Ocular trauma I

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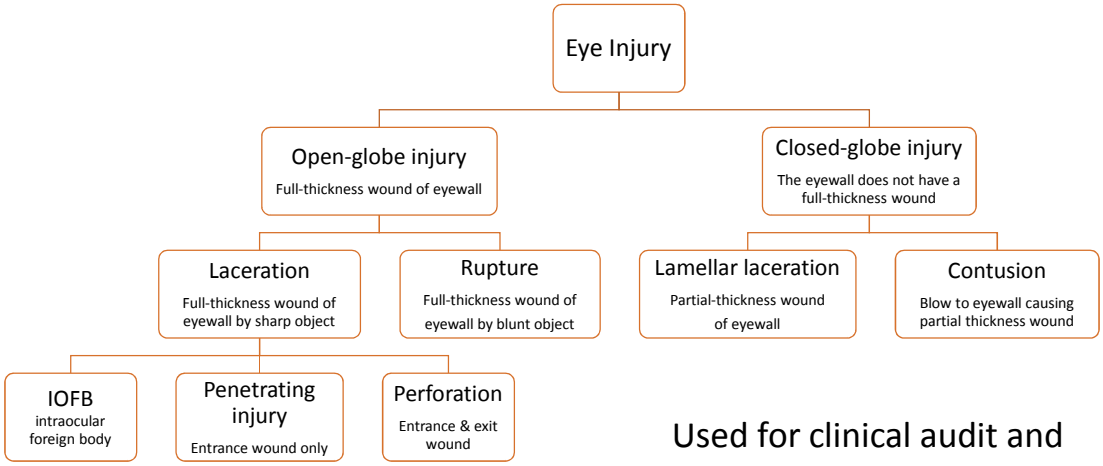
Introduction

- Eye injuries affect people, not just eyes
- Patient has been through a terrifying experience
- Anxiety about visual loss

Birmingham Eye Trauma Terminology System (BETTS)

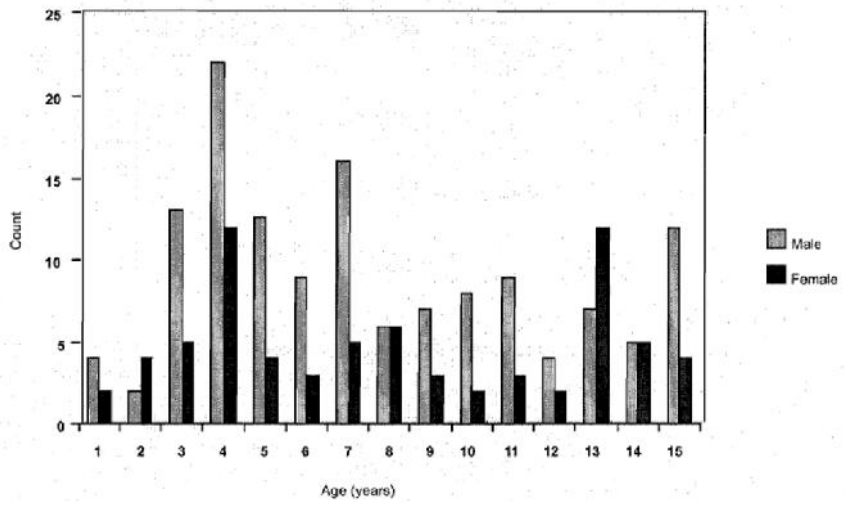


Used for clinical audit and trauma registries

Epidemiology

- Poor data
- WHO 1998: Worldwide
- eye injuries were responsible for
  - 1.6 Million blind in both eyes
  - 2.3 Million low vision in both eyes
  - 19 Million blind in one eye
  - 55 Million – restricted activity >1 day/year

Age of children with ocular trauma in KNH - 2008



Ocular trauma in 182 children admitted to KNH eye ward

- M:F = 2:1
- Peak age 4 years
- Open globe injuries =70%
- 1 day from injury to 1st health facility
- 3 days from injury to KNH
- Hospitalization = median 7 days
- 24% of hospital bills were waived

Causes of eye injuries

Object	Frequency	(%)
Stick	64	35.2
Stone	19	10.4
Knife	14	7.7
Wire	10	5.5
Nail	9	4.9
Pen	9	4.9
Glass	7	3.8
Fist/slap/whip	3	1.6
Metal	3	1.6
Others (hot oil, tyre bursts, falls, umbrellas, belt, door, road traffic accidents, arrows, the thorn-like tip of a sisal plant etc.)	40	22.0
Total	182	100

Ocular trauma in 524 adults admitted to MTRH 2011

- M:F = 3:1
- Median (IQR) age = 24 years (21-30)
- Setting - home (30.7%)
  - farm/workplace (24.6%)
- Open globe injuries =70%
- Causative agent - sticks (30.6%)
  - stones (12.2%)
- 3 days from injury to admission

Talking to patients with eye injuries - 1

- Patients with an eye injury are usually in pain and very frightened
- They need a gentle, reassuring approach
- Manage the anxiety of the patient & family
- Be calm, sympathetic, reassuring and yet authoritative
- Once the environment is settled, enquire gently and clearly what happened and when

Talking to patients with eye injuries - 2

- If you suspect a non-accidental injury handle this very delicately
- focus on the patient and the injury
- obtain information without assigning blame

Reassurance without unrealistic optimism

'The injury is very severe but we will do everything we can.'

- If you are not sure of the prognosis, use phrases like the following:
  'We don't know yet.'
  'Let's see how we get on.'
- Blame nothing but the injury.
  - Do not blame any part of previous care, or a delay in referral

Initial assessment

- assess the general state of your patient
  - alertness
  - orientation
  - general health

A - **Airway** with cervical spine protection
B - **Breathing** and ventilation
C - **Circulation**
D - **Disability** (using Glasgow Coma Scale and pupillary assessment)
E - **Exposure** and Environment control

History

- Mechanism of injury
- Time of day/night
- Where? – workplace,
- Events surrounding the injury – accident, fight
- Company? – who else was there?
- First aid?
- History of previous eye problems – spectacle use, squint, OU
- Alcohol (or drugs) intoxication
- Medical history
- Have the police been informed?

Examination

- Ocular trauma II – practical sessions

Ocular trauma score (OTS)

- Estimates prognosis (6 mth after injury)
- Assumes optimal management of the injury
- Predictive accuracy=80%
- Does not include associated injuries or ancillary tests (U/S, CT)

Table 1. Computational method for deriving the OTS score

Initial visual factor	Raw points
A. Initial raw score (based on initial visual acuity)	NPL = 60 PL or HM = 70 1/200 to 19/200 = 80 20/200 to 20/50 = 90 ≥ 20/40 = 100
B. Globe rupture	-23
C. Endophthalmitis	-17
D. Perforating injury	-14
E. Retinal detachment	-11
F. Relative afferent pupillary defect (RAPD)	-10
Raw score sum = sum of raw points	

Table 2. Estimated probability of follow-up visual acuity category at 6 months

Raw score sum	OTS score	NPL	PL/HM	1/200–19/200	20/200 to 20/50	≥ 20/40
0–44	1	73%	17%	7%	2%	1%
45–65	2	28%	26%	18%	13%	15%
66–80	3	2%	11%	15%	28%	44%
81–91	4	1%	2%	2%	21%	74%
92–100	5	0%	1%	2%	5%	92%

NPL: nil perception of light; PL: perception of light; HM: hand movements

Management

- Eye shield
- Tetanus prophylaxis
- Antibiotics

  -Topical

  -Intravenous antibiotics (Cefazolin,Gentamicin, Clindamycin)

  -Oral (Ciprofloxacin)
- Refer to Ophthalmology

The importance of timely surgery for trauma – at Kikuyu Eye Unit

- Delay in surgery for traumatic cataracts in young patients led to eyeball elongation
- Cases here were eyes whose surgery was delayed by >1 year
- Controls were eyes that were operated on ≤ year

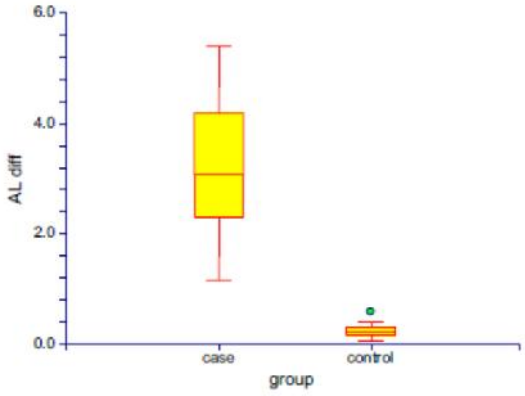


Figure 1. A box plot comparing the axial elongation (millimeters) between cases and controls (P = .000) (AL diff = axial length difference).

Median (IQR) difference between injured and non-iinjured eye
Cases = 3.09 mm; (2.45 to 4.13 mm)
Controls= 0.24 mm; (0.15 to 0.30 mm)

Prevention

- People assume that eye injuries are the result of '*accidents*', i.e. that they are outside of human control.
- EYE INJURIES ARE OFTEN PREVENTABLE
- The first step in prevention is to understand the local causes of ocular injuries and their patterns

Preventive interventions

- Establish a trauma registry
- Protective eyewear – workplace, sports
- Legislation and enforcement about the use of seat belts
- First aid management of agricultural/industrial eye trauma
- Advocacy – media campaigns

	Prevention at individual level	Prevention at community/public health level
Home	Keep sharp objects/chemicals away from children and look for safety standards in household products	Raise safety awareness on the use of tools and kitchenware around the house
Industry	Emphasise the use of helmets and eye protection	Raise awareness and advise industries on safer modifications of the work environment. May require introduction of safety legislation
Agricultural	Encourage the use of eye protection, particularly at harvest time	Audit injuries and their seasonality so that appropriate advice/education can be provided e.g. to fruit pickers or during grain harvests
Sport	Encourage the use of eye protection and/or helmets, e.g. for contact sports and racquet sports	Consider advocating for legislation to encourage compliance with protective eyewear use
Conflict	Give advice on the importance of using helmets and protective eyewear	Lobby government to provide protective gear and appropriate training for soldiers
Assault	Difficult to advice specific action at individual level	Encourage and support multidisciplinary action to reduce violence at a community level
Transport	Encourage motorists to wear seatbelts and cyclists and motorcycle users to wear eye protection	Advocate for legislation to support compliance
Fireworks	Promote keeping a safe distance during firework use, especially for children	Organise prevention messages in media during periods of festivity
Contact lenses	Give advice on contact lens wearing habits and discourage overnight use	Raise awareness among eye workers on lens types and correct wearing habits for contact lens users

Prevention messages

Setting	Individual level	Community/Public health level
Home	Keep sharp objects/chemicals away from children. Look for safety standards in household products. Don't leave children unaccompanied	Raise safety awareness on the use of tools and Kitchenware around the house Toys – cheap, safe, available
Industry	Helmets & protective eyewear (safety googles)	Safety inspections, Training on protective eyewear
Agricultural	Protective eye wear – pruning, spraying	Audit eye injuries
Sports	Helmets & protective eyewear	Legislation – sports associations
Conflict	Helmets & protective eyewear	Training of soldiers on eye protective wear
Transport	Seat belts, luminous wear	Legislation enforcement

Protective eyewear







Rehabilitation

- Someone with an eye injury is more at risk of another one
- Trauma & support counselling
- Visual rehabilitation – low vision services,
- Career change
- Disability benefits

Legal aspects

- Your notes may be needed as evidence
- It usually happens years or months later
- Always write clear, comprehensive notes – no blame
- Write only what you are sure of:

'The patient reports that he was injured by a colleague,' rather than
'The patient was injured by a colleague.'

Reasons for delay in appropriate management of ocular trauma in Africa

- Late presentation
- Previous inappropriate intervention – formal & informal
- Injury on a weekend
- Referral systems often dysfunctional
  - opening & closing times & charges unknown to patients
  - frequent staff absence
  - inexperienced staff deputizing

References

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