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# A Clinical Study of Proptosis Conducted In Government General Hospital, Guntur

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***Abstract:***
***Background:*** *Proptosis is defined as an abnormal forward protrusion of one or both eyeballs with respect to the orbit. Most common cause of Unilateral and Bilateral Proptosis is Thyroid Eye disease and other causes include Lacrimal gland tumors, Tumors of Paranasal sinuses. Unilateral Proptosis is seen in tumors, cysts, vascular anomalies. Bilateral Proptosis can be due to Inflammatory conditions like thyroid Orbitopathy, Myositis, Sarcoidosis, Neoplastic conditions like Optic Nerve Glioma, Lymphoma, and Vascular lesions like Arteriovenous shunts, Varix. Proptosis can be vision threatening due to Exposure Keratopathy, Optic nerve compression and Refractive changes, thus this study was undertaken to thoroughly evaluate and appropriately treat patients with Proptosis.*
***Materials and Methods:*** *All cases of proptosis attending the Government General Hospital, Guntur were recorded during this period 2019 October to 2020 October. 20 cases are included in the study. In addition to clinical examination all the required Hematological, Serological, Radiological, Microbiological, Pathological investigations were performed. In this study there is hardly any gender discrimination as both genders are equally affected.*
***Results:*** *45% of the cases presented in the age group of 26 to 40 years, 35% cases recorded in the age group of>40 years. The common etiological factor in the study is thyroid ophthalmopathy accounting for 30% of the cases, followed by tumors of lacrimal gland (10%), tumors from paranasal sinuses (10%). This disease is predominantly unilateral (65%) and rest of the cases are bilateral (35%). Proptosis is predominantly axial type accounting for 65% followed by up and out (20%)- type of eccentric proptosis. Benign lesions (65%) are more common than malignant.*
***Conclusion:*** *Proptosis most commonly occurred in the age group of 26 to 40 years. Affected both genders equally. Thyroid Eye disease accounts for majority of cases of presenting with Proptosis, which can be unilateral or bilateral. Cosmetic disfigurement, Strabismus, Visual loss are other manifestations along with Proptosis. Benign lesions are more commonly associated with Proptosis when compared to Malignant lesions.*
***Key words:*** *Proptosis, Exophthalmos, Orbit, Thyroid eye disease, Lacrimal gland tumors, Tumors of Paranasal sinuses, Exophthalmometry.*

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## I. Introduction

The eyes in their position are basic requisite for the symmetry of the face, any variation in their position invites the attention of onlooker and needs medical attention, as eyes are windows of soul or mirror of mind. Any disturbance of the orbit or a mass lesion is invariably followed by proptosis of eye. Proptosis by definition is passive protrusion of eye ball from the socket. Exophthalmos-an active and dynamic process of eye ball. Nature has designed the orbital cavity in such a way that the eye particularly anteriorly, fits as smoothly as a hand in glove and almost as snugly as a cork in a bottle. The forward displacement of the eye ball is a striking and disquieting symptom common to many pathological conditions, the diagnosis of which may present great difficulty and anxiety.

Diseases of orbit create some of the complex and perpetuating problems in Ophthalmology. After taking history and a thorough clinical examination, there invariably remains enough uncertainty and require consultation from other specialist usually such a complicated evaluation serves only to include or rule out groups of disease entities. Thus, is aptly said that orbit is a "Temple of surprises".

In this study an attempt was made to find out the etiological cause of all cases of proptosis that attended the department of Ophthalmology, Government General Hospital, Guntur from October 2019 to October 2020.
**TYPE OF STUDY:** Retrospective study.
**PLACE OF STUDY:** Government General Hospital, Guntur.
**AIM:** To study Proptosis cases in terms of etiology, incidence, laterality.

## II. Materials And Methods

A clinical study of 20 cases of proptosis was undertaken who attended department of Ophthalmology, Govt. General Hospital, Guntur from 2019 October to 2020 October.

A detailed clinical history of all cases was taken. Thorough clinical examination and investigations are done to diagnose the cause of proptosis. Clinical evaluation done for thyroid function. Oto-rhino-laryngologist, Neuro Surgeon, Radiologist, Radiotherapist, General surgeon were consulted wherever their help was required. In majority of the cases, a diagnosis could be made by through investigations and biopsy. All the cases were treated either with methods like medical, surgical, radiotherapy and few cases were referred to higher center for management. The cases were followed up for at least 6 months.

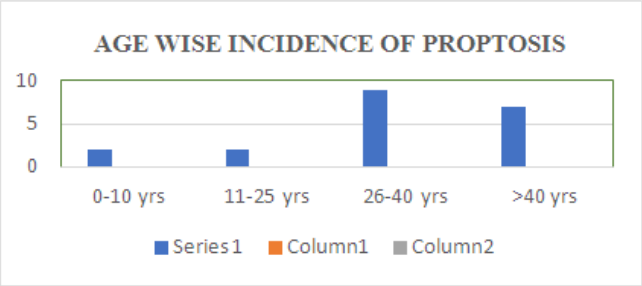
**INCLUSION CRITERIA:**
1.Included patients with symptoms like pain, protrusion of eyes.
2.Included patients with signs of inflammation, mass lesions.

**EXCLUSION CRITERIA:**
**1.**Patients with less than 10 years of age
2.cases of Pseudo-proptosis
3.Patients who are not willing to give consent.

## III. Results

**Table no.1** Age wise incidence of Proptosis
**Figure no.1**

| Age | Number of cases |
|---|---|
| 0-10 years | 2 (10%) |
| 11-25 years | 2 (10%) |
| 26-40 years | 9 (45%) |
| >40 years | 7 (35%) |




**Gender wise incidence of Proptosis among the study population:**
It was found that there is an equal incidence of Proptosis among males and females; thus, a ratio of 1:1 is recorded.

**Etiology of Proptosis**

**Table no.2**

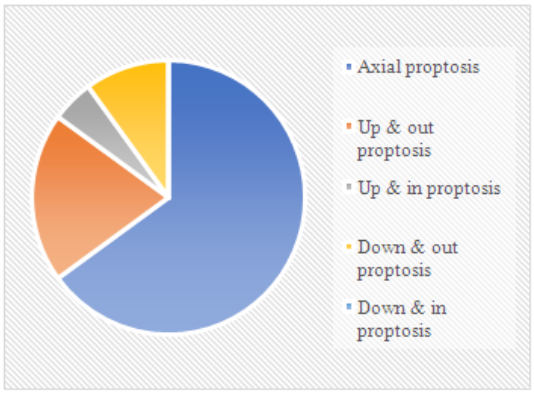
| Cause of Proptosis | Number of cases |
|---|---|
| Thyroid Orbitopathy | 6 (30%) |
| Pseudotumor | 2 (10%) |
| Tumors of Optic Nerve | 2 (10%) |
| Tumors of Lacrimal gland | 2 (10%) |
| Infections | 2 (10%) |
| Tumors of Paranasal sinus | 2 (10%) |
| Connective tissue tumors | 1 (5%) |
| Vascular causes | 1 (5%) |
| Lymphomas | 1 (5%) |

**Incidence of Axial vs Eccentric Proptosis**
(Eccentric Proptosis includes: Up & out, Up & In, Down & Out, Down & In proptosis)

**Table no.3**

| | |
|---|---|
| Axial Proptosis | 13 (65%) |
| Up & Out Proptosis | 4 (20%) |
| Up & In Proptosis | 1 (5%) |
| Down & Out Proptosis | 2 (10%) |
| Down & In Proptosis | Nil |

**Figure no.3**




## IV. Discussion

**PROPTOSIS** is the forward protrusion of one or both eyeballs or unilateral asymmetric protrusion of one eye by at least 2 mm. Normal upper limits - 22 mm in Caucasians, 24 mm in African-Americans**. Pseudoproptosis is** due to Unilateral high myopia, Buphthalmos. **9Ps (Krohel, Stewart & Chavis) – in the evaluation of Proptosis:** Pain, Progression, Proptosis, Pulsation, Pupil, PBCT, Perception of color vision, Peri orbital changes, Palpation

**PAIN:**
Seen in infections, inflammations, vascular, metastases, primaries, TAO, trauma

**PROGRESSION:** Can be Acute, Subacute, Chronic. Acute - hrs to week, Subacute-1-4 wks, Chronic- >1 month

**CAUSES OF PROPTOSIS:**

**Table no.4**

| Axial Proptosis | Down & Out | Upward displacement | Intermittent Proptosis |
|---|---|---|---|
| Cavernous hemangioma<br>Schwannoma<br>Neurofibroma<br>Hydatid cyst<br>TAO | Frontoethmoidal lesions<br>Mucocele<br>Fungal granuloma<br>Neoplasia<br>Fibrous dysplasia<br>Dermoid | Maxillary sinus lesions<br>Neoplasia<br>Fungal granuloma<br>Dumbbell dermoid<br>Lesions of inferior orbital space | • Idiopathic orbital inflammatory syndrome<br>• Lymphangioma<br>• Orbital varices<br>• Myocysticercosis |

**CLINICAL EVALUATION OF PROPTOSIS:**
It includes- Pulsations, Measurements: axial, vertical, horizontal, Valsalva maneuver, Periocular changes, Anterior segment and Fundus examination, Extra ocular movements, Cover test, PBCT, IOP, FDT if required, Palpation to look for bony regularity, temperature, tenderness, crepitus, description of mass- if thrill, retropulsion are present, Auscultation, Imaging, FNAC, HPE.

**1.MEASUREMENT OF PROPTOSIS:**
Should be done in Antero posterior (axial)**,** Horizontal**,** Vertical dimensions

❖ **NAFFZIGERS TEST**
To detect mild proptosis. Stand behind the patient and slowly tilt the head backwards. Look down over the patient's forehead - Proptosed eye appears first.

❖ **MILD PROPTOSIS**
Ask the patient to close the eyes gently. Keep a scale across the eye in contact with forehead and cheek. Normally there will be space between the scale and the closed lid. In proptosis this space is obliterated.

❖ **AXIAL MEASUREMENT:** Can be done with
- Hertel Exophthalmometer
- Leudde's Exophthalmometer
- Naugle Exophthalmometer

**HERTEL Exophthalmometer**

Has two foot plates, one fixed and other sliding. Rest fixed foot plate on lateral wall of right orbit. Slide the other one on the scale till it rests on the lateral wall of left orbit. Note the distance between two foot plates-Base reading. Occlude the other eye. Scale reading of anterior most part of cornea seen in profile.

❖ **HORIZONTAL DISPLACEMENT**

Mark center of nasal bridge and cover the other eye. In straight gaze measure the distance from the mark to nasal limbus. Repeat in the other eye. Lesser reading of proptosed eye means medial pushing. Larger reading means lateral pushing.

❖ **VERTICAL DISPLACEMENT**

Hold one scale joining the lateral canthi. Measure the distance from this scale to 6'0 clock limbus of each eye. Displacement of proptosed eye is inferior or superior can be measured.

**2.PULSATIONS:** Proptosis can be associated with pulsations which can be: Vascular- due to CCF, meningioma, orbital varix, aneurysm or Transmitted- due to Neurofibroma, trauma.

**3.PUPIL:** Should be examined for RAPD, which indicates Optic nerve damage due to Tumors of optic nerve or its sheath, Compression by lesions of central space, Enlarged extraocular muscles in TAO

**4.PERCEPTION OF COLOR VISION:** Simple and sensitive test, done using Ishihara charts. Color vision is defective in early optic nerve compression.

**5.PBCT (Prism bar cover test):** Performed to check for limitation of ocular motility. Causes of ocular motility in Proptosis can be:

- Restrictive: Thyroid associated ophthalmopathy (TAO), myositis, myocysticercosis
- Trauma: soft tissue edema, muscle entrapment, muscle injury
- Paralytic: Carotid-cavernous fistula (CCF)

**6.PERI ORBITAL CHANGES**

They include: Temporal fullness, Lid changes, Mass, Conjunctival changes.

**a)Temporal fullness** can be due to Sphenoid wing meningioma of lateral half, Dumbbell dermoid.

**b)Lid changes** include: Lid retraction, Lid lag, Lagophthalmos, Sinuous lid margin, Lid tumors

**LID RETRACTION**

- Most common lid change in TAO
- Mild: lid margin at the limbus
- Moderate: up to 4mm sclera seen
- Severe: >4mm

**LID LAG**

- Second most common change in TAO
- Can be unilateral or bilateral

**LAGOPHTHALMOS**

- Detected in early stages by looking from below
- Can lead to exposure keratitis

**LID MASS:** Its Surface**,** Vasculature**,** Transillumination**,** Margins**,** Posterior extent of borders should be examined

**c)Conjunctival changes:** Salmon patch**,** Chemosis, Caput medusae, SCH. Caput Medusae are engorged blood vessels around the limbus and is seen in CCF, Orbital abscess**,** TAO**,** Lymphangioma.

Figure no.3 showing chemosis of conjunctiva in Orbital cellulitis.

**Figure no.3**

According to Peyman's principles of ophthalmology, the most common lesions are grouped in the order given below:

**INFANTS:** Benign: Capillary hemangioma (most common)
Malignant: Metastatic Neuroblastoma (Next Common)

**CHILDREN:** Orbital cellulites-most common cause of proptosis, Rhabdomyosarcoma-most common primary orbital malignancy, Capillary hemangioma and Lymphangioma- vascular tumors are the common benign primary orbital tumors, Metastatic neuroblastoma –most common metastatic cancer

**ADULTS:**

Endocrine -Thyroid exophthalmos (most common)
Inflammatory -Inflammatory pseudotumor
Vascular -Cavernous hemangioma
Benign -Osteoma
Malignant -Basal Cell Carcinoma (most Common neoplasm of eyelid causing Proptosis

**INVESTIGATIONS:** Commonly performed investigations include

1.Exophthalmometry
2.Orbitometry
3.Radiography
4.Ultrasonic examination
5.Scanning by Radioactive isotopes
6.Thermography.
7.Computersed tomography
8.Tissue Imaging Techniques

**MANAGEMENT OF PROPTOSIS**: The orbital diseases causing proptosis have a wide variety of pathological processes. The anatomical proximity of the cranial cavity and nose and paranasal sinuses calls for the Rhinologist or Neurosurgeon when the disease involves those areas.

**1.MEDICAL TREATMENT:** The orbital diseases causing proptosis can be treated by either drugs, radiation or surgery alone with combination of two or more.

CORTICOSTEROIDS:

Corticosteroids are useful in the management of thyroid ophthalmopathy, pseudotumor. The treatment can be started with high doses of 100mg/day in divided doses and can be tapered down when there is response. If there is no response after 2 or 3 weeks, treatment should be changed to their response.

**Other modalities of Medical management include:** Antibiotics, Chemotherapy**,** Radiotherapy, Surgical treatment

**2.SURGICAL TREATMENT:** It include – Diagnostic or Excision Biopsy, Anterior orbitotomy, Lateral Orbitotomy, Trans-frontal approach, Orbital biopsy

## V. Conclusion

All the cases of proptosis attending Government General Hospital, Guntur During the period of 2019 October to 2020 October are recorded**.** Our study results goes in accordance with popular studies such Duke elder, Rhees case study from Mayo clinic by Drescher and Benedict and from the Registry of pathology in Washington, as most common non neoplastic origin is Endocrine Exophthalmos, tumors are more common primarily from orbit, and then para orbital (Paranasal sinuses, Pharynx). In all the cases where patient has reported or attended early, the results were good. Where there is undue delay in attending the hospital, the results were unfavorable. In a nut shell, with an early diagnosis and appropriate treatment, reasonably good rehabilitation, can be achieved.

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