

Proptosis - Profile from a Tertiary Care Centre in Northern Kerala

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ABSTRACT

Introduction: Proptosis is defined as an abnormal protrusion of the globe. Present study aimed to describe the clinico-radiologic profile and treatment outcomes of patients with proptosis coming to a tertiary care centre in northern Kerala during a period of 2 years.

Material and Methods: Prospective study of all patients with proptosis coming to Ophthalmology out-patient department during the study period - June 2013 to June 2015. Proptosis was defined by exophthalmometry (Luedde's exophthalmometer) value of >21mm or a difference of >2mm between both eyes. In all patients, a detailed history, proptometry, ophthalmological and systemic evaluation, relevant systemic investigations and CT or MRI or both were done.

Results: We had 18 patients. Male: female ratio was 1:1. Age ranged from 11-90 years with a median age of 52 years. Majority of the cases were orbital cellulitis (67%), of which those with cavernous sinus thrombosis were (17%), orbital cellulitis with subperiosteal abscess (11%), subperiosteal abscess following dacryocystitis (5%), orbital inflammatory disease (11%), thyroid eye disease (5%), lacrimal-gland tumor (5%), brain tumor (5%), and pneumo-orbit (5%), which were confirmed clinically and radiologically. Of the total cases 83% were unilateral. Most common etiology was infective 67%. 76% of patients were treated medically, 24% surgically. Of the 11 patients who presented acutely, 80% had excellent visual outcome. 33% of those with bilateral presentation and 66% of those with unilateral presentation were cured.

Conclusion: In this study, the most common etiology was of infectious origin, unlike thyroid eye disease. Clinico-radiologically, orbital cellulitis accounted for majority of the cases. Timely intervention provided good visual outcome and was life saving even in cavernous sinus thrombosis.

Keywords: proptosis, cavernous sinus thrombosis, orbital cellulitis

MATERIAL AND METHODS

This was a two year prospective study conducted from June 2013 to June 2015. Institutional Ethical Board clearance was obtained. All patients with proptosis that presented to the Department of Ophthalmology, during the study period were included. Proptosis was defined by exophthalmometry (Luedde's exophthalmometer) value of >21mm or a difference of >2mm between both eyes. Presentation of proptosis was defined as acute (within hours to days), sub acute (within weeks) and chronic (several months/years).

A written informed consent was obtained from all patients. The patients were evaluated by a detailed history, clinical examination, proptometry and relevant laboratory investigations. Orbital imaging by either CT and / or MRI was done in all patients. Medical and or surgical treatment was given according to standard protocol. The treatment outcome was analyzed by improvement in visual acuity and improvement in proptometry value on follow-up.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistical tools were used for the analysis.

RESULTS

Eighteen patients were included in the study (21 eyes). Age ranged from 11 to 90 years (median 52 years). Male: female ratio was 1:1. The disease presentation was unilateral in 15 patients (83%) and bilateral in 3 patients (17%). A total of 18 patients, 21 eyes were included in the study. Presentation of proptosis was acute in 11 patients and chronic in 5 patients, while 1 patient each had a sub acute and acute on chronic presentation. 15 eyes had axial proptosis and 6 eyes had non-axial proptosis. 4 eyes had optic nerve involvement which was detected by RAPD, poor visual acuity and abnormal color vision.

The most common etiology identified was infectious (14 eyes, 67%), while there were 2 eyes (10%) each of inflammatory, hormonal and neoplastic etiology and 1 eye (4%) with traumatic proptosis. Tables 1,2 shows the etiology and imaging findings of proptosis in our study.

16 eyes were treated medically and 5 eyes surgically.

Following treatment 17 eyes (81%) were cured of proptosis and 3 eyes (14%) were in the process of regression. 1 patient succumbed to death during the course of treatment. As shown in figure 1

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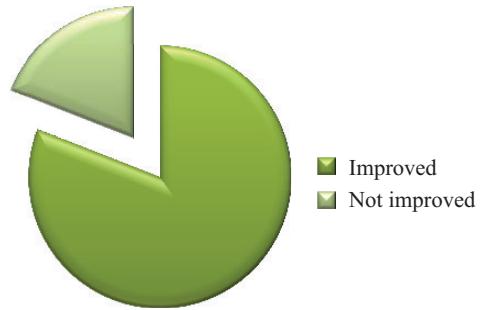
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Etiology	Number of cases	%	Number of eyes	%
Infective etiology	12	67	14	67
Orbital cellulitis				
1) Orbital cellulitis only	6	33	6	29
2) With cavernous sinus thrombosis	3	17	5	24
3) With subperiosteal abscess	2	11	2	10
Chronic dacryocystitis with subperiosteal orbital abscess	1	5	1	5
Inflammatory etiology				
Pseudotumour	2	11	2	10
Endocrine etiology				
Thyroid ophthalmopathy	1	5	2	10
Neoplasia				
Lacrimal gland tumor	1	5	1	5
Brain tumor involving frontal and ethmoidal sinuses	1	5	1	5
Trauma				
Traumatic pneumo-orbit	1	5	1	5

Table-1: Etiology of proptosis

Case	CT findings
Orbital cellulitis with cavernous sinus thrombosis	CT orbitobital cellulitis and CT venogram- dilated superior ophthalmic vein with partial filling defect and cavernous sinus filling defect
Orbital cellulitis	CT orbit- diffuse orbital fat edema- b/l turbinate hypertrophy, collection in maxillary and posterior ethmoid, mild thickening of left extra-ocular muscles, mild orbital fat edema
Endocrine	CT orbit- extra-ocular muscle enlargement without tendon involvement.
Inflammatory (pseudotumor)	CT orbit- extra-ocular muscle enlargement with tendon involvement
Neoplasia	CT orbit - soft tissue lesion In Orbit In extraconal Compartment
	CT orbit- mass in orbit extending to sinuses and anterior cranial fossa
Chronic dacryocystitis with orbital abscess	CT orbit- subperiosteal collection in the inferomedial part of left orbit, severe soft tissue edema. Enhancing collection within the fossa for lacrimal sac
Traumatic pneumo-orbit	CT orbit- pneumo-orbit, within intraconal space

Table-2: Imaging findings in proptosis.**Figure-1:** Treatment outcome**Figure-2:** Number of eyes visual acuity improved

Visual acuity improved in 17 eyes(81%) following treatment while 4 eyes(19%) had no improvement. Shown in figure 2.

DISCUSSION

Proptosis is a condition that has varied etiology, and can be neoplastic, vascular, infective, metabolic or inflammatory in origin.⁵

Infective etiology was the most common cause in our series (12 patients (67%), 14 eyes, (78%), while traumatic proptosis was the least common 1 eye (5%). Of the 12 patients (14 eyes) of infectious etiology, 6 patients (6 eyes) had orbital cellulitis alone, while 3 patients (5 eyes) had orbital cellulitis complicated by cavernous sinus thrombosis, 2 patients (2 eyes) had orbital cellulitis complicated by subperiosteal abscess and one patient (1 eye) had chronic dacryocystitis with orbital abscess. All of them were admitted and managed with intravenous broad spectrum

antibiotics covering gram negative, gram positive and anaerobic organisms for 7-10 days, non steroidal anti-inflammatory drugs, topical tear substitutes and topical antibiotics. In addition, Low Molecular Weight heparin (Enoxaparin 40mg s/c bd x 5 days) was given to patients with cavernous sinus thrombosis complicating orbital cellulitis and insulin injection was given for blood sugar control in diabetic patients.⁶

Of the 5 eyes with orbital cellulitis and cavernous sinus thrombosis, proptosis regressed completely in all, but visual acuity improved in only 3 eyes. Of the 6 patients with orbital cellulitis without cavernous sinus thrombosis, proptosis subsided in all patients and 5 patients had visual improvement following treatment. The lack of visual improvement in one patient was due to early involvement of optic nerve at the time of presentation.

The patient with chronic dacryocystitis and orbital abscess was

managed surgically by endoscopic drainage of subperiosteal abscess and endoscopic dacryocystorhinostomy, following which her proptosis completely resolved and she regained full vision. The 2 patients with subperiosteal abscess were treated with endoscopic drainage of abscess and were completely cured. The complications of orbital cellulitis are exposure keratitis, raised intra ocular pressure, central retinal artery or vein occlusion, optic neuropathy, endophthalmitis, subperiosteal abscess, intracranial complications like meningitis, brain abscess and cavernous sinus thrombosis.⁷ In our study we came across the following complications- central retinal artery occlusion, cavernous sinus thrombosis, subperiosteal abscess formation, optic neuropathy.

In our series, thyroid ophthalmopathy was the cause of proptosis in only one patient. She was treated by oral methimazole, oral prednisolone in tapering doses, topical tear substitutes and antibiotics with improvement in proptosis and visual acuity.

Two patients with orbital inflammation (pseudotumor) were treated with oral prednisolone, 1mg/kg body weight tapered every 10 days. Topical beta blocker to decrease intraocular pressure was needed in one patient. Both the patients showed improvement in proptosis and visual acuity following steroids. Neoplasms were the cause of proptosis in 2 of our patients. One patient with lacrimal gland adenocarcinoma was treated surgically by lateral orbitotomy and tumor removal, following which the proptosis was cured and visual acuity improved completely. The other patient had proptosis due to a brain tumor extending in to the orbit, sinuses and anterior cranial fossa. He succumbed to death during the treatment course.

The patient with traumatic pneumo-orbit was treated with oral antibiotics, topical antibiotics and NSAIDs with complete improvement in proptosis and visual acuity.

Along with proptosis, other ocular features seen in our series were decrease in visual acuity, extra-ocular movement restriction, diplopia, abnormal color vision, central retinal artery occlusion, choroidal detachment and cranial nerve palsies. In majority of our patients optic nerve was uninvolved (17/21 eyes, 68%).

Out of the 21 eyes, 14 eyes had infective etiology, out of which 5 had associated cavernous sinus thrombosis, of which 2 eyes presented with no perception of light and remained so after treatment. 3 eyes improved by 2 and half lines in snellens chart after treatment. Next 2 eyes were due to orbital cellulitis of which 1 eye presented with hand movements only and remained the same after treatment hence no improvement. Other eye improved by 2 lines. The 2 patients with orbital cellulitis with subperiosteal abscess had complete visual recovery following abscess drainage. In the patient with chronic dacryocystitis leading to orbital abscess, visual acuity in the eye improved by 3 lines. Out of the 2 eyes involved in endocrine etiology visual acuity of both eyes improved by 1 line. 2 eyes were involved in inflammatory etiology of which 1 improved by 1 line and other by 2 lines. Under neoplasia 2 eyes were included, 1 eye improved by 3 and half lines, the other case presented with no perception of light and succumbed to death during treatment course. In the eye with traumatic pneumo-orbit, visual acuity improved by 1line.

Proptosis in most of our patients were managed medically (16/21eyes, 80%) while 5 eyes were managed surgically.

Proptosis was cured completely in 17 eyes, 3 eyes became better and 1 patient succumbed to death during the course of treatment. In 17 eyes improvement of visual acuity occurred following treatment while 4 eyes had no improvement in vision. The patients with no improvement in vision were those having early involvement of optic nerve at the time of presentation. Study conducted by Masud MZ et al⁵ (n-60) reported neoplasms (33%) as the most common cause for proptosis followed by orbital inflammation(23%), orbital infection (20%), vascular abnormalities (7%) and trauma (5%).

In the study by Sabharwal et al⁷, (n-50), the male: female ratio was 1.08: 1 which was similar to our study. The most common lesion causing proptosis in their series was tumors (46%) and infections (28%) followed by inflammation (18%), trauma (6%) and vascular causes (2%). Among infectious causes the most common cause was orbital cellulitis similar to our series. Kandpal H et al⁶ from All India Institute of Medical Sciences reported that 60-80% of the inflammatory diseases of the orbit originated from the paranasal sinuses.

According to a study conducted by Somnath Saha et al¹, (31 patients) 90% of primary orbital tumors presented as proptosis. In the study by Radha. J et al³, from Kerala most common orbital tumor as lymphoid tumor. Inflammatory lesions accounted for 12.5% of all orbital lesions among which pseudotumor accounted for 4.2%.

CONCLUSION

Proptosis can cause significant disfigurement and visual deterioration. In our study, the most common etiology of proptosis was infectious. Timely intervention provided good visual outcome and regression of proptosis cosmetically for most and was life saving for many.

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