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A CLINICAL STUDY OF ORBITAL INJURIES

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ABSTRACT

The present study reveals that road traffic accidents, especially motor cycle crashes and interpersonal violence are the leading causes of orbital injuries seen most commonly in the young males between the age group of 20 to 40 years. Periorbital oedema and subconjunctival hemorrhage constitute the most common eyeball injury seen in orbital fractures. In the study, lateral wall and floor were commonly associated in orbital fractures. The high incidence of lateral wall fractures in the present study is due to the fact that our hospital is situated near a motor highway and 78 % of patients were involved in road traffic accidents.

Keywords:orbital septum, injury, hemorrhage

Introduction

The cranial and facial architecture of primates is beautifully arranged to protect the brain and eyes from the impact of fights and falls. The orbit is an anatomical region which is of clinical and surgical interest to many disciplines. All traumas to the face, particularly above the level of the mouth, require a careful ocular examination, including an estimation of the visual acuity of each eye. Some ophthalmic injuries are clearly apparent. However, other potentially blinding complications can easily be missed unless they are actively sought. Inadequate care can result in blindness, with its attendant social and medico legal implications. The initial examinations may be the only time that the physician is able to observe the damage to such structures such as the retina and optic nerve that may later become obscured by continued hemorrhage and cataract formation. Ophthalmic injuries in relation to maxillofacial trauma may be domestic injuries, injuries in travel and sports, industrial hazards, assaults, self-inflicted injuries, and so on. The injuries vary from lacerations of the lids and abrasions of the cornea to wounds or ruptures of the sclera, intraocular hemorrhages, dislocation of the lens, and detachment of the retina. Accidents involving the injury to the eyes and their adrenal incurred in traveling are common. In all accidents, whether incurred in trains, airplanes, or car, the injury tends to be severe, as a rule contusion leading to fracture of the orbit and rupture of the globe or penetrating injuries due to glass is associated with considerable facial damage, particularly lacerations of the eyelids and cheek. The treatment of facial trauma is generally reported separately from the management of specific ocular trauma due to the fact that many surgeons who manage facial injuries are not ophthalmologists. Some ocular injuries may require concomitant surgical treatment with facial injuries, while in other circumstances the presence of an ocular injury would contraindicate immediate surgery to repair the facial fractures.

Relevant Surgical Anatomy of the Orbit

The orbit is made up of seven bones. The orbital shape varies with age, gender and race and between individuals but the volume is usually 29 –30 cm^3 with the eyeball occupying 7cc of the orbital volume [1,8,9,10]. The bony orbit is a roughly quadrilateral, pyramidal cavity with its base directed forwards and lateral. It is comprised of 7 bones: maxilla, palatine, frontal, zygomatic, sphenoid, ethnocide and lachrymal bones (Figure 1 -1).

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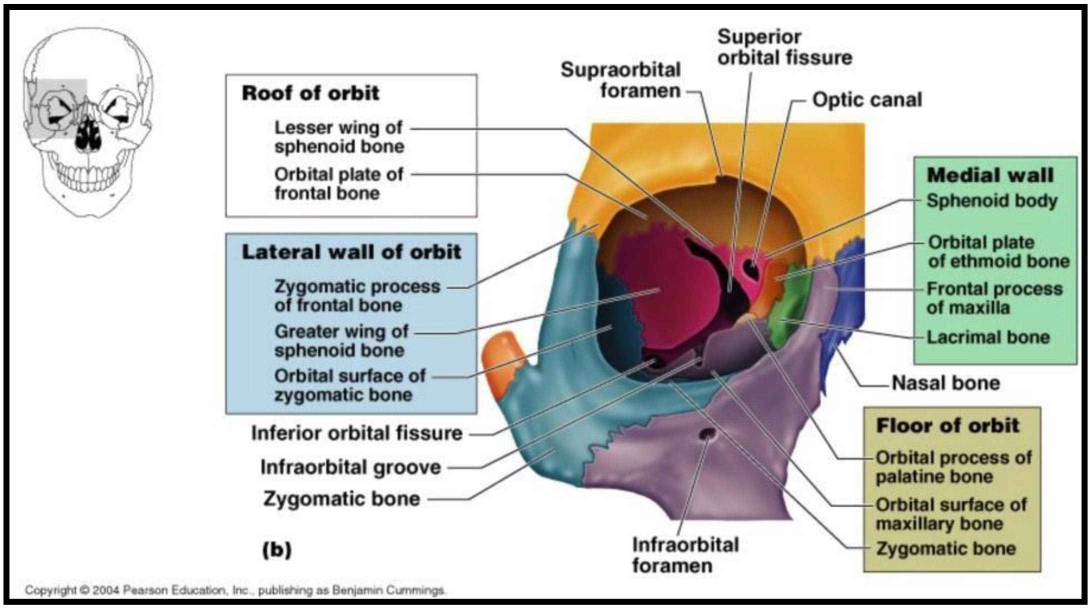

Figure 1.1Anatomy of the orbital walls

1.2 Soft tissues of the orbit

The eyelids are covered by a thin skin which overlies a lax areola tissue. It has a profuse blood supply. Opening of the eye is achieved by lavatory palpebrae superior is muscle, which is innervated by the coulometer nerve. Eye closure is carried out by the orbicular is ocular, supplied by the facial nerve. The orbital septum consists of a fibrous diaphragm extending from the periphery of the orbit to the tarsal plates. This septum prevents the escape of blood or pus outside the orbit if present with the orbit. Collections within this compartment may therefore lead to an increase in the retro bulbar pressure, which may cause vascular occlusion and hence interfere with the circulation to the retina and consequently affect sight. The lachrymal apparatus is involved in the production of tears and the removal of excess tears. The lachrymal apparatus consists of the lachrymal gland, lachrymal canaliculated, lachrymal sac and the nasolacrimal duct. Under normal conditions the lachrymal gland secretes just enough tears to replace those lost by evaporation. The nerve supply comes from superior nucleus via the greater petrosal nerve. The postganglionic fibers run with the zygomatic branch of the maxillary nerve, which anastomoses with the lacrimal nerve. There is a layer of periorbital fat which acts as a cushion upon which the extra-ocular muscles of the eye can move and rotate the eyeball within the capsule of Tenon, which is a thin membrane which envelops the eyeball from the optic nerve to the limbus. There are a large number of fibrous septa within the periorbital fat, which may become entrapped with the fat in orbital blowout fractures lead to interference with the free movement of the extraocular muscles. Periorbital fat fills both intraconal and extraconal spaces.Anatomic and histological study of the orbit, found a fine ligament system, interconnecting the orbital softtissue with the bony orbit. The presence of such a ligament system could play an important role in extraocular muscle motility defects,without the need for actual muscle entrapment.

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Muscles of the orbit:

The eyeball is moved by extrinsic or extra-ocular muscles consisting of four rectus (superior, inferior, medial and lateral) and two oblique (superior and inferior) muscles. The orbit also contains the levator palpebrae superior is for moving the upper lid. The extraocular muscles, posteriorly, travel adjacent to the orbital walls. Here they are vulnerable to the effects of fracture and to the trauma of surgical dissection. The four recti muscles originate from the common tendinous ring which surrounds the superior orbital fissure and the optic canal. As these muscles pass forwards from the apex of the orbit they broaden out, to form a cone of musclesaround the eye. They all pierce the facial sheath of the eyeball and are inserted into the sclera anterior to the coronal equator of the eye. The lateral rectus is supplied by the abducent nerve and the superior oblique by the trochlear nerve. All other muscles (superior, medial and inferior rectus and inferior oblique) are supplied by the third nerve (oculomotor).

Nerves of the orbit

The optic nerve is essentially an extension of the brain and is covered by dura, arachnoid and pia mater. In contrast to the immobile intracanalicular portion of the nerve, the orbital portion enjoys considerable mobility which decreases the likelihood of its injury in orbital trauma.The infraorbital nerve enters the orbit accompanied by the zygomatic nerve and Infraorbitalartery. The infraorbital nerve and artery occupy a groove in the posterior part of the orbital floor. Both enter the infraorbital canal and continue to the face, supplying nerves to the maxillary sinus and the anterior teeth . The zygomatic nerve passes along the lateralwall and divides into its zygomatico-temporaland zygomatico-facial branches. The former gives secretomotor fibers to the lacrimal nerve for the lacrimal gland. The oculomotor and the abducent nerves are situated inside the tendinous ring, and are therefore better protected thanthe trochlear nerve, which is more vulnerable along its course as it crosses above the origin of the levator and the muscle cone running along the upper part of the medial wall. The nerve to the inferior oblique muscle leaves the protection of the muscles between the inferior rectus and the lateral rectus and is at risk because of its proximity to the floor of the orbit.

Vessels of the orbit

The ophthalmic artery, a branch of the internal carotid artery, enters the orbit through theoptic canal within the dural sheath of the optic nerve. It gives off several branches that accompany the branches of nasociliary, frontal and lacrimal nerves. It supplies the ethmoid air cells, the external nose, the eyelids and forehead. The blood supply to retina is derived from the central retinal artery, a branch of the ophthalmic artery.

The globe of the eye

The eye contains the light sensitive retina and it i s provided with the cornea,lens and refractive media, for focusing images and with means of controlling the light admitted, the iris diaphragm. The inside of the globe is black to prevent internal reflections;the large area behind the lens is occupied by the vitreous body. In front of the lens a smallarea is filled by aqueous humour, the two compartments being incompletely divided into the anterior and posterior chambers by the iris. The space bounded by the inner margin of the irisis the pupil. The wall of the eye consists of three coats. The outer coat is fibrous and consists of the sclera and cornea; a vascular coat, the

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choroid, ciliary body and iris; and the innermost nervous coat, the retina. The sclera can be considered as a „cup - like‟expansion of the dural sheath of the optic nerve.

Ocular movements

The eyeball is moved by extra ocular muscles; superior, medial and inferior rectus muscles are responsible for adduction, medial movement of the eye, while lateral rectus muscle and both oblique muscles are responsible for abduction, lateral movement of the eye. Because the long axes of the muscles are not parallel to the long axis of the eyeball, the superior oblique turns the eye up and in (in torsion),with the action of the inferior oblique muscle turning the eye up and out (extortion).The collective action of both muscles will result in pure upward movement of the eyeball (supaversion). Inferior rectus and superior oblique have a similar collective action, resulting in pure downward movement (infraversion).

Etiology and Mechanisms of Orbital Fractures

The commonest causes of facial fractures are motor vehicle crashes (MVCs), assaults, falls and sports injuries [17-21]. However, similar more recent studies have established assault (stoning, fists, kicks) as the commonest cause of orbital fractures [20,21,23]. Airbags, paradoxically, have been reported to cause ocular injuries and less frequently orbital.

Orbital fractures can be broadly classified as follows:

1. Fractures limited to internal orbital skeleton. Orbital floor, medial wall, or roof can be involved. This type of fracture can be further classified into:

Trap door type of fracture – due to low velocity injuries Blow out fractures – due to blunt injuries/ fist injuries.Fractures involving orbital rim / along with internal orbital skeleton.

These fractures may be sub classified into:

- Inferior rim fracture
- Superior rim fracture
- Lateral rim fracture
- Rim fracture in association with fractures involving internal orbital skeleton

2. Fractures of orbit associated with other fractures of facial skeleton. These include:

- Zygomatico maxillary fracture
- Naso-orbito-ethmoid fracture
- Frontal sinus fracture
- Lefort II
- Lefort III

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3. Orbital apex fractures : These fractures should be identified early because of potential threat to neurovascular structures at superior orbital fissureand optic canal. Optic canal injuries can lead to traumatic

optic neuropathy.

Mechanisms of blow-out orbital fractures:

Three accepted mechanisms of blow-out orbital fractures have so far been described [15,21,26,27]which include:

Buckling or "Bone Conduction" theory:

Forces on the orbital rim are transmitted along the longitudinal axis of theorbital wall. This causes buckling particularly in the thinnest parts of the orbit.(Fig.1.5)

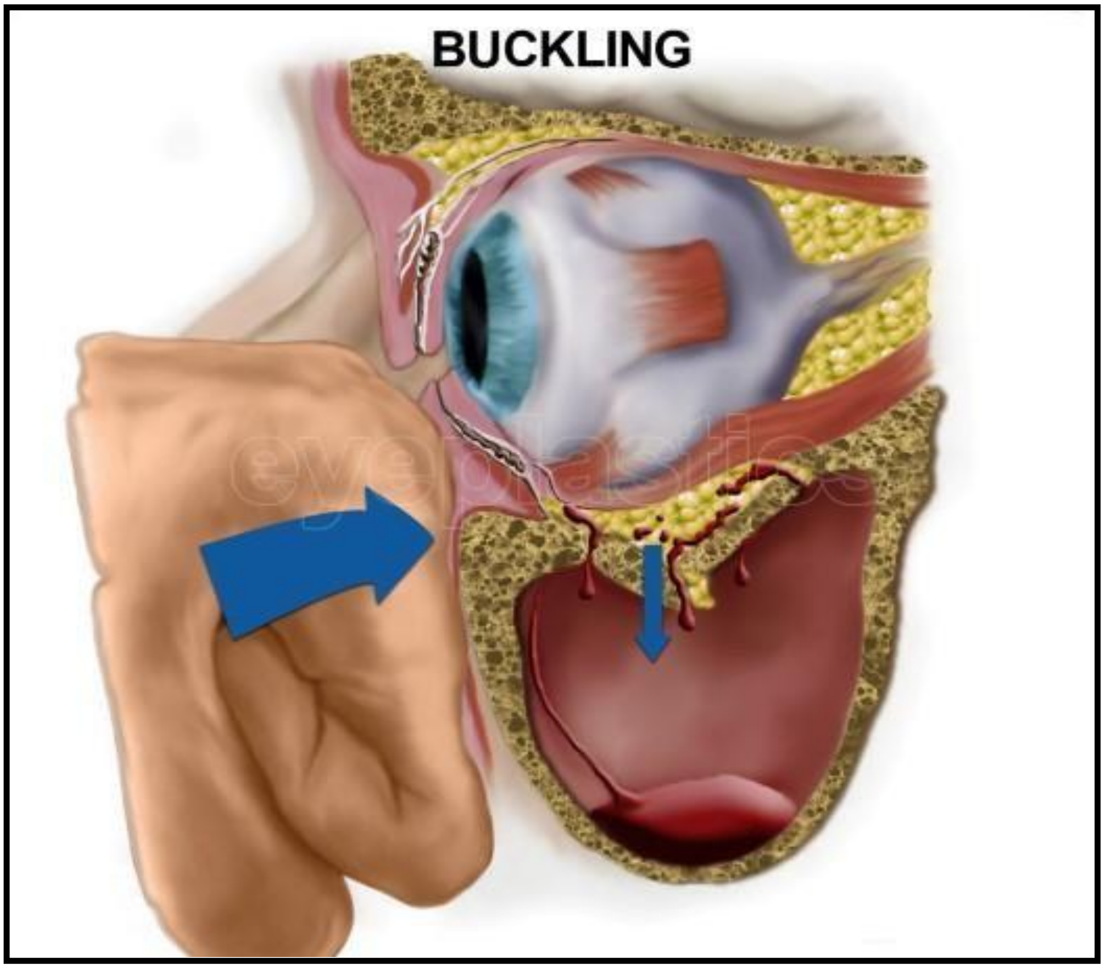

Fig.1.5 Showing buckling mechanism of blowout fracture.

1. **Globe to wall theory:** This involves the direct impact of the globe onto the orbital wall.(Fig.1.6)

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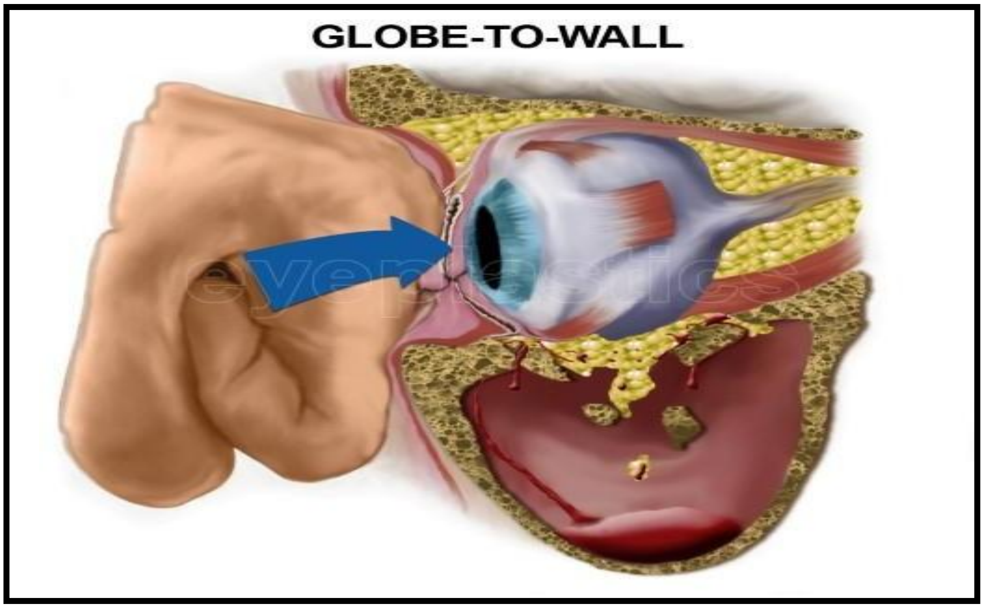

Figure.1.6 Globe to wall theory of blow out fracture Clinical

Presentation of orbital fractures

The ocular squeal of mid-facial fractures ranged from non-vision threatening injuries to vision-threatening injuries. It was also noted that pure orbital fractures were twice as common as impure orbital fractures. Of note is that some ophthalmic injuries may be apparent; However, other potentially blinding complications can easily be missed unless they are actively sought [31]. The loss of vision associated with missed potentially dangerous clinical features can attract serious litigations. Orbital soft tissue/the inferior rectus muscle becomes tightly entrapped in the fracture leading to ischemia and if not treated in time, fibrosis and permanent diplopia may develop. The symptoms and signs in the acute s tage of an „orbital floor trap door‟ fracture can be misleading and are often mistaken for those of cerebral concussion. The patient suffers from pain and nausea and sometimes from vomiting, bradycardia and syncope (oculocardiac reflex) [37]. In these cases, acute surgery to release the entrapped tissue is urgent if serious complications such as permanent diplopia are to be prevented.

Subconjunctival haemorrhage and periorbital ecchymosis:

Subconjunctival bleeding can occur in trauma confined to periorbital tissue. In the case of orbital fracture, blood starts to accumulate in the extraconal space then tracks anteriorly; this will appear as subconjunctival haemorrhage (Fig 1.7). Initial absence of subconjunctival haemorrhage, however, does not exclude the presence of fracture, as in some cases there will be no tearing in the periorbita, blood from the fracture slowly accumulating under the periorbital plane, which may take days to manifest on the conjunctiva. Circumorbital ecchymosis is a common sign intrauma to the pre-septal soft tissue (Fig.1.8).

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Fig1.7 Showingsubconjunctival haemorrhage in the left side.

Fig.1.8 Showing periorbitaledema and ecchymosis on the right side.

Assessment of ocular motility defects

The Hess chart test is commonly used test for assessment of extraocular motility defects. The Hess chart (Fig 1.9)gives a reproducible, record of ocular motility. It is obtained for each eye and usually the unaffected eye muscles show over action in contrast to the contra lateral affected muscle in the involved eye.

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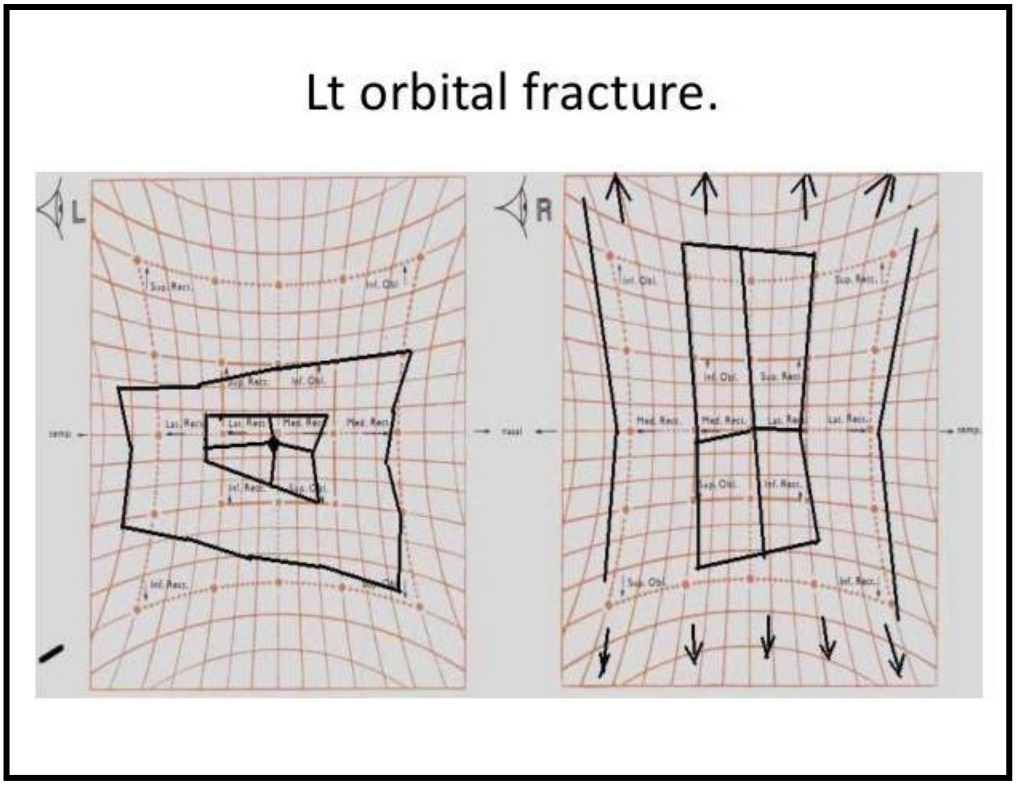

Figure 1.9 Hess chart of left orbital floor blowout fracture showing restriction of left upgaze (superior rectus and inferior oblique) and restriction on down gaze (inferior rectus).

Radiological findings:

The generally recommended imaging modalities for orbital trauma include plain radiographs(Waters and Caldwell views), CT scans (coronal, sagittal and axial slices), Ultrasound scan (USS),MRI and Cine MRI for dynamic evaluation [11,43,44]. CT scan is generally considered the gold standard for diagnosis of orbital fractures [5]. When it comes to bone resolution, CT scan remains superior to plain radiographs, USS and MRI images.

Computed tomography:

The use of CT is now a common place in the investigation of fractures. The nature of investigation does not only include its usefulness in the diagnosis of orbital fractures, but for its value in classification of blow out fractures of the orbit. The criteria for proper evaluation of an orbital injury, as an axial scan, beginning at the superior aspect of the frontal sinus and progressing through the entire orbit terminating at the maxillary alveolus. C oronal sections should begin anteriorly at the nasal pyramid and continue posteriorly through to the orbital apex. CT scan can demonstrate in both axial and coronal planes the extent of the fractured floor and its relationship to the soft tissue.

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Fig 1.9 CT facial bones showing lateral wall and zygomatic maxillary complex fracture

Table below summarizes some of the implant materials available in the market.

Table1.1 : Type of Implant Material [59]

TYPE OF IMPLANT MATERIAL	**EXAMPLE**
Autogenous materials	· Bone-calvarium, iliac crest, scapula, rib · Cartilage · Temporalis fascia · Dura · Dermis
Allogeneic materials	· Irradiated fascia lata .Lyophilized dura mater · Lyophilized cartilage
Alloplastic materials	**Nonresorbable** · Titanium mesh · Vitallium
	· Bioactive glass · Silicone · Teflon · Porous polyethylene sheet · BAG plate · Hydroxyapatite sheet
Resorbable	· PLLA plate · P(L/DL)LA 70/30 plate · PLLA/PGA sheet · Polyglycolic acid membrane · PDS sheet · Polyglactin-910 mesh · Polyglactin-910/PDS sheet · Periosteum-polymer complex

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Xenograft materials	· Collagen membrane
Others	· Suture suspension

AIMS AND OBJECTIVES

- To study the prevalence , presentation , involvement of eyeball and visual outcome in patients with orbital injuries.

Study Subjects

Inclusion Criteria :

- Age of patient more than 18 years of age both male and female.
- All patients with facial trauma with orbital injuries following road traffic accident, domestic violence or falls presenting to the emergency department in Sree Balaji medical college and hospital.

Exclusion Criteria :

- Age of the patient less than 18 years.
- Patients with previously known visual problems.
- Brought dead cases.

MATERIALS AND METHODS

This study is a prospective , hospital based study of patients with orbital injuries and other associated facial bone fractures reporting to casualty and department of ophthalmology in Sree Balaji Medical college and hospital. The study included 50 consecutive patients of orbital injuries attending our hospital.

Data collection :

After obtaining an oral informed consent from the subject and maintaining confidentiality detailed history, clinical ocular examination including orbital margin palpation, neuro-ophthalmological examination, slit lamp examination and fundus examination was done . Where the condition of the patient did not warrant the interview, the relatives or attendants were interviewed. Radiographic evaluation was done by X-ray and computed tomography initially to determine the orbital fracture patterns, soft tissue injuries, localization of orbital foreign bodies and recognize abnormalities of the contents and integrity of the globe.

1. RESULTS

- The study was conducted in patients with orbital fractures who came to the ophthalmology department

.Fifty patients with confirmed orbital fractures on CT scan were included in the study.

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Table 1 : Gender Distribution

Gender	No of cases	%
Male	44	88
Female	06	12
TOTAL	**50**	**100**

Out of the 50 cases, a majority of the participants were males comprising 88% (n-44) and the remaining 12%(n-6) were females.

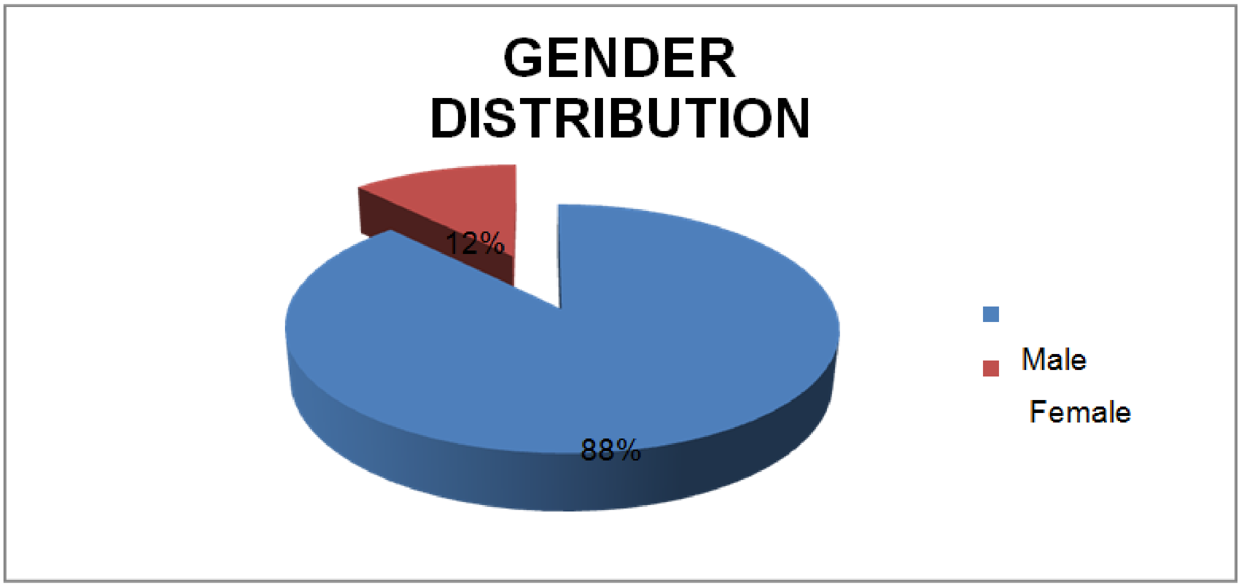

Table 2 : Age Distribution

AGE (in years)	Male	%	Female	%	Total	%
20 - 30	22	50	01	17	23	46
31 - 40	08	18	02	33	10	20
41 - 50	07	16	02	33	09	18

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> 50	07	16	01	17	08	16
TOTAL	**44**	**100**	**06**	**100**	**50**	**100**
MEAN	**49.67**					**46.17**
SD	**21.72**					**11.83**

In the group of 50 patients, the youngest participant was aged 20 years and the oldest being 84 years of the total sample. The mean age of male participants and female participants were 49.67 years and 46.17 years respectively.

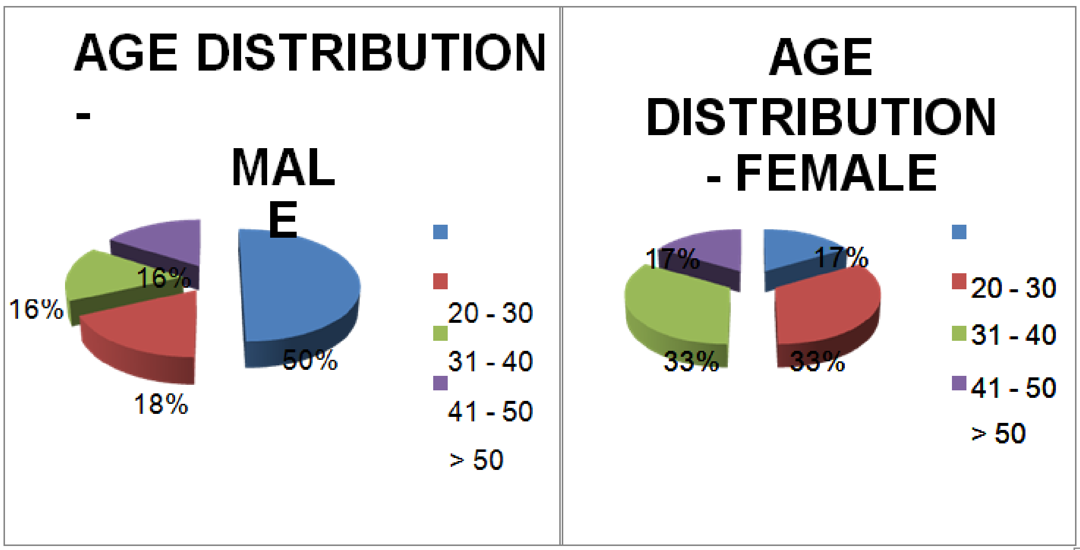

Table 3 : Gender-Wise Distribution According to Mode of Injury

Mode of Injury	**Males**	**%**	**Females**	**%**	**Total**	**%**
Road Traffic Accidents	35	80	04	67	39	78
Assault	05	10	00	00	05	10
Slip & Fall	02	05	02	33	04	08
Occupational injury	02	05	00	00	02	04
TOTAL	**44**	**100**	**06**	**100**	**50**	**100**

In this study, the gender wise distribution explains that 80 % of the male met with road traffic accidents which is the common etiology followed by assault 10 %. Among the females 67 % met

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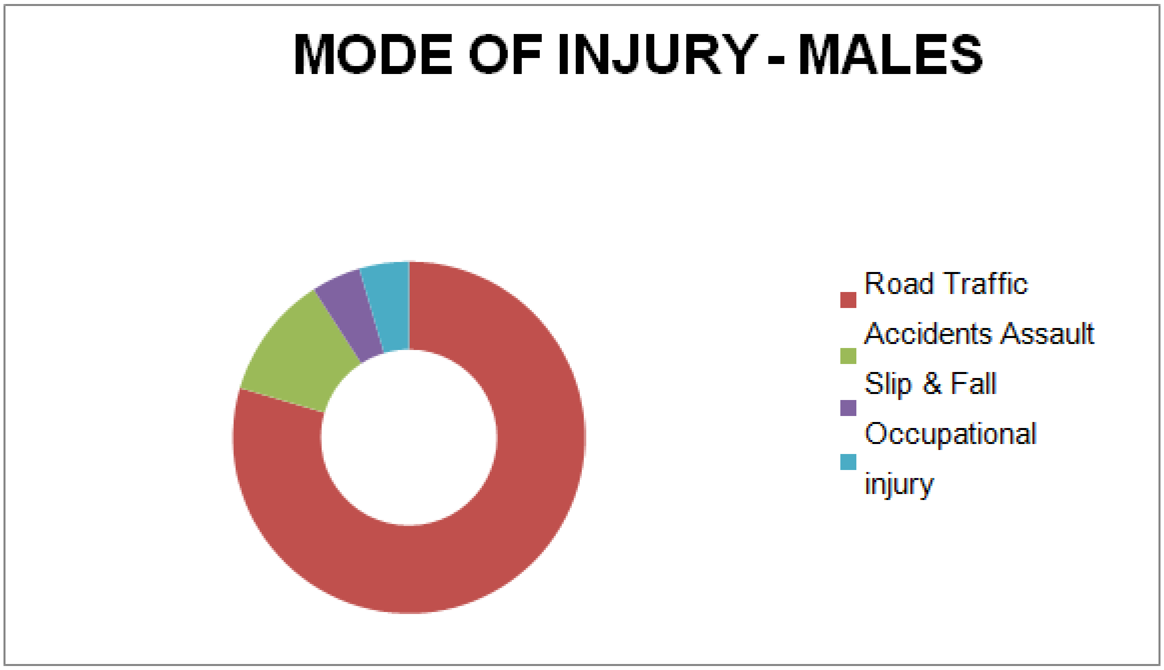
with road traffic accidents and 33 % had injury due to slip & fall. The chi-square test was recorded as χ^2= 6.537 with P value = 0.005 proving a statistical significance.

Hence, it can be concluded that the mode of injuries has significance with the gender and males are prone for road traffic accidents in the distribution of orbital fractures according to etiology with respect to the study group.



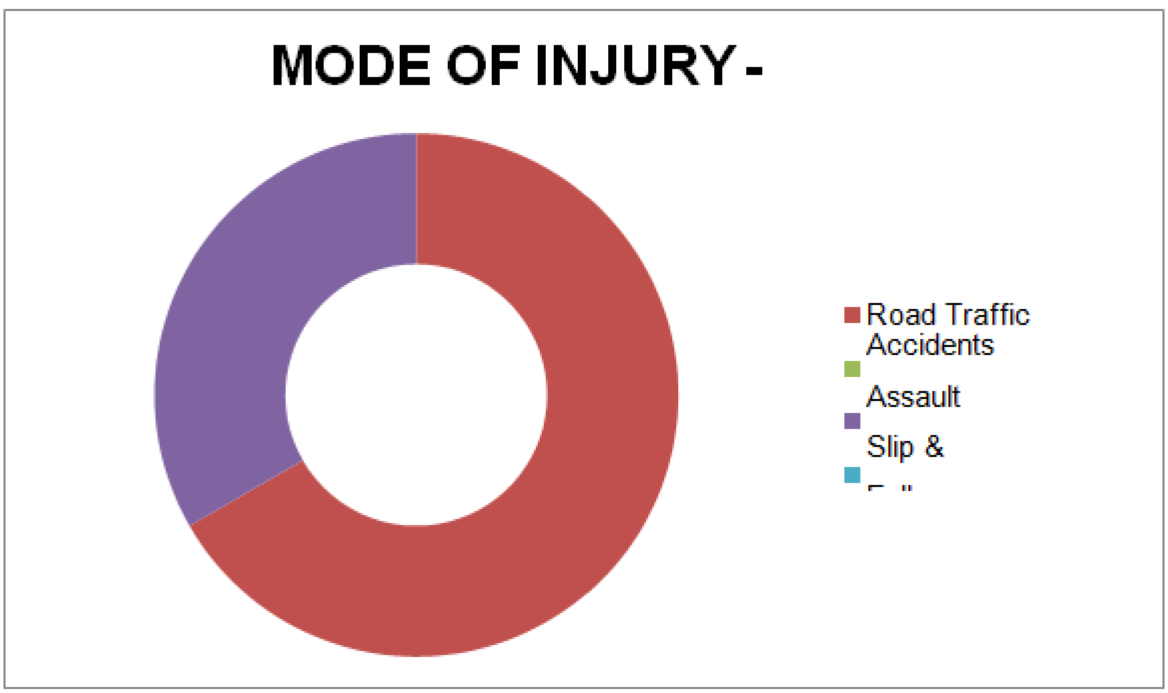


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Table 4 : Distribution of Orbital Wall Fractures

Orbital wall fracture	**No of cases**	**%**
Single wall	26	52
Two wall	14	28
More than two wall	10	20
TOTAL	**50**	**100**

The orbital wall fractures were distributed as 52 % in the single wall, 28 % in two walls and 20 % in more than two walls categories. The chi-square test was recorded as $\chi^2 = 8.320$ with P value = 0.016 proving a statistical significance. Hence it can be concluded that single wall fractures are highly significant in the distribution of orbital fractures according to etiology with respect to the study group.

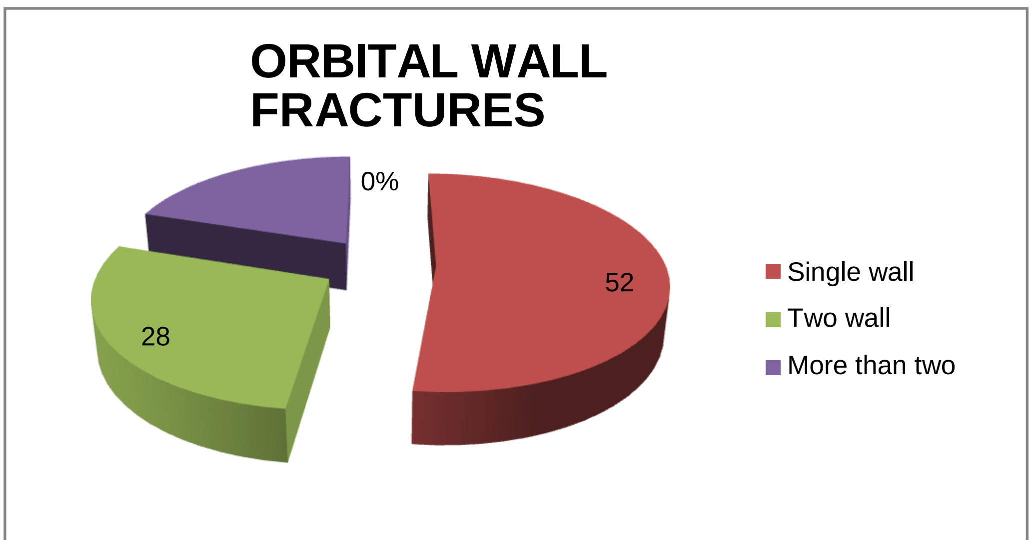

Table 5 : Distribution of Isolated Wall Fractures

Single wall fracture	**No of cases**	**%**
Lateral	16	62
Medial wall	02	07
Orbital floor blowout	03	12

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Infra orbital rim	05	19
TOTAL	**50**	**100**

Among the total cases, the distribution of the single wall fractures were of lateral (62%), media wall (7%) orbital floor blowout (12%) & infra orbital rim (19%).

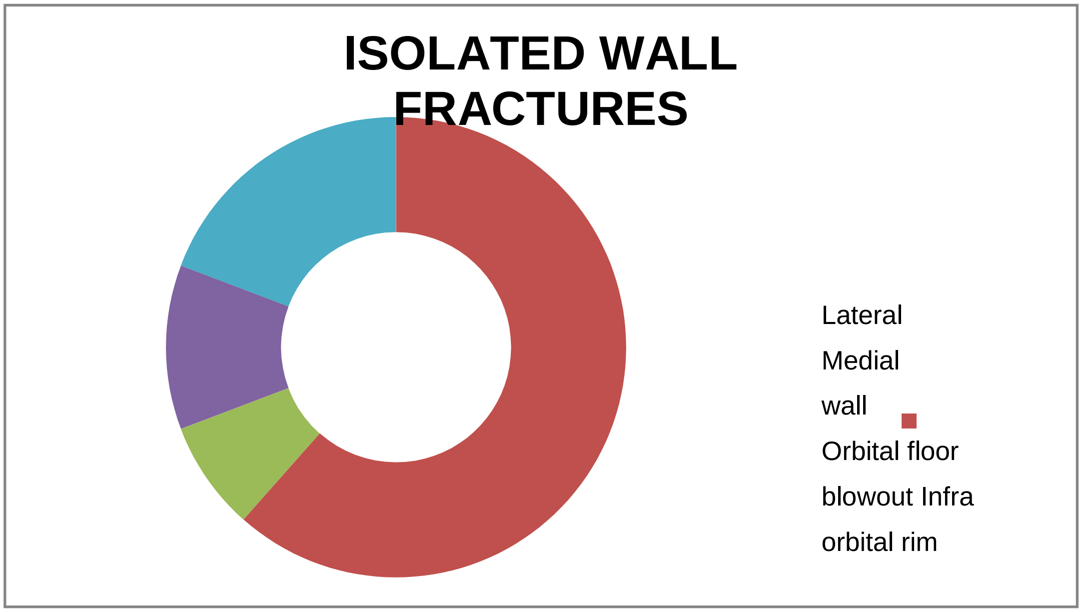

Table 8 : Traumatic Optic Neuropathy in Patients with Orbital Fractures

Type of fracture	No.of patients	Traumatic optic neuropathy
Single wall	26	NIL
Two wall	14	1
More than two wall	10	4
Total	**50**	**5**

Among the total cases of the study group, 10 % had optic nerve injury.40 % (n=4 out of 10) of the cases with more than two wall fractures had no perception of light.

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DISCUSSION

The present study has prospectively yielded useful information regarding the clinic-radiologic features associated with injuries of the orbital skeleton and the contiguous structures. The present study also agreed with published literature[8,14,17]that, injuries of the orbital skeleton and its related structures is indeed a common finding ofthe young and middle aged male in the 20 to 40 -year group. The high incidence of orbital trauma among the young and middle aged, could possibly be due to the high risk of road traffic accidents. Complications such as retro-bulbar hemorrhage, white-eye trap-door phenomenon, orbital apex syndrome, haemorrhage, infections, nonunion, melanin, paeresthesia, malocclusion, diplopia, enophthalmos, epiphora and even blindness can all be avoided by timely intervention [17,19,20,] 21 , 22 , 25 , 26 , 30 , 31 .

In this study, most of the patients presented to the casualty and were seen by the oral maxillofacial surgeon first and then referred to the ophthalmology department for evaluation . Notably in one case ,the patient with corneal perforation was identified late and the repair of the cornea was further delayed leading to reduction in the visual outcome. This emphasizes the timely diagnosis and intervention required for ophthalmological injuries. In this study, the principal causes of orbital fractures were motor vehicle crashes and inter personal violence which is comparable with the other literature[1,9,10,11,12,13].The high incidence of motor vehicle crashes in our study could be attributed to the general proliferation of motorcycles, underuse of helmets, insufficient lighting, rash driving and bad road conditions. This can also be due to the fact that motorcycles are more affordable, fuel efficient, cheap to maintain and above all, motorcycles are preferable because of their ability to maneuver the traffic jam. In the present study, there was a statistically significant relationship between gender and interpersonal violence. 88% of the males were involved in road traffic accidents. In fact, all the cases of interpersonal violence in the present study were males. Among the female 67% met with motor vehicle accidents and 33 % had injury d ue to slip and fall . This distribution could perhaps be attributed to the fact that those in the 21 -30-year age group are more impatient and indulge in rash driving. All the patients involved in motorcycle crashes did not wear helmet and the accidents occurred in the dim illumination hours, either in late nights or in the early morning.

The low incidence of fractures among the 41 -50- year- old age group could be explained bythe fact that as people grow older, they are more careful and less likely to be engaged into risky work that could potentially result in injuries [24].The mode of injury in the elderly age group was domestic falls. The ocular and peri-ocular examination findings in our study were similar to results from other studies [4,8,23]. The prevalence of eyeball injuries in orbital fractures in the present study is 76% (n-38).Notably, the prevalence of subconjunctival hemorrhage, peri-orbital oedema and peri- orbital ecchymosis was significant.

Pattern of orbital fractures

In the present study, the lateral wall zygomatic maxillary complex was the commonest affected site with up to 75% of patients affected. Unlike the findings from other studies, in which they reported higher incidence of medial wall fractures [1,27].Cagatay et all in their study also found that the common walls affected were the floor and the lateral wall[8]. The increased incidence of lateral wall fractures in our study, is due to the high number of road traffic accidents.

The inter-racial morphometric variations of the orbital anatomy could possibly explain why our results may not be consistent with what other authors have reported [3,7]. In a retrospective review of CT scans and demographics in an unselected cohort of 152 patients with orbital fractures, it

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was shown that most fractures involve the orbital floor in Caucasians and Asians, whereas in Afro-Caribbeans the most common site for fracture was the medial wall [7]. From the results, there was a statistical significance in the distribution of isolated wall fractures as compared to fractures involving two walls or more. There have been reports of the left orbit being affected more than the right[3].Despite these findings, statistical tests yielded no significance. It could be due to the natural protective reflex of the hands when trauma occurs. The right side is, therefore, better protected than the left because the majority of people are right hand dominant.

Most authors argue that the nose is the most frequently injured part of the face because of its central prominent positioning and thin cartilaginous skeleton. It is, therefore, thought that the impact on the nasal bones is transmitted to the thin medial walls bilaterally [27,28, 29]. However, depending on the striking angle and the magnitude of the force, fractures of the zygoma, maxilla, and frontal bone, which are thicker and harder than nasal bone, tend to occur unilaterally [28,29].

In the study, there was a statistical significance stating the fact that isolated wall fractures have a good visual outcome. Notably, in 5 cases there was total blindness and in others there was partial/transient visual loss. When there is fracture involving of the floor and medial wall there is blindness due to optic nerve injury. Four out of 5 cases with no perception of light were due to multiple orbital wall fractures. There was no patient with bilateral loss of vision which is similar to the published literature [2,3,8,15,16,18]. As confirmed in this study, the blindness usually occurs in association with orbital fractures involving more than two walls of the orbit. [5,6,18]. This is probably due to the injury to optic nerve in the optic canal. In the management of orbital trauma, which the “ABC”sequence must guide the priorities of treatment. Many orbit and oculoplastic surgeons agree that clinical findings are the major indicator for open surgery followed by radiologic investigation [25,30,31]. In the present study, 58% of patients were managed conservatively by means of pain management, tetanus toxoid, antibiotics, wound care, cold compression and corticosteroid therapy. Extra ocular movement restriction was seen in 6 patients. In our study , intravenous methylprednisolone was administered in patients with diplopic and gross reduction in vision. Three out of six patients who had no muscle entrapment but only diplopic, when treated with intravenous steroids showed considerable improvement. The color vision was normal in all the patients except for those with optic nerve injury. 36% (n- 18) underwent open reduction with internal fixation and 6 % (n- 3) were referred for neurosurgical intervention. Because 33.33%ofthe patients in this study had zygomatic fractures, surgery was, therefore, mainly done to correct truisms, malocclusion, malar collapse, infra-orbital paraesthesia,diplopia, extra-ocular muscle or peri-orbital fat entrapment and restoration of orbital volume. The number of patients lost for follow up were about 22%.

CONCLUSION

Depending on the severity of the injury, orbital fractures can be managed either conservatively or surgically. Since the common causes of orbital fractures were road traffic accidents and interpersonal violence, preventive measures to minimize the occurrence of these should be taken. The driving licenses should be issued only after testing their driving skills and should be educated about safe driving practices. They should be instructed to avoid rash driving. The public should also be educated on observation of road traffic regulations and finally law enforcement against interpersonal violence should be more stringent. All cases of orbital injuries should be seen by the ophthalmologist as early as possible for timely intervention of ocular injuries.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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