RESEARCH ARTICLE

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Socio-Demographic Characteristics, Clinical Presentation and Diagnosis of Orbital Mass by CT Scan among Pediatric Patients attended at A Tertiary Care Hospital in Bangladesh

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ABSTRACT

Background: **A multi-modality imaging approach plays a vital role for diagnosis however have a nonspecific appearance and need pathological confirmation to arrive at a specific diagnosis.**

Objective: **Evaluation of the demographic profile and Clinical Presentation in orbital mass lesion among paediatric group would provide a general guideline to diagnose the nature of orbital mass lesion along with each histological variety.**

Methodology: **This cross sectional study was conducted in the Department of Radiology and Imaging of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh during the period of January 2012 to December 2013 for duration of two year. The all patient below 18 years of age presented with suspected orbital mass and performed CT scan of orbit for diagnosis of the disease and also done histopathology after operation.**

Result: **A total number of seventy cases were selected among them majority 25(35.7%) patients belonged to age ≤5 years and distribution of male to female ratio was 1.3:1.Clinical presentation of the patients showed that majority 52(74.1%) had decrease vision of eye and 24(34.3%) had proptosis. In this study a total of 42 benign cases was identified by histopathology among them 21.4% patients had dermoid and identified 28 malignant cases, among them 12.9% had retinoblastoma.**

Conclusion: **Evaluation of CT scan findings in orbital mass lesion among paediatric group would provide a general guideline to diagnose the nature of mass lesion.**

Keywords: Orbital mass, retinoblastoma, socio-demographic characteristics.

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I. Introduction

A wide variety of orbital pathology is seen in the paediatric population. Radiological imaging plays a vital role in the diagnosis of these pathologies. While some lesions have characteristic imaging findings, others have a nonspecific appearance and need pathological confirmation to arrive at a specific diagnosis [1]. The orbital masses can be categorized based on their tissue of origin, tumors of mesenchymal origin (rhabdomyosarcoma, histiocytosis, leukemia and lymphoma), neural origin tumors (retinoblastoma, optic nerve glioma, meningioma, schwannoma, neurofibroma and neuroblastoma) and vascular malformations [2]. Imaging plays a vital role in their diagnosis and management by depicting the mass and its invasion and metastases.

Retinoblastoma is the most common intraocular tumor in children. The incidence is one in 17,000 births. Mean age is 2 years in unilateral forms (60% of cases) and 1 year in bilateral forms [3]. Usually the patients present with leukocoria or squint. Retinoblastoma is curable. If detected while still confined to the globe and if there are no metastatic risk factors, the survival rate is high following appropriate treatment [4], [5]. The preservation of visual function depends on initial tumor volume, the extension of the tumors to the macula and optic disk and the adverse effects of the treatments (cataracts, vitreous hemorrhage) [6].

Orbital rhabdomyosarcoma is the most common primary malignant orbital tumor in children and most common soft tissue malignancy of childhood [7]. They usually presents with progressive exophthalmos over days to weeks.

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Dermoid cyst is ectodermal origin in the wall of the orbit during the embryogenesis and usually presentation is in infancy with a painless swelling, most commonly located in the supratemporal aspect of the orbit [7].

Optic nerve glioma, median age two to six years and slow-growing tumor which presents with proptosis and visual loss. The tumor causes fusiform enlargement or thickening of the nerve, with moderate to marked enhancement which is generally less than optic nerve meningioma [8].

Secondary tumors in children is most commonly seen with neuroblastoma, up to 20% cases [9]. Granulocytic sarcoma or chloroma that involves the orbit results from leukemic infiltration [10]. Usually in patients with acute myelogenous leukemia as focal intra or extraconal masses. Lymphoma also have orbital, optic nerve or intraocular involvement [10].

Evaluation of the demographic profile and clinical presentation in orbital mass lesion among paediatric group would provide a general guideline to diagnose the nature of orbital mass lesion along with each histological variety.

II. Methodology

This is across sectional study in the Department of Radiology and Imaging of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. The study period was January 2012 to December 2013. Patient below 18 years of age came with suspected orbital mass and CT scan of orbit and histopathology done for diagnosis was enrolled in this study. CT scan images has-slice thickness is 2-3mm, axial cut with sagittal and coronal reconstructions. Approval of the study obtained from the Ethical Review Committee of BSMMU, Dhaka. Statistical analyses done from Statistical Packages for Social Sciences (SPSS-16).

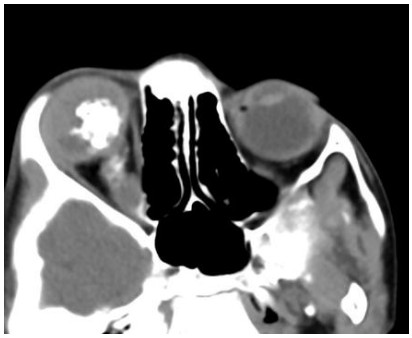

Fig. 1. Non-contrast CT scan of orbit showing intraocular solid mass with dystrophic calcification of right globe and proximal optic nerve swelling and calcification presents invasion (Retinoblastoma).

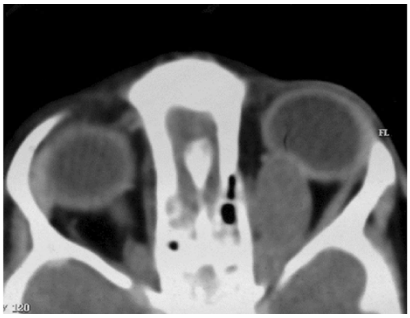

Fig. 2. CT scan showing left optic nerve glioma with proptosis. Non-contrast scan shows a lobulated isodense mass along the left optic nerve.

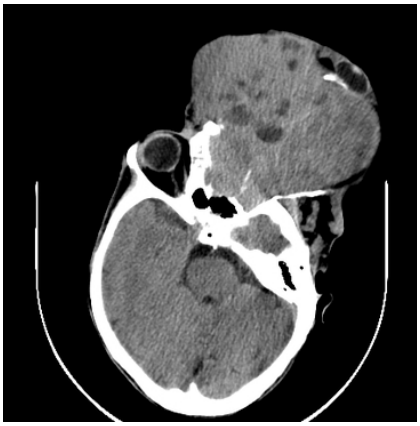

Fig. 3. CT scan showing a huge exophytic lesion (rhabdomyosarcoma) in left orbit.

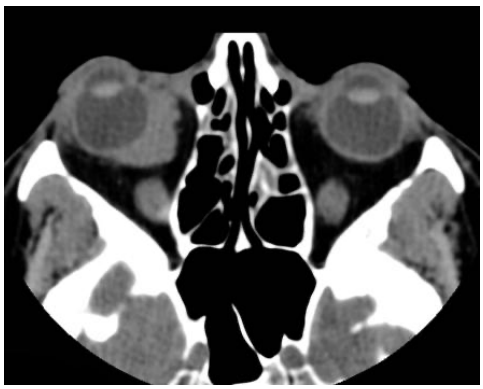

Fig. 4. CT scan showing orbital lymphoma. Soft tissue density lesion medial aspect of globe involving both intra and extraconal spaces.

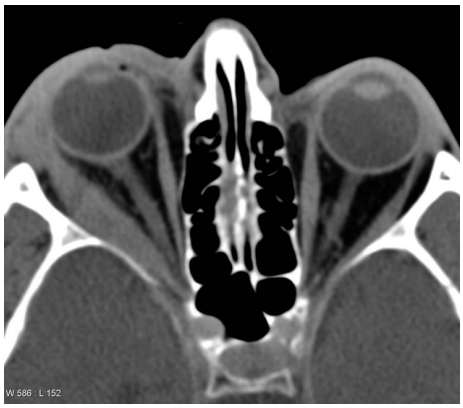

Fig. 5. CT scan showing lateral rectus swelling, preseptal and anterolateral aspect soft tissue swelling of right orbit (pseudotumor).

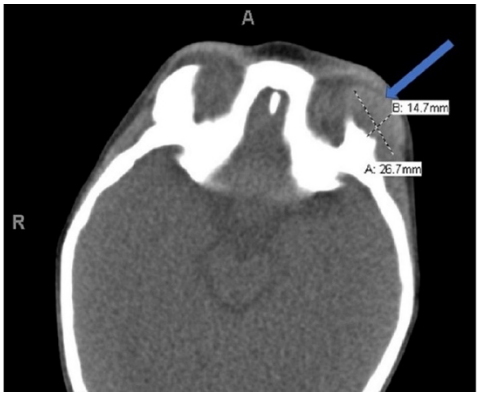

Fig. 6. CT scan showing lytic lesion at left zygomatic process with extension at left orbit.

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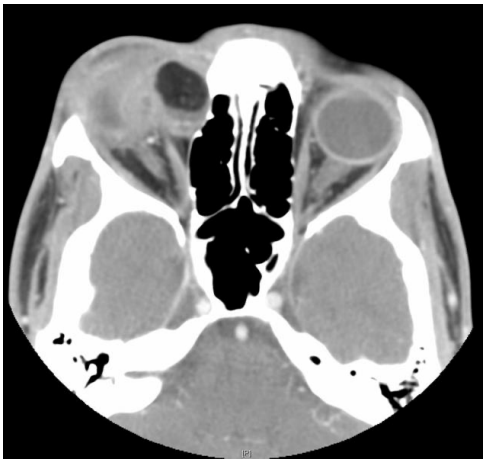

Fig. 7. CT scan showing a lesion having fat density area at anteromedial aspect of right orbit.

III. Results

A total number of cases are seventy.

TABLE I: DISTRIBUTION OF THE STUDY PATIENTS ACCORDING TO AGE (N=70)

Age (in year)	Number of patients	Percentage
0.5 to 5	25	35.7
6-10	8	11.4
11-15	19	27.2
16-18	18	25.7
Mean ± SD	10.03	±5.91
Range (min-max)	(6 months	-18 years)

TABLE II: DISTRIBUTION OF THE STUDY PATIENTS BY CLINICAL PRESENTATION (N=70)

Clinical presentation	Frequency	Percentage
Decrease vision	52	74.1
Proptosis	24	34.3
Swelling upper eyelid/eye	17	24.2
White eye	5	7.1
Swelling of right of face	2	2.9
Swelling and pigmentation of skin at left side of forehead	2	2.9
Mass at medial canthus of left orbit	1	1.4
Bluish growth at inner contour of right eye	1	1.4
Swelling at lateral aspect of right eye	1	1.4
Swelling at lateral aspect of left eye	1	1.4
Pigmentation of left side of face, downward deviation of left eye	1	1.4
Pigmentation of left side of forehead	1	1.4
Left side of face swelling with proptosis of left eye	1	1.4
Left side of face swelling with dropping of left upper eyelid.	1	1.4
Softness in left parietal region decrease vision of left eye	1	1.4

*Multiple responses are considered

In this study, 55.7% male and 44.3% patients were female (ratio was 1.3:1) (Fig. 8)

Table II -clinical presentation- majority 52(74.1%) had decrease vision of eye, 24(34.3%) had proptosis, 17(24.2%) had swelling upper eyelid.

Table III Histopathology- in malignant cases 9(12.9%) patients had retinoblastoma, 8(11.4%) had optic nerve glioma and 5(7.1%) had rhabdomyosarcoma. In benign cases, 15(21.4%) patients had dermoid, 7(10.0%) had pseudotumor, 6(8.6%) had hemangioma and 5(7.1%) had schwannoma.

TABLE III: DISTRIBUTION BY HISTOPATHOLOGY (N=70)

Histopathology	Number of patients	Percentage
Malignant		
Retinoblastoma	9	12.9
Optic nerve glioma	8	11.4
Rhabdomyosarcoma	5	7.1
Non-Hodgkin lymphoma	3	4.3
Eosinophilic granuloma	2	2.8
Hemangiopericytoma	1	1.4
Benign		
Dermoid	15	21.4
Neurofibroma	9	12.9
Pseudotumor	7	10.0
Hemangioma	6	8.6
Schwannoma	5	7.1

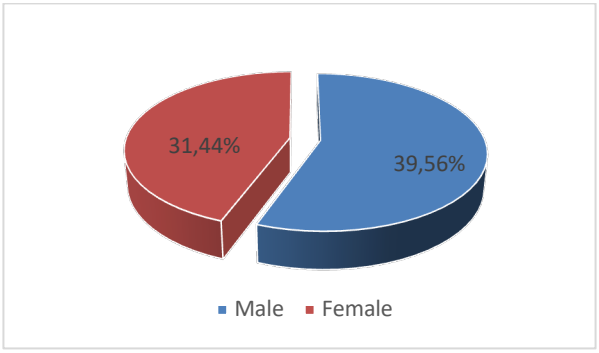

Fig. 8. Distribution of the study patients according to gender (n=70).

IV. Discussion

To evaluate the demographic profile, clinical presentation with histopathological correlation among pediatric orbital mass, seventy cases has been selected according to inclusion and exclusion criteria. In this study it has been observed that majority 25(35.7%) patients are ≤5 years and the mean age found 10.03± 5.91 years varied from 6 months to 18 years. Reference [6] reported in their study mean age has 2 years in unilateral forms (60% of cases) and 1 year in bilateral forms. In this study orbital mass are more common in male children, which 55.7% and 44.3% patients male and female respectively. Male to female ratio was 1.3:1. Refernce [5] and [11] mentioned there is a slight male predilection, with a male-to-female ratio of 5:3, in their study.

In this study majority (74.1%) of the patients had decrease vision of eye followed by 34.3% had proptosis, 24.2% had swelling upper eyelid. Another study done by [12] in-Ophthalmology Department, Leeds Teaching Hospitals NHS Trust, Leeds, UK, reported that the Similar observations regarding the clinical presentations.

In this study according to histopathology 28 malignant cases, among them 12.9% had retinoblastoma, 11.4% had optic nerve glioma and 7.1% had rhabdomyosarcoma. 42 benign cases were identified among them 21.4% patients had dermoid, 10.0% had pseudotumor, 8.6% had hemangioma and 7.1% had schwannoma. In a study done by [13] in Capital Medical University, Beijing, China, reported Benign lesions were demonstrated in 60 patients (22 male and 38 female), and malignant lesions in 42 patients (29 male and 13 female). There was no significant difference with benign versus malignant lesions ($p = 0.205$). This current study done to evaluate the CT scan finding of orbital mass in pediatric population with histopathological

correlation. CT scan is cost effective, faster technique and real time image.

V. Conclusion

Evaluation of orbital mass CT scan findings among pediatric group would provide a general guideline to diagnose the nature of mass lesion along with common characteristic amenable to each histological variety and thus it would contribute in evaluation of orbital mass in a highly efficient non-invasive method.

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