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A clinicopathological study of nasal and paranasal sinus tumours

Kliniczno-patologiczne badanie nowotworów jamy nosowej i zatok przynosowych

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ABSTRACT:

Introduction: A variety of benign and malignant tumours involving the nasal cavity and paranasal sinuses (PNS) are commonly encountered in clinical practice. The presenting features and symptomatology of all sinonasal masses are similar. It is impossible to determine clinically what pathology lies underneath. Therefore, a detailed history, clinical examination, proper imaging, and thorough histopathological evaluation are essential to reach a diagnosis.

Objectives: The purpose of this study was to classify various types of benign and malignant lesions presenting as nasal and paranasal mass and to characterize their clinico-pathological profile in a tertiary care center of Odisha.

Methods: This was a prospective study where 120 cases of nasal and paranasal masses were included over a period of 24 months (Sept. 2013–Sept. 2015). A clinico-pathological study was carried out in these cases. A provisional diagnosis was made after clinical assessment and radiological investigations, but final diagnosis was made after histopathological examination.

Results: There were more benign lesions than malignant lesions, i.e. 66.66% versus 33.33%, respectively. All age groups were involved and the mean age of presentation was 29.5 years for benign tumours and 50.25 years for malignant tumours. Male to female ratio was 3:1 for benign tumours and 1.7:1 for malignant tumours. In our study, among benign lesions the occurrence of angiofibroma was the highest – seen in 37.5% of cases. In malignant lesions, squamous cell carcinoma was the most common – in 67.5% of cases. Carcinoma of the nasal cavity was the most common malignant lesion, found in 70% of cases. Nasal obstruction was the most common (91.6%) presenting complaint followed by intermittent epistaxis (69.16%) and nasal discharge (58.3%).

Conclusion: We concluded that for proper evaluation of a sinonasal mass, clinical, radiological, and histopathological evaluation should be carried out conjointly in all cases. Histopathology always leads to confirmatory diagnosis but sometimes immuno-histocytochemistry becomes the ultimate diagnostic technique for correct and timely intervention.

KEYWORDS: histopathology, nasal obstruction, neoplastic lesion, squamous cell carcinom

STRESZCZENIE:

Wprowadzenie: W praktyce klinicznej często napotyka się rozmaite łagodne i złośliwe nowotwory jamy nosowej i zatok przynosowych. Wszystkie masy w obrębie nosa i zatok charakteryzują się podobnym obrazem klinicznym i symptomatologią. W związku z tym nie jest możliwe określenie choroby podstawowej na podstawie obrazu klinicznego. Rozpoznanie wymaga: dokładnego wywiadu, badania klinicznego, odpowiednich badań obrazowych oraz szczegółowej oceny histopatologicznej.

Cel: Celem niniejszego badania, prowadzonego w ośrodku trzeciego stopnia referencyjności w stanie Odisha, było sklasyfikowanie różnych rodzajów łagodnych i złośliwych zmian przyjmujących postać mas w jamie nosowej i zatokach przynosowych oraz scharakteryzowanie ich profilu kliniczno-patologicznego.

Metody: Do badania prospektywnego, prowadzonego w ciągu 24 miesięcy (wrzesień 2013–wrzesień 2015), włączono 120 przypadków mas nowotworowych w obrębie jamy nosowej i zatok. Wszystkie przypadki poddano analizie kliniczno-patologicznej. Wstępne rozpoznanie formułowano po przeprowadzeniu oceny klinicznej i badań radiologicznych, zaś ostatecznego rozpoznania dokonywano w oparciu o badanie histopatologiczne.

Wyniki: Liczba zmian łagodnych była większa niż złośliwych (odpowiednio: 66,66% i 33,33%). W grupie badanej znaleźli się pacjenci ze wszystkich grup wiekowych, przy czym średnia wieku w momencie prezentacji wynosiła 29,5 lat dla nowotworów łagodnych i 50,25 lat dla nowotworów złośliwych. Stosunek mężczyzn do kobiet to 3:1 w przypadku nowotworów łagodnych i 1,7:1 w przypadku nowotworów złośliwych. Wśród łagodnych zmian obserwowanych w naszym badaniu największą częstością występowania charakteryzowały się naczyniakowłókniaki, które stanowiły 37,5%. W przypadku zmian złośliwych naj-

częściej obserwowano raka płaskonabłonkowego, który stanowił 67,5%. Rak jamy nosowej stanowił 70% wszystkich zmian złośliwych. Dolegliwościami najczęściej zgłaszanymi przy prezentacji były: niedrożność nosa (91,6%), okresowe krwawienie (69,16%) i wysięk z nosa (58,3%).

Wniosek: Stwierdziliśmy, że w celu prawidłowej oceny patologicznej masy w obrębie jamy nosowej i zatok przynosowych konieczne jest jednoczesne wykonanie badania klinicznego, radiologicznego i histopatologicznego. Choć badanie histopatologiczne we wszystkich przypadkach zapewnia potwierdzenie rozpoznania, techniką diagnostyczną umożliwiającą prawidłową i szybką interwencję staje się badanie immunohistocytochemiczne.

SŁOWA KLUCZOWE: histopatologia, niedrożność nosa, rak płaskonabłonkowy, zmiana nowotworowa

ABBREVIATIONS

CT – computed tomography
FNAC – fine needle aspiration cytology
HPE – histopathological examination
MRI – magnetic resonance imaging
PNS – paranasal sinuses

INTRODUCTION

A variety of benign and malignant tumours involving the nasal cavity and paranasal sinuses (PNS) are commonly encountered in clinical practice [1]. The presenting features and symptomatology of all sinonasal masses are similar, i.e. nasal obstruction, rhinorrhea, blood-stained nasal discharge, epistaxis, oral symptoms, facial swelling, orbital symptoms, ear symptoms, etc. [2]. Various pathologies ranging from non-neoplastic lesions to malignant sinonasal tumor may mimic a simple nasal mass. It is impossible to determine clinically what pathology lies underneath. Advanced imaging techniques like computed tomography (CT) and magnetic resonance imaging (MRI) help us to reach at a presumptive diagnosis. However, a careful histopathological examination (HPE) is necessary to decide the nature of a specific lesion. Thus, a detailed history, clinical examination, proper imaging, and most importantly thorough histopathological evaluation are an essential part of work-up for a required and timely intervention [3]. The treatment depends on the kind and extent of lesion. The purpose of this prospective study was to classify nasal and paranasal sinus masses histopathologically as benign or malignant and provide for a clinico-pathological profile of sinonasal masses in our hospital, which is a tertiary care center.

MATERIALS AND METHOD

This prospective study was conducted by the Department of ENT & HNS of a tertiary care hospital in the state of Odisha. Over a period of 24 months (Oct. 2014 to Oct. 2016) all the patients attending the Otorhinolaryngology Department with a complaint of sinonasal mass and found to have a mass arising from the nose or PNS during the study period were included in the study. Polyps and rhinosporidiosis were excluded from the study. Previously treated cases of sinonasal disease with recurrence and patient's not-consenting evaluation as per proforma were also excluded from the study. A total of 120 cases of sinonasal masses fulfilling these criteria were finally included in this study. Written informed consent from the patients was taken. The patients selected for this study were subjected to a detailed history, clinical examination as per proforma and relevant radiological investigations like CT scan (axial/coronal section) or MRI of the nose and PNS (whenever required). HPE of removed tissue (either by biopsy or surgically) was carried out in most of the cases. The lesions were classified as benign and malignant.

RESULTS AND DISCUSSION

Tumours of the nose and PNS form a heterogenous group of lesions with a broad spectrum of histopathological features. A variety of these are quite impossible to differentiate clinically. They are frequently neglected by the clinicians and considered to be an infective or allergic condition. Benign sinonasal tumours account for a major proportion of visits to hospital (Fig. 1.–3.). The lack of differentiation of benign and malignant disorders at initial presentation leads to significant delay in initial diagnosis and therapy.

According to our study, benign tumours and malignant tumours make up 4.7% and 2.3% of all head and neck tumours respectively which is similar to the study of Sisson [4] and Dennis H. Krause et al. (1990) [5]. It was revealed that most patients presented to hospital either within 3 months (20.83%) or after 1 year of onset of symptoms (28.33%). This was the case because in malignant condition the symptoms were reported early by the patients as there was either nasal bleed or maxillo-facial swelling. On the other hand, mild and chronic symptoms like nasal obstruction, nasal discharge and headache were reported to hospital only after they became troublesome. Similar findings were reported on by S.S. Bist et al. (2012) [6]. The mean age of presentation for benign and malignant tumours was 29.5 years and 50.25 years respectively (Tab. I., II.). However, in the study by A. Humayun et al. [7] it was 39 years for benign tumours and 51 years for malignant tumours. The male:female ratio for benign tumours was 3:1 and for malignant tumours it was 1.7:1 (Tab. I., II.).

In the present study, addiction to tobacco (smoking + chewing), alcohol or betel nut either alone or in combination was an important risk factor in 70% of cases. It is similar to the study by Weizheng et al. [8] (Fig. 4.).

In both the benign and the malignant group, the maximum number of lesions was present in the nasal cavity (70%) followed by the maxillary sinus [9, 10].

The most common presenting symptoms for both benign and malignant tumours were nasal obstruction found in 91.6% of cases

Tab. I. Histological distribution of cases of benign tumours of the nose and PNS according to sex and age at onset.

BENIGN TUMOURS	NO. OF CASES	M:F	PEAK AGE OF PRESENTATION (DECADE)
Squamous papilloma	8	1,6:1	3
Inverted papilloma	16	3:1	5
Solitary nasal fibroma	2	F only	4
Ossifying fibroma	4	1:3	3–4
Osteoma	2	M only	4
Neurilemmoma	2	M only	7
Capillary Haemangioma	16	1:1	2 & 5
Angiofibroma	30	M only	2

Tab. II. Histological distribution of cases of malignant tumours of the nose and PNS according to sex and age at onset.

MALIGNANT TUMOURS	NO. OF CASES	M:F	PEAK AGE OF PRESENTATION (DECADE)
Squamous cell carcinoma	27	2:1	6–7
Rhabdomyosarcoma	2	1:1	1
T cell lymphoma	1	M only	4
Adeno-cystic carcinoma	1	F only	7
Malignant melanoma	2	1:1	4
Adenocarcinoma	4	1:1	4
Olfactory neuroblastoma	2	1:1	2
Plasmacytoma	1	M only	4

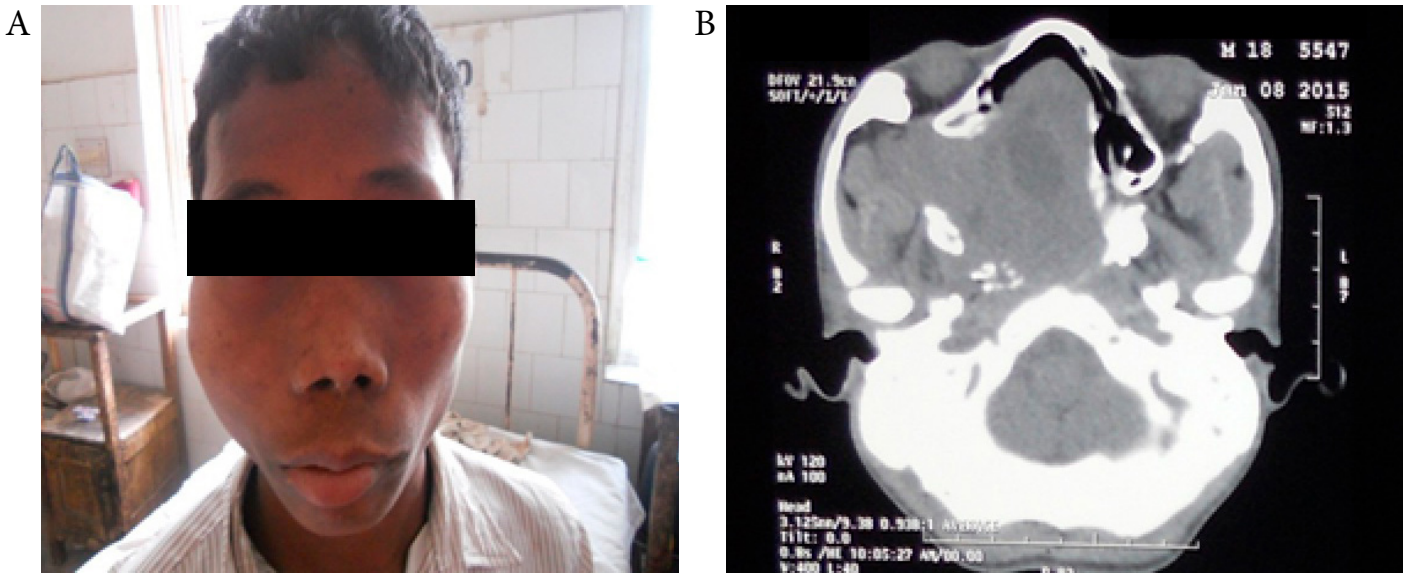

Fig. 1. (A) Clinical picture; (B) CT scan of pns of a patient with angiofibroma showing extension of tumour into the infratemporal fossa.

followed by epistaxis in 69.16% and nasal discharge in 58.3% (Fig. 5., 6.). Another study, by Patel S.V. & Katakwar B.P. 2009 [10], showed that the most common symptoms were nasal blockage (71%), nasal discharge (54%), and swelling or mass (39%). The most common examination finding for both benign and malignant tumours was facial swelling observed in 25.83%. Palatal bulge in the oral cavity was seen in 12.5% of malignant cases. This was in accordance with a similar study, by Iqbal S.M. & Hussain S.I. 2006 [11]. Proptosis was seen in 6.66% of all cases and no cases reported total loss of vision but decreased vision was reported on in 1.6% of cases. Decreased vision in our study was seen in malignant lesions (5%) in which either the orbit was involved by the sinonasal mass and caused stretching of the optic nerve or when there was intra-cranial extension of the mass involving the optic nerve pathway. Palpable cervical lymph node was found in 5% of cases. This could be attributed to the fact that in our study many patients were in advanced stage of sinonasal malignancy where metastasis to cervical lymph node occurred late in the course of disease.

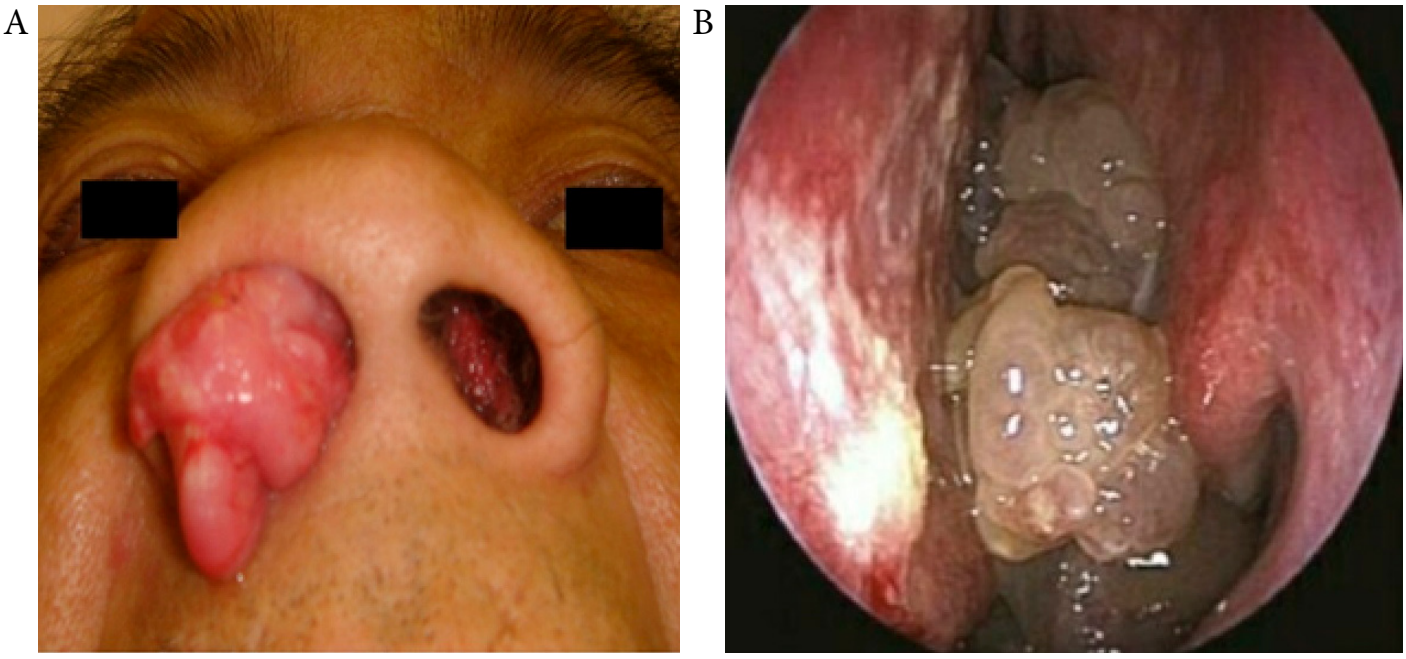

Fig. 2. (A) Anterior rhinoscopic and (B) endoscopic view of inverted papilloma with dns to the left.

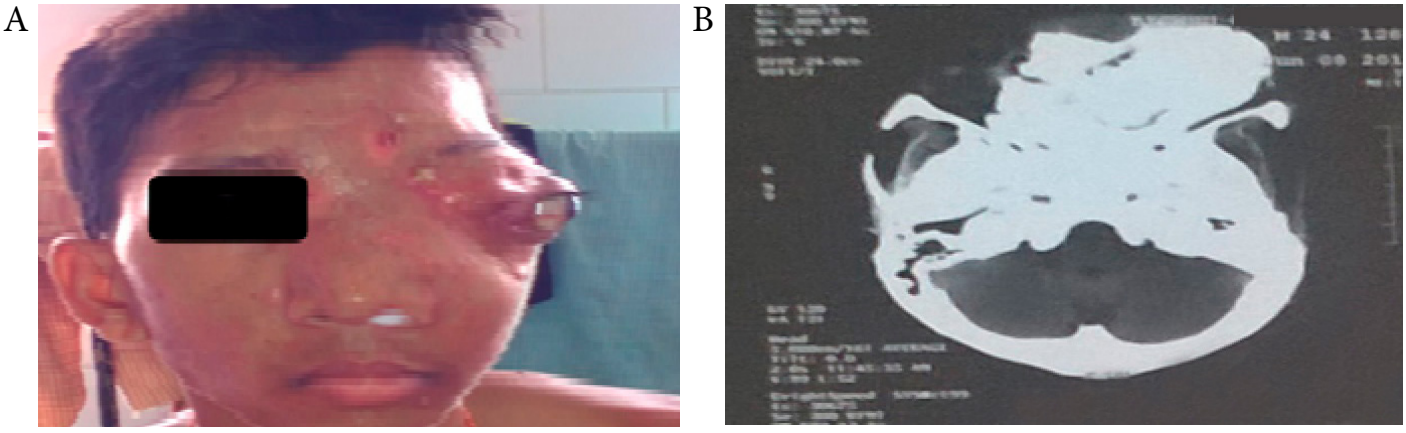

Fig. 3. (A) Clinical picture and (B) CT scan of PNS, axial view of fibrous dysplasia.

Radiological investigations were done in 78.33% of patients whereas in 21.67% of patients no radiological investigation was required. In case of malignant tumours, mass confined to nose and PNS in CT scan was found in 12.5% of patients, while bony erosion, a feature of malignancy, were observed in 70% of lesions. MRI was taken in 17.5% of patients to determine the extension of sinonasal masses into the orbit and intracranial cavity. CT scan is not reliable in assessing the extension of sinonasal mass lesions as retained or inspissated secretions and thickened mucosa within PNS can be misinterpreted as extension of malignancy (false positive) [12]. MRI revealed differences between true disease infiltration and obstruction secondary to infiltration of the draining ostia [13].

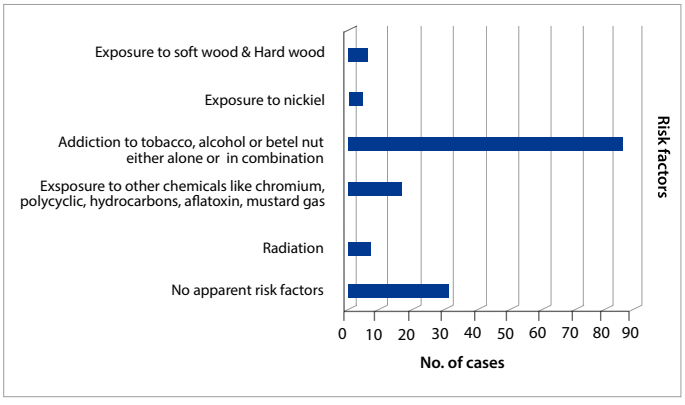

Fig. 4. Incidence of risk factors.

In our study, epitherlial tumours were less common than non-epithelial tumours in the group of benign tumours. Inverted papilloma was the most common epitherlial tumour and accounted for 20% (Fig. 2., 7.). Among non-epithelial tumours, angiofibroma (37.5%) was the most common one, followed by capillary haemangioma (20%) (Fig. 1., 8.). Solitary nasal Schwannoma was rare [14]. In our study, it accounted for as little as 2.5% of cases. Lesions presenting in the nasal cavity and PNS constituted approximately 4% of head and neck schwannomas [15–17].

Among the malignant lesions, squamous cell carcinoma was the most common histological variant (67.5%) as compared to

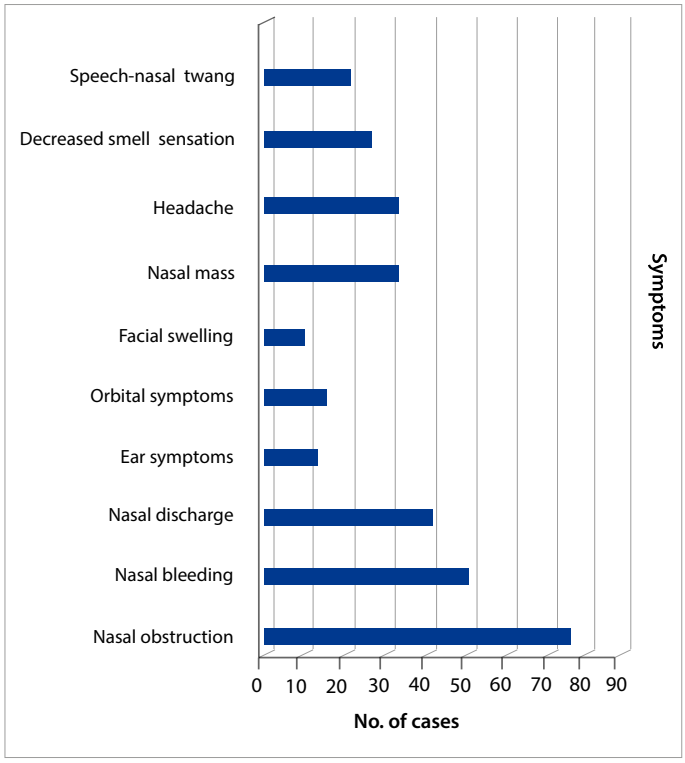

Fig. 5. Distribution of symptoms of benign tumours.

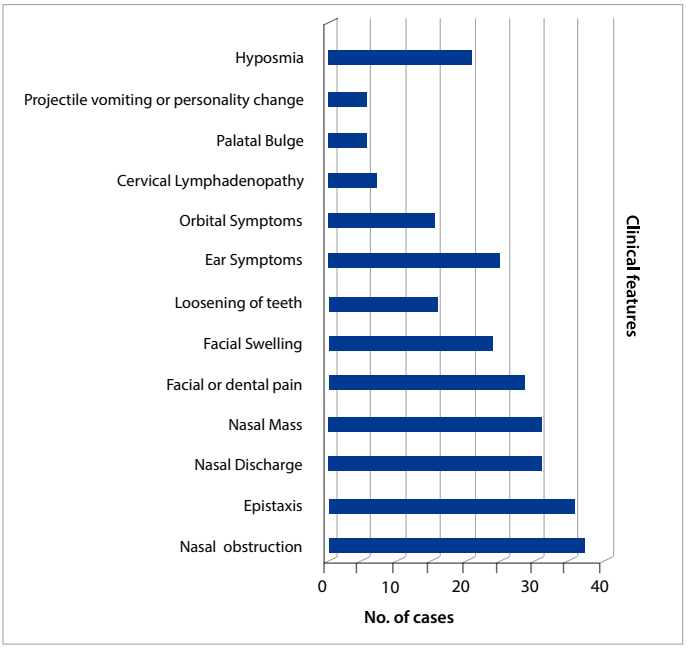

Fig. 6. Distribution of clinical features of malignant tumours.

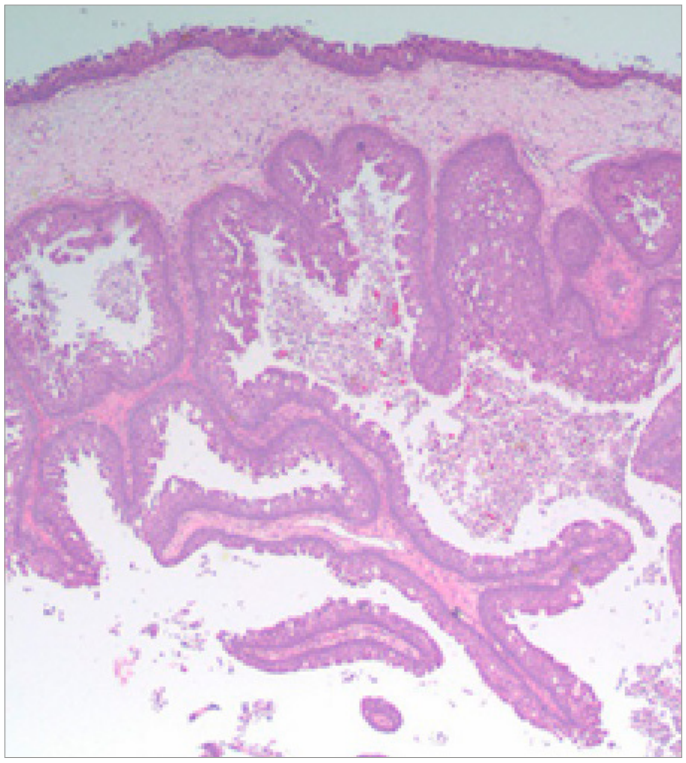

Fig. 7. HPE of inverted papilloma showing epithelium growing towards underlying stroma.

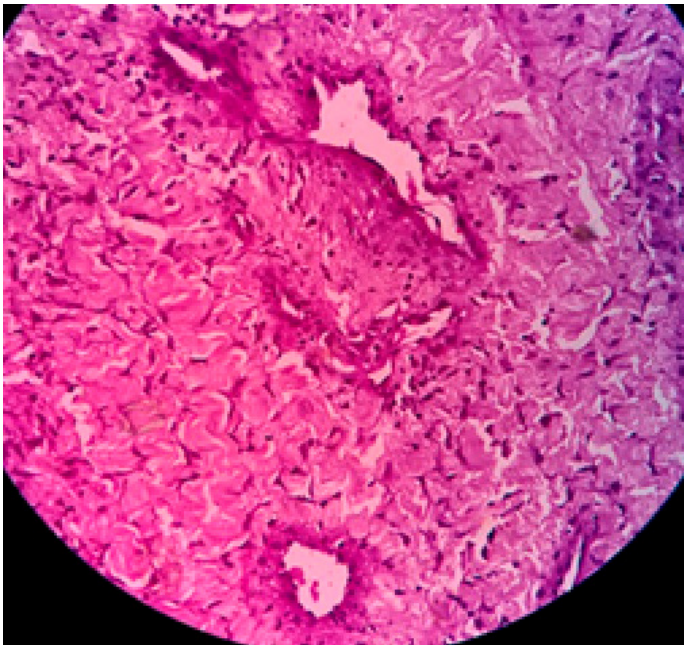

Fig. 8. HPE of angiofibroma showing vascular elements embedded in fi brous tissue.

the study by Modh et al. 2013 (43.75%) [18], Panchal et al. 2005 (48.9%) [19], and Dinesh Garg & Kusum Mathur 2014 (46.15%) [20]. Squamous cell carcinoma was more common between the 6th and 7th decade of life, with the M:F ratio of 2:1, as in the study by Ghosh and Bhattacharya 1966 [21] (Fig. 9., 10.). Adenocystic carcinoma was seen in only one patient (Fig. 11.). In the pediatric age group, rhabdomyosarcoma was the most common type (Fig. 12.).

CONCLUSION

The clinical and radiological features of tumours of the nasal cavity and paranasal sinuses are overlapping and often only a provisional diagnosis is possible. Definitive diagnosis requires histopathological examination but most of the lesions are either inaccessible for fine needle aspiration cytology (FNAC) or FNAC is not recommended because of fear of haemorrhage. Therefore, hi-

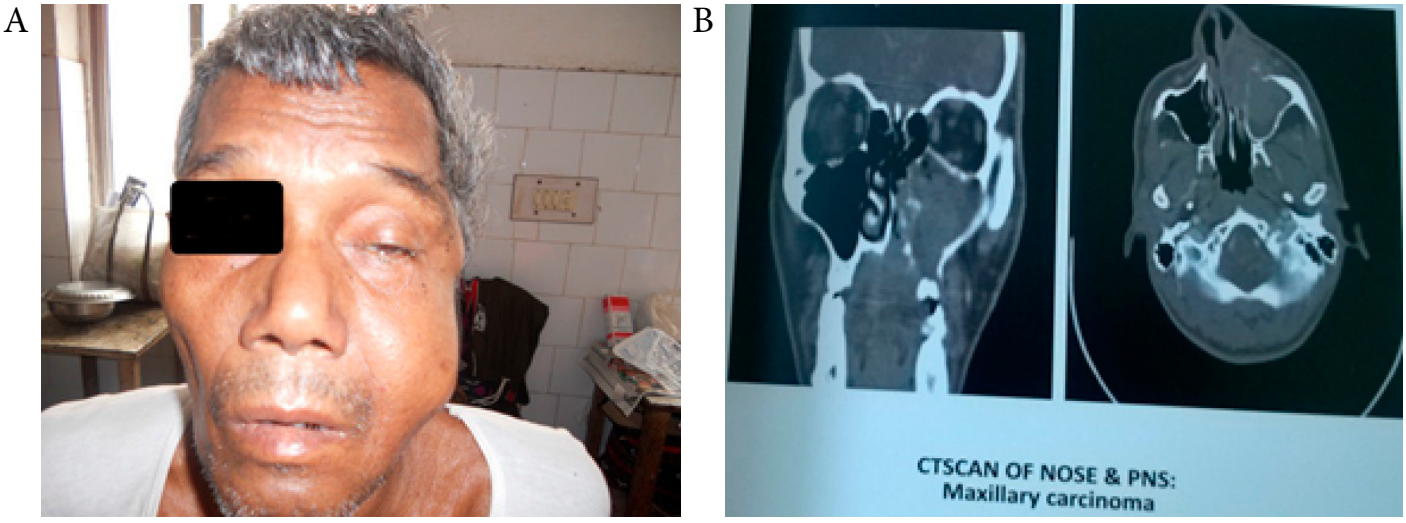

Fig. 9. SCC [squamous cell carcinoma] of left maxilla. (A) Clinical picture; (B) CECT [contrast-enhanced computed tomography] suggestive of enhancing lesion occupying the entire left maxilla extending to nasal cavity with widening of OMC [ostiomeatal complex], bone thinning of the wall of maxilla with bone destruction of palate and extension into oral cavity. The other one is non-contrast axial image representing the same.

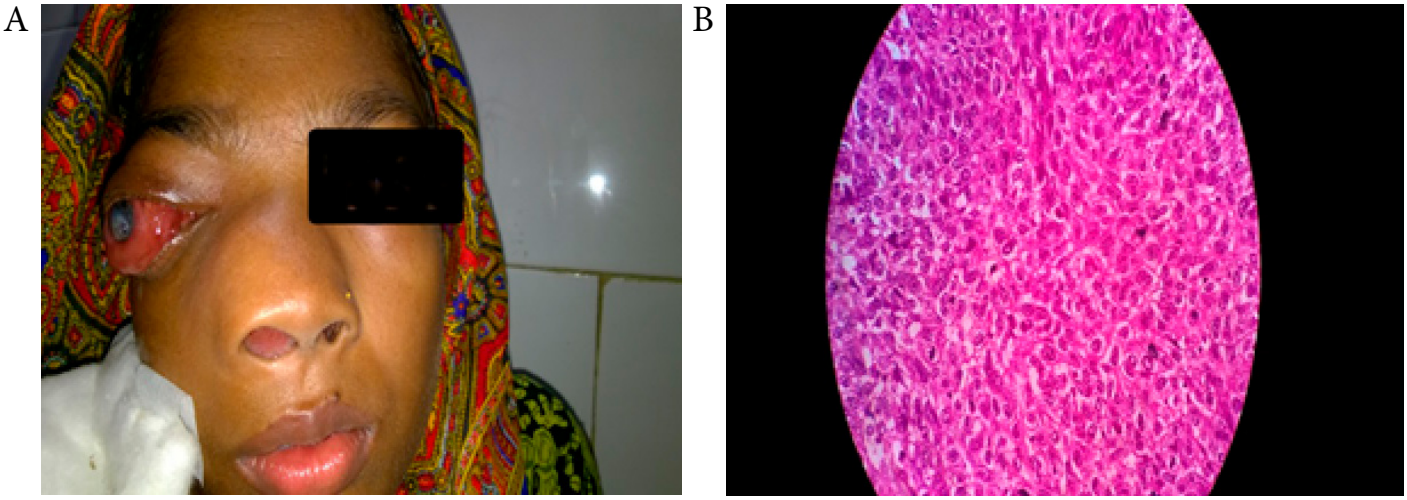

Fig. 10. (A) SCC of nasal cavity extending to orbit; (B) HPE showing cylindrical tumour cells with palisade arrangment.

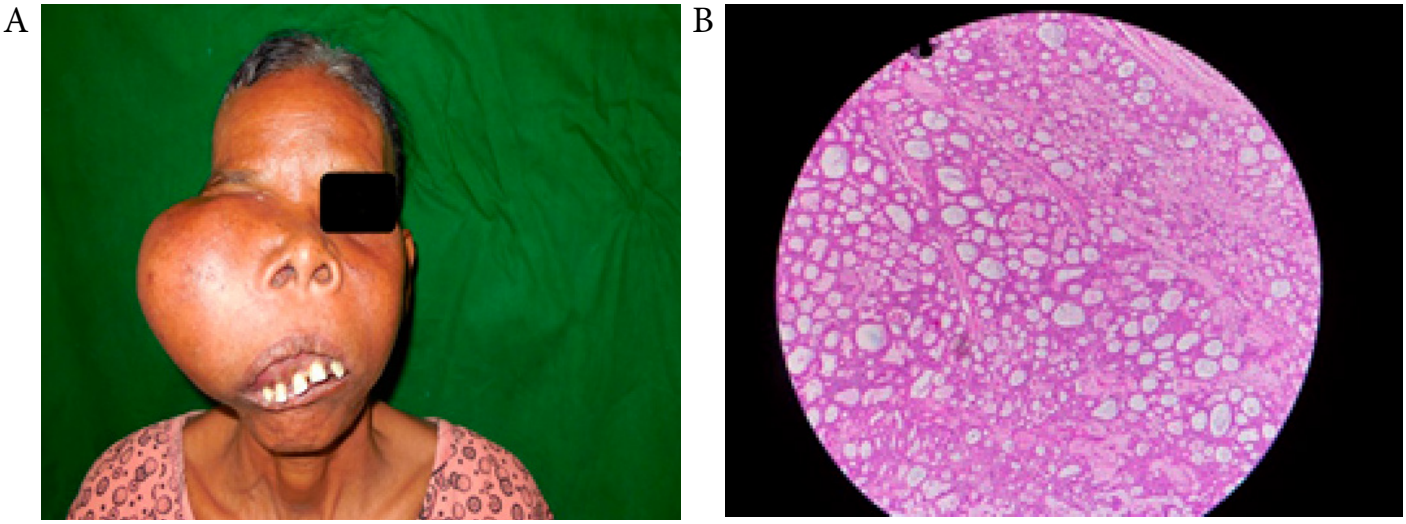

Fig. 11. (A) adenocystic carcinoma of right maxilla; (B) HPE of same.

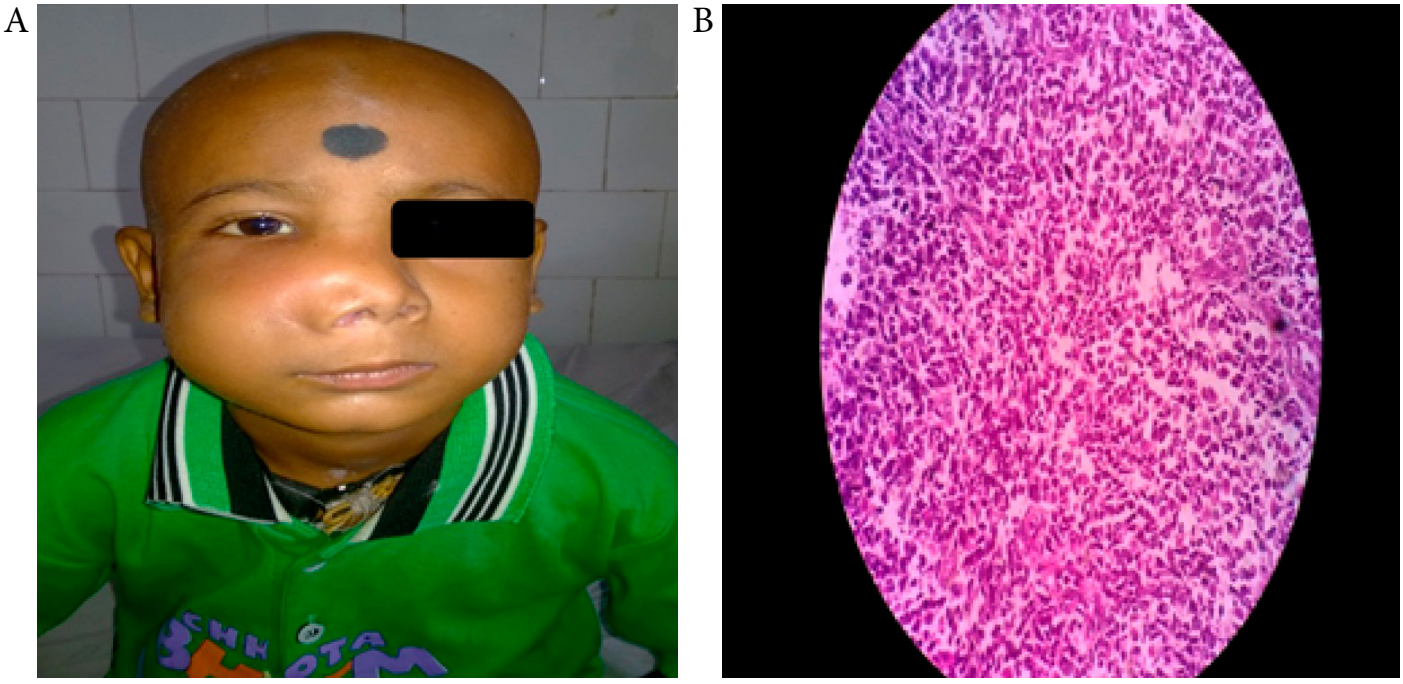

Fig. 12. Alveolar rhabdomyosarcoma; (B) HPE of same.

stopathology becomes the ultimate diagnostic technique for correct and timely intervention.

In the end we conclude that:

1. Histopathological examination is a simple, reliable and cost--effective diagnostic procedure for the detection of various tumours of the nasal cavity and paranasal sinuses;
2. Preoperative diagnosis based on proper clinical examination is consistent with histopathological diagnosis in most cases;
3. Angiofibroma is the most common benign tumour and squamous cell carcinoma is the most common malignant tumour in the nose as per our study population.

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