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Epidemiological Profile of Ocular Trauma in a Mid-Zonal Hospital of Armed Forces in North-East Region of India.

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Abstract
Introduction:
ocular trauma is an important cause of preventable ocular morbidity and blindness in addition to socioeconomic and psychological ramifications.The spectrum of ocular trauma ranges from minor injuries to very severe sight threatening injuries. Trauma is inevitable in war zone and routine army exercises.There are very few studies establishing relationship between occupation and ocular trauma in armed forces. This study was conducted to provide us with epidemiological data on ocular trauma cases in a mid-zonal hospital of armed forces in north-east region of India.
Aim: *to analyze the epidemiological profile of patients with ocular trauma among the soldiers of armed forces deployed in north eastern zone.*
Materials and Methods*: a prospective study was carried on 210 eyes of 200 patients of ocular trauma, presenting to emergency department and outpatient department in a mid-zonal hospital located at Dimapur, Nagaland, during twenty four months period. All demographic data, mode of injury along with complete ophthalmic workup was recorded. Classification system of Birmingham eye trauma terminology system was followed and ocular trauma score was calculated.*
Results*: The best corrected visual acuity at the time of presentation was 6/60 or better among 65%, worse than 6/60 were 25% and 10% were could not perceive light. In gender distribution male outnumbers females 69% and 31% respectively. Most of the cases were belonging to age groups of 30 years and younger 58%. In this study we found out that soldiers working in operations, training, sports and handling machineries (Outdoor) were more prone to trauma > 50% and soldiers of technical trade (Indoor) were least prone 5%. Among the children, school going population was more prone 16% and pre school was less prone being 8%.Adenexal injuries 35% were followed by contusions 25% and perforation being least 2%. Zone I 65% injuries out numbers the zone II and Zone III.*
Conclusion*: our study shows that whenever zone III is involved, the prognosis always remains guarded.Trauma is inevitable in war scenario, and for those sustaining trauma, multisurgeon intervention is needed. Wearing protective polycarbonate eye wear will minimize work related and sports related injuries.*
Key words: *closed globe injury, globe rupture, ocular trauma, open globe injury*

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I. Introduction:

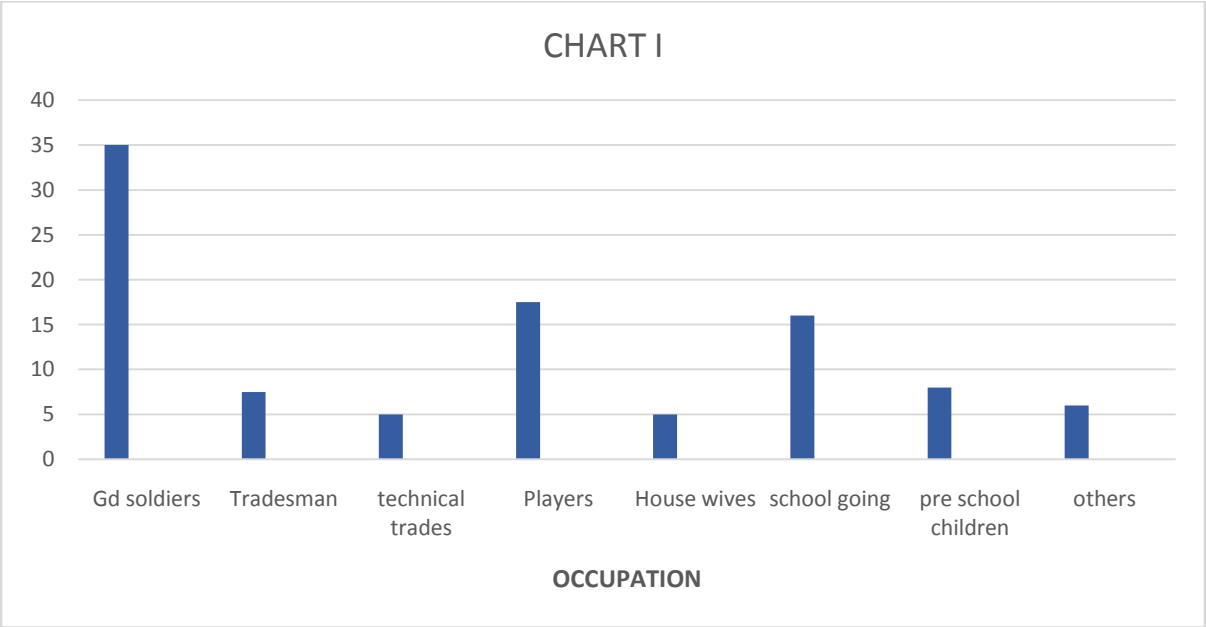
Trauma to the eye is an important cause of preventable ocular morbidity, more commonly in the younger population [(1-4)]. The spectrum of ocular trauma ranges from minor injuries to very severe sight threatening injuries. However, most of the ocular trauma is of minor nature, which can be treated in the OPD or minor OT itself. Only 1.5 – 2 % of ocular trauma warrants hospitalization[(1, 5)]. Trauma is inevitable in war zone and routine army exercises.A few previous studies have established a relationship between occupation and ocular trauma [(6-9)], but there are very few studies establishing relationship between occupation and ocular trauma in armed forces [(10,11)]. This study was conducted to provide us with epidemiological data on ocular trauma cases in a mid-zonal hospital of armed forces in north-east region of India.

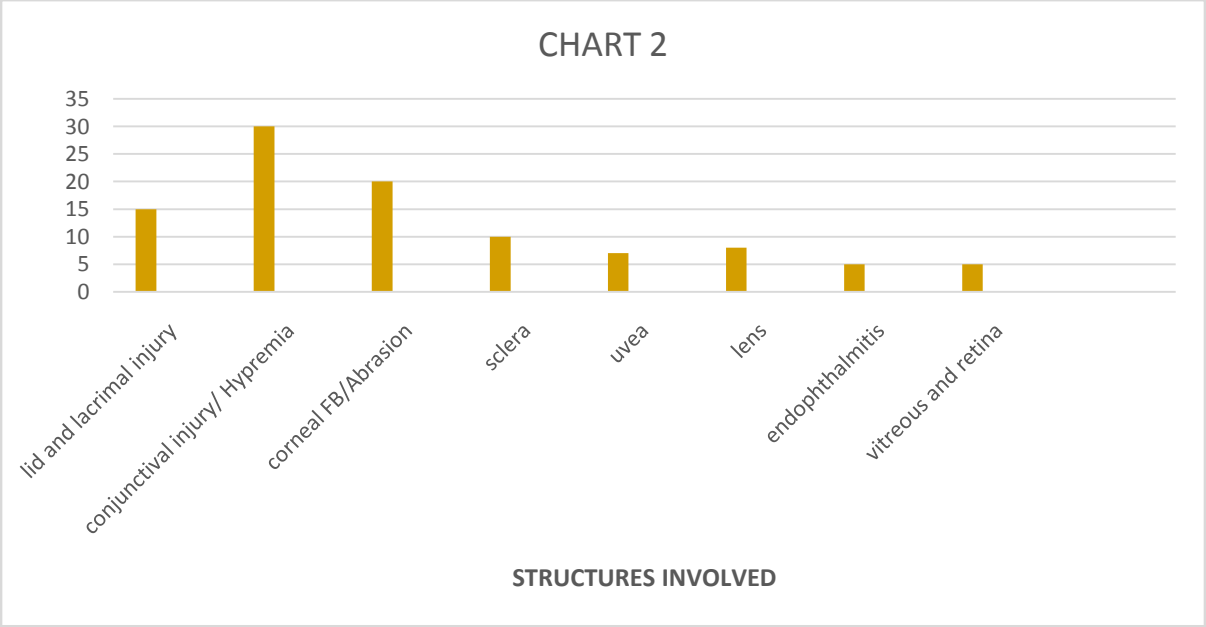
S.No		Initial BCVA (%)	Final BCVA (%)
1	Grade I (> 6/12)	40	56
2	Grade II (6/12-6/60)	25	25
3	Grade III (6/60-1/60)	20	10
4	Grade IV (HMCF)	10	5
5	Grade V (NLP)	5	4

Table 1

Sex distribution	
Males	69%
females	31%
AGE DISRIBUTION	
< 30 Yrs	58%
30- 50 Yrs	36%
>50 Yrs	06%

Table 2





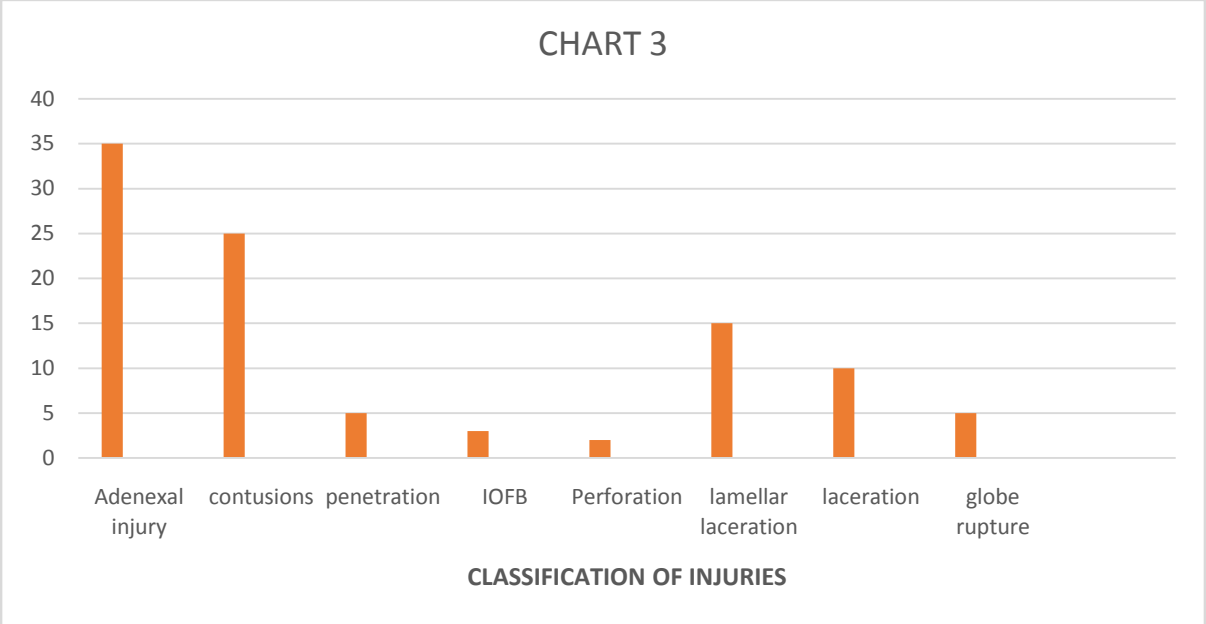


CHART 3
40
35
30
25
20
15
10
5
0
Adenexal injury
contusions
penetration
IOFB
Perforation
lamellar laceration
laceration
globe rupture
CLASSIFICATION OF INJURIES

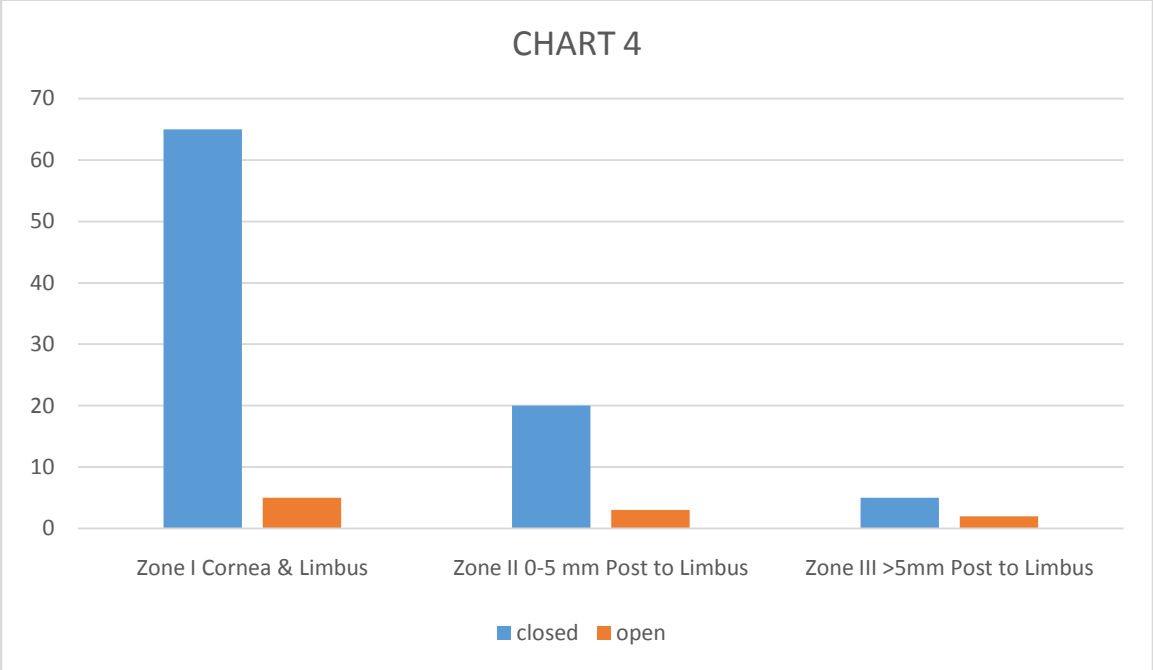
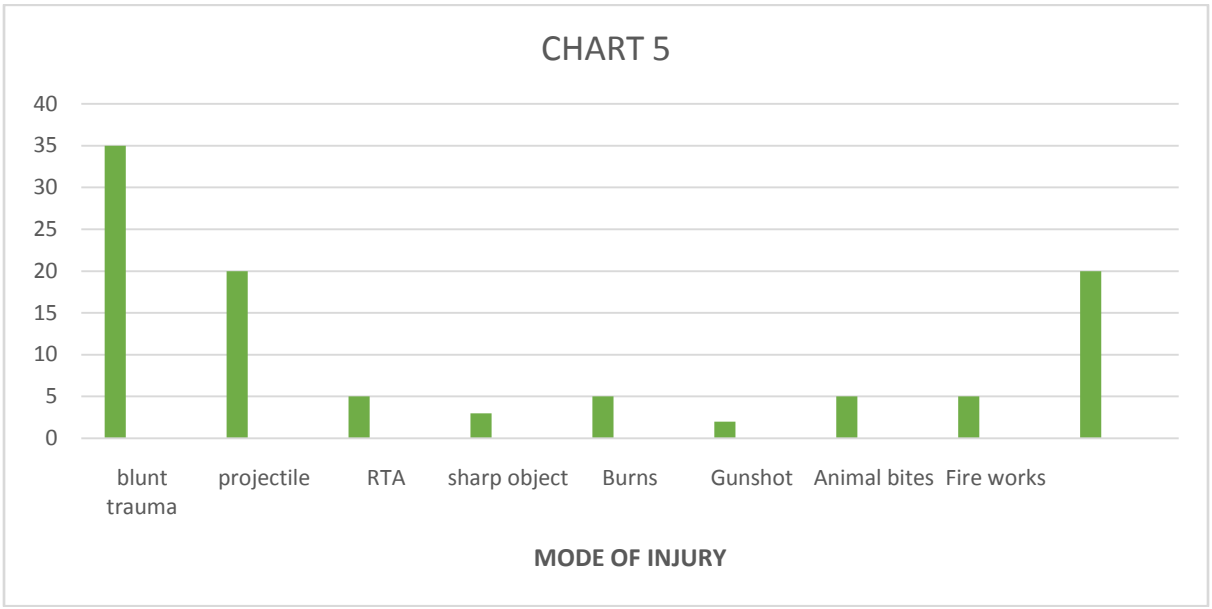
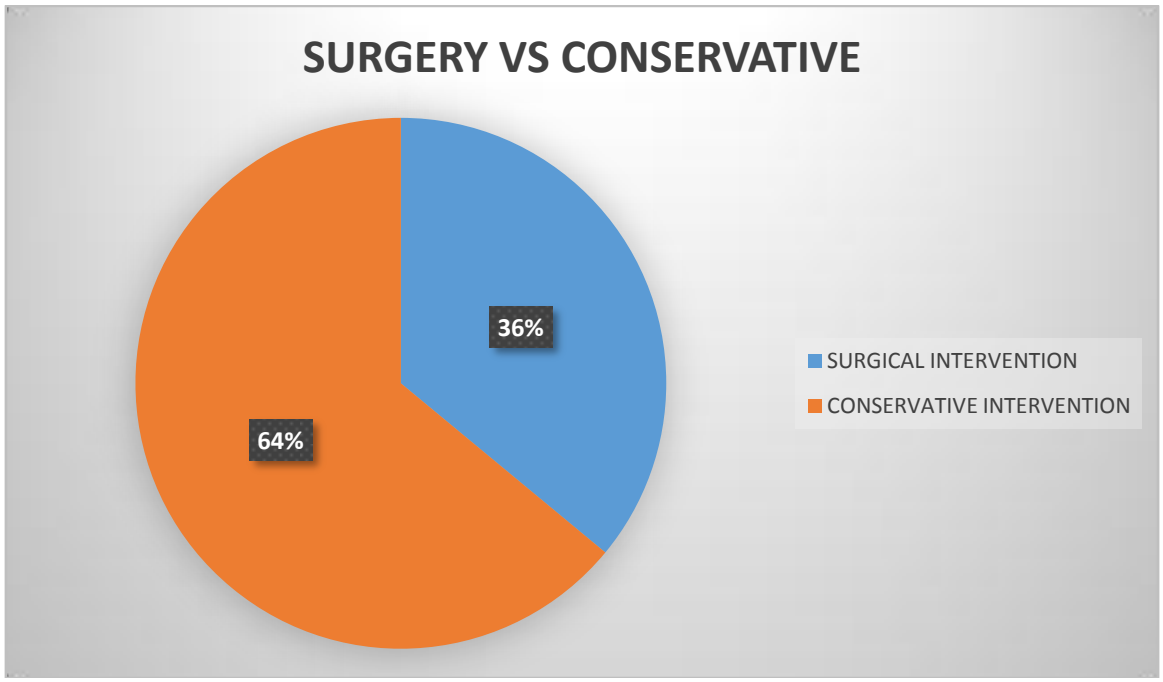


CHART 4
70
60
50
40
30
20
10
0
Zone I Cornea & Limbus
Zone II 0-5 mm Post to Limbus
Zone III >5mm Post to Limbus
closed
open





II. Material and methods:

This study included 210 eyes of 200 patients of ocular trauma, presenting to emergency department and out patient department of in a mid zonal hospital at Dimapur, Nagaland between July 2017 to July 2019. It was a prospective study. The clientele were mainly serving personnel, their families and few ex service men. The patient demographic data were noted. Complete history of mode and place of injury with nature of injury was noted. Complete details of ophthalmic examination including initial best corrected visual acuity (BCVA) at presentation, details of lid or facial injury, any pupillary defect, presence or absence of foreign body, involvement of cornea, corneosclera, sclera & uvea were noted. The presence and absence of associated vitreous hemorrhage, retinal tears, retinal detachment & choroidal rupture, if any was documented.Relevant investigations like IOP, USG B scan, CT Scan, MRI and VEP was done, whenever indicated.

The ocular injuries were classified using standardized international classification of ocular trauma, Birmingham eye trauma terminology system &Ocular trauma score (OTS) was used to assess the severity of injury.The patients were divided into those managed conservatively and surgically.

III. Results:

The best corrected visual acuity at the time of presentation was 6/60 or better among 65%, worse than 6/60 were 25% and 10% were could not perceive light (Table no 1). In gender distribution males outnumbers females 69% and 31% respectively (Table no 2). Most of the cases were belonging to age groups of 30 years and younger 58%(Table no 2). In this study we found out that soldiers working in operations, training, sports and handling machineries (Outdoor) were more prone to trauma > 50% and soldiers of technical trade (Indoor) were least prone 5%(Chart no 1). Among the children, school going population was more prone 16% and pre school was less prone being 8% (Chart no 1). Conjunctiva and cornea were most frequently involved structures 50% and retina and vitreous being least 5%(Chart no 2). Adenexal injuries 35% were followed by contusions 25% and perforation being least 2%(Chart no 3). Zone I 65% injuries out numbers the zone II and Zone III (Chart no 4). Most common mode of injury was blunt trauma followed by projectile injury and IED blast (Chart no 5).Approx 1/3 of patients (36%) required surgical intervention.

Visual acuity with No PL was seen among ten cases (10) cases at the time of presentation, seven (7) of which consists of open globe trauma with a high moving stone in various different scenario and a case of splinter injury following IED blast which had already developed endophthalmitis at time of presentation. In our study we found that the trend of ocular trauma was predominantly unilateral. However, 10 cases had bilateral ocular trauma.

IV. Discussion:

Ocular trauma is an important preventable cause of ocular morbidity and blindness. In our study, the prevalence of ocular trauma is appx 11.5 %, which is higher than to previous studies [12,13]. The mean age at presentation was 29 years suggesting that the ocular trauma is strongly associated with the risk taking behavior in susptible groups i.e young adults[1].

The overall pattern of serious injuries observed in our study regarding age group, cause and mode of injury is similar to the studies done in past reported by Tielsh*et al.*[12] and Cao *et al*[13]. However, there is slight difference in our study being high rates of blast injuries (splinter injuries) as our patients are of armed forces, with high risk taking behavior. More precisely, the job profile and working environment of the soldiers involve handling of explosives during training as well as during operations. In extra curriculum activities eg. sports and recreational activities like up keeping of their area of living, the incidence of ocular trauma goes higher.

In our study blunt trauma and projectile trauma was found to be one of the major mode of injury, which is supported by Nirmalan*et al.*[14]. in our study 38% required active multi surgical intervention at higher center in addition to medical treatment. In our study, it was found that only 30% patients were wearing protective glasses when trauma occurred. Incidence of ocular trauma among the pediatric age was 16 % in schoolgoing and 08% in preschool population. It is emphasized that the patients who sustained occupational trauma, none was wearing protective glasses or gear at the time of injury. A similar finding was observed by Vats et al[15].

The target groups for prevention of ocular trauma among soldiers of armed forces are young adults (< 30 Yrs), and those involved in the operations, sports, training and those handling any kind of machinery. The studies involving long term effect of out come of trauma in armed forces are still missing. Such studies can further define target groups more precisely and steps for prevention. This study helps in defining the risk factors, prognosticating ocular injuries at the time of presentation and their prevention among the armed forces group of population.

V. Conclusion:

our study shows that whenever zone III is involved, the prognosis always remains guarded. As it has been emphasized always preventing ocular trauma is more critical than attempting to restore vision after suffering an injury. Trauma is inevitable in war scenario, and for those sustaining trauma, multisurgeon intervention is needed. Wearing protective polycarbonate eye wear will minimize work related and sports related injuries[16,17]. Limitation of this study was loss of follow up of few patients to assess final visual outcome.

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FIG 1 (a) PENETRATING TRAUMA

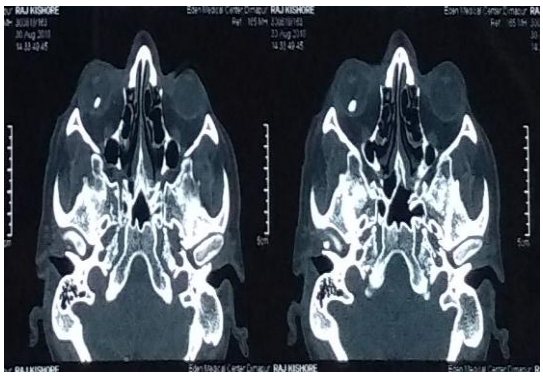

FIG 1 (b) IOFB SAME PATIENT

FIG 2 (a) PENETRATING TRAUMA WITH PROLAPSE OF UVEAL TISSUE

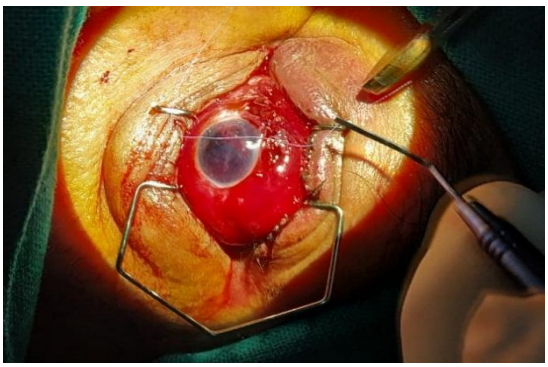

FIG 2 (b) AFTER REPAIR

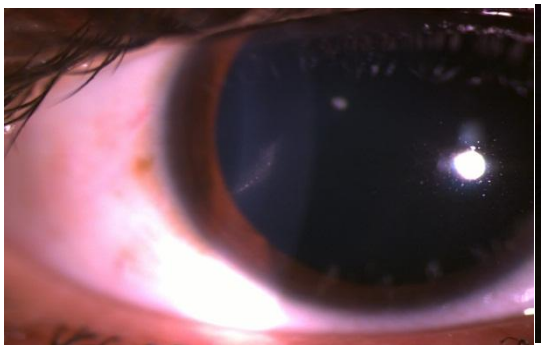

FIG 3 PARTIAL THICKNESS LACERATION CORNEA

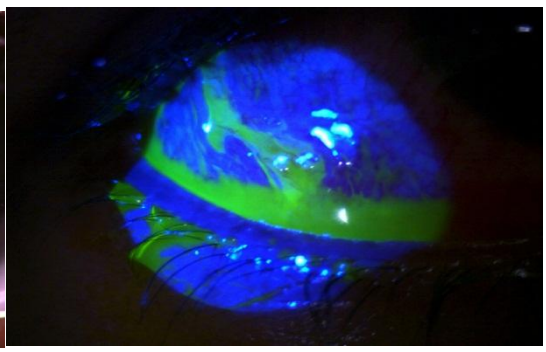

FIG 4 CONJUCTIVAL LACERATIONOF

FIG 5 (a) CLOSED GLOBE INJURY PATIENT RD

FIG 5 (b) RETINAL TEAR IN SAME

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