ISSN: 1343-4292
Volume 140, Issue 03, June, 2022

Proptosis Related to E.N.T Diseases: A Prospective study

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ABSTRACT— A prospective study of 25 patients with proptosis related to E.N.T. diseases were referred to E.N.T. department, Al- Yarmouk Teaching Hospital during period from Oct. 2000 to Oct. 2001. A complete clinical evaluation of cases had been done by history taking, proper clinical examination, radiological examination, microbiological study, and histopathological examination. Thirteen patients were males and twelve patients were females. The age of them ranged between 4 – 71 years with mean age 37.14 years. The most common associated symptoms and signs with proptosis were nasal obstruction, hyposmia, headache, diplopia, nasal mass and impairment of eyeball movement. The results showed that the proptosis was due to inflammatory lesions of sinonasal region in 64%, malignant tumours in 28% and benign tumours in 8%. The orbital infection complicated acute bacterial sinusitis was the most common inflammatory lesion causing proptosis which formed 24% of all cases followed by fungal sinusitis which formed 20 % of all cases CT scan was very helpful in early diagnosis of the diseases and in detecting the extension of lesions The orbit and its contents are at risk in different types of pathological lesions involving sinonasal region, therefore the proper otorhinol aryngological examination for each patient complains of proptosis is essential and the otorhinolaryngologist play an important role in the diagnosis of diseases that cause proptosis.

KEYWORDS: Roptosis

1. INTRODUCTION

Proptosis is a condition in which the eyeball protrudes abnormally. Exophthalmos has actually been used as a synonym for exophthalmos. Exophthalmos is classified by purists as proptosis with lid lag because it is so common. usually seen in patients with Grave's illness) Epstein claims that in Proptosis, the earth sticks out by 18 inches.an exophthalmos occurs when the globe protrudes by more than 18 millimeters According to Henderson, Proptosis caused by endocrine causes should only be called exophthalmos. Proptosis is a term that distinguishable from the phenomenon known as exorbitism, in which the decrease in orbital volume results in the Anteriorly protruding orbital contents Proptosis in exorbitism is always in front of the eyeball. The orbit and the paranasal sinuses: anatomical relationships.

There are two ways in which the orbit is linked to the sinuses
: 1. Anatomically, both in terms of its location and in terms of its function. The drainage of venous blood (They both share the same venous drainage). From 11 o'clock to 6 o'clock, the paranasal sinuses encircle the orbit. inferiorly. The orbit is shaped like a pyramid, with several bones forming the top. The orbit's superior wall is made up of maxillary sinus and the orbital floor share the floor of the frontal sinus. The lateral wall of the ethmoidal sinus shares the medial wall of the orbit. These bones are intertwined. extremely thin, making it possible for infections to spread in both directions. The orbit's medial wall is extremely thin. That's why it's called lamina papyracea. The orbit's distinct anatomy: First and foremost, it's a closed-off area.2. There are no lymphatics in it. There may be a point at which intraorbital pressure breaks down. Muscle and fat make up the bulk of the orbit's structure. As a result of this excessive interstitial tissue, the extraocular muscles are fine voluntary muscles. Vein drainage in this area is unusual: The veins that drain this region have an unusual

appearance. the subsequent features: Because the entire venous system in this region lacks valves, a two-way flow of blood is possible. An infection that spreads from one part of the body to another is now a possibility. Face and cavernous sinuses are linked by the superior ophthalmic vein. The cavernous sinuses can become infected from infections on the face. The inferior ophthalmic vein connects the orbit with the veins of the pterygoid, one of which is branched off from the other. branch connects the orbit to the cavernous sinus and plexus. The orbital cavity has a volume of approximately 30 ml. Because the orbit's contents are inside or near the orbit, any disease process is contained by the orbital walls. its orbital contents forwards, this displacement of the globe known as. The ocular protrusion. Diplopia and blindness are other signs of globe displacement. Proptosis can be remembered with the help of the mnemonic VEIN. Violent causes of death Explanation: E – Endocrine Acute and chronic inflammation Neoplasticity. An endocrine cause of proptosis is defined by the following characteristics: 1. The presence of a lid lag or lid retraction. The upper eyelid has a temporal flare. Congestion in the orbital plane. Proptosis may be caused by neoplasms that affect the orbit. The eye is right here. pushed forward in an aggressive manner. axial proptosis is a type of proptosis. Tumors that affect the brain axial proptosis can be caused by damage to the optic nerve. These patients have a disease that causes no discomfort. It's the only one. Patients with adenocystic carcinoma of the lacrimal gland experience no pain. In these cases, there is a lot of excess Because the tumor has invaded the nerves, the patient feels discomfort. It is also possible for proptosis to be caused by neoplastic lesions affecting the paranasal sinuses.

The most common and harmless There are several types of sinus-involved tumors that can result in proptosis:
1. Papilloma that is inverted
2. Paranasal sinusitis caused by fungi.
3.The paranasal sinuses are involved in the mucoceles.
4.maxillary fibrous dysplasia
5.Involved sinuses of the front and ethmoid 6.Angiofibroma
of the nasopharynx in children.

Hertel mirror exophthalmometers are used to measure the degree of eyeball protrusion when measuring proptosis. To gauge distances, the distance between the lateral rim of the orbit and the tip of the cornea is utilized. proptosis. Normal operating conditions call for a distance of about 18 mm, but Differences between races. The examiner is seated in front of the patient, at the patient's eye level, to perform the exam. The blue arched support of the exophthalmometer is then placed at the temporal lateral orbital region of the eye. walls. First, the instrument is held firmly in place with both hands. temporal side of the right-hand orbital wall (which should be felt against the bottom of the temporal bone) point of reference). Afterwards, the movable part is positioned so that the orbital wall on the left faces the bottom of the arched support. Lateral orbital wall spacing can be determined by measuring it. The distance from the upper end of the scale can be noted for future use. What does the examiner inquire about? the patient to keep their eyes open wide and face straight ahead. Proptosis is checked during the examination. Each eye is a window to the soul. Using a mirror with a millimeter scale marked on it, one can measure one's height in millimeters. Moving the head horizontally until the red fixation line is 22mm from the eye. The examiner is now able to do their job. Using the millimeter reading, locate the patient's corneal apex.

ISSN: 1343-4292
Volume 140, Issue 03, June, 2022

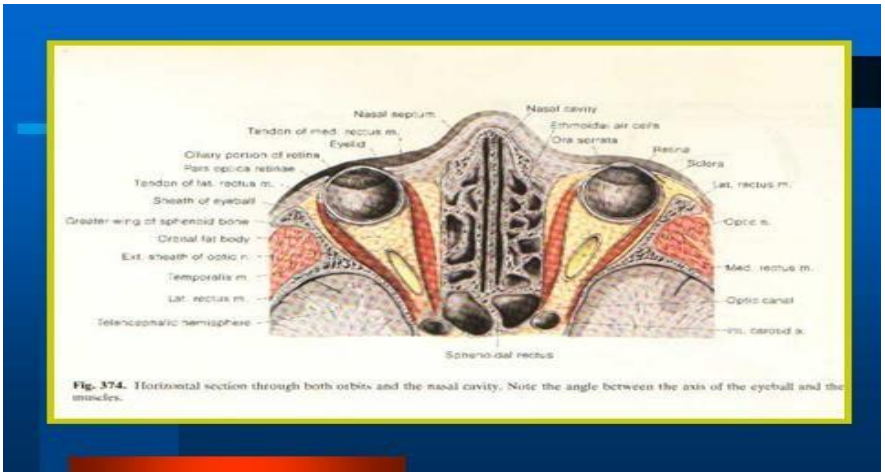

Fig. 374. Horizontal section through both orbits and the nasal cavity. Note the angle between the axis of the eyeball and the muscles.

Differential diagnosis pseudoproptosis
1. Unilateral eyelid retraction
2.Facial asymmetry
3. Unilateral macrophthalmos.
4. Unilateral microphthalmos.
5. Unilateral blepharoptosis

Investigation
Standard Roentgenography, Orbital phlebography. Ultrasonography, Computed tomography, Magnetic resonance imaging, Orbital endoscopy, Biopsy techniques, Fine Needle aspiration biopsy, Core biopsy, Endoscopic Biopsy

2. PATIENTS AND METHODS

The prospective study was carried out at otorhinolaryngology department of khanaqin general Hospital during the period from October 2018 to October 2019 During this period we received 30 cases of proptosis in E.N.T. clinic. They were referred to E.N.T clinic from ophthalmogical and orbital clinic, medical ward, general surgery clinic and outpatient clinic After evaluation of cases we found that in 5cases the proptosis was not related to E.N.T. diseases and were diagnosed as following Three cases of Graves disease, one presented with unilateral proptosis and two cases presented with bilateral proptosis.

Thus in this prospective study we studied only, 25 cases of proptosis which had been caused by E.N.T. disease and assessment of cases was done as following (as shown in the formula).

Complete history regarding the duration, nasal symptoms, ophthalmological symptoms, associated symptoms and past medical and surgical history.

Complete clinical examination regarding the general examination, examination ofnose, examination of eyes by ophthalmologist, examination of face and neck, other routine E.N.T. examination of ear and throat, examination of cranial nerves and fibreoptic nasopharyngoscopical examination. One case of orbital cellulitis had not been caused by sinus infection, and the source of infection was from the facial skin? One case of orbital lymphoma presented with unilateral proptosis

2.1 Investigations included

Haematological investigation e.g. complete blood picture, ESR, renal function test, blood sugar and liver function test Radiological examination included Plain x-ray for paranasal sinuses and nasopharynx, usually occiptomental and lateral views for all patients. – CT scan was performed fer 23 out of 25 patients MRI was performed for 5 out of 25 patients Plain chest X-ray was performed for all patients.

Ultrasonography was performed for orbits of 2 patients and for abdomen of 9 patients Direct smear for bacteriological and fungal study was taken from noses of 16 patients Histopathological examination for 16 patients. The informations that had been obtained are analyzed.

2.2 Analysis of statistical data

All data were collected and analyzed by using SPSS (statistical package for social science). Statistical analysis was performed using Chi-squared test to compare discrete variables and Student's (t)test was used to compare mean time of healing and to compare mean age in between groups. $p < 0.05$ was considered statistically significant for all tests.

3. Results

Table 1 Distribution of patients according to age and gender

Age/year	♂	%	♀	%	Total	%
0 - 10	1	4	1	4	2	8
11 - 20	2	**12**	7	28	9	36
21 - 30	2	8	0	0	2	8
31 - 40	1	4	1	4	2	8
41 - 50	2	8	1	4	3	12
> 50	5	20	2	8	7	28
Total	13	52	12	48	25	100

Table (2) Frequency of symptoms

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Volume 140, Issue 03, June, 2022

SYMPTOM	No. of patients	%
Proptosis	25	100
Nasal obstruction	20	80
headache	18	72
Nasal discharge	17	68
Hyposmia	17	68
Periorbital pain	16	64
Diplopia	16	64
Epiphora	10	40
Post nasal discharge	8	32

Table (3) Frequency of clinical sign

SIGN	No. of pat	%
Proptosis	25	100
Nasal discharge	12	48
Expansion of medial canthus	12	48
Nasal mass	10	40
Impairment of eyeball movement	9	36
Tenderness	7	28
Reduction of visual acuity	5	20
Ptosis	4	16
Postnasal mass	3	12
Optic disc change	3	12
Facial swelling	2	8
Redness or ulceration of sclera	2	8
Neck mass	2	8

Table 4 Frequency of cranial nerves impairment

Cranial nerve	No. of patients	%
II	3	12
III	4	16
IV	3	12
V	2	8
VI	2	8

Table 5 Distribution of patients according to major pathological lesion and gender

Type of lesion	♀	%	♂	%	Total	%
Inflammatory	9	36	7	28	16	64
Benign tumour	2	8	0	0	2	8
Malignant tumour	1	4	6	24	7	28

Table 6 Distribution of patients according to specific pathological finding

ISSN: 1343-4292
Volume 140, Issue 03, June, 2022

Type of lesion	No. of pat.	% from total
Inflammatory lesions		
Orbital infection due to bact. sinusitis	6	24
Fungal sinusitis	5	20
Frontoethmoidal mucocele	3	12
Non specific chronic inflammation	1	4
Nasal polyp	1	4
Benign tumours		
Frontoethmoidal osteoma	2	8
Malignant tumours		
SCC of maxillary sinus and nasal cavity	2	8
Adenocarcinoma of ethmoidal sinus	1	4
Hemangiopericytoma of maxillary sinus	1	4
Nasopharyngeal SCC	1	4
Nasopharyngeal Rhabdomyosarcoma	1	4
Astrocytoma	1	4

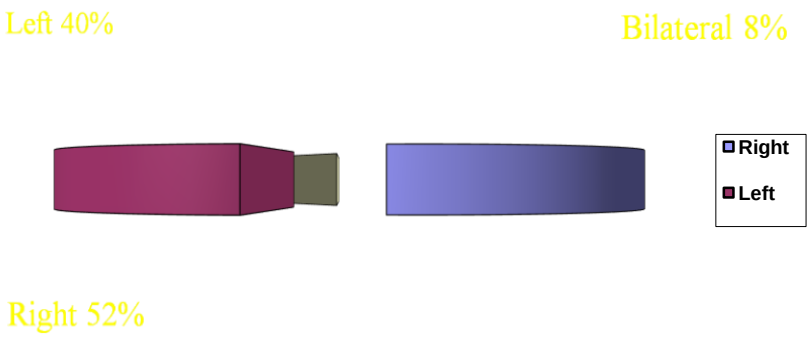

Figure 3-3: The side of proptosis

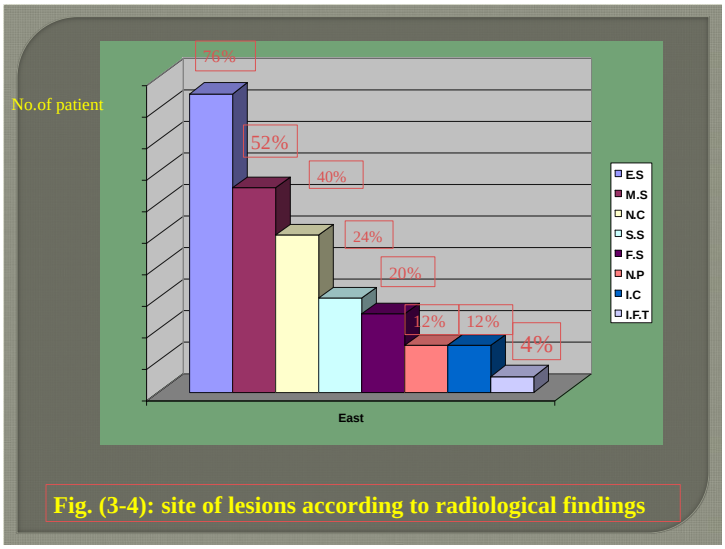

Fig. (3-4): site of lesions according to radiological findings

4. DISCUSSION

The study included 25 patients complained of proptosis caused by E.N.T diseases; gender distribution clarified that 13 of them (52%) were malesandtherest 12 (48%) were females, thus the male were slightly more than females {fig3-1), but Zaidi (1991) (25) found that females were more than males; 58.8% females and 41.1% males and Al-khalili (1998) (26) found that females also were slightly less than males, 49 % females and 51% males. Thus there is no significant difference in incidence of proptosis related to E.N.T diseases between males and females. The patients' age ranged from 4 years to 71 years, the age was divided into six groups;0-10 years, 11-20 years, 21-30 years, 31-40 years, 41-50 years and 51 years and above. The number of patients in first decade of life were 2 (8%)while in second age group 11-20 years were 9 (36%), in age group 21-30 were 2 (8%), in age group 31-40 years were 2 (8%), in age group 41- 50 years were 3 (17%) and in age group above 50 years were 7 (28%) {fig 3-2) and table no. 1. Thus the highest incidence was in second decade of life (36%) followed by age group above 50 years (28%) In other study Zaidi (1991) (25) found that the age of his patients ranged from 11-54 years and the highest incidence was in age between 45-54 years. The duration from the appearance of proptosis till admission to the hospital ranged from 6 days – 2 years, so the average duration between the appearances of proptosis till admission to the hospital in otolaryngologist department was 12.3 months, a figure was not found in other study We found that 13 patients out of 25 patients (52%) had proptosis of right eye, 10 patients out of 25 patients (40%) had proptosis of left eye and only 2 patients had bilateral proptosis (8%) {fig 3-3). This result Show difference with result of Zaidi (1991) (25) who reported just unilateral proptosis, 52.9% left and 47.1% right but Al- Khalili26 found that proptosis involve right eye in 42.9% and left eye in 56% and bilateral proptosis in 1.1% Regarding the presenting symptoms and signs that associated with proptosis, we found that the nasal obstruction was the commonest symptom (80%) followed by headache (72%), nasal discharge and hyposmia (68%) for each symptom, periorbital pain (64%), diplopia (64%), epiphora (40%), disturbance of vision (24%) while blindness (12%). Table no. 3 In other study, Johnson (1984) (27) found that the common presenting symptoms with proptosis were nasal obstruction, nasal discharge periorbital and facial pain and diplopia, Zaidi (1991) (25) reported similar presenting symptom that associate with proptosis, Al- Khalili (1998) (26) reported the diplopia in 14.5% We found that the commonest signs associated with proptosis were expansion of medial canthus and nasal discharge, 48% for each sign followed by nasal mass in 40%, impairment of eyeball movement 36%, reduction of visual acuity 20%, ptosis 16% and optic disc change 12%, table no. 4.

In study of Johnson (1984) (27), the most common sign were nasal discharge, nasal mass and visual loss. The cranial nerves examination revealed that there was impairment in the optic nerve in 12% of cases, oculomotor nerve in 16%, trochlear nerve in 12%, trigeminal nerve in 8%, abducent nerve in 8%, table no.5 The radiological study of our 25 patients revealed that in most patients, the lesions involved more than one site of the sinonasal region and its surrounding area in addition to the involvement of the orbit and it was not limited to one site or one type of the paranasal sinuses and we found that in 23.cases (92%) The lesions involved the ethmoidal sinus in 19 cases 76% which mean it was the most common site of involvement by lesion that causing proptosis in E.N.T practice according to this study .The maxillary sinus was the second most common site of involvement by the lesion that causing proptosis and it was involved in 13 cases (52%) followed by the nasal cavity which was involved in 10 patients (40%), sphenoidal sinus was involved in 6 cases (24%) and the frontal sinus was involved in 5 cases (20%), table no. 6 {figure 3-4) After confirming the definite diagnosis of cases, we found that the types of the pathological lesions that causing proptosis could be categorized into 3 major groups Group I: The inflammatory lesions were the most common causes of proptosis in E.N.T practice and in 16 patients (64%) the proptosis was caused by inflammatory lesion involving the paranasal sinuses and the nasal cavity, 9 of them were females (36%) and 7 patients were male (28%), table no.7 This result is similar to report by Zaidi (25) who found that 64.7% of proptosis in E.N.T practice was caused by inflammatory lesions Group II: The malignant tumours that had been diagnosed in

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seven patients (28%), one patient was female 4% and 6 of them were males (24%), table no. 7. Thus according to this study the malignant tumour was the second most common major cause of proptosis in E.N.T practice, and this was slightly higher than what was reported by- Zaidi (1991) (25) who found 23.5% of proptosis in E.N.T were caused by malignant lesion and it was the second most common cause according to his study Group III: The benign tumours that were the causes of proptosis in 2 patients only (8%) and both of them were females, table no. 7 and this percentage was slightly higher than what had been reported by Zaidi (1991)(25), who found that the benign tumour formed 5.8% of pathological lesion of sinonasal region that causing proptosis.

When we distributed the patients of each major pathological lesion group according to the age, we found that 8 patients out of 25 patients (32%) had inflammatory lesion causing proptosis, and their ages ranged between 11-20 years, 3 patients had inflammatory lesion and their age were above 50 years (12%) and 2 patients aged between 4150 years (8%). This means that the highest incidence of inflammatory lesion of sinonasal region that causing proptosis occurred in young age(between 11-20 years) and they formed 32% of total number of patients and 50% of patients that had inflammatory lesions caused proptosis, table no. 8 (figure 3 – 5) The age of patients that had benign tumours causing proptosis was 20 years for one patient(4%)and 52 years (4%), for the other patient table no. 8 Regarding the age of patients that had malignant tumours which caused proptosis, we found that 4 patients (16% of total number of patients and 57% of patients that had malignancy) aged above 50 years and one patient for each followingagedgroup;010years, 21-30 years, and 31-40 years. This mean that the malignant tumours of the sinonasal region may cause proptosis at any age but most commonly occur in old age group above 50 years. We studied the types of inflammatory lesions causing proptosis and we found that the orbital infection as an acute complication of bacterial sinusitis was the most common cause of inflammatory lesions and it was diagnosed in 6 patients out of 25 patients (24%) of total number of patients (table no. 9) and 37.5% of patients that had inflammatory lesions, 4 patients of these 6 patients were diagnosed as orbital cellulitis without abscess formation caused mild proptosis and they formed 16% of total number of patients, 25% of all patients with inflammatory lesions and 66.6% of patients that had orbital infection due to acute sinusitis, while Bharath (1995) (28). Reported orbital cellulites with mild proptosisin 38.4% of allhis cases who had proptosis We found that one patient of these 6 patients had orbital cellulitis with subperiosteal abscess caused moderate to severe proptosis and they formed 6.2% of all patients who had inflammatory lesions and 16.6% of patients who had orbital infection due to sinusitis while Bharath (1995) (28) reported subperiosteal abscess with moderate proptosis in61.6% of all his cases who presented with proptosis We found that one patient was acaseof cavernous sinus thrombosis which caused bilateral proptosis ((6.2 % of all patient with inflammatory lesion and 16.6% of patient who had orbital infection due to acute sinusitis) Among these cases, one involved only one sinus cavity (16.7%) and 5 (83.3%) involved a combination of multiple sinuses. Alfred (1987) (29) reported similar result that in 15.7% of cases one sinus was involved and in 84% multiple sinuses were involved. The age distribution of these 6 patients clarified that 4 patients (66.6%) of them were in second decade of life, and 83.3% of the patients who had proptosis due to orbital complication of bacterial sinusitis were below the age of 20 years. This is similar to report by Moloney (1987) (30) who found 85% incidence below 20 years and report by Bharath (1995) (28) who found that 76% of his patient under 20 years. We found that only one patient of these 6 patients had visual loss (16.6%) and this is similar to what be reported by Robert (2001) (15) in his literature that the risk of visual loss is 10-33%. The second most common type of inflammatory lesions that caused proptosis was fungal sinusitis, which was diagnosed in 5 patients out of 25 patients (20%) (table no. 9), and they formed 31.2% of all patients who had inflammatory lesions. This result is less than the result of Zaidi (1991) (25) who reported that 41.1% of all his cases.

5. CONCLUSION

From this study we can conclude that The orbit and its content are at risk in different types of inflammatory and neoplastic lesions that involves the sinonasal region. The proptosis is very important clinical sign

presented to the otolaryngologist and it is an important ocular manifestation of E.N.T diseases and it should be regarded seriously, investigated thoroughly and treated meticulously. The otolaryngologist has an important role in the diagnosis of the diseases that causing proptosis and if these diseases originates in the sinonasal region and extended to the orbit. Advanced radiological examination as CT Scan and MRI in coronal and axial section are very helpful investigation in the early diagnosis of E.N.T diseases that invade the orbit leading to proptosis and in detecting the extension of the lesion to all surrounding area.

6. RECOMMENDATION

IT is important that the ophthalmologist become more familiar with the otorhinolaryngological diseases that may cause proptosis and early consultation of otolaryngologist play an important role in detecting the cause of proptosis. The acute bacterial sinusitis especially in young patient should be diagnosed early and treated properly to prevent its orbital complication that may cause blindness. The proper otorhinolaryngological examination is essential for any immune compromised patient developing proptosis and the physicain should be oriented that the fungal sinusitis may be the cause of proptosis. Radiological evaluation of the paranasal sinuses by CT Scan is necessary for each patient complains of proptosis. For the purpose of defining an appropriate prevalence of otorhinolaryngological diseases that cause proptosis inour country. Further study is required with comparison with the result of our study and we recommend another study dealing with management of otorhinolaryngological diseases that cause proptosisand the effectiveness of this management in reducing the proptosis and saving the eye. The proper management of proptosis require combined team of specialists include ophthalmologist, neurosurgeon and otorhinolaryngologist.

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