LENS and LENS DISEASES

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The lens is a transparent structure. It consists of the capsule, anterior epithelium and lens fibers

Its metabolic needs are met by humor aqueous. Glucose provides most of the energy requirements of the lens. Most of the glucose is broken down via the hexokinase pathway. Elevation of glucose levels inhibits this way and glucose is diverted into the sorbitol shunt (via aldose reductase enzyme).

CATARACT

The exact biochemical disorders responsible for the formation of cataracts in animals

- Lens nutrition
- Energy metabolism
- Protein metabolism
- Osmotic balance

- İrriversibl changes lens protein contents
- Epithelial Na/K adenosine triphospate pump activity ↓
- Antioxidant activity ↓
- Proteolytic enzyme activity ↑

→ Changes in lens capsule, epithelium and fibers

↓

Lens fibers rupture
Cell death

← Loss of transparency

CLASSIFICATION

Etiology

Primary	inherited
Secondary	metabolic
	traumatic
	intraocular disease (uveitis, infection)
	toxic
	congenital abnormalities
	nutritional

Age of development

- juvenile
- senile
- acquired

CLASSIFICATION

Position within the lens

- anterior capsular
- anterior subcapsular
- cortical
- nuclear
- posterior subcapsular
- posterior capsular

Stage of development

- Incipient
- Immature (early / late)
- Mature
- Hypermature
- Morgagnian

- Incipient
  - minor opacities
  - perfect view of fundus
  - early, focal opacity
- Immature
  - the opacity is more extensive
  - the transparency of the lens is reduced but not totally lost
  - in early stage, good view of tapetal reflex and fundus
  - in late stage, can still see tapetal reflex but very limited view of fundus
- Mature
  - the lens is totally opaque
  - the eye is functionally blind
- Hypermature
  - varying degrees of lens opacity
  - the degraded lens proteins leak through the lens capsule into the anterior chamber
  - wrinkled capsule, ‘sparkly’ cataract
- Morgagnian
  - the nucleus may remain with a shrunken capsule around it, after the cortex has escaped, and may sink to the bottom of a lens whose cortex has liquefied.

Diabetik Katarakt

In hyperglycemia, hexokinase is saturated and more glucose enters the sorbitol pathway. In sorbitol pathway, glucose is metabolized by aldose reductase. The resulting hyperosmolarity of the lens leads to fluid ingress. As more fluid enters the lens, its transparency disappears.

Treatment of Cataract

Medical Therapy

Antioxidants

Aldose reductase inhibitors

Surgical Therapy

1. Discission and Aspiration
2. Extracapsular extraction
3. Phacoemulsification
4. Intracapsular extraction

LENS LUXATION

- Lens luxation occurs when all of the lens zonules are torn.
- If some of the lens zonules are torn, it is called subluxation
- Lens displacement
- Following the luxation, the lens move anteriorly, posteriorly or in the vertical plane of the eye

CLASSIFICATION

Primary

Hereditary

Weakened lens zonules

Secondary

Blunt traumas

Glaucoma

Uveitis

Intraocular tumors

Cataract

Clinical Signs

- ✓ Iridodonesis

  Iris vibration

- ✓ Syneresis

Increased lens movement causes the vitreus touching the posterior lens. The vitreus separates from deep region. The damaged vitreus eventually liquefies and is replaced by humor aqueous. Syneresis is this liquefaction process.

- ✓ Aphakic crescent

In subluxation, the dorsal edge of the lens becomes visible in the pupil. Where the lens is missing is called an aphakic crescent.

- ✓ In lens luxation, the depth of the anterior chamber usually increases.
- ✓ In anterior lens luxation, corneal edema, pain and glaucoma may be seen.

The treatment is surgical