Original Article

Clinician's approach for spectrum of orbital diseases: An overview

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Abstract

Purpose: To study the varied clinical presentation and outcome of management of orbital diseases and to ascertain the concordance of FNAC with histopathology. **Materials and Methods:** This is a prospective interventional study wherein each patient's clinical presentation was noted. Outcome of management was evaluated based on symptomatic relief, regression of signs, noting any intraoperative or postsurgical complication, recurrence, and cosmetic result in terms of surgical scar. **Results:** Neoplasia was commonest 33/76; (43.42%), followed by infective and inflammatory conditions 21/76; (27.63% cases), thyroid-associated orbitopathy accounting for 12/76 cases (15.78%), whereas cystic lesions and vascular malformations were 4/76 (5.26%) each. Other disorders constituted a mere 2.65%. Proptosis was the commonest mode of presentation. It was seen in seventy out of seventy-six patients (92.1%). In 86.3% of the cases, there was successful surgical outcome. Of 22 surgically managed cases, recurrence was noted in three cases (13.6%). 90% concordance was seen with histopathology in cases where FNAC was done prior to surgery for diagnosing nature of disease. **Conclusions:** Majority of orbital and adnexal conditions can be provisionally diagnosed based on imaging; however, an adjunct invasive investigation such as FNAC or biopsy may be required. In the present study, in seven cases (9.2%) FNAC was needed, whereas in two cases (2.63%) biopsy was needed. A definitive diagnosis was confirmed by histopathology in 22 surgically managed cases and by excision biopsy in two. 22/76 (28.94%) of the cases needed surgical treatment, and other cases required conservative or palliative approach.

Keywords: Aetiology of orbital diseases, orbital clinical profile, orbital symptoms, orbitotomy

Introduction

Infective and inflammatory conditions as well as tumours of orbit and ocular adnexa are frequently seen in ophthalmic practice. It is not uncommon for neurophysician, endocrinologist, paediatrician and ENT surgeon to primarily examine such cases, which require consultation not only with them but also ophthalmic opinion is required. In the Indian scenario, especially the rural population will primarily consult the general physician despite having visual symptoms, even if there is profound diminution in vision. A basic understanding at the general physician level is mandatory for purpose of referral. Congenital conditions such as dermoid and epidermoid cysts and vascular disorders are also not uncommon. In majority of cases, the clinician requires imaging methods for a provisional clinical diagnosis. However, in certain clinical conditions, an adjunct noninvasive investigation like B-scan ultrasound or an invasive diagnostic modality such as fine-needle aspiration cytology or biopsy is extremely helpful in disclosing nature of lesion. Conditions like orbital cellulitis and cavernous sinus thrombosis (CST) need prompt medical attention, intravenous antibiotics being the mainstay, whereas orbital diseases causing hampered axoplasmic conduction in optic nerve require prompt surgery to relieve pressure on the nerve, at times requiring multidisciplinary teamwork for good outcome.

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Received: 08-05-2023 **Revised:** 29-06-2023
Accepted: 01-07-2023 **Published:** 04-04-2024

Access this article online

Quick Response Code:

Website: http://journals.lww.com/JFMPC

DOI: 10.4103/jfmpc.jfmpc_761_23

How to cite this article: Khan L. Clinician's approach for spectrum of orbital diseases: An overview. J Family Med Prim Care 2024;13:851-8.

Purpose

To study clinical presentation, frequency of occurrence, and outcome of the management of orbital and adnexal diseases, success being defined as no recurrence with cosmetically acceptable scar if present and to ascertain the concordance of FNAC with histopathology in surgically managed cases of orbital and adnexal diseases.

Materials and Methods

The present research is an interventional study comprising of a series of seventy-six consecutive cases of orbital diseases excluding ocular trauma, which were managed in a tertiary eye care centre.

The research complies with all the relevant national regulations, institutional policies, and is in accordance with the tenets of the revised Declaration of Helsinki, and has been approved by the institutional ethical committee of a medical college in Central India. Informed consent was obtained from all adult participants to participate in the study. For participants under 15 years of age, informed consent was obtained from a parent or guardian.

History was elicited carefully in every case followed by a detailed clinical examination and investigations. Clinical examination included Ophthalmic and general examination.

Based on clinical and investigative findings, treatment was planned either as conservative or surgical. An informed written consent was taken prior to surgery. Patients diagnosed with diseases requiring intravenous antibiotics were hospitalized for the same, those with vascular malformations of orbit or adnexa were given sclerosing agent (injection bleomycin) intralesionally on outpatient basis after prior lung function test. Simple excision, orbitotomy, wide excision, enucleation, and exenteration were done as indicated. When orbitotomy and exenteration were planned, additional preparation included elicitation of history of intake of antiplatelet and/or anticoagulants, which were withdrawn and prior arrangement done for blood transfusion. Surgery was followed by examination to note outcome. Once confirmation was established by histopathology, frequency and need of follow-up was informed to the patient based on the entity diagnosed. Outcome of management was evaluated based on symptomatic relief, regression of signs, noting any intraoperative or postsurgical complication, recurrence, and cosmetic result in terms of surgical scar.

Observation

Apart from vascular, infective, and inflammatory conditions, various diseases diagnosed were classified as per Duke Elders' system of classification as primary, secondary, and metastatic tumours.

[Table 1] Classified orbital diseases; $n = 76$

[Table 2] Categorized management of the series.

The series consisted of 39 females and 37 males; minimum age was 14 months, whereas oldest in this series was 72 years old. The following patients are discussed in brief.

Histology favoured diagnosis of epidermoid cyst[1] in a young female [Figure 1].

There was a mass causing considerable dystopia of globe[2] [Figure 2].

On palpation, the mass was firm in consistency, immobile, and continuous with palpebral part of lacrimal gland.[3,4] When severed surgically, care was taken not to excise part of palpebral lobe.[4] Histology proved it to be adenocystic carcinoma of lacrimal gland.

A female having down and out proptosis in right eye on imaging had a large fluid filled frontal sinus.[5] In another female in her sixth decade, MRI brain and orbits showed the extent of metastasis in orbit for which exenteration[6] was done.

There was history of enucleation done for squamous cell carcinoma nearly one year back.[7]

In a mid-aged female, a small peanut sized mass was palpable (barely visible), inset arrow [Figure 3], which during excision was found to be fused with orbital floor.

Histology in this case (Figure 3: Right) showed features of granuloma with typical Langhans cells. Granulomas arising from orbit and left lateral wall of orbit have been reported.[8,9]

In a mid-aged male presenting with complete ptosis of right side with bag of worm feel, we speculated possibility of lymphangioma; in down gaze, cornea of right eye was at a lower level than that of left eye. A strip of conjunctiva overhanging the lash line was excised for biopsy. The features were consistent with lymphangioma, which can occur in orbit.[10]

A two-year-old, who was born with protruding left eye, underwent CT brain and orbits using contrast in view of high suspicion of a vascular malformation in orbit.[11] CT angiography of brain showed large anomalous venous channel arising in the interthalamic region. Sudden bleeding in retro orbital sinusoidal spaces had caused painful exacerbation in proptosis. In view of irreversible compressive optic nerve axonal damage, a prompt ultrasound guided aspiration was done using scalp vein needle.[12] Bleomycin was injected into this malformation in a dose of 1.0 mg per kilogram body weight.[13]

A female child (Age 13 years) was brought with fever, headache, and protrusion of eyeball with restriction of ocular movements increasing in one day, with acute fall in acuity to finger counting two feet. Endoscopic ethmoidal sinus surgery with orbital decompression was done.[14] Two days later her visual acuity

Table 1: Data of orbital diseases observed *n*=76

Infective and Inflammatory conditions	Primary Tumour		Secondary Tumour				Metastatic Tumour	Others
	Benign	Malignant	Origin within orbit		Origin contiguous to orbit			
			Benign	Malignant	Benign	Malignant		
Orbital cellulitis *n*=11 Cavernous sinus thrombosis *n*=6 Aspergillosis *n*=1 orbital pseudotumour *n*=1 Tolossa Hunt syndrome *n*=1 Orbital cold abcess *n*=1 Tuberculoma of orbital floor *n*=1	Dermoid cyst *n*=1 Epidermoid *n*=1 Epidermal inclusion cyst *n*=2 Fibroangioma *n*=1 Optic nerve glioma *n*=2 Optic nerve meningioma *n*=3 SFT *n*=1 *	Plasmacytoma from soft tissue of orbit *n*=1 Squamous carcinoma *n*=1	Pleomorphic adenoma *n*=1	Adenocystic carcinoma of lacrimal gland *n*=1 MALT Lymphoma *n*=1 Retinoblastoma *n*=2 Melanoma *n*=1 Uveal melanoma *n*=1 Optic disc melanocytoma *n*=2	ADNEXA Lid hamartoma *n*=2 Foreign body granuloma *n*=1 Lymphangioma of lid *n*=1 NASOPHARYNX Angiofibroma *n*=1 Frontoethmoidal mucocele *n*=1 Complicated sphenoidal sinusitis *n*=1 CRANIAL CAVITY CCF *n*=1† Pituitary adenoma *n*=2 Astrocytoma *n*=1	Sebacious carcinoma *n*=2 Squamous nasopharyngeal carcinoma *n*=1 Solitary plasmacytoma from frontal bone *n*=1	Neuroblastoma *n*=2	Thyroid orbitopathy (12:ul9;bl3) Orbital venolymphatic malformation *n*=1 Venolymphatic malformation in neonates *n*=2

*Solitary fibrous tumor †Carotid cavernous Fistula ul-unilateral bl-bilateral

Table 2: Categorized management of the series

Conservative	Surgical	Surgical followed by palliation
Optic nerve meningioma *n*=1	Lateral approach (orbitotomy) *n*=4 [Pleomorphic adenoma, meningotheliomatous meningioma, fibroangioma, Epidermoid cyst]	Plasmacytoma (on recurrence) *n*=2
Paediatric metastatic Neuroblastomas, *n*=2	Anterior approach orbitotomy *n*=2 (Lacrimal gland carcinoma and meningioma)	Psammomatous meningioma *n*=1
Vascular malformation, *n*=2 Lymphangioma *n*=1	Exenteration *n*=1 (recurred squamous cell carcinoma in enucleated socket)	Squamous cell carcinoma *n*=2
Thyroid eye disease, *n*=12 Optic nerve head melanocytoma *n*=2 Cold abscess *n*=1	Endoscopic approach through nasal route *n*=3 (Fronto-ethmoidal mucocele, Nasoangiofibroma, Squamous carcinoma of nasopharynx)	Sebaceous carcinoma *n*=2
Orbital cellulitis, *n*=11 Optic nerve glioma *n*=2 Tolosa Hunt syndrome *n*=1 Orbital Pseudotumour *n*=1	Endoscopic sinus surgery with orbital decompression *n*=1 (case of sinusitis with ophthalmoplegia and compressive optic neuropathy)	Nasoangiofibroma *n*=1
Aspergillosis *n*=1 Hamartoma *n*=1 (adnexal follow-up case) INTRACRANIAL: Astrocytoma *n*=1 CCF *n*=1 Pituitary adenoma *n*=2 Cavernous sinus thrombosis, *n*=6 USG guided aspiration of blood in vascular malformation in child followed by injection of sclerosing agent *n*=1	Wide excision in enucleated socket *n*=1 (Solitary fibrous tumour) Enucleation in 3 (Uveal melanoma *n*=1, Retinoblastoma *n*=2). SIMPLE EXCISION Sebaceous carcinoma *n*=2 MALT Lymphoma *n*=1 Dermoid cyst *n*=1 (adnexal; over frontozygomatic suture) Tubercular granuloma (left orbital floor) *n*=1 Foreign body granuloma *n*=1 Epidermal inclusion cyst *n*=2 Hamartoma *n*=1 Plasmacytoma *n*=1	Retinoblastoma *n*=1

was 6/24 with normally reacting pupils and reversal of ocular movements.

In a female with massive unilateral proptosis wide excision was done, histopathology and immunohistochemistry favoured a diagnosis of spindle cell tumour[15,16] (solitary fibrous tumour).

A five-year-old male child presented with right orbital swelling and mild bilateral proptosis. This was a case of round cell tumour with rosettoid pattern, consistent with metastatic neuroblastoma, diagnosed on FNAC, confirmed by histopathology.[17]

A young male had clinical manifestations of cold abscess presenting with mild proptosis and orbital osteomyelitis. It manifested with discharging sinus and inflammation.[18]

Results

Proptosis is the commonest mode of presentation of orbital diseases (92.063%), followed by Ptosis (13.88%) globe dystopia (13.88%), restricted ocular movements in 26.3%, ophthalmoplegia in 2.63% cases, and absence of globe with a mass replacing it in 2/76 (2.63%).

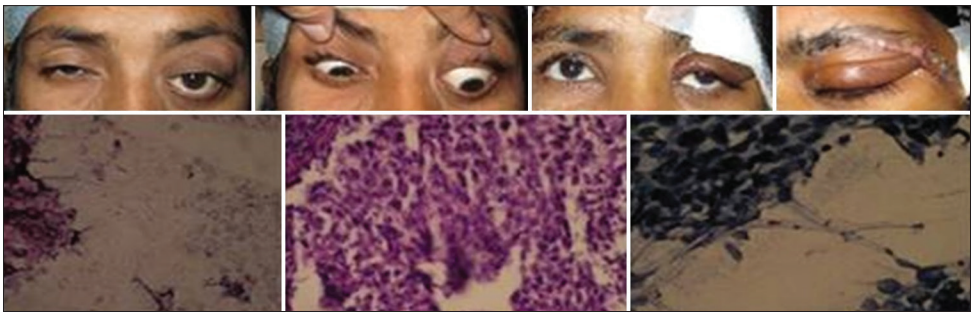

Figure 1: Above left: preoperative images. Above right: Postoperative scar due to lateral orbitotomy. Bottom extremes: FNAC showing anucleate and mature squamous cells, few red cells and granular material, suggestive of *epidermal inclusion cyst*. Bottom centre: HP images confirming FNAC findings

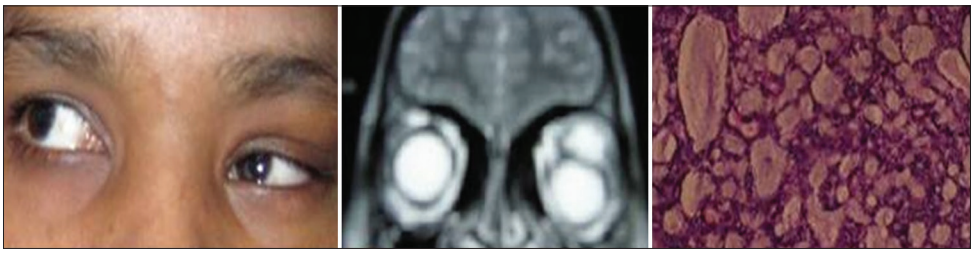

Figure 2: Cells having scanty cytoplasm with round or ovoid basophilic nucleus. These cells exhibited no evidence of mitotic activity but were seen to be arranged in a cribriform manner

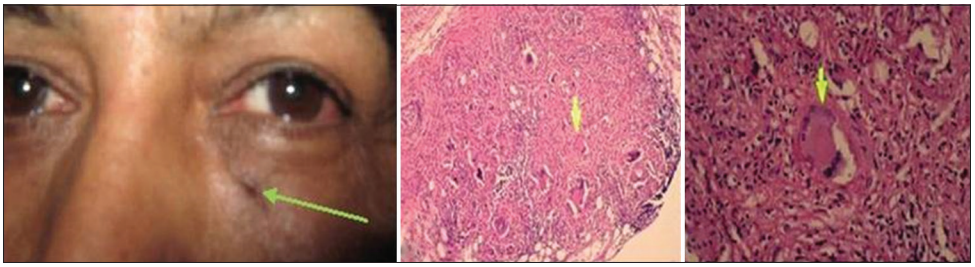

Figure 3: Left: Nodule at inferior orbital rim (green arrow). Right: Histopath showing multiple granulomas with Langhans giant cell

Neoplasia was commonest 33/76 (43.42%), followed by infective and inflammatory condition 21/76 (27.63% cases), thyroid-associated orbitopathy accounting for 12/76 cases (15.78%), whereas cystic lesions and vascular malformations were 4/76 (5.26%) each. Other disorders constituted a mere 2.65% [Refer Table 1]. Proptosis was seen in 70 of 76 patients (92.1%). In 86.3% of the cases, there was successful surgical outcome. Of 22 surgically managed cases, recurrence was noted in three cases (13.6%). 90% concordance was seen with histopathology in cases, where FNAC was done prior to surgery for diagnosing nature of disease.

Surgery and outcome

Orbitotomy was done in six patients with unilateral proptosis. A scar was seen postoperatively due to Stallard Wright incision in four patients who underwent lateral orbitotomy, beneath the eyebrow in a case of lacrimal gland carcinoma operated by anterior orbitotomy, while one underwent orbitotomy by combined anterior with medial approach. In two young females, scar being underneath the eyebrow was barely visible, while in two young males, it was camouflaged in the lateral aspect of lid crease. In case of lid hamartoma, it was concealed under medial eyebrow.

A definitive diagnosis could be made by histopathology in 22/76 cases in the present series (28.9%). In two patients out of 76 (2.63%), a definitive diagnosis was made only after immunohistochemistry (solitary fibrous tumour and plasmacytoma). Concordance between histopathology and FNAC was established in 90% cases; only in one case of psammomatous meningioma, the cytological features on FNAC mislead to a diagnosis of adenocystic carcinoma.[19]

To summarize, irrespective of aetiology, orbital diseases have an array of presentations such as proptosis, ptosis, globe dystopia, restriction of ocular movements, diplopia, and varying loss of visual acuity. Even clinicians might come across absence of globe with a mass replacing it (2.63% in present series).

In few cases, a definitive diagnosis is possible only by IHC (2.63%).

Orbital tuberculosis is an underdiagnosed entity, being commoner than believed to be. It was established in (2/76) 2.63% cases in this study.

Discussion

Proptosis was seen in 70/76; 92.1% cases collective of unilateral and bilateral. In course of our study, we observed that majority of cases having orbital and adnexal disease, inclusive of sino orbital diseases, and intracranial mass presented with unilateral proptosis, which was observed in 65 of 70 (92.85%). This is comparable to that reported by Mohan H and Sen DK (1971), who noted 128 cases of unilateral out of a total of 138 cases of proptosis (92.75%). We came across bilateral proptosis only in five cases in our series of 76 (one 38-year-old female patient who had coarsening of facies, menopause, and homonymous hemianopia, later diagnosed to have pituitary adenoma. Three cases having bilateral proptosis were thyroid-associated orbitopathy, whereas a five-year-old male child had bilateral proptosis of unequal extent in both eyes due to metastatic neuroblastoma).

In the present study, neoplasia was the commonest entity noted (43.42%), with thyroid orbitopathy being 15.78%, while Sharma *et al.*[20] in their study carried out at Himachal noted 23.3% thyroid orbitopathy, 16.7% being inflammatory disorders, 13.3% being lymphoproliferative disorders with metastatic lesions being only 10% and 6.7% being vascular neoplasms and vascular structural lesions each. They came across 3.3% cystic lesions with no tubercular entity diagnosed in their series of 30 cases.

In another study by Assavedo *et al.*,[21] inflammatory diseases and thyroid orbitopathy constituted 21.7% of the cases, tumours constituted 43.6% with congenital malformations and vascular affections being 0.7% each, whereas in our study, 15.78% Thyroid eye disease (TED) were noted, Assavedo *et al.*[21] reported only 4.9% dysthyroid orbitopathy.

Primary intraorbital meningioma is a rare tumour arising from optic nerve. It produces early visual loss along with disc oedema. We managed two primary intraorbital meningiomas, both having moderate visual loss (6/36 and 6/24) with slowly progressive unilateral proptosis. Of them, one underwent lateral orbitotomy, and histopathologic confirmation was in favour of meningotheliomatous type [Figure 4]. Second case diagnosed as primary intraorbital meningioma is on bi-yearly follow-up as it is benign. Excision can be considered once optic atrophy commences.

A young female having extracranial meningioma with history of proptosis for one year was diagnosed as psammomatous meningioma on histopathology. Intracranial meningiomas secondarily invading the orbit are the commonest (approx. 90%). In a study, Wright *et al.* (1989) on 50 patients with optic nerve sheath meningioma reviewed at Orbital Clinic Moorefield's Eye Hospital, and 15 were males and 33 were females.[22]

A patient with small prominence near supraorbital notch had recurrence and was advised MRI thereafter. He had already undergone excision biopsy at our centre. On recurrence, he consulted elsewhere and was advised to get an MRI done. Suspicion of cysticercosis existed as there was hypo intensity on T1 with hyper intensity on T2 STIR sequence. Imaging of orbit with MRI provides better anatomic details with T1 weighted sequences and superior visualization of pathological conditions on T2 weighted sequence.[23] As patient consulted at our centre first, excision biopsy having been done two years back, we were confident that the excised mass was a hamartoma, still, to improve patient satisfaction we got a routine B-scan ultrasound with 12 MHz probe done. It enabled us to convince the patient that if present, a cyst would have been picked up at such a superficial location. Moreover, colour Doppler ultrasound demonstrated an unusually high vascular network apart from larger calibre supraorbital vessels. It was an anatomical variation (hamartoma) requiring no treatment. Reassurance was all that was needed.

Though imaging is helpful for the clinician, in cent percent case it is not conclusive: as exemplified by following situations. A) Fullness of upper lid sulcus with ptosis and dystopia in a seventeen year old girl, on MRI appearing as meningioma, proved erroneous when excision biopsy showed it to be a lacrimal gland carcinoma. B) On imaging, the mass appearing as Pleomorphic adenoma, moulding to globe on CT scan, was actually due to lymphoproliferative disorder. In this patient FNAC was of great help since it disclosed possibility of a malignant mass. C) Imaging characteristics of recurrent hamartoma mimicked that of a cysticercus cyst. Hamartoma in Greek means "fault" used initially to mean "missing the mark in spear throwing." Common hamartomas are pigmented naevi, angiomas, and neurofibromas.

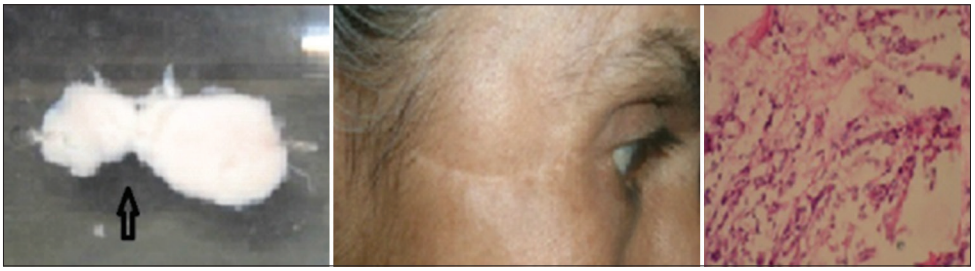

Figure 4: Left; optic nerve cut section, Center: Scar due to Stallard Wright incision, Right: Histopath of meningotheliomatous meningioma

In one patient, where FNAC was performed under guidance of ultrasound, aspirate disclosed features of a large and deep seated epidermoid cyst.[24] In the second patient, there was a diagnostic dilemma since location and bluish skin discolouration of a soft to cystic lesion, appearing classically as hemangioma (in medial part of upper lid) proved erroneous since FNAC disclosed cystic nature, turbid fluid being aspirated. Histology confirmed it to be an inclusion cyst. It is formed by the inclusion of a small portion of epithelium or mesothelium within connective tissue along a line of fusion of embryonic process. An exudation cyst is formed by slow seepage of exudates into a closed cavity, as in our patient, since on doing FNAC 3.5 cc cystic fluid was aspirated. In another young male FNAC from lacrimal gland showing presence of bizarre cells with mitotic figures in aspirated tissue warned us of being faced with a malignant growth arising from lacrimal gland. Eventually, on recurrence, aspiration cytology helped in making a provisional diagnosis of plasmacytoma owing to plasma cells in plenty with the classical eccentric nucleus and perinuclear halo. Immunohistochemistry after excision confirmed this diagnosis.

Dermoid cysts are frequently encountered, and are the most common periorbital tumour in childhood constituting 33% of all orbital cysts.[24] Though present congenitally, the cyst enlarges later in life. In one patient [Figure 1], there was history of painless slowly progressive mass at upper and outer quadrant of orbit, while excising this mass (diagnosed as epidermal inclusion cyst on FNAC), the wall was found to be fused with periorbita, which had to be scraped. Orbital cutaneous fistula may result after incomplete excision of cyst wall. In adulthood, dermoid cysts may have a more posterior location, as in our case. The posterior limit of the cyst was beyond mid-third of orbit.

A clinicians approach in orbital disease may vary from conservative with review as per need, to prompt surgery; the former is desirable since few orbital diseases have dormant course and may be followed up conservatively exemplified by primary intraorbital optic nerve meningioma, optic disc melanocytoma, and adnexal hamartoma. On the contrary, promptness for surgery is indicated and is essential to relieve pressure effect on optic nerve by orbital decompression for salvaging vision, exemplified by a case of sphenoidal sinusitis in this series where endoscopic transethmoidal sinus surgery with orbital decompression done timely could restore vision. Infective conditions such as orbital cellulitis and cavernous sinus thrombosis and fungal infections require prompt medical attention. Vascular malformations are usually not an emergency unless sudden bleeding compromises the optic nerve functionally, as seen in a neonate with vascular malformation.

Despite thorough ophthalmic examination, in significant number of cases systemic approach is mandatory for clinical correlation such as thyroid eye disease, cold abscess and orbital secondaries.

Orbitotomy by lateral approach was required in four cases for which modified Kronlein approach[25,26] was used, in one case only anterior approach was used whereas one case underwent orbitotomy by combined anterior with medial approach.

Intra- and postoperative complications

1. Transient LR palsy was seen after lateral orbitotomy in one female operated for primary intraorbital meningioma.
2. Corneal facet was noticed on second postoperative day in another patient who underwent lateral orbitotomy for mass in mid-third on lateral aspect of orbit, and it healed within a week with topical antibiotic and lubricant.
3. Recurrence following excision was seen in three subjects out of 22 (13.6%). Early recurrence occurred in meningioma, five months later in plasmacytoma and recurrence after two year in lid hamartoma after excision biopsy.

In the first case, the mass was diagnosed as psammomatous meningioma that recurred two months after excision (orbitotomy by combined medial and anterior approach), whereas second was diagnosed as plasmablastic plasmacytoma. Not being equipped with PET CT at that time, both young patients with recurrence were referred to an oncologist. In the third recurred case (histologically proven hamartoma), reassurance was all that was needed.

In a retrospective study by Jian *et al.*[27] on postoperative visual impairment and surgical outcome of 165 patients, 7.3% had severe visual impairment with no light perception in 1.8% cases. Out of these, 3/121 anterior orbitotomy patients and 9/121 lateral orbitotomy patients had severe visual impairment, whereas none of the patients had this complication by transcranial approach.

In our series, orbitotomy was performed in six cases (in four cases by lateral approach and in one case by combined medial with anterior approach, while in one case by only anterior approach) and visual impairment was not encountered in any.

In majority cases 19/22, 86.3%, we could give the benefit of optimal surgical outcome including a cosmetically acceptable scar. In two patients (one each managed conservatively and surgically as cases of subperiosteal tubercular abscess near frontozygomatic suture and tubercular granuloma arising from orbital floor respectively), following diagnosis there was need of antitubercular treatment, which was instituted for 9 months and 6 months, respectively, to affect radical cure. Preservation of form and contour of the globe by sclerotherapy in case of venolymphatic malformation of orbit can be considered optimal outcome as there is little scope of tumour resection. Functional preservation of eye may not always be possible in such cases.

Study limitations

Patients might have been missed on referral from neurology and endocrinology; hence, percentage of cases having space occupying lesions and thyroid-associated orbitopathy could be erroneous.

Conclusion

Orbital diseases can present with varying degree of visual loss; thus, there is need to diagnose and treat at times on urgent basis, so that sight is preserved as far as possible. In majority of orbital and adnexal conditions, diagnosis can be made based on imaging. However, clinician might require an adjunct invasive investigation such as biopsy or FNAC. Though FNAC is invasive, complications as grave as blindness have been reported and warrant its judicious use as it is of immense help as a diagnostic tool.[28] It is useful in cases of diagnostic dilemma or may be required in few cases as an adjunct diagnostic aid.

Systemic approach is mandatory in cases such as thyroid-associated orbitopathy, cold abscess, and orbital secondaries. Apart from surgical treatment, a significant number of cases require conservative or palliative approach. In isolated cases, reassurance is all that is needed, exemplified in the present study in case of optic disc melanocytoma and recurred hamartoma near the eyebrow.

Although we discussed various surgical approaches in our study for a wide spectrum of diseases, a significant number of cases could be managed conservatively with adequate follow-up. The required approach for clinician in orbital disease can vary from 'wait and watch', to prompt surgical intervention; orbital and adnexal diseases should not be dealt too enthusiastically by surgery; rather, it should be planned only after assessing risk benefit ratio and patient's compliance for follow-up. Educating the patient about the disease including need of palliation and follow-up is especially emphasized for cases that are prone to recur, thereby decreasing morbidity and improving quality of life of these patients.

Key points

1. A thorough knowledge of common orbital diseases, their aetiology, and mode of presentation can enable clinicians to suspect and thus diagnose a wide spectrum of orbital diseases.
2. Systemic approach is mandatory in cases such as thyroid associated orbitopathy, cold abscess and orbital secondaries.
3. Educating the patient about the disease including need of palliation and follow-up is especially emphasized for cases that are prone to recur, thereby decreasing morbidity and improving quality of life of these patients.

Acknowledgement

The author is thankful to Prof Dr Amit Verma and Dr Kamal Malukani for diagnostic histopathology and cytology. Prof Dr P K Sethi and Prof Dr Baser are acknowledged for teamwork in cases of orbitotomy and endoscopic sinus surgery.

Informed consent

Informed consent was obtained from all participants to participate in the study.

Ethical approval

The research complies with all the relevant national regulations, institutional policies, and is in accordance with the tenets of the revised Declaration of Helsinki and has been approved by the institutional ethical committee.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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