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Ocular injuries - A Review Article

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ABSTRACT

Eye being a delicate structure, sometimes even a small trauma may have devastating effects. Due to industrialization, unprotective measures in daily activity the incidence of injuries is increasing, like any other part of the body, eyes are also not exempted from these injuries. A successful patient outcome in the setting of ocular emergencies depends on correct diagnosis, treatment, and disposition of patients with all types of ocular trauma, including pain management and referral. Injuries range from mild, non-sight-threatening to extremely serious with potentially blinding consequences. WHO programmed for the Prevention of Blindness have estimated that some 55 million eye injuries restricting activities more than one day occur each year, World wide, there are approximately 1.6 million people blind from eye injuries, 2.3 million with bilateral visual impairment and 19 million with unilateral vision loss. A significant burden of ocular trauma in the community requires that its prevention and early management be a public health priority. In Ayurvedic classics, *Nayanabhighata Pratishedha Adhyaya* completely deals with ocular injuries which imply the importance of the immediate measures and management to be undertaken for the injured eye.

Key words: Ocular Trauma, Blindness, Ayurveda, *Nayanabhighata Pratishedha*.

INTRODUCTION

Among all the Indriyas eye is considered as *Shreshta*^[1]

Eye has an utmost importance among all the sense organs as it helps the individual to perceive the nature through vision. Vision is a primary factor which helps us to connect with the surrounding and keeps us safe. As it is highly sensitive and delicate organ it is well protected by hard bony cavity, Eye brows, Eye lids, Eye lashes and Soft tissue posterior to eye ball. In spite of all these protective structures eye gets injured.

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Classification

It can be divided as

1. Mechanical injuries
2. Non-mechanical injuries
3. Chemical injuries

Mechanical injuries

- a. Closed globe injury - Contusion, Lamellar laceration and Extra ocular foreign body.
- b. Open globe injury - Rupture, Lacerations, Intra ocular foreign body.
- c. Ocular foreign bodies

Non-mechanical injuries

- a. Electrical injury
- b. Radiation injury
 - Thermal lesions
 - Abiotic lesions
 - Ionizing lesions

Chemical injuries

1. Alkali injury
2. Acid injury

Closed globe injury

Eye injury without full thickness defect of the coats.^[2]
But there is an intra ocular damage.

It is of two types^[3]

1. **Contusion** - It usually results from blunt trauma such as fist fight, sports ball injuries etc. Common site of impact is the infra temporal area of the eyeball.
2. **Lamellar laceration** - Results from sharp objects like bow and arrow, nail trauma, flying pieces of metal, wood, glass, stone etc.

Damage is present at the site of impact or at a distant site varying in severity from simple corneal abrasion to intraocular damage.

Changes in Cornea - Simple abrasion, Recurrent corneal erosion, Tear in Descemet's membrane, Corneal oedema, Blood staining of the cornea.^[4]

Treatment^[5]

1. Debridement of loose epithelium followed by patching for 48hrs.
2. Lubricant eye drops
3. Atropine eye drops
4. Topical Antibiotics
5. Rest to the eyes

Changes in sclera and Anterior chamber - In case of scleral wound force usually comes from infra temporal region and wound occurs at the weakest part of the sclera. Traumatic hyphaema, Exudates.^[6]

Treatment^[7]

- Suturing to reappose the tissues.
- Local and systemic antibiotics, steroids.
- large non-resolving hyphemas causing raise in IOP should be drained.

- In severe cases Enucleation.

Changes in Iris, Pupil and ciliary body - Partial and complete tear of iris, Traumatic aniridia, Traumatic mydriasis, Traumatic miosis, Angle recession, inflammatory changes.^[8]

Treatment^[9]

- Complete rest to the eye
- Antibiotics and Anti-inflammatory drugs

Changes in Choroid and lens - Rupture of choroid, Choroidal detachment, Traumatic choroditis, Choroidal haemorrhage, Vossius ring, Lenticular opacity, Subluxation of lens, Total dislocation.^[10]

Treatment - Bed rest, Rest to the eyes, Dark glasses, in case of opacity - Cataract surgery on its maturation.^[11]

Changes in Vitreous - Liquefaction of vitreous, Vitreous herniation, Vitreous detachment, Vitreous haemorrhage.^[12]

Treatment

- Fomentation
- Sub conjunctival injection of saline
- Oral administration of iodides and mercury
- Extensive Vitrectomy.

Changes in retina - Commotio retinae, oedematous or Degenerative changes, Haemorrhages, Retinal tears.^[13]

Treatment

- Sometimes haemorrhages get absorbed within few weeks.
- Sometimes heal by fibrosis and leave an area of atrophy which is clinically presented as scotoma, central scotoma indicates macular atrophy with gross diminution of vision.
- Myopes and old people are prone to retinal tear and detachments.

Intra ocular pressure changes (IOP) - Traumatic glaucoma, Traumatic hypotony.^[14]

- Conservative treatment - Mitotics in combination with acetazolamides and intravenous mannitol to settle the tension.

Traumatic changes in refraction - Astigmatism, Myopia and Hypermetropia.^[15]

Open globe injury - Eye wall has full thickness wound.^[16]

It is of two types

- Rupture** - Usually caused by blunt trauma. Impact results in momentary increase in IOP and an inside out injury at the weakest part of the eye ball that is in the vicinity of the canal of schlem. Direct rupture is very rare, indirect rupture occurs due to compression force.^[17]
- Laceration** - Caused by sharp instruments like needles, knives, nails, arrows, screw drivers, pens, pencils, compasses, glass pieces, bullet and iron foreign body in lathe workers, road traffic accidents etc. Wound occurs at site of impact by outside in mechanism.^[18]

It is of two types

- Penetrating** - Single laceration which traverse only once.
- Perforating** - One entry one exit point.

Ocular damage depends on - speed and extent of penetration, hence the injuries are potentially serious and should be treated at the earliest.

Changes seen indifferent ocular structures

Conjunctival wounds and corneal wounds

Treatment^[19]

- Wiping the Fornices with well lubricated glass rod to avoid adhesion.
- Wound more than 3mm should be sutured using silk sutures.
- Sub conjunctival haemorrhages absorb within 1-3 weeks without treatment.
- Institution of intensive treatment with antibiotics and eye bandage.

Scleral wounds - Superficial wound and deep wounds.

Treatment - Suturing

Lens - Commonest Intraocular tissue to get injured in perforating injuries. Damaged lens shows various degree of opacification (rosette cataract).^[20]

Treatment^[21]

Cataract surgery with intraocular lens implantation.

In severe injuries uveal tissue, vitreous and retina may show ruptures, wide detachments and even extrusions.

The whole globe may be disorganized where the treatment adopted is Enucleation.

Extra ocular foreign bodies^[22]

These are quite common in industrial and agricultural workers. Foreign bodies are Particles of iron, emery, coal, husk of paddy, wings of insect, particles of sand, dust, wood, mosquitoes and even eyelashes.

Common sites

- Conjunctiva** - Sulcus subtarsalis, Bulbar conjunctiva and Superior fornix
- Cornea** - Epithelium and Stroma

Examination Techniques - Slit lamp bio microscopy, Oblique illumination and Double eversion of lids

Symptoms - Watering of eyes, pain, on rubbing corneal abrasion, Sharp pain, Photophobia, Defective vision, Reflex blepharospasm, ciliary and conjunctival congestion.^[23]

Treatment^[24]

Under local anesthesia

- Superficial foreign body removal with spud or cotton wick
- Deep foreign body removal with needle
- Magnetic foreign body removal by hard magnet.

Intra ocular foreign bodies (IOFB)^{[25],[26]}

These usually occur followed by penetrating and perforating injuries. Common foreign bodies are chips

of iron, steel, particles of glass, stone, lead pellets, aluminium, plastic, wood and copper percussion caps.

Location of IOFB - Anterior chamber, Iris, Posterior chamber, Lens, Vitreous cavity, Retina, choroid and Orbital cavity.

Reactions of the Foreign body

1. Inorganic

2. Organic

Inorganic

- a. No reaction - Inert substances like glass, plastic, porcelain, gold, silver and platinum.
- b. Local irritative - Lead and aluminium particles.
- c. Suppurative - Pure copper, zinc, nickel and mercury.
- d. Specific reactions - Iron and copper alloys.

Organic

These include Wood and vegetative materials which undergo putrefication changes

They cause Proliferative reaction and ophthalmianodosum

Treatment

- Foreign body in anterior chamber - Removal through corneal incision
- Foreign body in iris - Sector Iridectomy
- Foreign body in lens - Through extra capsular extraction
- Foreign body in vitreous and retina - Through posterior route
- Magnetic removal
- Forceps removal with pars plana Vitrectomy

Sympathetic Ophthalmitis

It's a bilateral granulomatous pan uveitis that occurs after the uvea of one eye is subjected to a penetrating injury due to either accidental trauma or surgery.^[27]

- Injured eye is called excited eye

- Non injured eye developing uveitis is called sympathizing eye

Incidence of sympathetic ophthalmitis is reduced due to meticulous repair of the injured eye utilizing microsurgical techniques and potent steroids. It is the most dreaded complication of perforating injury.

Clinical features

Photophobia, Keratic precipitates on the back of the cornea, Pain, Corneal oedema and opacity, Vitritis, Dalen fuchs nodules and Papillitis Redness, Lacrimation.^[28]

Treatment^[29]

- Early excision of injured eye
- When there is hope of saving useful vision then
 - Meticulous surgical repair
 - Topical, systemic antibiotics, steroids and topical atropine
 - If uveitis is not controlled enucleation.

Chemical injury^{[30],[31]}

They are commonly seen and generally cause burns which vary in severity from transient Irritation to sudden loss of vision.

Mode of injury

1. Agricultural accidents - Fertilizers, Insecticides.
2. Domestic accidents - ammonia, solvents, detergents.
3. Deliberate chemical attack - With acids to disfigure the face.
4. Chemical lab injury - acids and alkalis
5. Chemical warfare injury - Mustard gas

Extent of damage depends on

1. Concentration of the chemicals
2. Duration of contact of the chemicals with the ocular tissues.

Alkali - Lime, caustic potash, caustic soda and liquid ammonia.

Mechanism of damage

1. Dissociate and saponify fatty acids of the cell membrane, destroy the structure of the cell membrane causing cell death.
2. Being hygroscopic absorbs moisture from the cell causing necrosis
3. They combine with lipids of the cells causing softening and gelatinization

Clinical features

Intense lacrimation, Photophobia, Pain, Conjunctivitis, Chemosis.

Acids - Sulphuric acid, hydrochloric acid and nitric acid.

Mechanism of damage

Instant coagulation of proteins which acts as barrier. This prevents deeper penetration.

Management

- Immediate and thorough ocular irrigation for about 20-30 min or until normal pH is restored.
- Mechanical removal of contaminant.
- Removal of contaminated and necrosed tissue.

For rapid and uncomplicated healing^[32]

- Topical antibiotics
- Cautious use of topical steroids
- Cycloplegics
- Ascorbic acid in the form of eye drops
- Lubricant eye drops
- Autologous serum
- Covering the denuded area with mucus membrane Graft prevents Symblepharon

Non-Mechanical injury^{[33],[34]}

1. **Electrical** - results from the passage of electric current through the body by lightening or by contact with live wire while the body is earthed.
- Conjunctiva - Hyperemia, chemosis, and sub conjunctival hemorrhage

- Cornea - Transient striate or diffuse opacities
- Iris and Ciliary body - Irritative and transient inflammatory reactions
- Pupil - Extreme unilateral or bilateral miosis with spasm of accommodation
- Lens - Sub capsular opacities
- Choroid - Choroidoretinitis
- Retina - Retinal Oedema, papilledema and hemorrhages
- Optic nerve - Transient optic neuritis

2. Radiational - Caused by

- Infrared rays - Solar macular burns
- Ultraviolet rays - Photo-ophthalmia, Senile cataract.
- X-rays, diathermy - Causes ocular lesions like Radiation kerato conjunctivitis, Radiation dermatitis of lid, Radiation cataract, Radiation retinopathy.

Treatment

- Prophylaxis.
- Bandaging, cold compress.
- Antibiotics and atropine.
- Tarsoraphy.

NAYANABHGHATA

Abhghata means to hurt, injure, kill and destroy, it also has synonym trauma which means injury, wound and emotional shock.

Classification**Sanghata Balapravritta Vyadhi**

1. *Shastra Krita (Praharashakti Jaata)*
2. *Vyalakrita*

Based on Nidana

1. *Murtha*
2. *Amurtha*

Nidana ^[35]

- Application of *Tikshana Anjana* to exhausted eyes
- Exposure to *Vata, Atapa, Dhuma, Raja*
- Insect bite and contact with toxic materials
- Injury to the eyes while playing in water
- Awakening at night and fasting
- Gazing sun, fire, moon, planets, stars and other luminous objects.
- Seeing continuously moving objects.

Nidana according to different Acharyas

Visualization of *Sura, Rishi, Gandharva, Mahauraga* and *Surya* causes loss of vision.^[36]

Samprapti

Abhighata leads to vitiation of *Pitta* and *Rakta* followed by vitiation of *Vata* and *Kapha* which leads to formation of *Sopha* followed by formation of *Puya* which causes *Bhedha* of *Twacha* causing *Vruna*.

Lakshanas

Injured eye shows redness, burning, oedema, suppurative reaction and grittiness.^[37]

Sashalya Netra Lakshanas

Excessive lacrimation, redness, difficulty in opening and closing of eye lids are the features of *Sashalya Netra*. *Yogaratanakara* also opines the same.^[38]

Sadhya Asadhyata

- Injury to first *Patala* - *Sadhya*
- Injury to two *Patalas* - *Krichra Sadhya*
- Injury to all the three *Patalas* - *Asadhya*
- When eye ball is crushed, pushed deep into the socket or becomes lax or dislocated - *Asadhya*
- Where pupil is dilated, minor degree of redness, slight blurring of vision - *Yapya*
- Eyeball is situated in its proper place and does not look dirty, with normal vision - *Sadhya*.^[39]

Chikitsa

1. In case of minor trauma to the eye, the pain rapidly disappears by fomentation from the vapours of the mouth.^[40]
2. *Nasya, Asyalepa (Bidalaka), Seka, Tarpana, Kshataja* and *Pittaja Shoolahara Chikitsa* with *Snigdha, Sheeta* and *Madhura Rasa Dravya* should be done.^[41] All measures to restore vision to be adopted at the earliest.
3. *Chakradatta* explains after assessing the injury mild fomentation with cloth should be given. Later *Aschyotana* with *Stanya* and *Pittajakshtaja Chikitsa*.
4. *Nishadi Akshi Purana* - Powders of *Haridra + Musta + Triphala + Darvi + Sharkara + Yashtimadhu* processed with *Stanya* relieves pain caused due to injury.^[42]
5. Freshly extracted *Swarasa* of tender leaves of *Rohisha* grass is used for *Aschyotana*.
6. *Bhaishajya Ratnavali* also has reference of *Nishadi Akshipurana* in case of *Abhighata*.
7. Cold applications like *Tarpana* with *Snigdha* and *Sheeta Dravya*, oral intake of *Triphala* is recommended.^[43]
8. *Chakradatta* and *Bhaishajya Ratnavali* states same regarding *Abhighata Chikitsa*.
9. *Chakradatta* explains *Netrabhighatahara Ghrita* - *Aja Ghrita + Aja Ksheera + Madhuka + Utpala + Jeevaka + Rushabaka* are processed together and *Ghrita* is prepared. Effective in all types of *Abhighata*.^[44]
10. *Bhaishajya Ratnavali* mentions *Madhukadya Ghrita* instead of *Netrabhighatahara Ghrita* in context of *Nayanabhighata Chikitsa*.
11. In cases where the eyeball is pushed deep into socket, it should be made to bulge out by holding the breath, inducing vomiting, sneezing and pressure over the throat.
12. In cases, where the eye ball is protruding from the socket, deep inspiration and irrigation of the head with water.^[45]

13. *Yogaratanakara* mentions *Aschyotana* with *Sheeta Dravyas*, *Punarnava Moola Kalka Pindi*, *Lepa* with *Rakta Chandana*, *Seka* with *Stree Dugdha* and *Raktamokshana*.^[46]
14. Equal quantity of *Lodhra* + *Yashtimadhu* should be fried in ghee, powdered and processed with goats milk. Used as *Seka*.
15. *Chakradatta* mentions *Aschyotana* using *Sheeta Dravyas* in eye injuries.

DISCUSSION

- Irrespective of the type, it is very essential to assess the severity of ocular injury.
- One should implement required management as early as possible.
- *Acharya Sushruta* has dedicated a chapter for ocular injuries from which it is evident that ocular injuries were quite common during those days and is common even today.
- *Nidana*, *Lakshana*, and *Chikitsa* of *Abhigataja Vrana* mentioned for various structures of the body can be made applicable judiciously for *Netra* and its *Avayava*.
- *Chatradharana* and *Padatradharana* are the preventive measures mentioned in our classics as a part of *Dinacharya*.
- Transplantation of the eye is explained in classics long back.
- Presently Enucleation is performed in case of irreversible vision loss and in severe ocular damage.
- If an individual is endowed with all other sensory faculties, strength, beautiful appearance etc. but without eye sight he will be as useless as an insect says *Acharya Charaka*.

CONCLUSION

1. All ocular injuries should be treated as emergencies, as it disturbs the normal visual function and in severe cases complications may develop leading to excision of the eye ball.

2. A good visual prognosis can be achieved by following Ayurvedic treatment modalities performed under absolute aseptic precautions.
3. Training about hazards associated with specific activities, facilitating the availability of eye wears may prevent or decrease mortality and morbidity of ocular injuries.
4. Training should be given for baby care givers to prevent the eye trauma in children.

REFERENCES

1. Vaidya Jadavaji Trikamji Acharya, *Sushruta Samhita*, Uttara tantra, 1st Chapter, Chaukamba Orientalia, Varanasi.
2. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 426.
3. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 426.
4. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 428.
5. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 428.
6. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 428.
7. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 429.
8. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 430.
9. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 430.
10. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 430.
11. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 430.
12. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 430.
13. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no – 382.
14. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 431.
15. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 431.
16. A K Khurana, *Comprehensive Ophthalmology*, Jaypee Brothers Medical Publishers, 6th edition, pg no – 426.

17. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 426.
18. 18.A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 426.
19. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 432.
20. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no –383.
21. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 433.
22. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 427.
23. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 427.
24. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 427.
25. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no –383.
26. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 433.
27. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no – 387.
28. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 437.
29. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 438.
30. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 440.
31. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no -382
32. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 440.
33. Ramajit Sihota and Radhika Tandon Parson's diseases of the Eye by, 21st edition, Published by Elsevier 2011, pg no – 374.
34. A K Khurana, Comprehensive Ophthalmology, Jaypee Brothers Medical Publishers, 6th edition, pg no – 440.
35. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi.pg-641.
36. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi.pg-641.
37. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi.pg-641.
38. Hariharaprasad Tripathi, Nertarogadhikara, Vangasena, Chapter 36th, Chaukamba samskrita samsthana, Varanasi, Pg no- 503.
39. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi. pg-641.
40. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi. pg-641.
41. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi. pg-641.
42. Chakrapanidatta, translated by Dr, G Prabhakar Rao, Chakradatta, Netra roga chikitsa, Chaukamba orientalia, Varanasi, pg- 567.
43. Vaidya Shodhala, Gadanigraha, Netrarogadhikara, Chaukamba Samskrita Samsthana, Varanasi, Pg no- 113.
44. Chakrapanidatta, translated by Dr, G Prabhakar Rao, Chakradatta, Netra roga chikitsa, Chaukamba orientalia, Varanasi, pg- 567.
45. Vaidya Jadavaji Trikamji Acharya, Sushruta Samhita, Uttara tantra, 19th Chapter, Chaukamba Orientalia, Varanasi.pg-641.
46. Vaidya Lakshmipathi Shastri, Yogaratnakara, Netra roghadhikara, Chaukamba Orientalia, Varanasi, pg-393.

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