

# EYE INJURIES IN BOXING

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## Introduction

The era of blindness as a result of boxing is past.

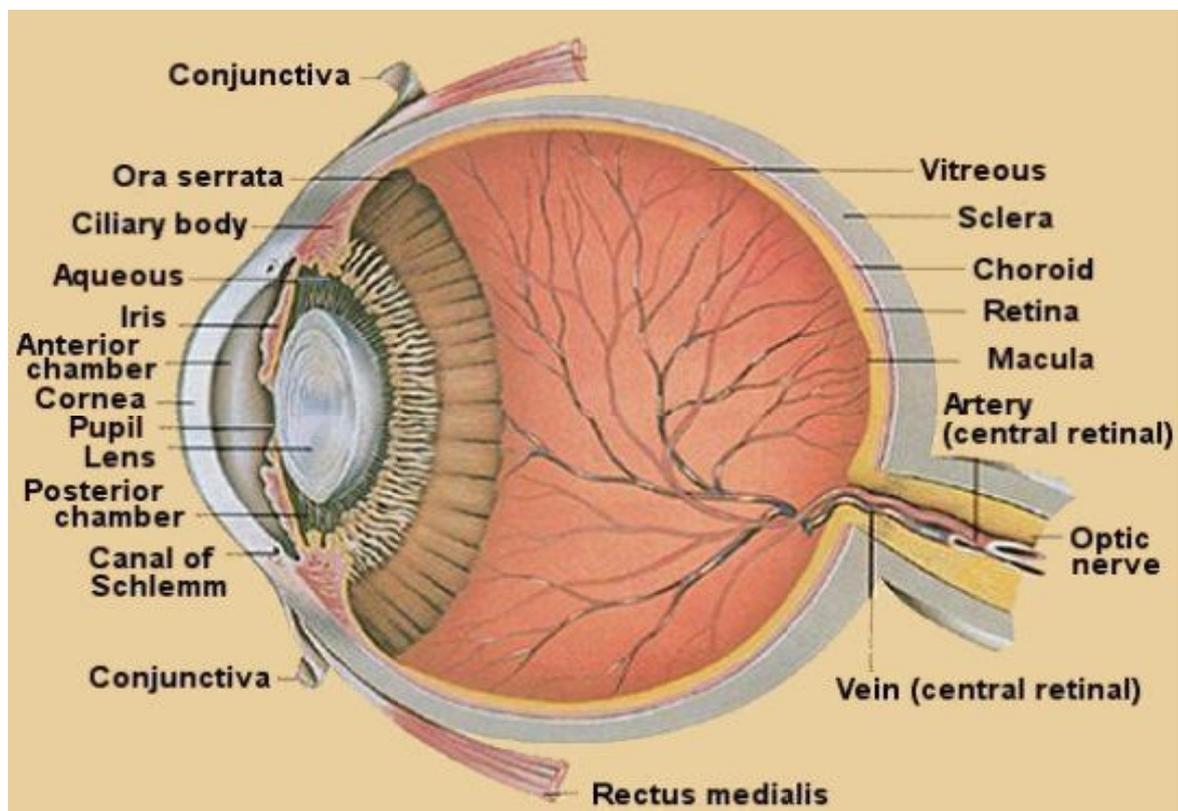
However boxing doctors have become more aware of ocular damage: retinal detachment being the most frequently observed serious injury in professional boxing.

## Ocular injuries as a result of boxing mainly affects professional boxers

The eye is relatively well protected by the orbit except at the front.

The ocular damage is caused by direct blunt trauma or sometimes by indirect shock.

## ANATOMY



- Eyelids

## **Lacrymal system**

- Orbit and its content :
  - The eyeball
    - The front segment :
      - Conjunctiva
      - Cornea
      - Anterior chamber
      - Iris –corneal angle
      - Iris
      - Lens
    - The rear segment :
      - Sclera
      - Choroid
      - Retina
  - . macula
  - . periphery
    - Vitreous humour
- The neuro muscular cone

## ***PATHOLOGY***

Lesions observed:

- Oedema
- Haemorrhages
- Ruptures
- Tears
- Detachments

## ***PATHOPHYSIOLOGY***

In reference to the cerebral injuries three mechanisms explain the ocular damage :

- Direct force = “ coup”
- Transmitted force = “contrecoup”
- Anterior compression and equatorial expansion with the following effects :
  - for the orbit and its content : stretching and shortening of each component leads to = haemorrhage or rupture
  - antero posterior shift of the eyeball brings about high pressure in the orbit resulting in = blow out fracture
  - shockwaves going through the sclera

## **OCULAR CONCUSSION INJURIES**

- Eye lids :
  - wound
  - oedema or swelling
  - haematoma
- Orbit :
  - fracture (floor ++)
  - underplaced fracture ??? Sorry I do not know what this is ??displaced
- Lacrymal system :
  - rupture
- Neuro-muscular cone:
  - bleeding
  - diplopia
- Eyeball
  - Front segment :
- Conjunctiva : haemorrhage  
chemosis
- Cornea :
  - epithelial laceration ++
  - tears in Descemet' membrane
  - complete rupture
  - interstitial opacities
  - pigmentary deposits
  - Anterior chamber :  
traumatic hyphema
  - Iris and ciliary body :
    - changes in the pupil and accommodation ++
    - traumatic miosis and accommodation spasm
    - traumatic iridoplegia and cycloplegia
    - tears at the pupil border
    - iridodialysis
    - recession of the angle +
  - Lens and zonula :
    - opacities:**
      - subepithelial
      - subcapsular
      - traumatic zonular cataract
      - diffuse concussion cataract
      - total cataract
      - subluxation, luxation
  - Rear segment
  - Choroid :

concussion edema  
hemorrhage  
laceration  
rupture  
detachment

- Retina :  
oedematous and atrophic changes  
concussion oedema  
macular (Berlin oedema)  
peripheral atrophic changes  
**retinal detachment**

**All those lesions are described in literature and may be theoretically observed**

**In fact:**

- Slight incidents :
- eyelid and eyebrow wounds, haematoma
- cornea laceration by glove abrasion : 2 particular accidents
- post traumatic diplopia following an hematoma on the inside of the orbit or a muscular injury.
- lid emphysema, in the case of a fracture, the air of the sinus penetrates into the orbit.

Remark: repeated lesions of the brow may train a healing granuloma which is best excised to prevent recurrences

- Severe accident :
  - Orbit fracture
  - Cataract :
    - clinical sign = fall of vision
    - diagnosis = lens opacity
    - treatment = intra ocular lens (IOL)
    - result is excellent but unfitness to box

- Retinal detachment  
usually secondary to pre-existent lesions, sometimes caused by an unique shock.

Mechanism = a retinal detachment occurs for two reasons: either there is a tear or because there is an abnormal traction on retina

clinical signs = immediately or not, black spots, flashes

diagnosis = fundus ophthalmoscopy

direct by binocular vision

or indirect by Goldman glass

treatment = endo-ocular surgery completed or not, by laser photo coagulation

**Prevention must be the first treatment**

## **Statistics, studies summary:**

No report in medical literature describing ocular injuries prior 1980.

- 1981 : A.L. Whiteson

10 retinal detachments over the preceding 35 years

- 1986 : Giovinazzo

74 boxers, asymptomatic and theoretically chosen in sequential fashion (every 7<sup>th</sup> boxer)

= '49 (66%) pathologic changes!!

ranging from cutaneous scarring to retinal detachment''

- 1987 : sponsored by the New York State Athletic Commission (NYSAC)

### **154 boxers examined by 20 ophthalmologists**

'cataract' = 5  
detachment = 1

- 1989 : NYSAC

### **286 boxers, 22 ophthalmologists**

'cataract' = 30  
detachment = 3

- 1989/1999 : Medical Commission of French Boxing Federation :  
8000 boxers, every, year during 10 years (annually ocular examination is obligatory)  
23 boxers unfit to box for ocular problems : **only in professional boxing**

operated cataract = 5  
successfully (100%)

operated detachment = 13

(60% successfully

threatening retinal lesions = 5

(tears, holes)

laser photocoagulation = 180

### **Discussion :**

- The 1989 study concerns boxers examined for ocular problems. It was flawed as one ophthalmologist who examined only 8% of the boxer discovered 95% angle recession!! (that amount of vision threatened is rare in boxing).
- Different types of cataract must be distinguished : minimal, subcapsular, anterior posterior, cortical or total. Supervision is required to avoid dangerous development

## **OCULAR SAFETY IN BOXING**

For a number of years ocular safety has been a concern for the IABA Medical Commission.

### **An annual examination is recommended**

- to maintain a reasonable limit for boxing
- to check the state of the eye
- to detect pre existing lesions around the retina
- to decide preventive treatment (laser photo coagulation)

### **Ocular requirements for licensure by INTERNATIONAL ASSOCIATION of AMATEUR BOXING**

- Uncorrected visual acuity:  
20/200 or better in each eye
- Corrected visual acuity:  
20/60 (amblyopia) or better in each eye
- Myopia:  
No more than -3,50 dioptries in each eye
- No intra ocular surgery (cataract, retinal detachment)
- No refractive surgery
- Absence of ‘major ocular pathology’ (glaucoma, macular abnormalities, major lens abnormality, dangerous peripheral retinal lesions).