Dissertation on

STUDY OF ROLE OF FINE NEEDLE ASPIRATION BIOPSY IN ORBITAL & EYELID LESIONS

Submitted in partial fulfillment of requirements of

M.S. OPHTHALMOLOGY

BRANCH - III

REGIONAL INSTITUTE OF OPHTHALMOLOGY

MADRAS MEDICAL COLLEGE

CHENNAI- 600 003

THE TAMILNADU

DR.M.G.R. MEDICAL UNIVERSITY

CHENNAI

APRIL 2014

CERTIFICATE

This is to certify that this dissertation entitled **"STUDY OF ROLE OF FINE NEEDLE ASPIRATION BIOPSY IN ORBITAL & EYELID LESIONS"** is a bonafide record of the research work done by **Dr. FARAZ ALI MOHAMMAD,** post graduate in Regional Institute of Ophthalmology and Government Ophthalmic Hospital,Madras Medical College and Government General Hospital, Chennai-03, in partial fulfillment of the regulations laid down by The Tamil Nadu Dr.M.G.R. Medical University for the award of M.S. Ophthalmology Branch III, under my guidance and supervision during the academic years 2011-2014.

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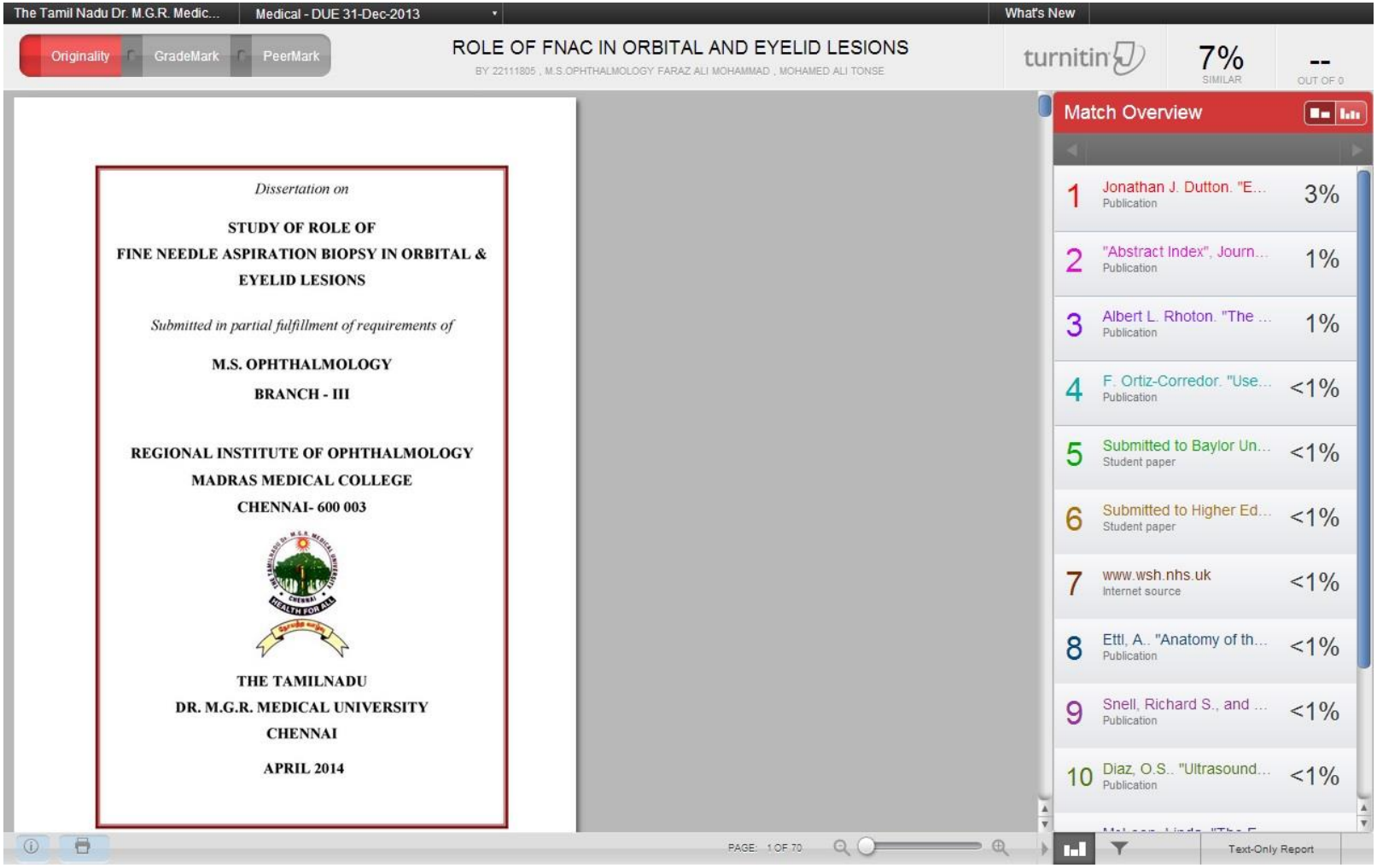
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Dissertation on STUDY OF ROLE OF FINE NEEDLE ASPIRATION BIOPSY IN ORBITAL & EYELID LESIONS Submitted in partial fulfillment of requirements of M.S. OPHTHALMOLOGY BRANCH - III REGIONAL INSTITUTE OF OPHTHALMOLOGY MADRAS MEDICAL COLLEGE CHENNAI- 600 003 THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY CHENNAI APRIL 2014 PART I ANATOMY OF ORBIT AND EYELIDS CLINICAL ANATOMY OF THE ORBIT The orbit is a pear shaped cavity enclosing a volume of about 30ml and made up of 7 bones. The orbit contains the eyeball and extraocular muscles, nerves, vascular elements, lacrimal gland and the spaces between them are completely filled with lobules of orbital fat and connective tissue fascia . The orbital septum,...

TITLE: ROLE OF FNAC IN ORBITAL AND EYELID LESIONS

AIM : To study the role of FNAC in eyelid and orbital lesions in comparision to biopsy.

Materials and methods : 40 patients with eyelid (24) and orbital lesions (16) were subjected to FNAC and then later to Biopsy and the results were compared and tabulated. Only firm eyelid lesions >5mm in size and anterior orbital lesions were included in the study.

RESULTS : This shows that FNAC in eyelid and orbital lesions is a reliable diagnostic tool with histopathological correlation of >80 % in orbital lesions and correlation of 91.3%The sensitivity of FNAC for malignant lesions to be 88% and its specificity to be 100%.The positive predictive value of FNAC for malignant lesions is 100% and negative predictive value is 89%.

CONCLUSION : FNAC gives rapid results and correlates highly with Tissue biopsy proven HPE, FNAC can be considered as a primary investigation in the diagnosis of eyelid and anterior orbital lesions and can be done safely as an outpatient procedure.

Keywords : FNAC , Biopsy , HPE , Anterior orbital lesion , eyelid lesion

CONTENTS

ABBREVIATIONS

RE	:	RIGHT EYE
LE	:	LEFT EYE
NAD	:	NO ABNORMALITY DETECTED
DM	:	DIABETES MELLITUS
HTN	:	HYPERTENSION
FNAC:		FINE NEEDLE ASPIRATION CYTOLOGY
FNAB:		FINE NEEDLE ASPIRATION BIOPSY
HPE	:	HISTOPATHOLOGICAL EXAMINATION
USG	:	ULTRASONOGRAPHY
CT	:	COMPUTERISED TOMOGRAPHY
IOP	:	INTRAOCULAR PRESSURE
BP	:	BLOOD PRESSURE
FBS	:	FASTING BLOOD SUGAR

PART I

ANATOMY OF ORBIT

AND

EYELIDS

CLINICAL ANATOMY OF THE ORBIT

The orbit is a pear shaped cavity enclosing a volume of about 30ml and made up of 7 bones.

The orbit contains the eyeball and extraocular muscles, nerves, vascular elements, lacrimal gland and the spaces between them are completely filled with lobules of orbital fat and connective tissue fascia.

The orbitalseptum separates the anterior orbit from the eyelid. The orbital apex is the posterior end where the four walls of the orbit converge.

The seven bones forming the orbital walls are fig (1):

1. Frontal
2. Ethmoid ,
3. Maxillary ,
4. Palatine ,
5. Sphenoid
6. Lacrimal and
7. Zygomatic bones.

The orbital bones contributing to the walls of the orbit are as follows:

Roof Frontal bone Lesser wing of the sphenoid bone	**Medial Wall** Frontal process of the maxillary bone Lacrimal bone Ethmoid bone Body of the sphenoid bone
Floor Maxillary bone Zygomatic bone Palatine bone	**Lateral Wall** Zygomatic bone Greater wing of the sphenoid bone

THE BASE OF THE ORBIT:

The anterior open end of the orbit is called as the base. A ring of compact bone forms the orbital margins. They are the following:

Superior margin Formed by orbital arch of frontal bone	**Lateral orbital margin** Formed by zygomatic bone and zygomatic process of frontal bone Strongest part of the base.

Inferior margin	**Medial orbital margin**
Formed by zygomatic bone and zygomatic process of frontal bone	Upper part formed by frontal bone and continuous with posterior lacrimal crest Lower part formed by anterior lacrimal crest on frontal process of maxilla

THE APEX OF THE ORBIT

The apex of the orbit refers to the posterior end of the orbit, fig (1), where the four orbital walls converge and it contains

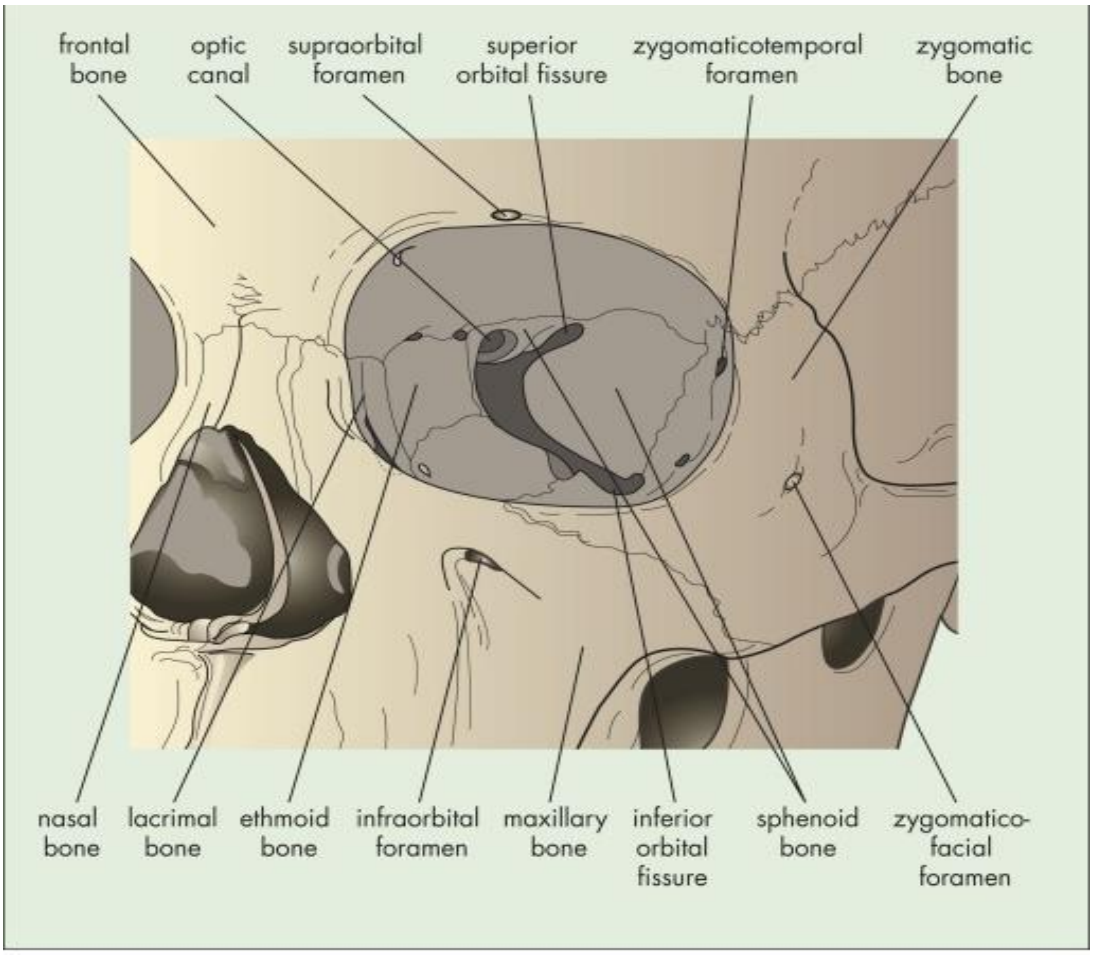
1. Optic canal – which transmits the optic nerve and Ophthalmic artery
2. Superior orbital fissure – which is further divided into upper , middle and lower parts by the common tendinous ring

Upper part transmits – lacrimal nerve, frontal nerve, trochlear nerve, recurrent branch of ophthalmic artery and superior ophthalmic vein

Middle part transmits - superior and inferior division of oculomotor nerve, nacociliary nerve and abducent nerve.

Lower part – transmits inferior ophthalmic vein.

Fig 1. Showing the 7 bones forming the orbital walls, the Base & the apex of the orbit



PERIORBITA:

The surface of the orbital bones is lined by periosteum. This is known as periorbita. It is usually loosely attached to the bone .At the sutural sites, lacrimal fossa, superior and inferior fissures and the orbital margins, the periorbita is firmly attached. Also the ring of Zinn is formed by the thickening of the periorbita.

ORBITAL FASCIA: It is the lining of the intraorbital structures and is a thin membrane made up of connective tissue.

The orbital fascia can be studied under the following headings:

- The Fascial sheaths of the extraocular muscles
- Intermuscular septa
- Fascial expansions – capsulopalpebral fascia , Suspensory ligament of Lockwood , superior transverse ligament of Whitnall
- Tenon’s capsule or Fascia bulbi – which lines the globe from limbus to the optic disc but is separated from the sclera by a potential subtenons space.

The other**contents of the Orbit**are as follows:

The **eyeball**:About one fifth of the orbital volume is occupied by the eyeball.

Muscles: The extraocular muscles originate from the walls of the orbit to insert onto the globe which include the four recti muscles – Superior,Medial,Lateral, inferior recti and the obliques – superior and inferior obliques.

Nerves: The nerves contained in the orbit are

- the Optic Nerve ,
- the oculomotor nerve , trochlear nerve , abducent nerve -innervate the extraocular muscles
- Branches of Ophthalmic and Maxillary division of Trigeminal nerve.

Blood vessels: Ophthalmic artery and its branches, branch of middle meningeal artery, infra orbital vessels and the superior and inferior ophthalmic veins.

ORBITAL FAT: Occupies most of the orbital cavity and is divided by intermuscular septa into central and peripheral parts anteriorly while posteriorly the central and peripheral parts are continuous.

Lacrimal gland.

SURGICAL SPACES OF THE ORBIT:

The various connective tissue structures divides the orbit into various spaces of surgical importance and are as follows:fig (2)

- Sub Tenon’s space - The potential space between the sclera and subtenons.
- Anterior (peripheral) space – bound anteriorly by septum orbitale, posteriorly merges with the central space, internally by extraocular muscles and their septa and peripherally by the periorbita.
- Posterior / Central space: bounded anteriorly by the fascia bulbi, posteriorly continuous with the peripheral orbital space, and peripherally by the extraocular muscles and their septa. Also called retrobulbar space.
- Apical space: anteriorly merges with anterior and central spaces, peripherally by periorbita, and posteriorly ends at the apex of the orbit.
- Sub-periosteal space: A potential space between the periorbita and the orbital bones. Strong adhesions between the orbital bones and the periorbita limit the space anteriorly.

Fig (2) surgical spaces of the orbit

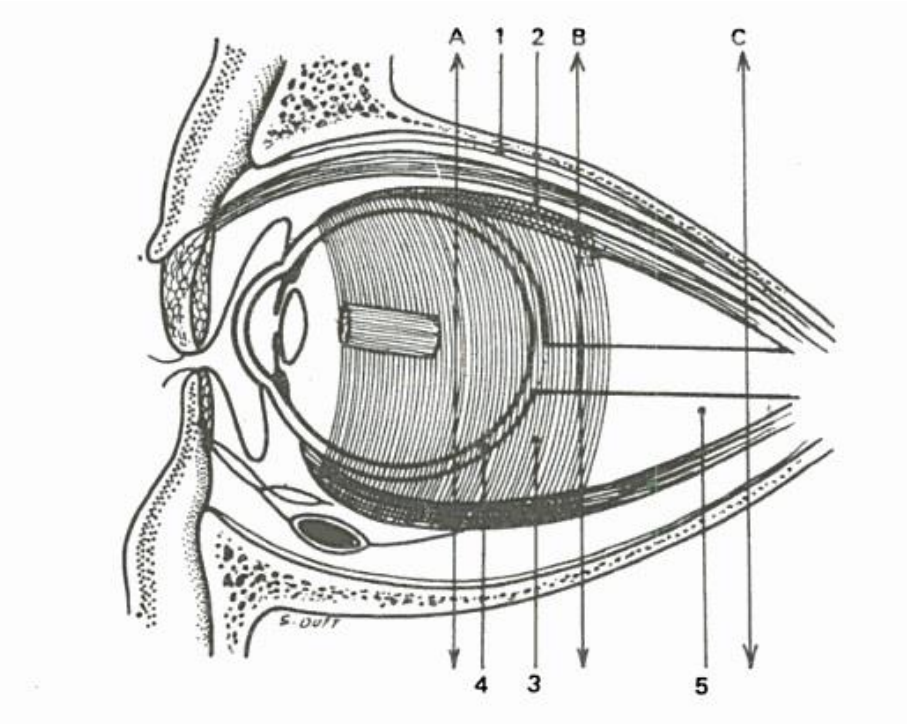


Fig showing section of orbit at various levels dividing into surgical spaces. Sagittal section above and corresponding coronal sections at levels A,B,C showing 1.subperiosteal space 2.peripheral space 3.central space 4.Tenons space 5.orbital apex showing merging of peripheral and central spaces.

LESIONS OF ORBIT BASED ON PATHOPHYSIOLOGY

INFECTIONS	Preseptal cellulitis Bacterial orbital cellulitis Rhino-orbital mucormycosis
NON-INFECTIVE INFLAMMATORY DISEASE	Idiopathic orbital inflammatory disease Orbital myositis Acute dacryoadenitis Tolosa–Hunt syndrome Wegener granulomatosis
VASCULAR MALFORMATIONS	Varices Lymphangioma
CYSTIC LESIONS	Dacryops Dermoid cyst Sinus mucocele Encephalocele
TUMOURS	Capillary haemangioma Cavernous haemangioma Pleomorphic lacrimal gland adenoma Lacrimal gland carcinoma Optic nerve glioma Optic nerve sheath meningioma Plexiform neurofibroma Isolated neurofibroma Lymphoma Embryonal sarcoma Adult and childhood metastatictumours Orbital invasion from adjacent structures
	Direct and indirect carotid cavernous fistula

ORBITAL LESIONS DEPENDING ON LOCATION

SUBPERIOSTEAL SPACE	Dermoid and Epidermoid cyst , subperiosteal abscess ,hematoma fibrous dysplasia , expanding mucocele
PERIPHERAL / ANTERIOR ORBITAL SPACE	Lymphoma Capillary Hemangioma Lacrimal gland tumour Pseudotumour
CENTRAL SPACE	Cavernous hemangioma Meningioma Optic Nerve Glioma Solitary Neurofibroma
APICAL SPACE	Pseudotumour Meningioma
SUB TENONS SPACE	Abscess

CLINICAL ANATOMY OF THE EYELIDS

They are mobile tissue curtains placed in front of the eyes and serve in protecting the globe.

The various functions of the eyelids are the following:

1. Help spread the tear film evenly over the surface of the eye.
2. The eyelids collect tears and propel them to the medial canthus, where they enter the lacrimal drainage system.
3. The eyelashes protect the cornea from glare and injury by sweeping particles from the front of the eye and reflex movements.

   The eyelids consists of the following layers:Fig (3)

   - Skin
   - Subcutaneous areolar tissue
   - Striated muscle – Orbicularis oculi and Levator palpebra superioris
   - Submuscular areolar tissue – contains nerves and vessels
   - Fibrous layer – Tarsal plate and orbital septum
   - Non – striated muscle fibres – Mullers muscle
   - Conjunctiva

Layers of the eyelid

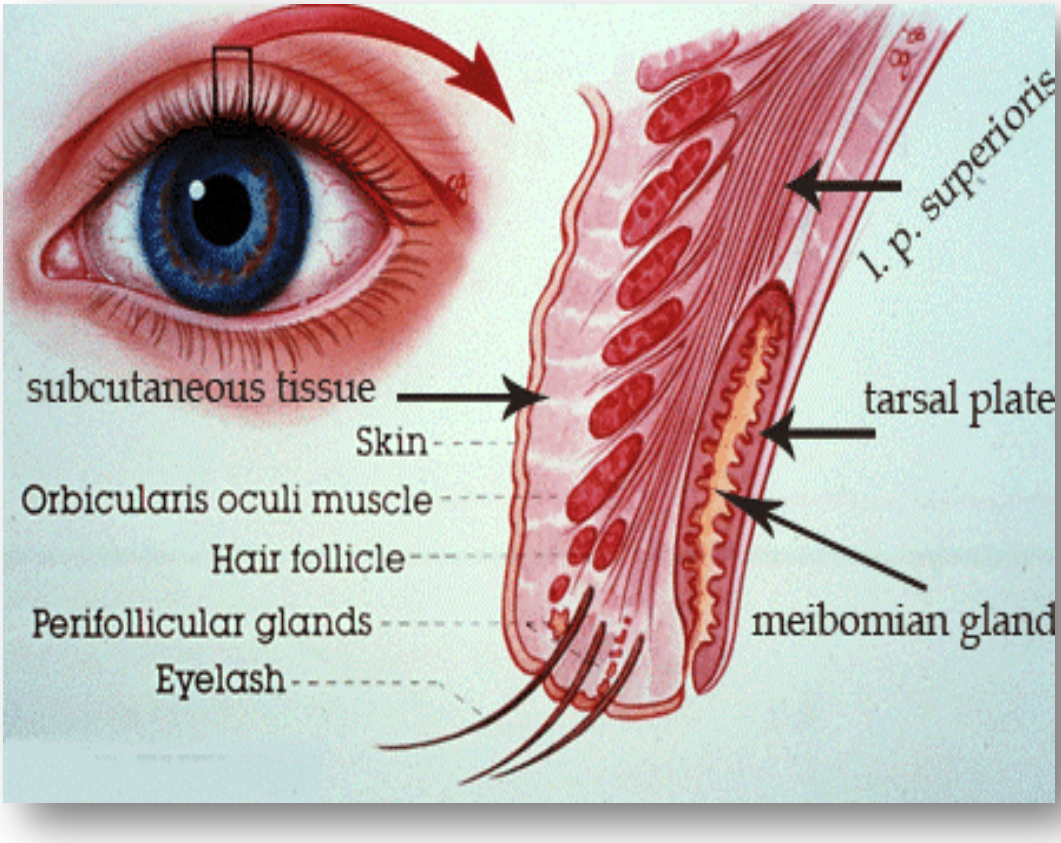


Fig (3) showing cross section of the eyelid

ORBICULARIS OCULI:

The Orbicularis oculi is supplied by the **Facial nerve (CN7)** and can be divided into the Orbital portion & Palpebral portion.

1. **Orbital portion** - overlies the bony orbital rims
2. **Palpebral portion** – a) **Preseptal** part - over the orbital septum in both upper and lower eyelids.

b) The **pretarsal** portion of the muscle overlies the tarsal plates.Medially, the pretarsal fibers fuse to form a prominent bundle of fibers called **Horner's muscle**, whichhelps in the lacrimal pump drainage by maintaining the posterior position of the canthal angle & tightens the eyelids against the globe during eyelid closure.

Orbital Septum

The orbital septum is a thin, fibrous membrane that begins at the orbital rim. Distal fibres of the orbital septum merge into the anterior surface of the levator aponeurosis. The point of insertion usually is about 3–5mm above the tarsal plate. In the lower eyelid the septum fuses with the capsulopalpebral fascia and gives rise to the common fascial sheet which inserts onto the lower border of the tarsus

EYELID RETRACTORS

They consist of the levator palpebrae and Müller’s muscles in the upper lid.

The LPS arises from the lesser wing of sphenoid and runs forward above the superior rectus muscle. A condensation is seen along the muscle sheath, at the superior orbital rim,called the transverse orbital ligament of Whitnall from where the muscle continues downward as its aponeurosis for about 14–20mm before it insertsonto the tarsal plate. At the upper edge of the tarsus, this aponeurosis sends numerous interconnecting slips forward and downward whichgets inserts ontothe pretarsal orbicularis muscle and subcutaneous tissue, which ultimately forms the lid crease.

Müllers muscle originates from the undersurface of the LPS and inserts onto the anterior edge of the superior tarsal border and receives sympathetic innervation. Lesion in this sympathetic pathway causes HORNER’S syndrome.

In the lower eyelid, the sheaths around the inferior rectus, inferior oblique and the Lockwood’s ligament gives rise to the **capsulopalpebral fascia**.This fibrous sheet passes upward,fuses with fibers of the orbital

septum and gives rise to the common fascial sheet which inserts onto the lower border of the tarsus.

TARSAL PLATES:

They impart structural integrity to the each eyelid. The width of each plate is about 25mm and the height of the tarsal plates in the upper eyelid is 8–12mm and 3.5–4mm in the lower eyelid and . About 25 Meibomian glands are located within the upper tarsus and 20 in the lower tarsus. They produce the lipid layer of the precorneal tear film.

CONJUNCTIVA:

It is a mucous membrane which lines the anterior surface of the globe and the posterior surface of the eyelids and contains small accessory lacrimal glands within the sub mucosal connective tissue. It can be divided into:

1. **The palpebral conjunctiva** which lies closely along the posterior surface of tarsal plate and Mullers muscle.
2. **The bulbar conjunctiva**. It is continuous with the palpebral portion above and below atthe furnaces.

LESIONS OF EYELID:

Can be divided into benign and malignant lesions.

Benign nodules & cysts :	Chalazion Dermoid Epidermoid cyst Epidermal inclusion cyst Cyst of moll & Zeis
Benign epidermal tumors :	Squamous cell papilloma Basal cell papilloma Actinic keratosis
Benign adnexal tumours	Syringoma Pilomatricoma
Benign pigmented lesions	Freckle Congenital / acquired melanocytic nevus
Miscellaneous benign tumours	Capillary hemangioma Neurofibroma
Malignant tumours	Basal cell carcinoma Keratoacanthoma Squamous cell carcinoma Sebaceous cell carcinoma Melanoma Merkel cell carcinoma Kaposi sarcoma

DIAGNOSIS OF LESIONS

The diagnosis of the various orbital and eyelid lesions are done in a stepwise approach:

1. **History taking and physical examination**: to determine if the disease is characterized by features of inflammation, infiltration, vascular change or mass effect, and it helps define the location of the lesion.

2. **Imaging techniques**– helps localize the lesion ,define relationship of lesion and its effect on adjacent structures. Also defines its surface features and infiltrative effects if any. Imaging can also give an idea as to the compressibility, vascularity, and positional changes of the lesions. Imaging studies frequently used are USG, CT scans and MRI.

   These help to arrive at a differential Diagnosis.

3. **Tissue Diagnosis**: This gives the definitive diagnosis and therapeutic decisions are made.

TISSUE DIAGNOSIS

A tissue diagnosis is the final diagnosis and confirms the nature of the lesion.

The tissue samples can be obtained by:

PREOPERATIVE DIAGNOSIS: Fine needle aspiration cytology

INTRA and POST OPERATIVE DIAGNOSIS: Frozen section

Imprint Cytology

Incisional Biopsy

Excisional Biopsy

FINE NEEDLE ASPIRATION CYTOLOGY:

Fine needle aspiration cytology has an important application in clinical practice. It was defined by Banforth (1996) as one of the most useful component of non-exfoliative or clinical tissue cytology.

For over a century diagnostic pathology had centered on surgical biopsy and histopathology. It is due to the pioneering work by Papanicolou, in the diagnosis of uterine carcinoma by exfoliative cytology from the accessible anatomical sites that the focus has now shifted to less invasive procedures which could serve both as a screening and diagnostic technique.

The History of needle biopsy has been traced to reports published in 1847 by Kun.Greid and Grey in 1904, which demonstrated trypanasomal organisms in aspirates from lymph nodes. It was Guthrie in (1921) who reported the use of needle aspiration in the diagnosis of Malignant Lymphomas. It was Martin and Ellis in 1927 at Memorial Hospital,USA, who reported 65 aspirations from a number of organs. Confident diagnoses were made by including cell block preparations in their study. In 1930, Steward described aspiration in 2500 tumours from the same institute. In Europe ,Zajicek and Franzen at Karolinska Hospital , Sweden were the first to describe precise diagnostic criteria in a variety of conditions in 1950. [10]

In 1972 , ocular lesion cytology was described by Naib.[12]

In 1975 , FNAC in orbital tumours was described by Schyberg.[8]

FNAC for intraocular tumours was proposed in 1979 by Jacobiec et al.[9]

The gold standard method for diagnosis of tumours is Biopsy. FNAC is a safe, reliable, relatively non-invasive method that can be used in place of open biopsy.

FNAC is considered as an important preliminary diagnosis and can be used to diagnose easily palpable tumours of the breast, Lymph nodes, salivary glands,Orbit and eyelids.

FNAChas also been done for deeper lesions inthe abdomen, retroperitoneal space,and prostate.

The Accuracy can be increased by combining the procedure with USG/ CT guidance.

FINE NEEDLE ASPIRATION CYTOLOGY TECHNIQUE

The procedure for FNAC is generally the same for any site in the body. An Ophthalmologist or Pathologist can safely do the procedure in the outpatient department under strict aseptic precautions. It can be done directly under vision or CT guidance. Local anaesthesia is generally not indicated. Using “sampling technique”, a 23 gauge needle is introduced into the lesion, moved in various directions and then withdrawn gently,wherein, the cellular aspirate moves into the needle by capillary action.

The aspirate is then spreadover a slide, fixed in isopropylalcohol and stained with hematoxylin and eosin, examined and reported.

Advantages and Limitations:

The advantages of FNAC in eyelid and Orbital lesions are:

- It is quicker to perform, easily repeatable, and can be done as an outpatient procedure with quick reporting of results without need for anaesthesia or orbitotomies. Results are obtained within a few hours.
- Causes only minimal trauma at the site of interest.

- Can be used in patients who are severely ill with risk factors for anaesthesia and surgery.
- When the suspected tumour doesn't require surgical intervention for treatment, such as, Lymphoma, Metastatic tumours, Rhabdomyosarcoma, infections, sarcoidosis.
- More cost effective as it avoids unnecessary admissions, saves time and makes use of minimal instrumentation.

FNAC in Orbital and eyelid lesions can be used to differentiate between malignant and benign lesions with ease.

Limitations of FNAC in Orbit and Eyelid lesions are:

- Deep seated orbital lesions are to be avoided due to the risk of retrobulbar haemorrhage. Risk can be reduced by using USG guidance for deep seated lesions.
- Lacrimal gland tumoursare to be avoided for the risk of breaching the capsule and local metastasisalong needle biopsy track.
- Fibrous nature of tumour leads to difficulty in diagnosis.
- Sample adequacy is important as an accurate diagnosis cannot be made if haemorrhagic aspirate or insufficient material is aspirated.
- Rare potential complications are penetration of the sclera, Diplopia and Ptosis.

TISSUE BIOPSY

A Biopsy can be Incisional or Excisional. An excisional biopsy serves as both diagnostic and as treatment.

Incisional: using a blade or a biopsy punch, in which onlya part of the lesion is removed to allow histological diagnosis.Usually done in suspected malignant lesions.

E**xcisional**: in which the entire lesion is removed and a histological diagnosis made;

Usually indicated for suspected benign lesions,cystic lesions, well circumscribed and encapsulated lesions such as Dermoid, cavernous hemangioma, pleomorphic adenomaof lacrimal gland, neurilemoma and fibroushistiocytoma. Biopsy has the added advantage of being therapeutic in such cases.

In Orbital lesions obtaining sample for tissue diagnosis may warrant an orbitotomy.

In the eyelid lesionsexcision biopsy may be of the following types:

1 **Shave excision** using a blade to remove shallow epithelial tumours, such as papillomas and seborrhoeic keratosis
2 **Full-thickness skin excision** for tumours that are not confined to the epidermis.

Biopsy obtained samples are fixed in 10% formaldehyde to preserve morphology , dehydrated in graded alcohol , cleared in xylene and embedded in paraffin wax. 5 – 6 micron thick sections made, stained using Hematoxylin and Eosin, examined by the pathologist and reported. This process takes a minimum of 5 days.

Other techniques:

Core Biopsy: It is a more invasive procedure compared to FNAC and makes use of a 2-4mm diameter trephine. Passed into the lesion after sufficiently anesthetizing the area with a gradual rotatory motion and the specimen is obtained.It has the advantage of being a rapid procedure with quicker reporting and can be done for deeper lesions but it requires more expertise and is a much more invasive procedure as compared to FNAC. [16]

Frozen section: also known as *cryosection* and it involvesthe histological examination of the margins of the excised specimen during surgery to ensure tumour cell free margins. If tumour cells are present in a particular area, further excision is performed until the specimen is tumour free. Although the results are obtained immediately, it requires more expertise, the use of a microkeratome known as cryostat, and the quality of slides to be examined is lower than the traditional histology techniques. [17,18]

Moh's micrographictechnique:Fig (4)

This technique was founded by Frederick mohs in the 1930's.

In this technique, layered excision of the tumour is carried out, colour coded using dyes,fixed, processed and a map of the edges of the tumour is created.

If tumour cells are still present, further tissue excision is done till clearance is achieved.

This procedure requires considerable expertise, is time-consuming, but minimizes the removal of normal tissue and maximizes the removal of the tumour cells.

It gives minimal recurrence rate and is very useful in eyelid tumours where reconstruction plays an important role. [19,20,21,22]

Fig 4.Procedure of Moh's micrographic technique:

Step 1 showing tumour site, step 2 showing schematic removal of visible portion of tumour.

Step 3: showing division of excised tissue into quadrants and staining with colour dyes and a map of tissue made.

Step 4: checking the excised quadrant for any residual tumour cells.

Step 5: removal of residual tumour and steps 3 & 4 repeated till tumour free margins are obtained.

REVIEW OF LITERATURE

FNAC is a safe, reliable, relatively non-invasive method that can be used in place of open biopsy.[13]

In 1972, ocular lesion cytology was described by Naib.[12]

In 1975, FNAC in orbital tumours was described by Schyberg. [8]

FNAC for intraocular tumours under imaging guidance was proposed in 1979 by Jacobiec et al.[9]

Various studied were carried out at research institutes which supported the view that FNAC could be considered as a first line investigation in eyelid and orbital lesions.

JanW M Tijl, Leo Koorneef et al studied 46 cases of orbital lesions over a period of 6 years. They found an accuracy of up to 81% with Histo pathological control[11].

Asadi Amoli et al studied 62 orbital cases over one and a half years and they found out the procedure to be safe , with a sample adequacy of 66.66% in benign and 82.6% in malignant lesions and with an accuracy of 94.73% in malignant and 57.69% in benign lesions[13]

M.H.Roozitalab et al studied 26 lesions of various eyelid (12) and orbital tumours (14), and found out FNAC to be safe, with consistent diagnosis in >85% of the cases with easy differentiation of the lesions into benign and malignant lesions.[12]

Vemuganti GK et al reported an accuracy of >90% in eyelid and orbital lesions.[14]

Ketki Bagchi et al studied 30 cases of various eyelid and orbital lesions over a period of 3 years and found FNAC to be safe, with a diagnostic accuracy of 90%. For the malignant mass lesions they obtained a sensitivity rate of 95. 65% and specificity rate of 75%.[15]

All the various studies show FNAC to be a safe procedure which can be done easily as an outpatient procedure with easy differentiation between benign and malignant lesions and with a diagnostic accuracy between 81 – 95 %.

FNAC in eyelid and orbital lesions are being studied to see the diagnostic accuracy in our population and in our setup.

PART – II

AIMS AND OBJECTIVES

AIMS AND OBJECTIVE

OBJECTIVE/AIM

To evaluate the diagnostic accuracy of FNAC in orbital and eyelid lesions in comparison to biopsy.

PRIMARY OBJECTIVES

To evaluate the diagnostic accuracy ofFNAC in Orbital and eyelid lesions in comparison to biopsy.

SECONDARY OBJECTIVES

1. To evaluate the safety profile of FNAC as compared to biopsy.
2. To note the difference in time delay between specimen collection and reporting between FNAC and Biopsy.
3. The role of FNAC as a primary investigation in Secondary orbital tumours.

MATERIALS AND METHODS

METHODOLOGY

SUBJECT SELECTION:

40 cases were included in the study which included 24 cases of eyelid lesions and 16 cases of anterior orbital lesions, which presented to our OPD over a period of 2 years.

INCLUSION CRITERIA:

1. Solid Lesions >5mm,
2. Eyelid lesions and
3. Anterior orbital lesions

EXCLUSION CRITERIA:

1 Lacrimal gland lesions – for fear of breach of capsule and tumour seeding along the needle track

2. Deep seated lesions – for fear of absence of visualization and risk of hemorrhage.
3. Pregnant women

REGISTRATION

NAME: AGE: SEX: M/F

OCCUPATION: ADDRESS:

EYE INVOLVED: RE/ LE

HISTORY:

A detailed history regarding of the presenting symptoms such as onset of lesion, duration,progression, any previous surgery and treatment of eye in the past, history of any loss of weight were asked for. Systemic factors like diabetes, hypertension, Ischemic heart disease, renal diseases were also asked for.

A thorough evaluation of patients was performed which included general and ocular examination.

General examination:

General vital data like pulse, blood pressure, peripheral pulses were noted

Ocular examination:

- Eyelid: position of the eyelids, fullness and contour. Site, size, colour of lesion. Associated tenderness if any. Consistency of lesion.

- Orbital lesion:site,size,tenderness, consistency of lesion, pulsations if any, variation with Valsalva manoeuvre, any displacement of the globe.
- Visual acuity was recorded by Snellen's chart in all cases.
- Anterior segment examination by slit lamp examination, fundus examination by 90D and indirect ophthalmoscope was done.
- Tension recorded by Applanation tonometry.
- Colour vision and field examination.

Other Investigations:

- BP,
- RBS,
- Complete Hemogram,
- Bleeding time,
- Clotting time.

TECHNIQUE OF FNAC

All patients with solid anterior orbital and lid lesions, after obtaining the patients consent, were subjected to FNAC in the Outpatient department under aseptic precautions fig(5).

All the FNAC were performed without local anesthesia by using a fine 23G, 3cm long needle attached to a 10ml disposable syringe .The lesions were palpated and Using the “sampling technique”, once the needle was in the lesion, maximum retraction of the plunger was maintained and after a gentle to and fro movement in various directions,the plunger was released, and after the aspiration, 2 slides were prepared for each lesion and were immediately fixed with isopropyl alcohol and sent for examination.

After reporting the FNA results, Biopsy of the aspirated masses were performed in the patients as an elective procedure in the operating theatre. A comparison of the diagnoses between the FNAC & Biopsy results, adequacy of samples and time taken from obtaining the sample, to reporting of results were also made.

Fig 5. TECHNIQUE OF FNAC

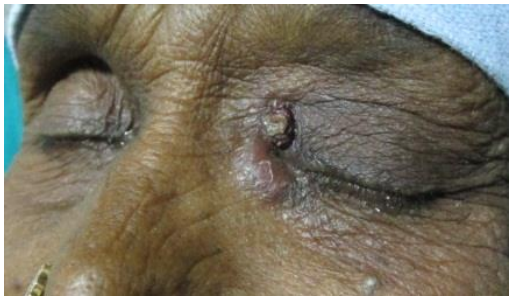


Fig showing an eyelid lesion

Fig showing the palpation of lesion under aseptic precautions

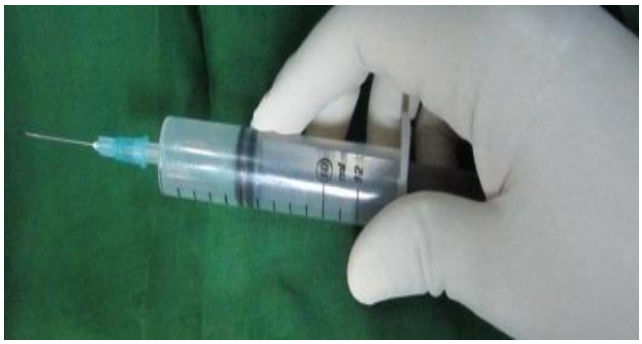


Fig showing the 23gauge needle with attached 10cc syringe

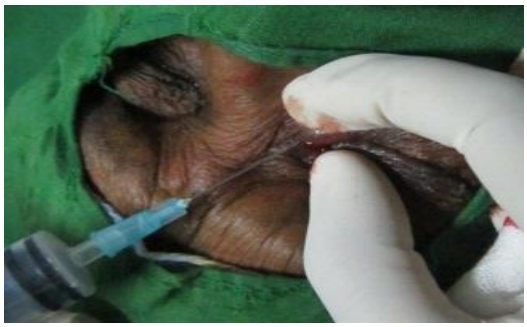


Fig showing aspiration of lesion using sampling technique

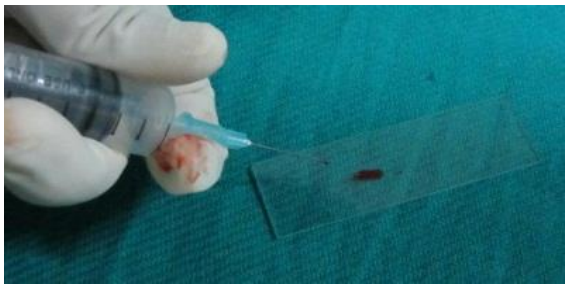


Fig showing preparation of slide

Fig showing the coupling jar which contains 10% isopropyl alcohol in which the slides are fixed

RESULTS

RESULTS

40 patients were included in this prospective study which included:

- 24 cases of eyelid lesions.
- 16 cases of orbital lesions.

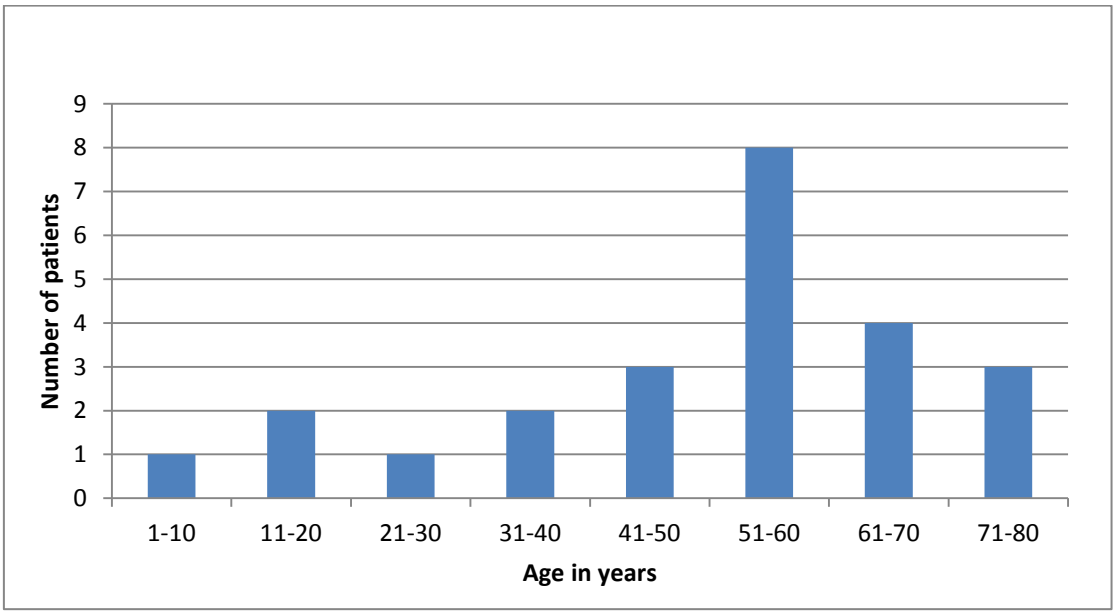
1. AGE DISTRIBUTION

The following table shows the age distribution in the 24 patients of eye lid lesions.

Table (1) – age distribution in eyelid lesions

Age group	No. of patients	%
1-10	1	4.16
11-20	2	8.33
21-30	1	4.16
31-40	2	8.33
41-50	3	12.5
51-60	**8**	**33.33**
61-70	4	16.66
71-80	3	12.5
Total	24	100

Graph 1 – showing the age distribution in patients with eyelid lesions



A total number of 24 cases of eyelid lesions were studied.The maximum number of cases, 33.33% (8 patients), were seen in the age group of between 51-60 years.

The youngest patient included in the study was of 3 years while the oldest patient was of 75 years old.

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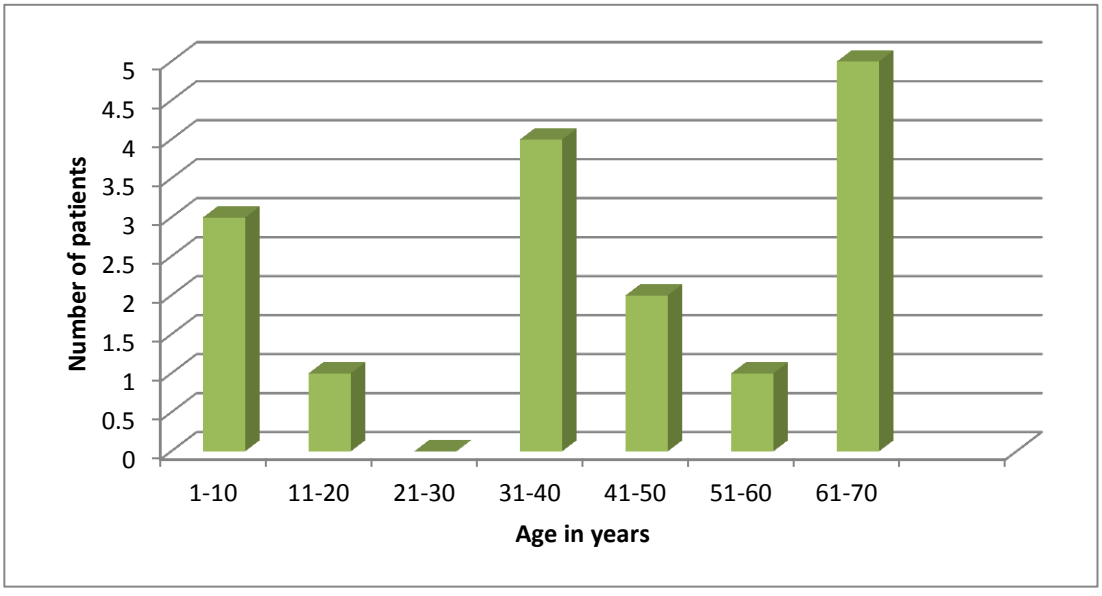
Table (2) – age distribution of patients in orbital lesions

Age group	No. of patients	%
1-10	3	18.75
11-20	1	6.25
21-30	0	0
31-40	4	25
41-50	2	12.5
51-60	1	6.25
61-70	**5**	**31.25**
Total	16	100

Graph (2) age distribution in orbital lesions



A total of 16 patients were included in the study out which the maximum number of patients 31.25% (5 patients) belonged to the age group between 61-70.

The youngest patient included in the study was a one and a half year old patient and the oldest patient was of 65 years.

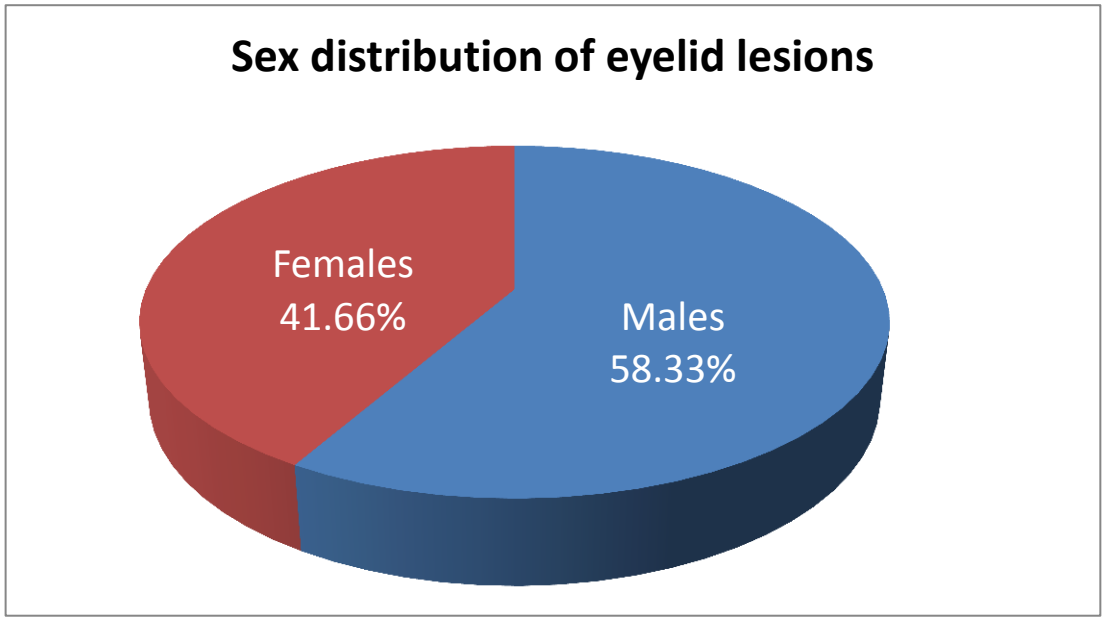
2. SEX DISTRIBUTION

The sex distribution in patients with eyelid lesions and orbital lesions are tabulated as follows:

TABLE – 3 Sex distribution in patients of eyelid lesions

	Frequency	**%**
Male	14	58.33
Female	10	41.66
Total	**24**	**100**

Graph 3 - sex distribution in patients with eyelid lesions

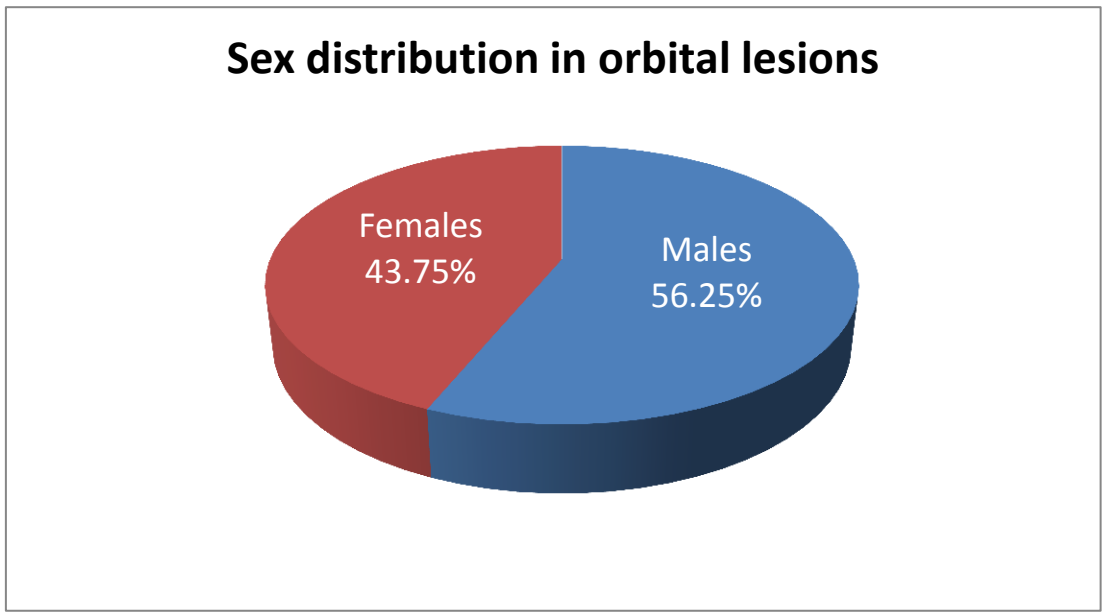


Out of the 24 eyelid lesions studied, the majority were males and they constituted 58.33% of the group, while females constituted 41.66% of the group.

TABLE – 4 Sex distribution in patients of orbital lesions

	Frequency	**%**
Male	9	56.25
Female	7	43.75
Total	**16**	**100**

Graph 4 – sex distribution in patients with orbital lesions



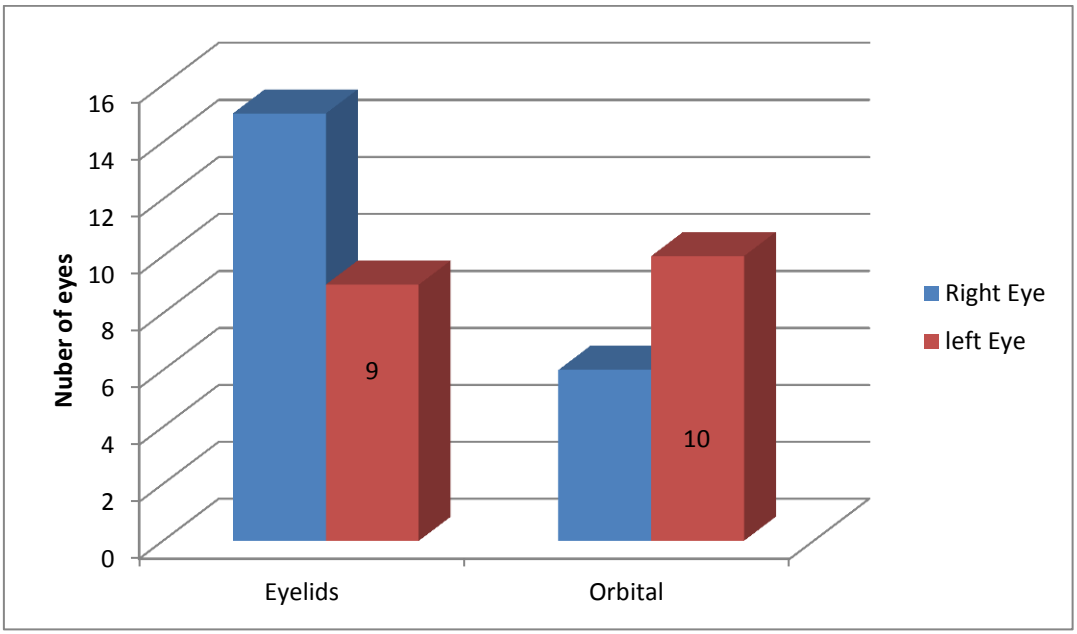
Out of the 16 orbital lesions studied, the majority of the patients 56.25% were males, while females made up the remaining 43.75% of the group under study.

3. LATERALITY

Table 5 – showing laterality of eyelid and orbital lesions.

LESION	RE	LE	Total
Eyelids	15	9	24
Orbital	6	10	16

Graph 5 – showing laterality of eyelid and orbital lesions.



Out of the 24 patients of eyelid lesions studied, 62.5% (15 patients) belonged to the right eye while 37.5% (9 patients) had lesions in the left eye.

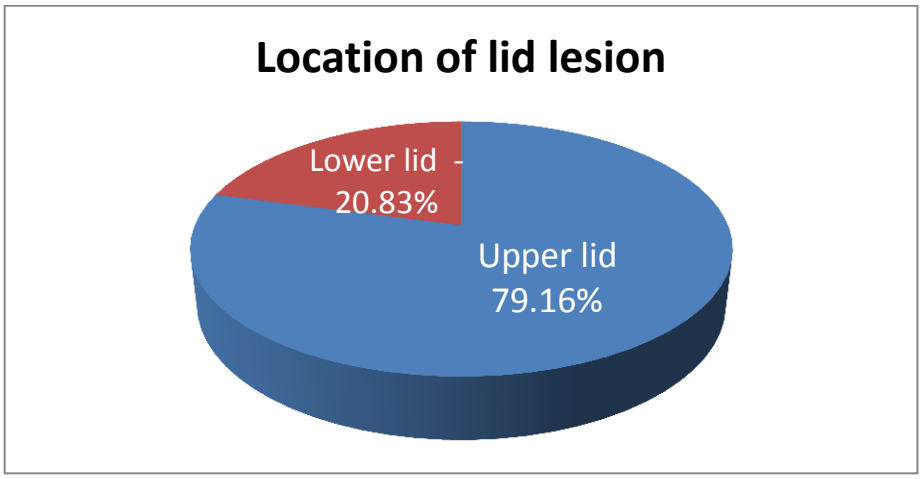
Similarly, in the 16 patients of the orbital lesions group, only 37.5% (6 patients) had lesions in the righteye, while 62.5% (10 patients) had lesions in the left eye.

4. LID INVOLVEMENT

Table 6 – showing lid involvement in eyelid lesions

Upper lid	Lower lid	Total
19 cases – 79.16%	5 cases – 20.83%	24 cases

Graph 6 – showing lid involvement in eyelid lesions.



The majority of the eyelid lesions 79.16% of cases belonged to the upper eyelid, the lower eyelid constituted the remaining 20.83 %.

5. FNAC SAMPLE ADEQUACY

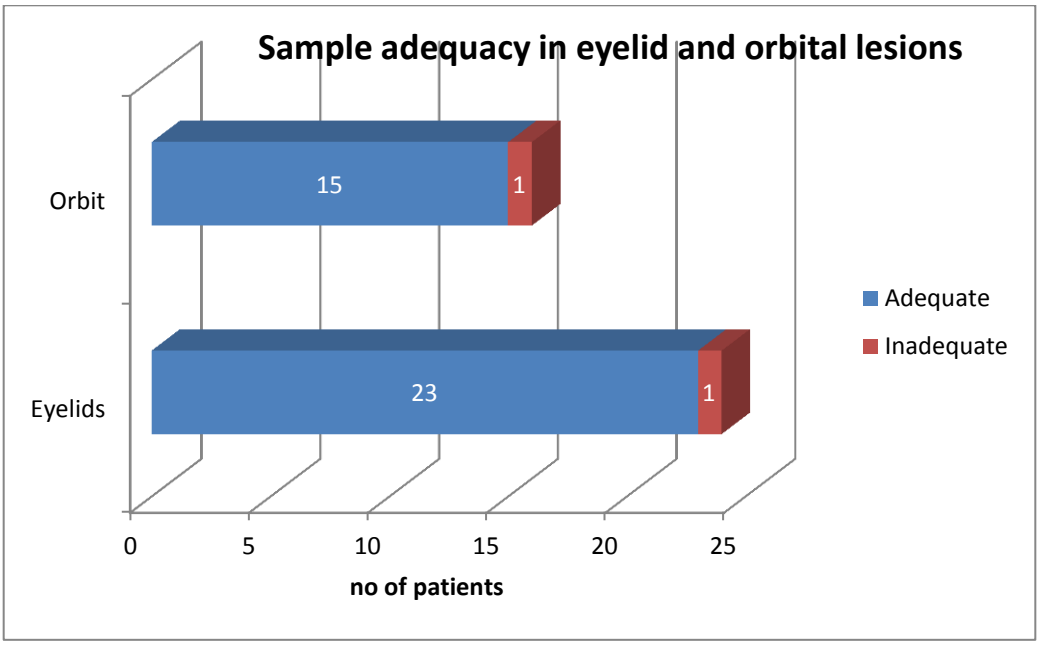
Table 7.Showing sample adequacy in eyelid and orbital lesions

LESION	ADEQUATE	%	INADEQUATE	%	TOTAL
Eyelid	23	95.8%	1	4.16%	24
Orbit	15	93.75%	1	6.25%	16

Out of the 24 eyelid lesions, 23 of the aspirates were adequate for an FNAC diagnosis. That is, a sample adequacy of 95.8%. Only 1 aspirate or 4.16% was inadequate.

Similarly, in the 16 orbital cases, sample adequacy of 93.75% (15 cases) was noted, whereas 6.25% of samples (1 aspirate) were inadequate.

Graph 7: showing sample adequacy in eyelid and orbital lesions



6. CORRELATION OF MALIGNANT AND BENIGN LESIONS ON FNAC & BIOPSY

The final diagnosis was confirmed by histopathological examination of tissue biopsy. The nature of the lesions are as follows:

Eyelid lesions: No of benign lesions – 10, Malignant lesions – 14.

Orbital lesions: No. of benign lesions - 8, Malignant lesions -8.

In FNAC, Positivity for malignancy was shown by cellular atypia, nuclear pleomorphism, irregular nuclear membrane or prominent nucleoli.

Out of the 38 adequate samples, (23 eyelid and 15 orbital samples), the no of aspirates, which showed benign characteristics and the number of aspirates which showed positivity for malignancy are compared with HPE as follows:

Table 8: FNAC comparision to the nature of lesion with HPE for eyelid lesions

HPE diagnosis	FNAC diagnosis			Total
	Malignant	Benign	Inadequate	
Malignant	14 (100%)	-	-	14
Benign	-	9 (90%)	1	10

Table 9: FNAC comparision to the nature of lesion with HPE for orbital lesions

HPE diagnosis	FNAC diagnosis			Total
	Malignant	Benign	Inadequate	
Malignant	8	-	-	8
Benign	-	7	1	8

Summarizing the % of benign and malignant lesions on FNAC for eyelid and orbital lesions

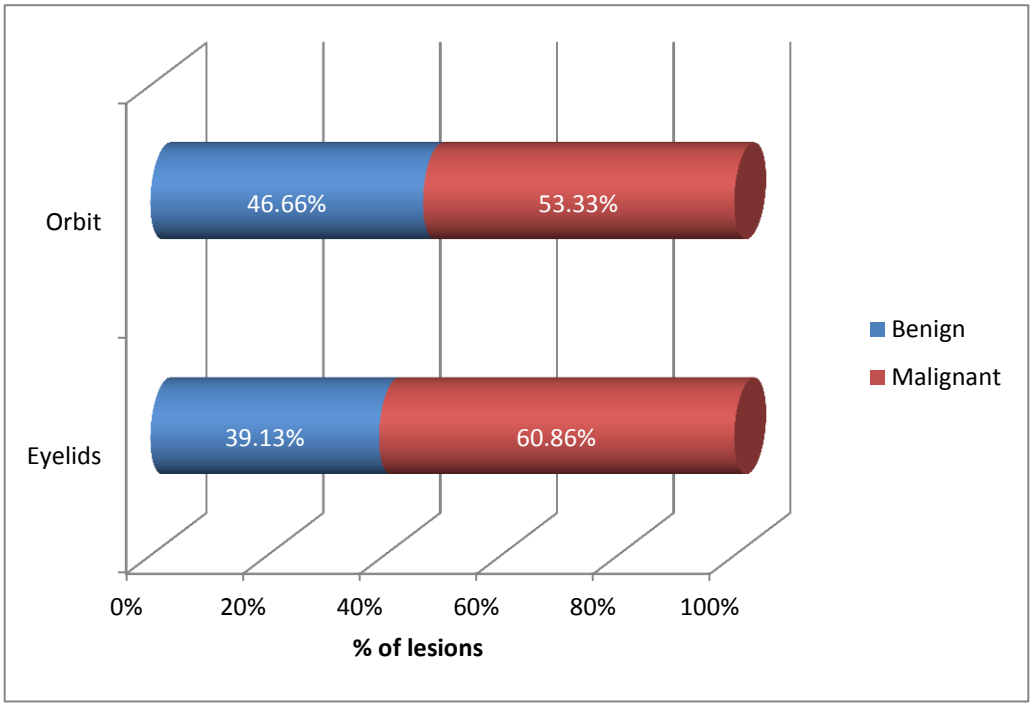
Table 10: Percentage of Benign and malignant samples noted on FNAC

Lesion	**Benign lesion**	**% Benign**	**Positive for Malignancy**	**% Malignant**
Eyelids	9	39.13%	14	60.86%
Orbit	7	46.66%	8	53.33%

Out of the adequate eyelid samples, 60.86% (14 aspirates) were positive for malignancy while the remaining 39.13% (9 aspirates) were reported as benign.

Similarly, 53.33 % of adequate orbital aspirates showed positivity for malignancy while 46.66% (7 cases) showed a benign nature of the aspirate.

Graph 8: Showing FNAC % for benign & malignant lesions



7. FNAC v/s Biopsy Correlation

After obtaining the FNAC reports, the biopsies of the respective lesions were carried out as an elective procedure, underanaesthesia and the results collected, tabulated and the FNAC results were compared with the same.

Among the eyelid lesions: No of benign lesions – 10, Malignant lesions – 14.

Among the Orbital lesions: No. of benign lesions - 8, Malignant lesions -8.

The tabulated results are as follows:

Table 9: Biopsy v/s FNAC for patients with eyelid lesions

HPE DIAGNOSIS	Benign/ Malignant	FNAC Diagnosis Correlation			Total
		Inadequate	Exact correlation	Indefinite	
Dermoid	Benign	0	1	0	1
Epidermoid	Benign	0	2	0	2
Inflammatory lesion	Benign	0	2	0	2
Sebaceous cyst	Benign	0	1	0	1
Infected cyst	Benign	0	1	0	1
Neurofibroma	Benign	**1**	0	**2**	3
Sebaceous cell ca	Malignant	0	7	0	7
Squamous cell ca	Malignant	0	4	0	4
Basal cell Carcinoma	Malignant	0	2	0	2
Malignant Melanoma	Malignant	0	1	0	1
Total		1	21	2	24

Inadequate aspirate: Out of the 24 aspirates, 1 aspirate (**4.16**%) was inadequate and had shown only proteinaceous fluid. HPE confirmed this lesion as neurofibroma.

Indefinite diagnosis: Out of the 23 adequate aspirates,indefinite diagnosis were seen in 2 aspirates **(8.69%**), both of them had shown the lesion to be a benign spindle cell tumour. HPE confirmed both these lesions as neurofibroma.

Exact Correlation: Out of the 23 adequate aspirates,**91.30%**(21 aspirates) showed an exact correlation with the HPE diagnosis.

Graph 9: FNAC vs Biopsy for patients with benign & malignant eyelid lesions

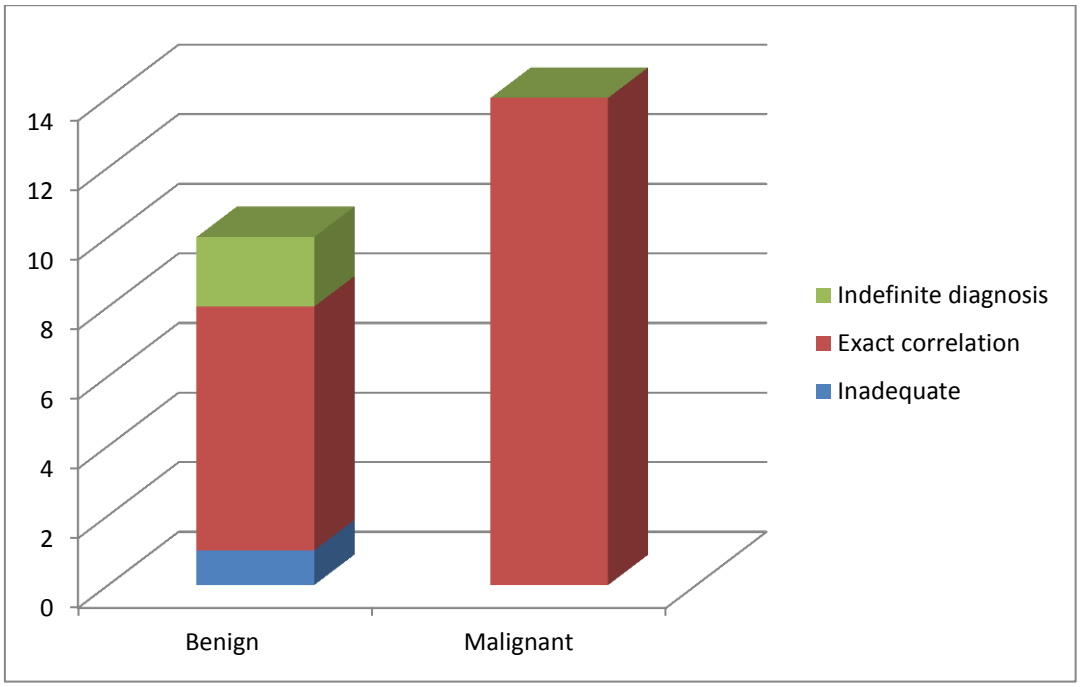


Table 10. Biopsy vs FNAC Anterior Orbital lesions

HPE DIAGNOSIS	**Benign/ Malignant**	**FNAC Diagnosis Correlation**			**Total**
		Inadequate	**Exact correlation**	**Indefinite**	
Epidermoid	Benign		1		1
Hemangioma	Benign		1		1
Pseudotumour	Benign		2		2
Neurofibroma	Benign			**1**	1
Teratoma	Benign		1		1
Schwanomma	Benign			**1**	1
Solitary fibrous tumor	Benign			**1**	1
Non – Hodgkins Lymphoma	Malignant		5		5
Ewings sarcoma	Malignant		1		1
Signet ring Ca	Malignant		1		1
Chloroma	Malignant	**1**			1
Total		1	14	1	**16**

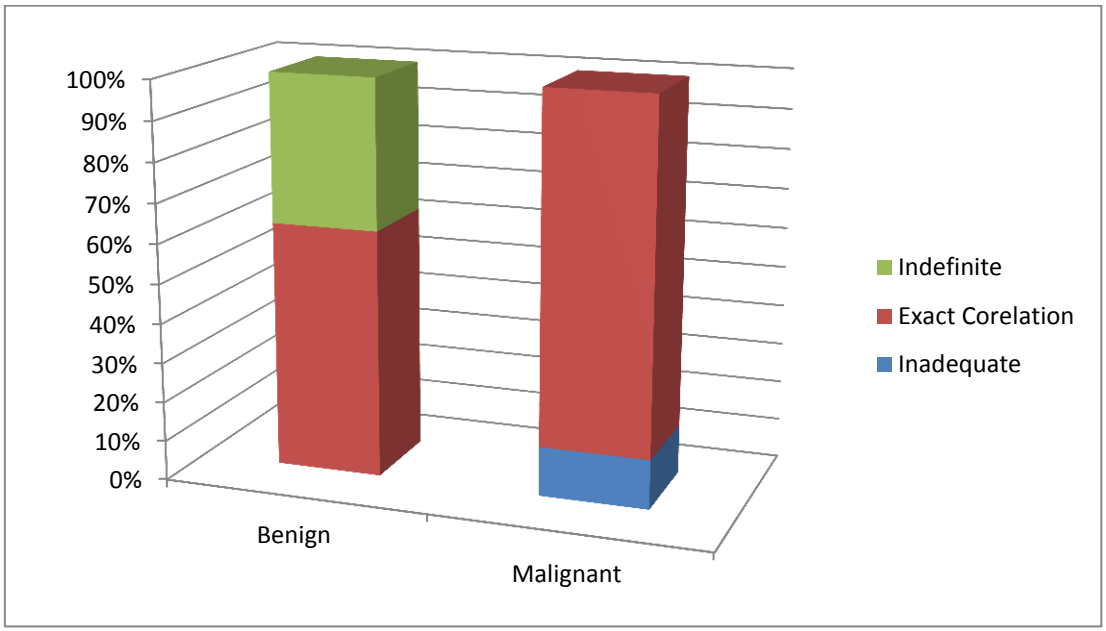
Inadequate aspirate: Out of the 16 aspirates, 1 aspirate (6.25%) was inadequate and had shown no cells. HPE confirmed this lesion as Chloroma.

Indefinite diagnosis: Out of the 15 adequate aspirates,indefinite diagnosis were seen in 3 aspirates **(**20.00%), two of them had shown the lesion to be a benign spindle cell tumour. HPE confirmed one of this lesion as neurofibroma. The other benign spindle tumour was confirmed

as a Schwanomma. The third indefinite sample on FNAC showed a benign epithelial tumour. HPE confirmed the lesion to be a Solitary Fibrous tumour.

Exact Correlation: Out of the 15 adequate aspirates, **80.00%** (12 aspirates) showed an exact correlation with the HPE diagnosis

Graph 10: Biopsy vs FNAC Anterior orbital lesions



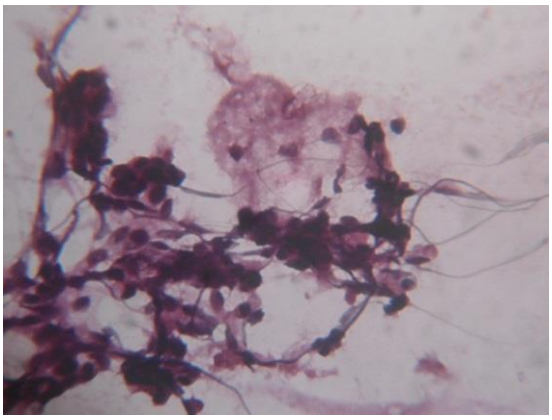
8. TIME OF OBTAINING RESULTS

After obtaining the FNAC samples for cytology, the time from obtaining the sample to the time of obtaining the results were documented.

All cytology reports (40 cases) were received within 6 hours of sending the aspirates.

All HPE reports (40 cases) were received on the 5^{th} day of sending Biopsy samples.

FNAC AND BIOPSY OF EYELID LESIONS



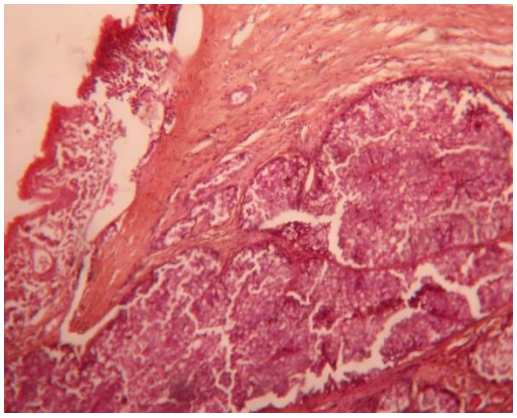
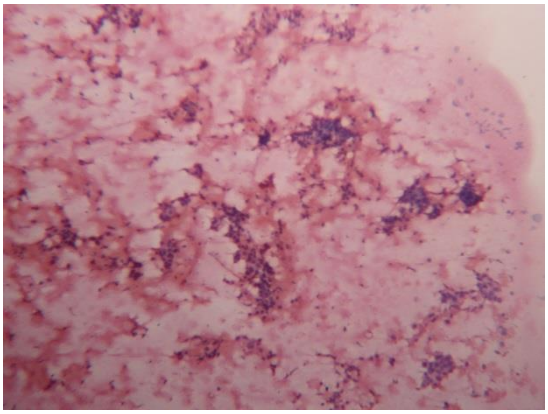


Fig of patient 5;146/12 showing FNAC of Sebaceous cell carcinoma showing cellular atypia and vacuolated cytoplasm and its HPE showing malignant sebaceous cells with vacuolated cytoplasm



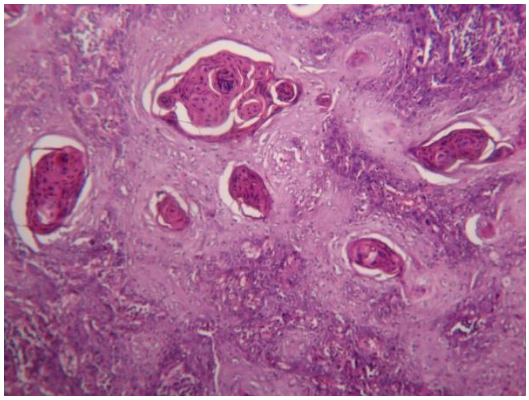
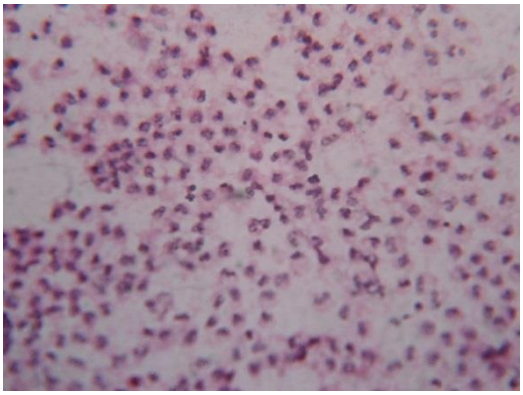


Fig of patient 1; 279/10 FNAC showing malignant squamous cells & HPE of Squamous cell carcinoma with keratin pearls.Case of Squamous cell carcinoma.



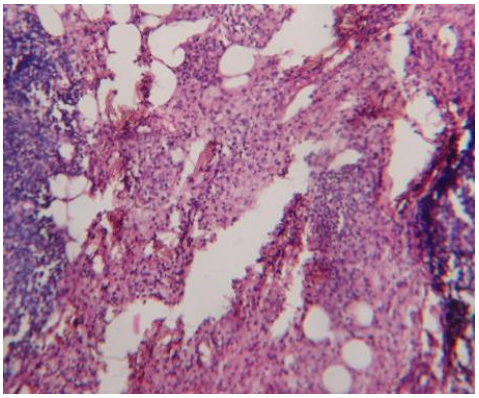
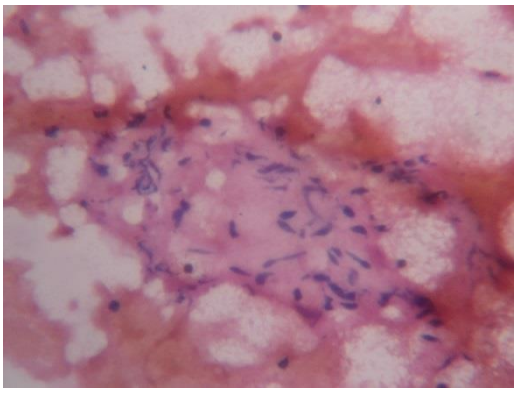


Fig of patient 18;224/13 FNAC showing benign nature with inflammatory cells and HPE confirming benign lesion with sheet of histiocytes with lymphoid follicle. No cellular atypia. Case of chronic inflammatory lesion.



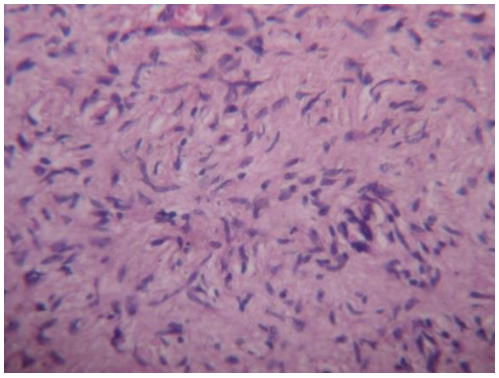


Fig of patient 9;375/12 FNAC showing benign nature of lesion with spindle shaped cells & HPE showing benign lesion with sheets of spindle shaped cells. Case of Neurofibroma.

FNAC & BIOPSY OF ORBITAL LESIONS

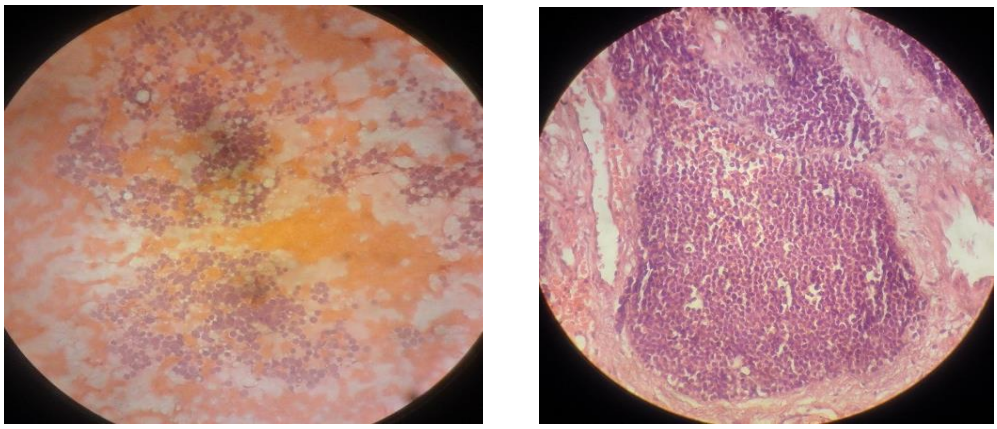


Fig of patient 27;242/11 FNAC showing cellular atypia with small round cells with attempted rossette forrmation. HPE showing cellular atypia , small cells with infiltration. Case of Ewings sarcoma.

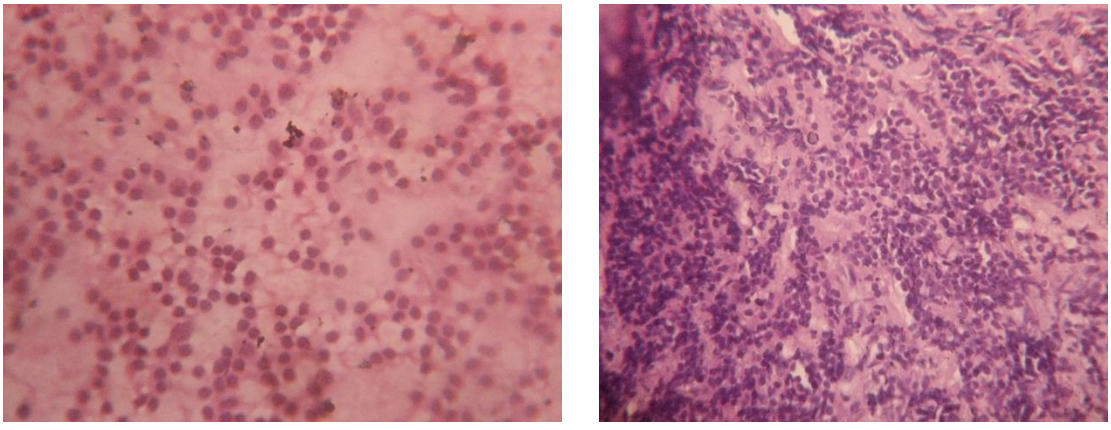


Fig of patient 25;225/11 FNAC showing sheets of lymphoid cells with atypia. HPE showing small round to oval sheets of lymphoid cells with atypia. Case of Non – Hodgkins Lymphoma

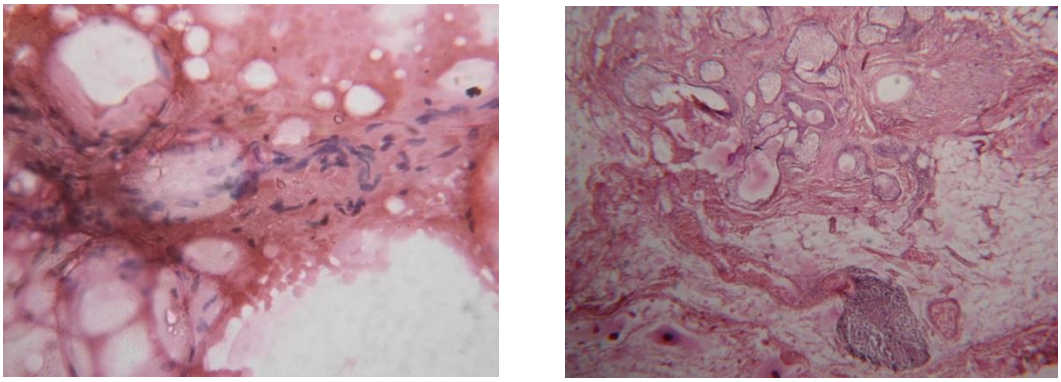


Fig of patient 36;380/12 FNAC showing benign lesion with mature adipoctyes, few squamous epithelial cells and anucleated squamous. HPE confirms benign case of Teratoma.

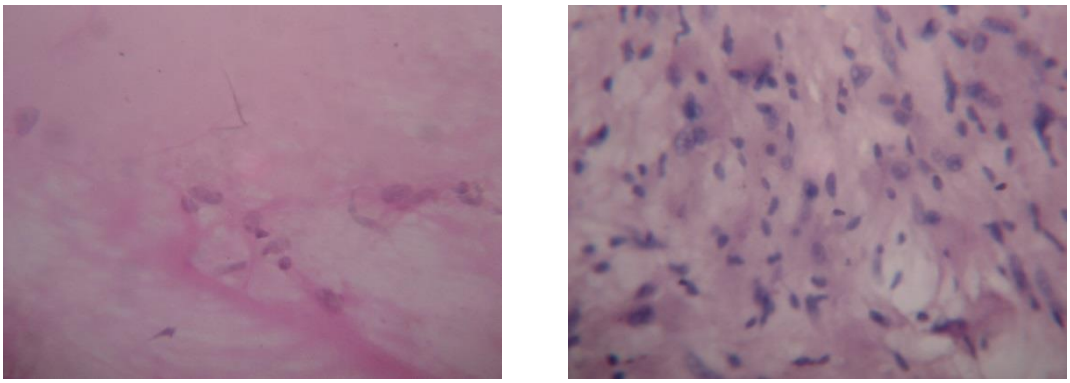


Fig of patient 34;353/12 FNAC showing benign lesion with scanty cells with plump spindle shaped cells with elongated nuclei. HPE confirms benign nature of lesion with spindle shaped cells with verroucay bodies. Case of Schwanomma.

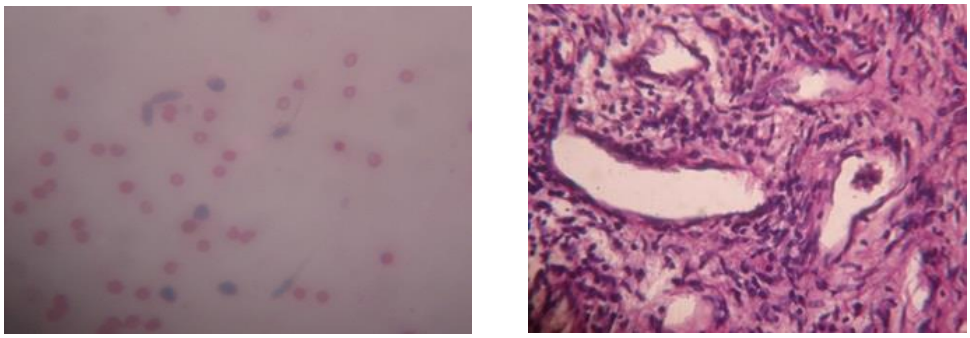


Fig. of patient 38;388/12 FNAC showing a benign epithelial neoplasm. HPE shows benign epithelial neoplasm with vascular spaces arranged in a patternless pattern. Case of solitary fibrous tumour.

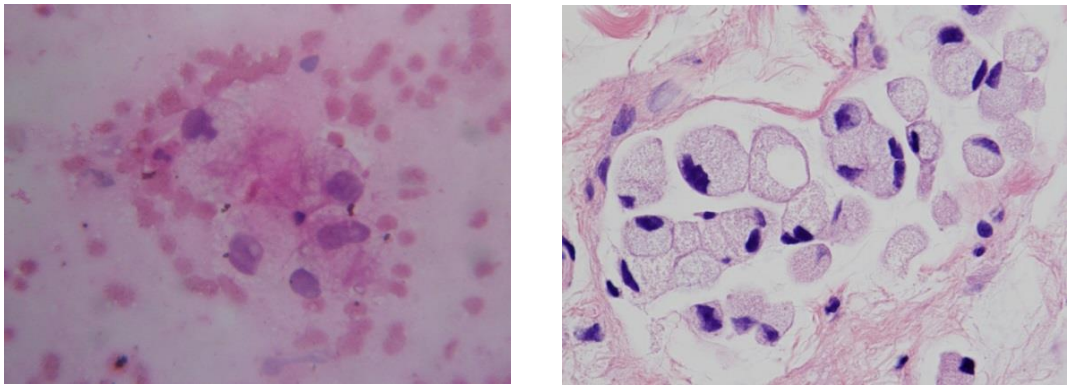


Fig of patient 37;109/12 FNAC Showing cellular atypia with Signet ring cells & HPE showing atypia with signet rings. Case of metastasis to the orbit by gastric adenocarcinoma.

STATISTICS

Data was analyzed using SPSS software :

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
fnac * biopsy	40	100.0%	0	.0%	40	100.0%

fnac * biopsy Crosstabulation count

		biopsy		
		.00	1.00	Total
fnac	.00	17	1	18
	1.00	0	22	22
	Total	17	23	40

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	36.135[a]	1	.000		
Continuity Correction[b]	32.374	1	.000		
Likelihood Ratio	46.824	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	35.232	1	.000		
N of Valid Cases	40				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.65.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.950	.048	18.849	.000[c]
Ordinal by Ordinal	Spearman Correlation	.950	.048	18.849	.000[c]
	N of Valid Cases	40			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Pearsonsα^2 value: 0.950 was obtained.

P value 0.001

We found the sensitivity of FNAC for malignant lesions to be 88% and its specificity to be 100%.

The positive predictive value of FNAC for malignant lesions is 100% and negative predictive value is 89%.

Therefore, in our study we found FNAC to be a definite indicator of malignancy as confirmed by biopsy.

DISCUSSION

DISCUSSION

1. Age:

In our study of 40 cases, 24 cases of eyelid lesions and 16 cases of orbital lesions were included.

Among the 26 eyelid lesions,the maximum number of cases, 33.33% (8 patients), belonged to the age group between 51-60 years.

The youngest patient included in the study was a 3 year old male while the oldest patient was of 75 years old.

Among the total of 16 patients of orbital lesions, themajority of patients 31.25% (5 patients) belonged to the age group between 61-70.

The youngest patient included in the study was a one and a half year old patient and the oldest patient was of 65 years.

In our study we observed wide variation in the age incidences of eyelid and orbital lesions based on the etiology, but a majority of the eyelid cases were seen in the age group between 51 -60 years and the orbital cases in the age group of 61 -70.

2. **SEX**:

Out of the 24 eyelid lesions studied, the majority were males and they constituted 58.33% of the group, while females constituted 41.66% of the group.

Out of the 16 orbital lesions studied, the majority of the patients 56.25% were males, while females made up the remaining 43.75% of the group under study.

In our study we observed eyelid and orbital lesions to be more common in the males.

3. LATERALITY:

In our study,out of the 24 patients of eyelid lesions studied, 62.5% (15 patients) belonged to the right eye while 37.5% (9 patients) had lesions in the left eye.

Similarly, in the 16 patients of the orbital lesions group, only 37.5% (6 patients) had lesions in the righteye, while 62.5% (10 patients) had lesions in the left eye.

In our study we found eyelid lesions to be more common in the right eye while left eye involvement was commoner in patients with orbital lesions.

4. LID INVOLVEMENT:

The majority of the eyelid lesions, 79.16% belonged to the upper eyelid, the lower eyelid constituted the remaining 20.83 %

In our study we found out upper eyelid involvement to be very common

5. FNAC SAMPLE ADEQUACY

Out of the 24 eyelid lesions, 23 of the aspirates were adequate for an FNAC diagnosis. That is, a sample adequacy of 95.8%. Only 1 aspirate or 4.16% was inadequate.

Similarly, in the 16 orbital cases, sample adequacy of 93.75% (15 cases) was noted, whereas 6.25% of samples (1 aspirate) were inadequate.

In our study FNAC samples were adequate for commenting on the cytopathological characteristics of the lesions.

6. BENIGN & MALIGNANT CHARACTERISTICS FNAC VS BIOPSY

In our study we compared the FNAC samples with the tissue biopsies of the 24 eyelid and 16 orbital lesions.

Out of the HPE proven 14 eyelid malignantlesions, FNAC showed positivity for malignancy in all 14 of the samples.

Out of the HPE proven 10 benign eyelid lesions, FNAC showed absence of malignancy in the 9 adequate samples.

Out of the HPE proven 8 orbitallesions, FNAC showed positivity for malignancy in all 8 of the samples.

Out of the HPE proven benign 8 orbital lesions, FNAC showed absence of malignancy in 7 of the adequate samples.

Summarizing, FNAC was able to detect malignancy in 100% of the cases.

Therefore, in our study we found out that FNAC in adequate samples is an excellent tool to find out the nature of the lesion in both eyelid and anterior orbital lesions.

7. FNAC vs Biopsy tissue diagnosis correlation

JanW M Tijl, Leo Koorneef et all studied 46 cases of orbital lesions and they found an accuracy of up to 81% with Histo pathological control[11].

M.H.Roozitalab et al studied 26 lesions of various eyelid (12) and orbital tumours (14), and got a consistent diagnosis in >85% of the cases.[12]

Vemuganti GK et al reported an accuracy of >90% in eyelid and orbital lesions.[14]

Ketki Bagchi et al studied 30 cases of various eyelid and orbital lesions over a period of 3 years and found a diagnostic accuracy of 90%.[15]

In our study, out of the 23 adequate eyelid aspirates,**91.30%**(21 aspirates) showed an exact correlation with the HPE diagnosis.

And out of the 15 adequate orbital aspirates, **80.00%** (12 aspirates) showed an exact correlation with the HPE diagnosis.

In our study **FNAC in adequate samples was able to accurately diagnose the lesions in 91.30% of eyelid lesions and 80.00% of orbital lesions.**

Among the cases of indefinite diagnoses, 8.69% in eyelids and 20% in orbital lesions, FNAC was able to diagnose the benign nature of the lesion and the basic architecture of the lesion. 3 lesions were found to

have a benign spindle tumour like pattern and 1 lesion was found to have benign epithelial component with few fibrous tissue.2 benign spindle tumours were confirmed as neurofibroma on HPE. 1 benign spindle tumour was confirmed as Schwanomma. The benign epithelial neoplasm was confirmed as a solitary fibrous tumour.

Even a rare tumour such as Ewings Sarcoma of the orbit was diagnosed on FNAC.

In our study

Pearsonsα^2 value: 0.950 was obtained.

P value 0.001

This shows that FNAC in eyelid and orbital lesions is a reliable diagnostic tool.

The sensitivity of FNAC for malignant lesions to be 88% and its specificity to be 100%.

The positive predictive value of FNAC for malignant lesions is 100% and negative predictive value is 89%.

Therefore, in our study we found FNAC to be a definite indicator of malignancy as compared to biopsy.

8. RAPIDTIY OF PROCEDURE

In our study all our cytopathology reports were obtained within 6 hours of obtaining the specimen while biopsy reports for eyelid and orbital lesions were obtained on the 5^{th} day of obtaining the specimen.

Therefore, our study shows that FNAC is an excellent tool for rapid diagnosis of eyelid and orbital lesions.

CONCLUSION

CONCLUSION

- FNAC of eyelids and orbit is a safe procedure, can be done without anaesthesia in the outpatient department.
- FNAC can be done in patients who are not fit for surgery nor have high risk for anaesthesia.
- FNAC delivers results within 5-6 hours.
- FNAC differentiates lesion as benign or malignant easily.
- FNAC can be considered as a first diagnostic investigation of choice in tumours such as,Lymphoma, Metastatic tumours, infections that don’t require surgical intervention for treatment.

FNAC gives rapid results and correlates highly with Tissue biopsy proven HPE, FNAC can be considered as a primary investigation in the diagnosis of eyelid and anterior orbital lesions and can be done safely as an outpatient procedure.

PART III

PROFORMA

Evaluation of case of Orbital and eyelid lesion.

Name: **Age:** **Sex:**

Occupation: **Address:**

Regn. Number

Presenting complaints:

History of present illness:

Eyelid / Orbital lesion : Onset and Progression
Defective vision:
Pain scoring:
History of trauma:

Other history: Thyroid disease , sinusitis, aggravation with respiratory infections, History of weight loss if any , History of associated neck swellings or lymph nodes.

Treatment history
Past History:
Similar complaints in the past .
H/O Thyroid disease , HIV, anticoagulants , Tuberculosis , Diabetes , Hypertension or any known drug reactions.

Family history:

Personal history:

General systemic examination:

Pulse:	Pallor
BP:	Icterus
Neck Swellings	Lymphadenopathy
CVS:	Respiratory System:
Abdominal Examination:	ENT Examination

Ocular examination:

Visual acuity

Refraction

Color Vision:

Visual fields

Orbital & eyelid lesion:

Inspection:

Compensatory head posture:

Facial symmetry:

Ocular symmetry:

Mass description:

Eyelids

Position (MRD1 and MRD2):

Fullness

Contour

Movements/Lid Lag

Lagophthalmos

Mass lesion

Palpebral fissure height

Orbital lesion :

Pulsations

MEASUREMENTS:

Hertel's (B.R……mm)

Horizontal

Vertical

Valsalva maneuver:

Periocular changes

Conjunctiva

Cornea

Anterior chamber

Pupil

Lens

Fundus

Ocular motility

Palpation:

Bony regularity:

Temperature :

Tenderness:

Crepitus:

Description of Mass:

Thrill/ Reducibility:

Retropulsion:

Fundus Examination:

Impression: (D/D):

Procedure :

FNAC:

Procedure Performed:

HPE Diagnosis:

Postop followup:

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SR. NO	IP No	NAME	AGE	SEX	LATERALITY	SITE	FNAC SAMPLE ADEQUACY	FNAC positive/negative for malignancy	FNAC Result	Biopsy Result	CORRELATION
1	279/10	Krishnan	56	M	LE	UL nodular	Adequate	positive	Squamous cell Ca	Squamous cell Ca	Yes
2	69/12	Lakshmi	60	F	RE	LL ulcerative lesion	Adequate	positive	Basal Cell Ca	Basal Cell Ca	Yes
3	158/12	Muniyammal	55	F	LE	UL pigmented	Adequate	positive	Melanoma	Melanoma	Yes
4	414809	Nandhini	13	F	LE	UL firm lesion	Inadequate	Inadequate	protenceous fluid	Plexiform Neurofibroma	Inadequate
5	146/12	Laxmi	65	F	LE	UL nodular	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
6	475843	Natchimuthu	75	M	RE	UL ulcerative	Adequate	positive	Squamous cell Ca	Squamous cell Ca	Yes
7	278/12	Sasikala	18	F	RE	UL firm lesion	Adequate	negative	Dermoid cyst	Dermoid cyst	Yes
8	354/12	Velusamy	60	M	LE	UL Nodular	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
9	375/12	Ponniyammal	67	F	RE	UL firm lesion	Adequate	negative	Benign spindle cell	Neurofibroma	Indefinite
10	6/13	Krishna	69	M	RE	UL ulcerative	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
11	21/13	Sudhakar	3	M	LE	UL firm lesion	Adequate	negative	Infected cyst	Infected cyst	yes
12	108/13	Kumar	39	M	RE	UL firm lesion	Adequate	negative	Epidermoid cyst	Epidermoid cyst	Yes
13	164/10	Shalini	21	F	RE	UL firm lesion	Adequate	negative	Benign spindle cell	Neurofibroma	Yes
14	179/13	Shanmugam	55	M	RE	UL firm lesion	Adequate	negative	Epidermoid cyst	Epidermoid cyst	Yes
15	44/13	Kanagarasu	48	M	LE	UL ulcerative	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
16	204/13	Kasturi	55	F	RE	LL fungating lesion	Adequate	positive	Squamous cell Ca	Squamous cell Ca	Yes
17	212/13	Suguna	58	F	RE	UL ulcerative	Adequate	positive	Basal Cell Ca	Basal Cell Ca	Yes
18	224/13	Mohamed	72	M	RE	UL firm lesion	Adequate	negative	Inflammatory lesion	Inflammatory lesion	Yes
19	290/13	Venkatesh	48	M	RE	UL firm lesion	Adequate	negative	Sebaceous Cyst	Sebaceous cyst	Yes
20	373/13	Selvam	48	M	RE	UL nodular	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
21	448/13	Sagayam	54	M	RE	LL nodular	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
22	181/13	Jayaraman	75	M	LE	LL ulcerative lesion	Adequate	positive	Squamous cell Ca	Squamous cell Ca	Yes
23	286/13	Panja	39	M	LE	LL nodular	Adequate	positive	Sebaceous Cell Ca	Sebaceous Cell Ca	Yes
24	262/12	susaiammal	60	F	RE	UL firm lesion	Adequate	negative	Inflammatory lesion	Inflammatory lesion	Yes
25	227/11	Raja	46	M	LE	Ant Sup Orbital Mass	Adequate	positive	Non-Hodgkins lymphoma	Non-Hodgkins Lymphoma	Yes
26	314/10	Kannamal	65	F	LE	Ant Inf Orbital Mass	Adequate	positive	Non-Hodgkins lymphoma	Non-Hodgkins Lymphoma	Yes
27	242/11	Vijaykrishnan	1.5	M	LE	Inf Orbital Mass	Adequate	positive	PNET/EWINGS	Ewings	Yes
28	278/11	Moorthy	65	M	LE	Ant Inf Orbital Mass	Adequate	positive	Non-Hodgkins lymphoma	Non-Hodgkins Lymphoma	Yes
29	131/10	Sambandan	66	M	LE	Ant Sup Orbital Mass	Adequate	positive	Non-Hodgkins lymphoma	Non-Hodgkins Lymphoma	Yes
30	180/12	Chellapan	65	M	LE	Ant Inf Orbital Mass	Adequate	positive	Non Hodgkins Lymphoma	Non-Hodgkins Lymphoma	Yes
31	188/12	Kuppuraj	35	M	RE	Ant Sup Orbital Mass	Adequate	negative	Benign epithelial Neoplasia	Solitary Fibrous Tumour	Indefinite
32	213/12	Palani	35	M	LE	Ant Sup Orbital Mass	Adequate	negative	Epidermoid cyst	Epidermoid cyst	Yes
33	241/12	Dhanam	40	F	RE	Ant Sup Orbital Mass	Adequate	negative	Benign Neoplasm	Hemangioma	Yes
34	353/12	Gowri	47	F	RE	Ant Sup Orbital Mass	Adequate	negative	Benign spindle cell tumour	Schwanomma	Indefinite
35	359/12	Nagammal	53	F	LE	Ant Inf Orbital Mass	Adequate	positive	Non-Hodgkins lymphoma	Non-Hodgkins Lymphoma	Yes
36	380/12	Ramya	9	F	RE	Ant Inf Orbital Mass	Adequate	negative	Teratoma	Teratoma	Yes
37	109/12	Narasammal	33	F	LE	Ant Inf Orbital Mass	Adequate	positive	Signet Ring Ca /Mets	Signet Ring Ca	Yes
38	116/12	Sheikh Abdul	62	M	RE	Ant Sup Orbital Mass	Adequate	negative	Pseudotumour	Pseudotumour	Yes
39	242/13	Ganesan	5	M	RE	Ant Sup Orbital Mass	Inadequate	Inadequate	Inadequate	Chloroma	Inadequate
40	412/13	Mohana	14	F	LE	Ant Sup Orbital Mass	Adequate	negative	Benign spindle cell tumour	Neurofibroma	Yes