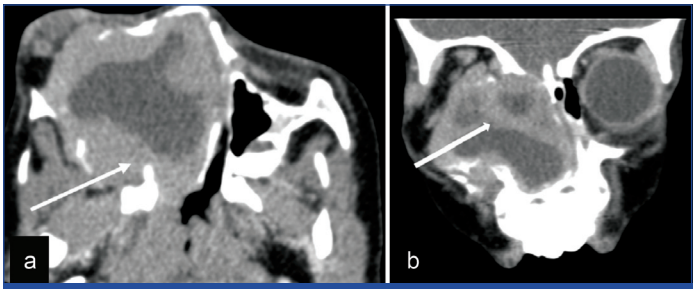
Primitive Neuroectodermal Tumour (PNET): A one-year-old girl presented with progressively increasing right-sided nasal obstruction and proptosis over two months. Examination revealed a fleshy pink mass filling the right nasal cavity up to the anterior nares. CT of the paranasal sinuses demonstrated a large heterogeneously enhancing necrotic mass centred in the right maxillary sinus [Table/Fig-1a] with extension into the right orbit [Table/Fig-1b] and right nasal cavity. Endoscopic biopsy suggested a PNET. Following surgical excision, the child received radiotherapy and adjuvant chemotherapy. At 7-year follow-up, she remained asymptomatic.

Case 2

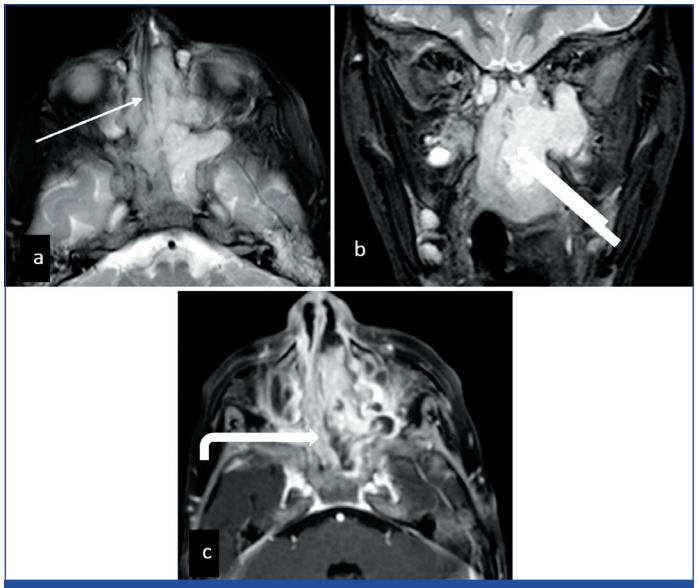
Pleomorphic Rhabdomyosarcoma (RMS): A two-year-old boy presented with progressive nasal obstruction for three months associated with mild left periorbital swelling. Examination showed bilateral blood-stained mucoid discharge. Contrast-enhanced MRI revealed a mass involving both nasal cavities and the nasopharynx [Table/Fig-2a] with left intra-orbital extension [Table/Fig-2b] and heterogeneous post-contrast enhancement [Table/Fig-2c]. Biopsy confirmed pleomorphic RMS. Bone scan showed an abnormal increase of tracer in the maxilla, nasal bones, and base of the skull, suggestive of metastatic disease. He was started on one cycle of chemotherapy (Vincristine, Actinomycin and Ifosfamide). He did not respond to treatment, and the mass showed no features of regression. The family was counselled regarding the poor prognosis, and further chemotherapy was stopped. They opted for treatment at local hometown.

Case 3

Sinonasal meningioma: A 10-year-old girl presented with complaints of nasal bleeding for three years. It was initially on

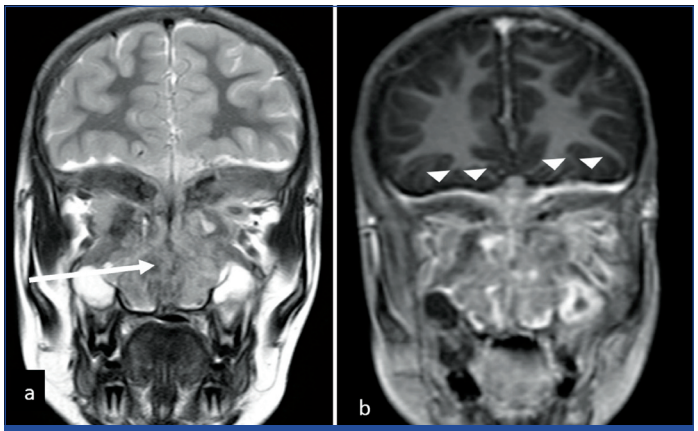


[Table/Fig-1]: a) Axial image from Contrast enhanced CT of the paranasal sinuses showing a heterogeneously enhancing necrotic mass in the right maxillary sinus (white thin arrow) extending into the right nasal cavity displacing the nasal septum to the left and into the nasopharynx posteriorly; b) Coronal reconstruction showing intra-orbital extension of the mass (white thick arrow) displacing the medial rectus muscle superiorly.



[Table/Fig-2]: a) Axial T2W image from MRI of nose and paranasal sinuses showing a hyperintense mass involving bilateral nasal cavities (white thin arrow) extending into the nasopharynx; b) Coronal reconstruction T2W image showing extension of the mass into the left orbit (white thick arrow) through the inferior orbital fissure; c) Axial post-gadolinium T1W FS image shows heterogenous enhancement of the mass with few non-enhancing necrotic areas within (white curved arrow).

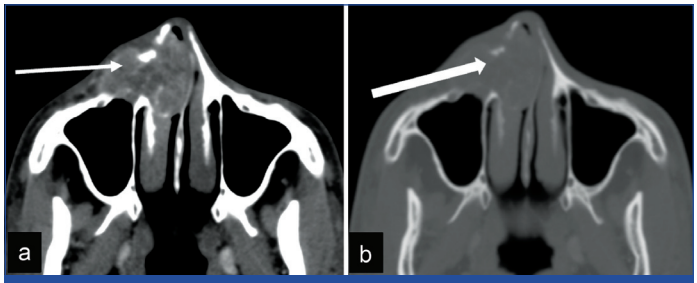
the left-side, and subsequently involved the right-side. She also complained of bilateral nasal obstruction and nasal swelling. She had a progressive decrease in vision in both eyes and perception of light only in the right eye. She complained of frontal and intermittent holocranial headache, not associated with nausea or vomiting. There was no significant past medical or surgical history. Examination showed swelling of the nasal dorsum with proliferative masses filling both nasal cavities. MRI revealed a T2 iso-hyperintense mass in the nasal cavity, with destruction of the nasal septum and turbinates, extending into the maxillary sinuses and orbits [Table/Fig-3a], resulting in optic nerve displacement. Adjacent dural enhancement was noted without brain parenchymal involvement [Table/Fig-3b]. A diagnosis of sinonasal meningioma was suggested and confirmed on biopsy. Due to the mass's aggressive nature, surgery was not considered. The child was started on radiotherapy, and she was lost to follow-up.



[Table/Fig-3]: a) Coronal T2W image of MRI of the face showing an iso-hyperintense mass (white arrow) involving bilateral nasal cavities with destruction of the nasal septum and turbinates extending into the maxillary sinus and orbits; b) Coronal post gadolinium T1W image showing heterogeneous enhancement of the mass with adjacent dural thickening and enhancement (white arrow heads), no brain parenchymal extension.

Case 4

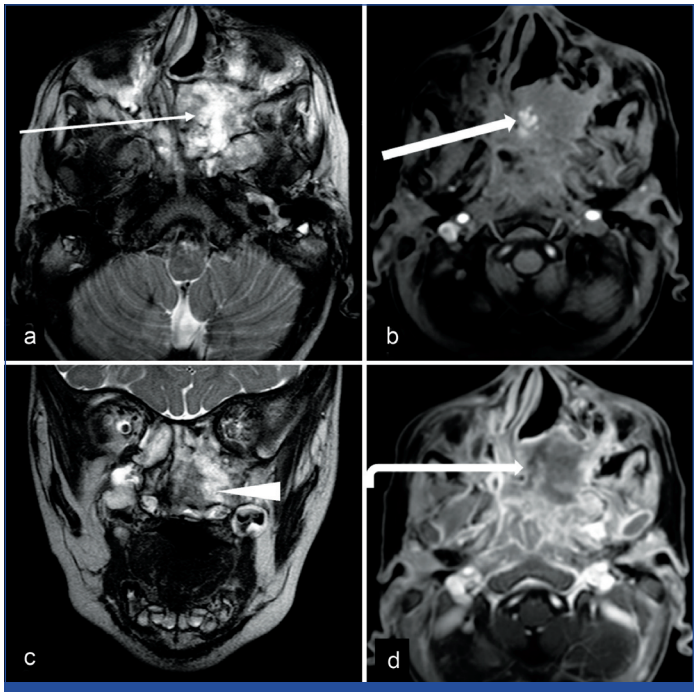
Syringocystadenoma Papilliferum (SCAP): An 18-year-old boy presented with a one-year history of right-sided nasal swelling. Examination revealed a firm mass in the right nasomaxillary region with deviation of the nasal septum to the left. He underwent a prior biopsy and excision elsewhere one year ago and presented to our centre with complaints of swelling over the right-side of the nose associated with pain and nasal block, and two episodes of epistaxis. Prior biopsy and excision elsewhere were reported as syringocystadenoma papilliferum. CT demonstrated a heterogeneously enhancing soft-tissue mass centred in the right nasal cavity [Table/Fig-4a] with destruction of the right nasal bone [Table/Fig-4b], suggestive of recurrence, along with mild erosion of the anterior wall of the right maxillary sinus. Repeat excision biopsy revealed adenoid cystic carcinoma. The mass was excised, and the patient received postoperative radiotherapy (66 Gy in 33 fractions) for three months. His first follow-up at three months showed no evidence of disease recurrence clinically and significant resolution on imaging.



[Table/Fig-4]: a) Axial image from CECT of the nasal cavity showing a heterogeneously enhancing soft-tissue density mass (white thin arrow); b) Axial image bone window of the CT showing destruction of the right nasal bone (white thick arrow), erosion of anterior wall of the right maxillary sinus with minimal soft-tissue extending into the sinus.

Case 5

Sinonasal yolk sac tumour: A one-year-old boy presented with bilateral nasal obstruction, noisy breathing, and left-sided proptosis for six months. Examination showed a mass occupying the left nasal cavity with palatal impingement. MRI demonstrated a lobulated T2 heterogeneously hyperintense [Table/Fig-5a] and T1 hypointense mass with focal haemorrhagic areas [Table/Fig-5b], displacing the nasal septum to the right and causing obstruction of the contralateral nasal cavity [Table/Fig-5c]. Mild heterogeneous post-contrast enhancement was seen [Table/Fig-5d]. Biopsy confirmed a sinonasal yolk sac tumour. Serum alpha-fetoprotein levels were elevated with a value of 77200 IU/mL. Abdominal ultrasound excluded gonadal involvement. He was given JEB chemotherapy (Carboplatin +



[Table/Fig-5]: a) Axial T2W image from MRI of the face showing a lobulated T2 heterogeneously hyperintense mass in the left nasal cavity (white thin arrow); b) Axial T1W image from the MRI study showing focal areas of T1 hyperintensity suggestive of hemorrhagic foci (white thick arrow); c) Coronal reconstruction showing a heterogeneously hyperintense mass (white arrowhead) in the left nasal cavity; d) Axial post-gadolinium FS T1W image showing mild heterogeneous enhancement (white curved arrow).

Etoposide + Bleomycin), which he tolerated well. AFP levels measured 10 days after chemotherapy had decreased to one-third of the initial value (25500 IU/mL). This was followed by endoscopic excision, and he remained disease-free at 10-year follow-up.

DISCUSSION

Radiological assessment of sinonasal neoplasms predominantly employs a dual-modality approach consisting of CT and MRI. CT remains the gold standard for delineating the impact of lesions on adjacent osseous structures, while MRI offers superior soft-tissue contrast, enabling the differentiation of malignant pathology from coexisting mucosal thickening or secretions. Furthermore, MRI is useful for evaluating local extension into the orbits, soft-tissues, and intracranial compartments. Positron Emission Tomography (PET) may be employed to facilitate metabolic staging and identify metastatic spread [2].

PNETs belonging to the Ewing sarcoma family are aggressive tumours characterised by early spread and heterogeneous imaging features such as necrosis, haemorrhage, and calcification.

Important differentials for destructive sinonasal masses include olfactory neuroblastoma and rhabdomyosarcoma [3].

A biopsy-proven case of PNET was reported by Filiatrault D et al., in an 11-year-old girl who presented with nasal obstruction and complete opacification of the right maxillary sinus and nostril on plain radiograph. CECT of the paranasal sinuses showed similar findings of a heterogeneously enhancing mass in the right maxillary sinus with destruction of the walls of the sinus and associated extension into the right nostril. However, in contrast, there was no intra-orbital extension in their study. In view of intraorbital extension in the present case, the differential diagnosis of RMS was considered [4].

Shahidatul-Adha M et al., reported a case of pleomorphic RMS in a four-year-old girl with left divergent squint for one month. CT scan of the paranasal sinuses showed an aggressive left sinonasal enhancing mass with orbital and intracranial extension superiorly involving bilateral cavernous sinuses, bifrontal extradural space, and the left temporal lobe. This was in contrast to the case in the present series where the mass was confined to bilateral nasal cavities, nasopharynx and left orbit [5].

Gupta D et al., reported a case of a 12-year-old girl with chief complaints of proptosis of the left eye. On MRI, the lesion appeared predominantly hypointense on T2-weighted images with a few focal T2-weighted hyperintense intralesional foci (hypointense on T1W with rim enhancement), iso- to hypointense on T1-weighted images with evidence of homogenous enhancement on postcontrast scans. No brain parenchymal infiltration was seen. The imaging findings were in keeping with sinonasal meningioma, similar to the case in the present series [6].

Burns MJ et al., concluded that Sino-orbital yolk sac tumours are rare and have variable presentations, dependent on the extent of local invasion. Early diagnosis and multimodal therapy are paramount for improving overall survival [7].

CONCLUSION(S)

Paediatric nasal masses commonly present with nasal obstruction. While inflammatory causes predominate, rare and aggressive lesions may be encountered, necessitating detailed imaging evaluation.

REFERENCES

[1] Rodriguez DP, Orscheln ES, Koch BL. Masses of the nose, nasal cavity, and nasopharynx in children. Radiographics. 2017;37(6):1704-30.
[2] Koeller KK. Radiologic features of sinonasal tumors. Head Neck Pathol. 2016;10(1):1-12.
[3] Tsokos M, Alaggio RD, Dehner LP, Dickman PS. Ewing sarcoma/peripheral primitive neuroectodermal tumor and related tumors. Pediatric and developmental pathology. 2012;15(1_suppl):108-26.
[4] Filiatrault D, Jéquier S, Brochu P. Pediatric case of the day. Primitive neuroectodermal tumor (PNET) of the right maxillary sinus. Radiographics. 1993;13(6):1397-99.
[5] Shahidatul-Adha M, Saizul Z, Hussain FA, Abdullah B. Pediatric sinonasal rhabdomyosarcoma presented as squint: A case report and literature review. Cureus. 2021;13(10):e18548.
[6] Gupta D, Goyal K, Singh I, Kaushal S. Primary sinonasal meningioma: An uncommon cause of proptosis in children. J Mahatma Gandhi Inst Med Sci. 2017;22(1):38-39.
[7] Burns MJ, Zheng L, Dalla-Pozza L, Graf NS, Walton J, Tumuluri K. Yolk sac tumours of the orbit and sinonasal tract. Orbit. 2022;41(6):680-86.

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