

# Aging & Ophthalmology

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**Dr Denis Malaise**

**January 2018**



## Major ocular diseases

- 1. Cataract**
- 2. Age-related macular degeneration**
- 3. Ischemic optic neuropathy**
- 4. Horton arteritis**
- 5. Glaucoma (chronic and acute)**
- 6. Diabetic retinopathy**

## Objectives of good care

« active » population

- Vision 10/10
- Normal IOP
- Good visual field
- Vision without glasses

Geriatric population

- INDEPENDENCE
- Quality of life

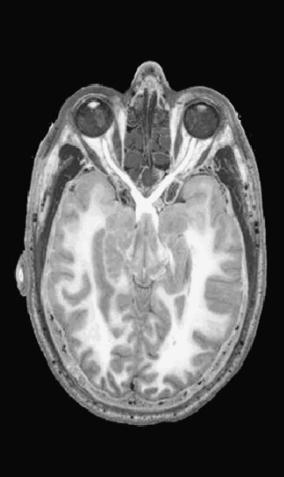
## Ophthalmic geriatric consultation

- Evaluate visual functions
- Detect ocular problems
- Consider the context
- Provide potential solutions



## Visual performance psychosensory tests

- Auditory
- Visual
- Conceptual
- Locomotor
- Nutritional

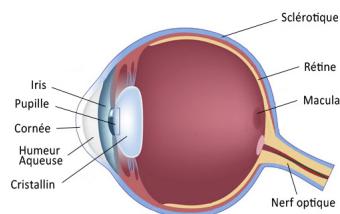


- Neurological deficits
  - Understanding
  - Expression
  - Confusion
  - Contact

## Aging of ocular structures anatomical aspects

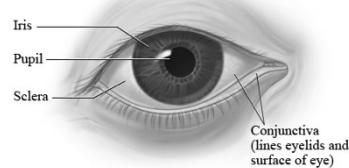
### • Annexes

- Lids
- Lacrymal gland



### • Globe

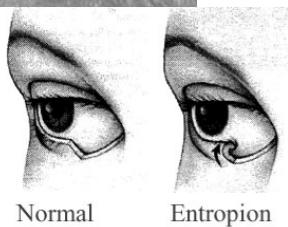
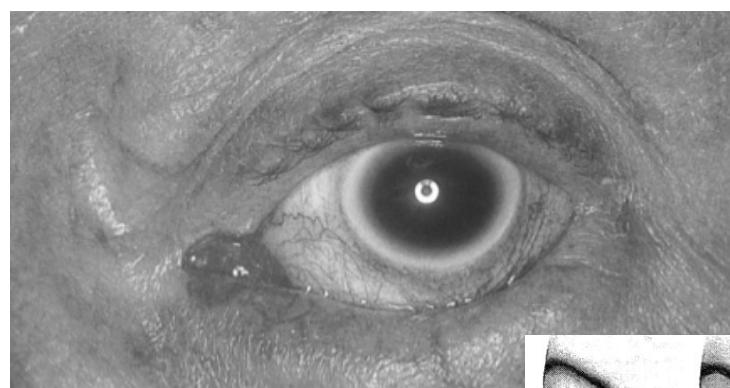
- Cornea
- Lens



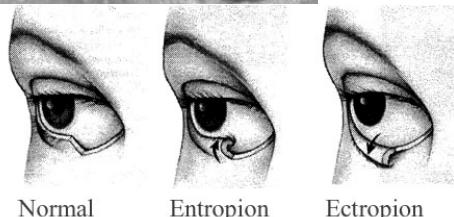
### **Lids : Blepharochalasis**



### **Lids : Entropion**



## Ectropion

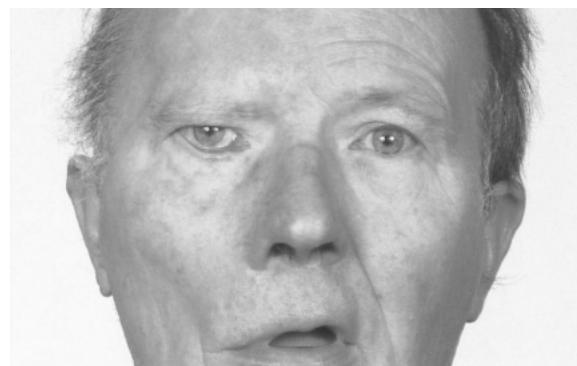


Normal

Entropion

Ectropion

## Paralytic ectropion

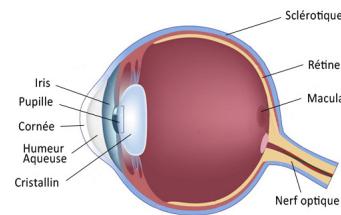


# Aging of ocular structures anatomical aspects

- **Annexes**

- **Lids**

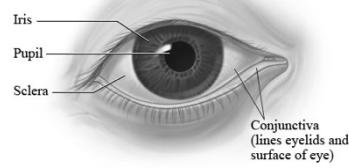
- **Lacrymal gland**



- **Globe**

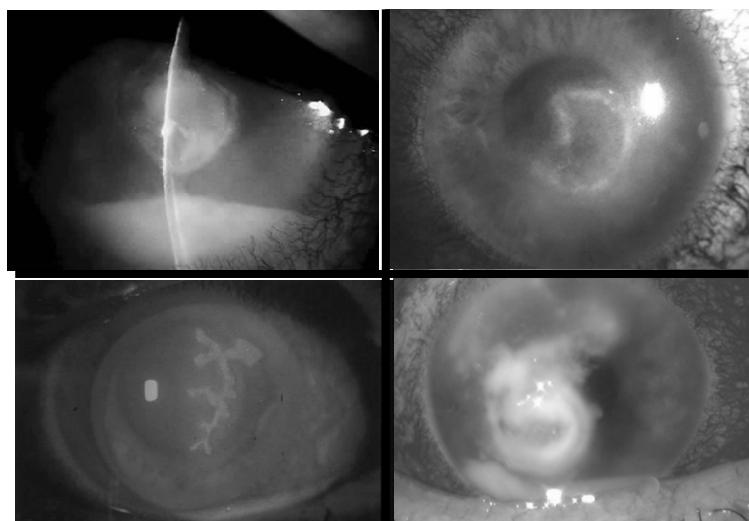
- **Cornea : keratitis**

- **Lens**

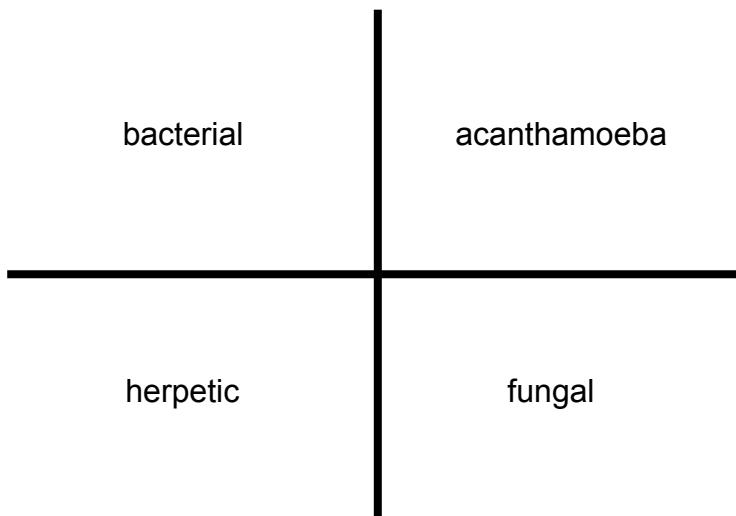


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## Cornea : Infectious keratitis



## **Infectious keratitis**

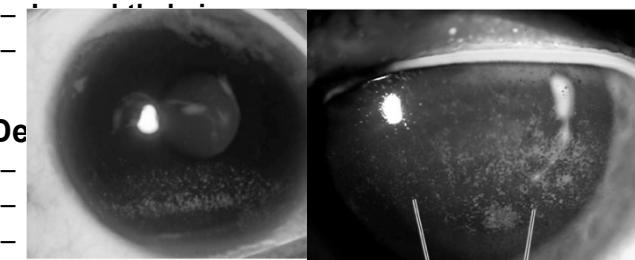


## Infectious keratitis risk factors

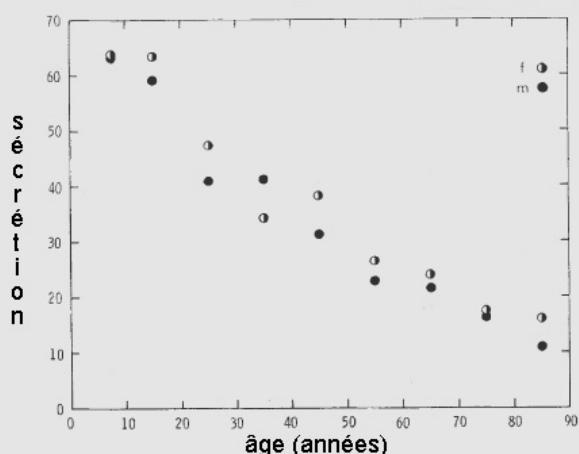
- **Cataract suture (at 12 o'clock)**
  - **Epithelial defect**
    - Contact lenses
    - Dry eye
    - Neurotrophic keratitis, corneal decompensation
    - Lagophthalmic eye
    - Trichiasis
  - **Decreased immunity**
    - Systemic factors
    - Cancer / oncologic treatments
    - Local corticosteroids

## Infectious keratitis risk factors

- Cataract suture (at 12 o'clock)
- Epithelial defect
  - Contact lenses
  - Dry eye
  - Neurotrophic keratitis, corneal decompensation
  - 
  - 
  -
- De

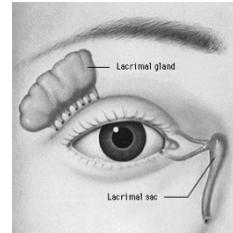


Evolution de la glande lacrymale



## Dry Eye mechanisms

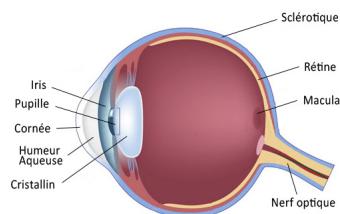
- ↓ Tears production : lacrymal gland
  - Age-related involution
  - Sjogren type I or II (dry mouth, arthritis)
    - ⇒ anti SS-A, SS-B, ANA, rhumatoïd arthritis
  - Corneal hypoesthesia (trigeminal lesion, zoster)
  - Atropine-like effect of many drugs
    - ⇒ sedatives, neuroleptics, anti-H1...



## Aging of ocular structures anatomical aspects

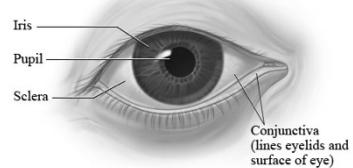
### • Annexes

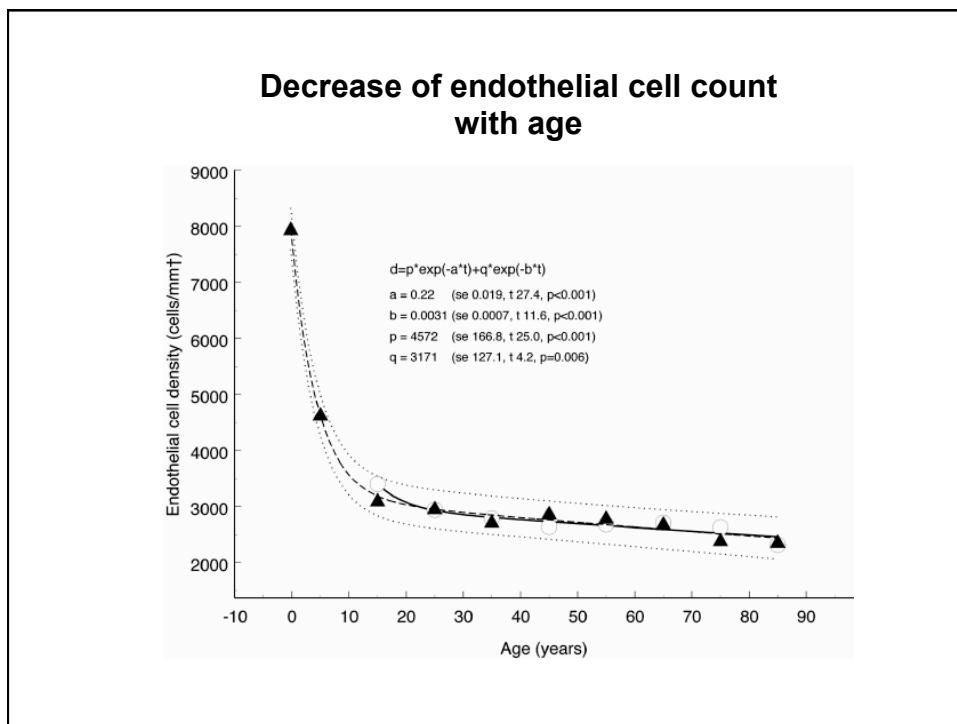
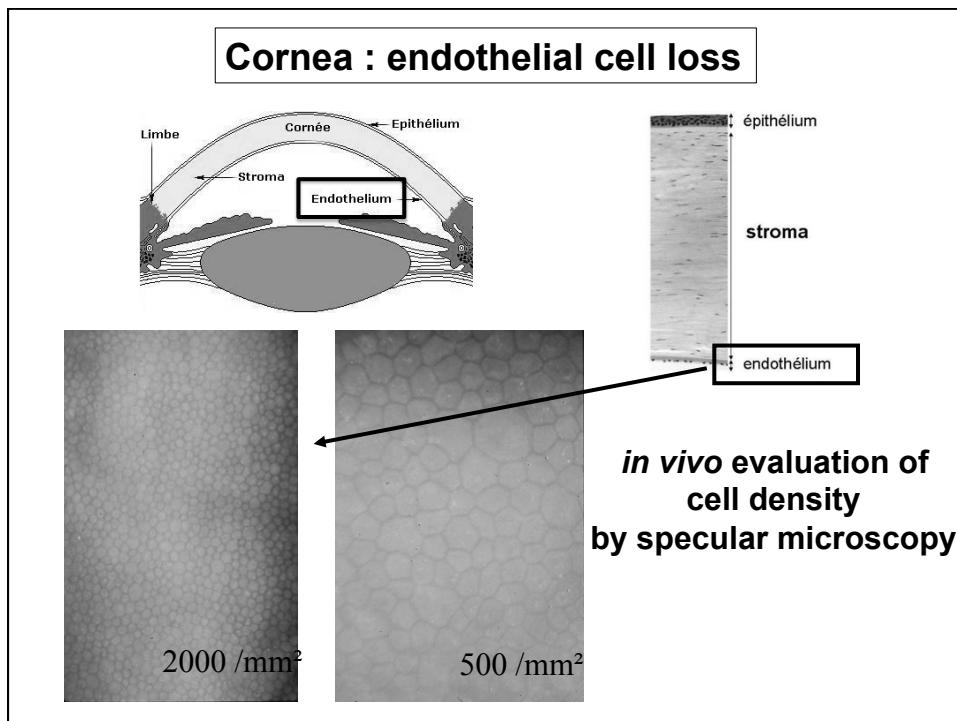
- Lids
- Lacrymal gland

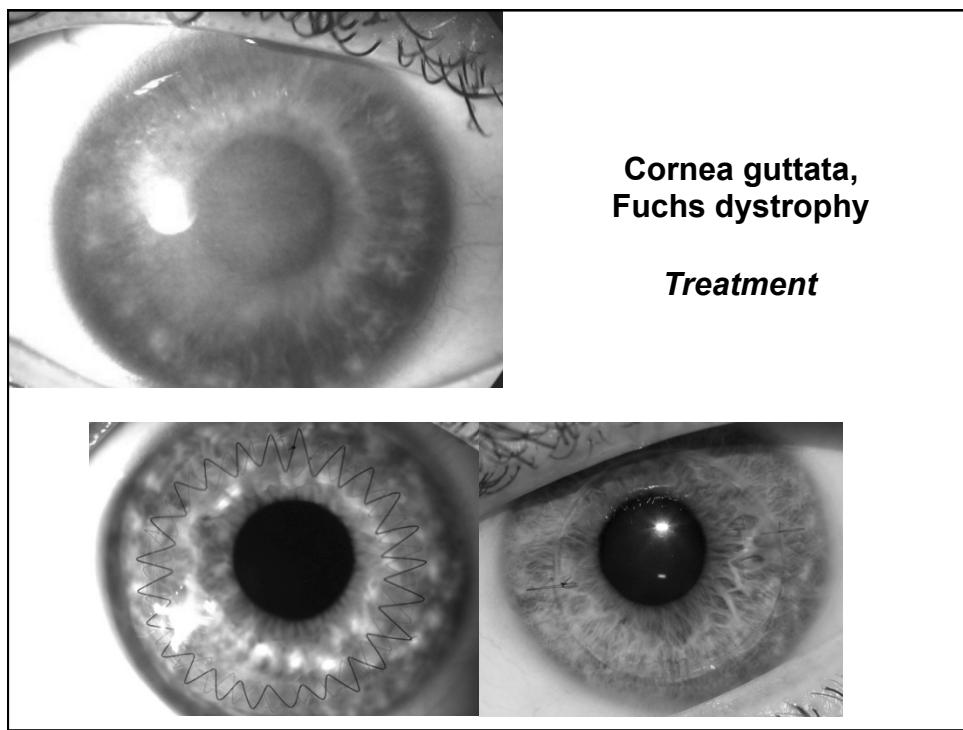
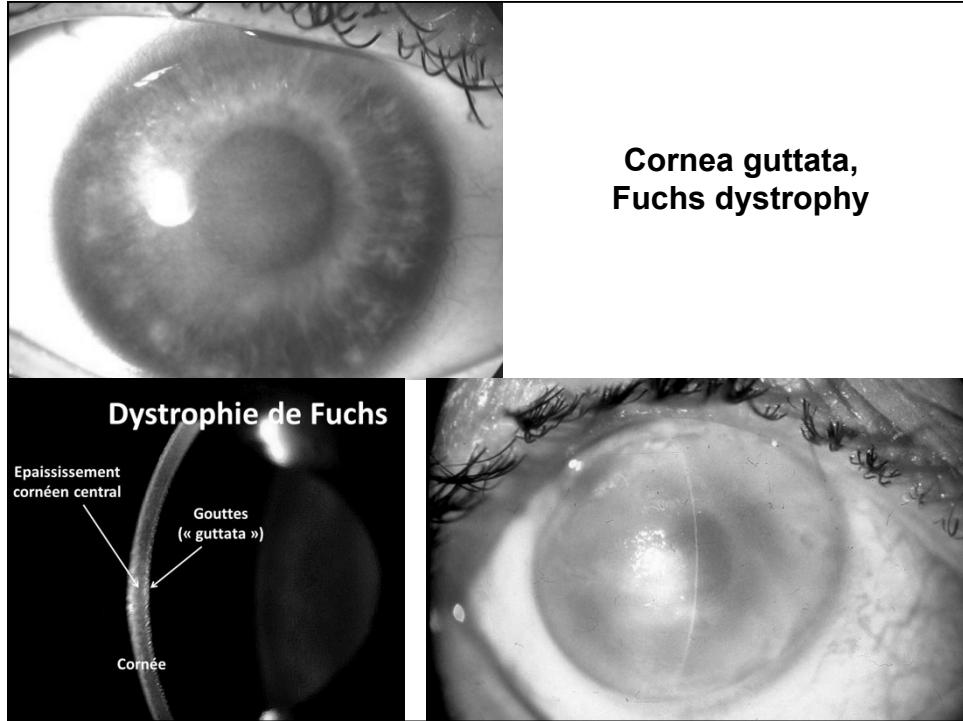


### • Globe

- Cornea : degeneration
- Lens







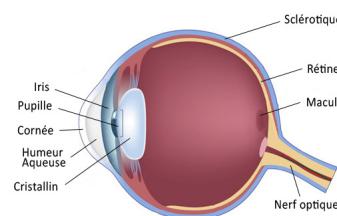
## Corneal decompensation mechanisms

- Age-related involution
- Genetic involution (cornea guttata)
- Complicated cataract surgery
- Glaucoma (acute)

## Aging of ocular structures anatomical aspects

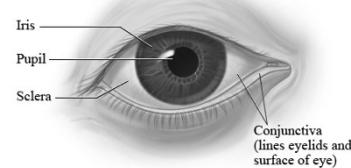
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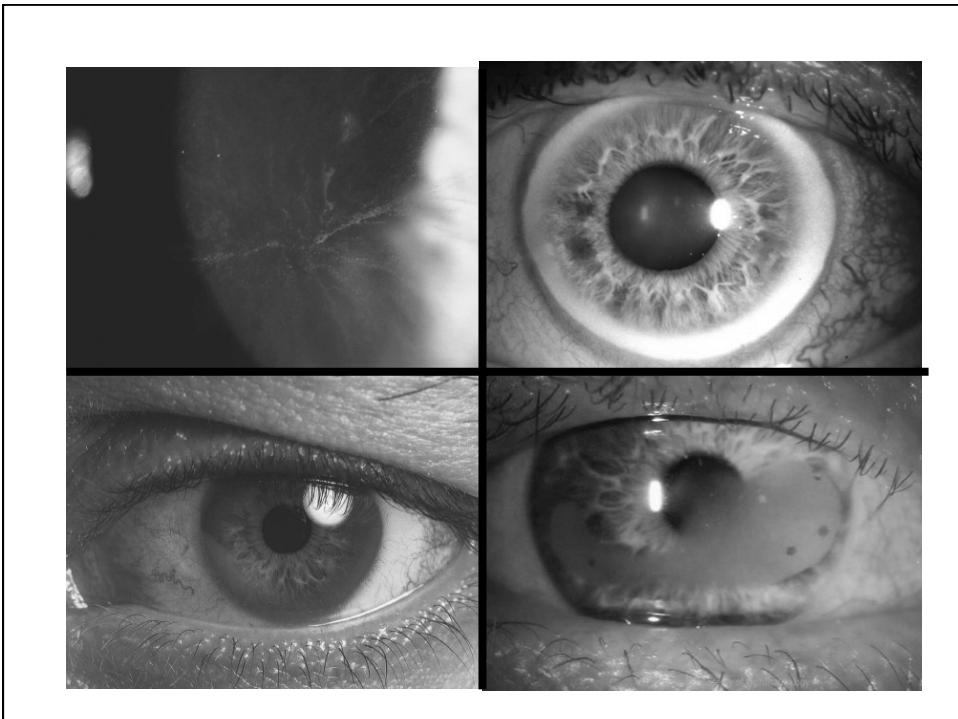
- Lids
  - Lacrymal gland



- Globe

- Cornea : deposits
  - Lens





### Corneal deposits

amiodarone

cholesterol (age)  
gerontoxon

copper  
(Wilson)

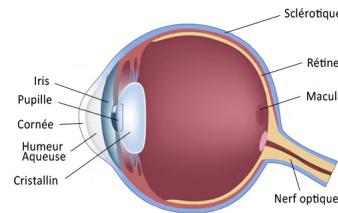
calcium  
(band keratopathy)

# Aging of ocular structures anatomical aspects

- Annexes

- Lids

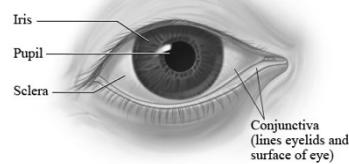
- Lacrymal gland



- Globe

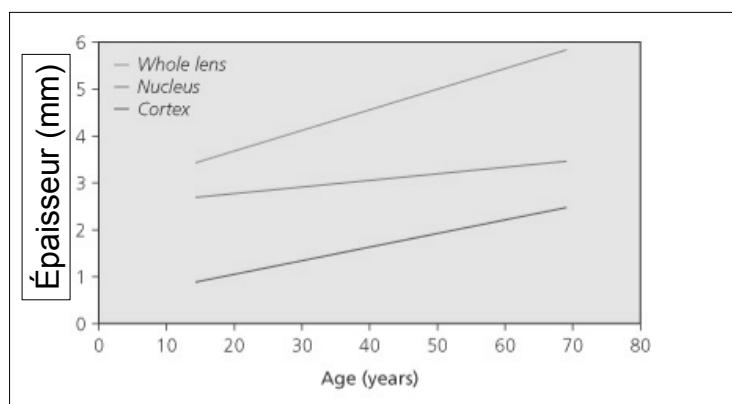
- Cornea : keratitis

- Lens



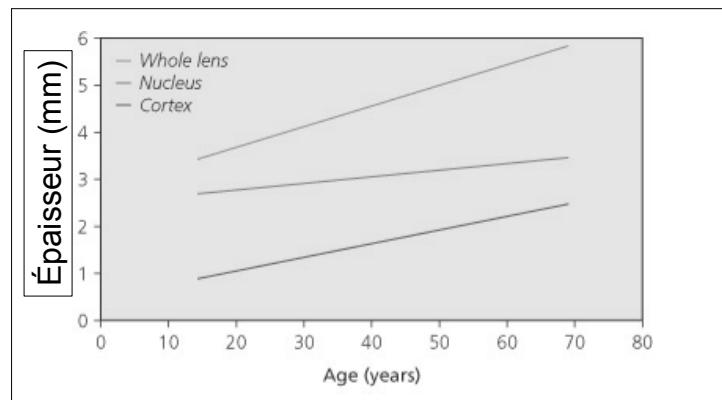
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## Age-related lens modifications



- ☞ Presbyopia
- ☞ Risk of acute angle closure glaucoma
- ☞ Cataract

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### Angle closure glaucoma crisis

- Symptoms :
  - high pain
  - nausea
  - vomiting
  - halos
- Signs :
  - unilateral red eye
  - half-mydriasis



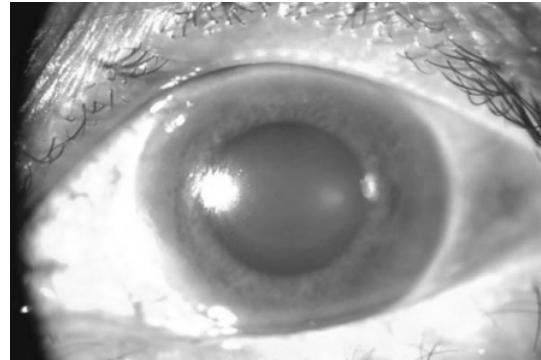
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- half-mydriasis
- corneal oedema



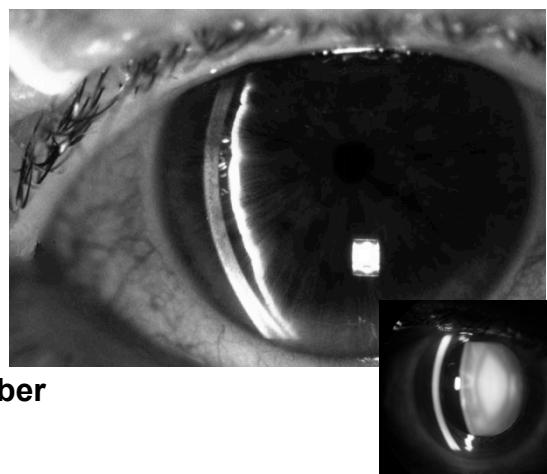
## Angle closure glaucoma crisis

- Symptoms :

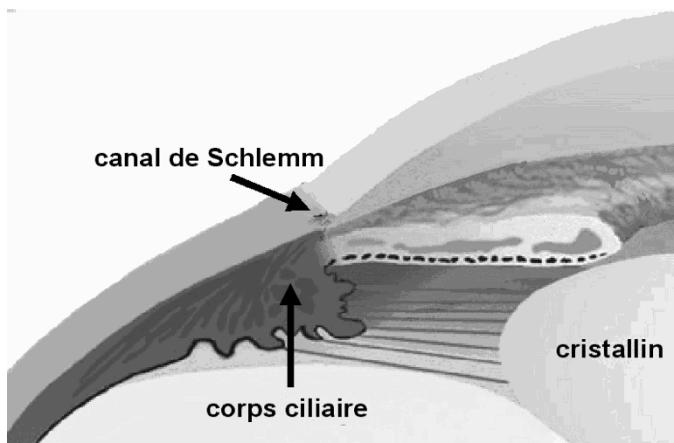
- high pain
- nausea
- vomiting
- halos

- Signs :

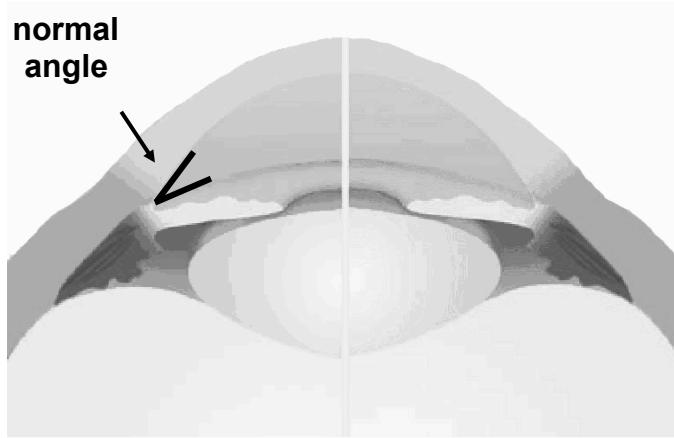
- unilateral red eye
- half-mydriasis
- corneal oedema
- small anterior chamber



## Angle closure glaucoma crisis

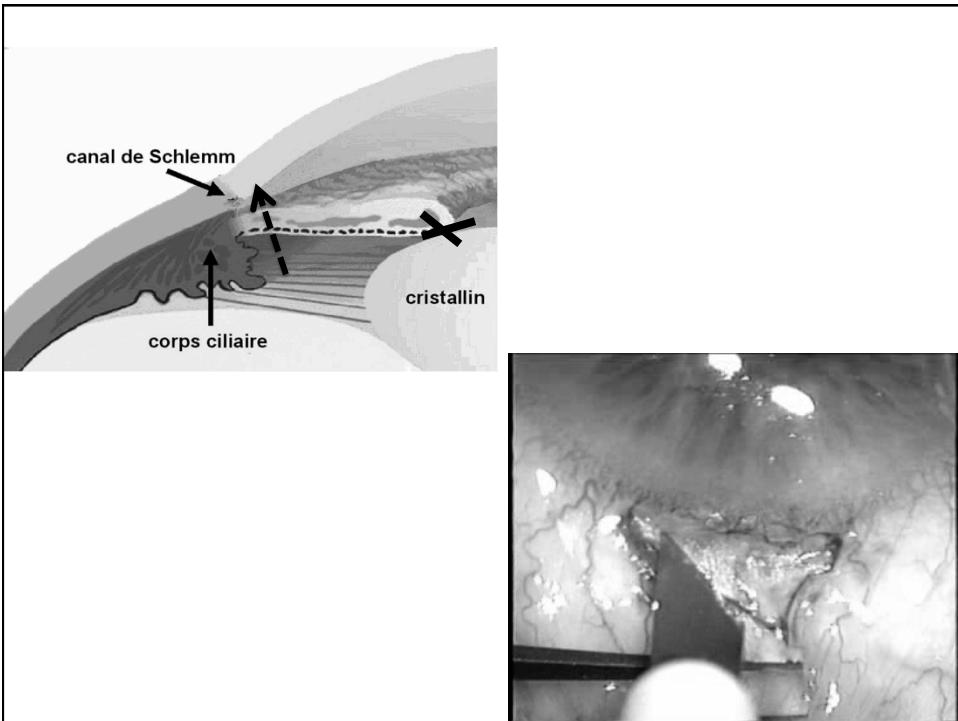


## Angle closure glaucoma crisis

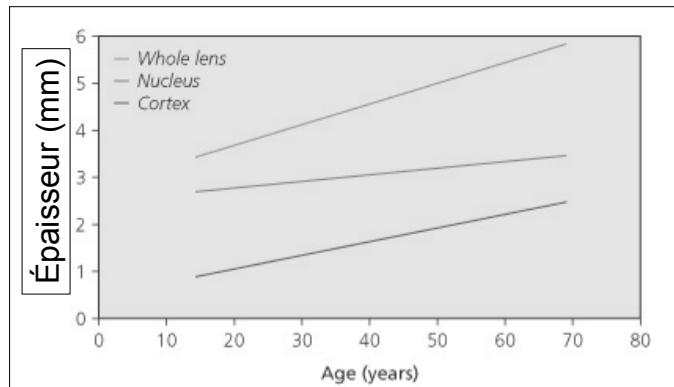


## Angle closure glaucoma crisis risk, consequences and treatment

- Small hypermetropic eyes
  - Cataract
  - Stress, obscurity,  
**mydriatic drugs**
- 
- Very high IOP
    - ☞ Optic disc ischemia
    - ☞ Corneal decompensation
    - ☞ Iris atrophy
- 
- Emergency treatment
    - decrease IOP
      - Mannitol 20% 250 ml
      - Diamox 500 mgr
      - local hypotensive drops
    - prevent recurrence
      - (pilocarpine every hour)
      - (pilocarpine fellow eye)
      - laser iridectomy
      - cataract extraction

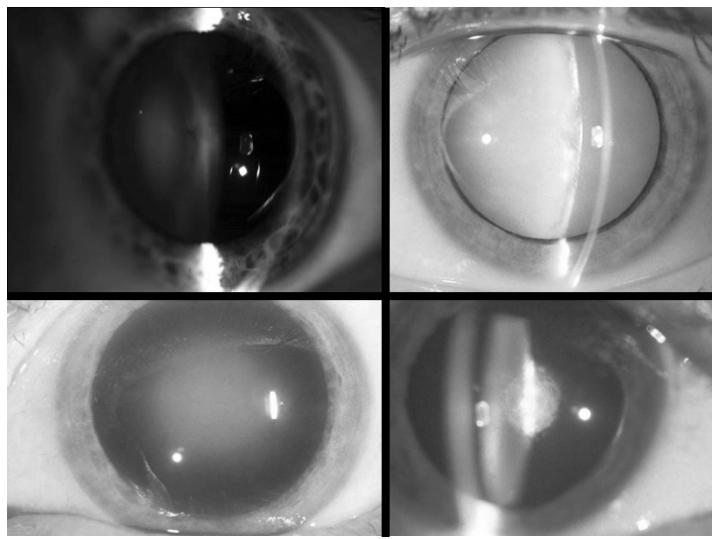


### Age-related lens modifications



- ☞ Presbyopia
- ☞ Risk of acute angle closure glaucoma
- ☞ Cataract

### Cataract ophthalmic aspects



## Cataract ophthalmic aspects

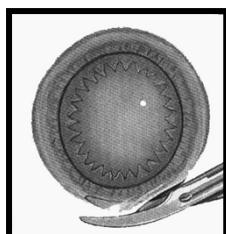
nuclear cataract  
(section view)

white cataract  
(section view)

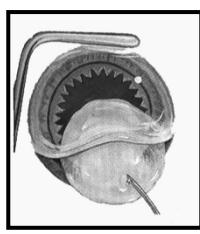
nuclear cataract  
(frontal view)

posterior cataract  
(steroid-induced)

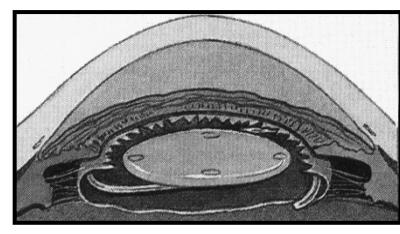
## Current cataract surgery 3 basic steps



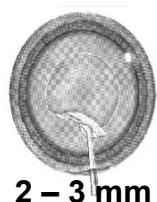
incision



extraction

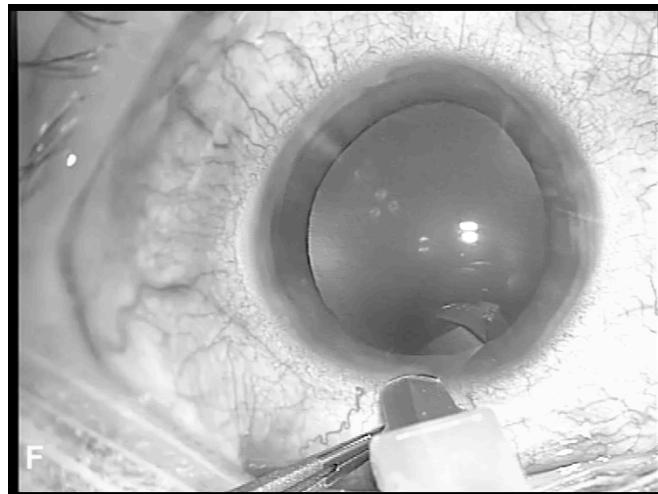


implantation

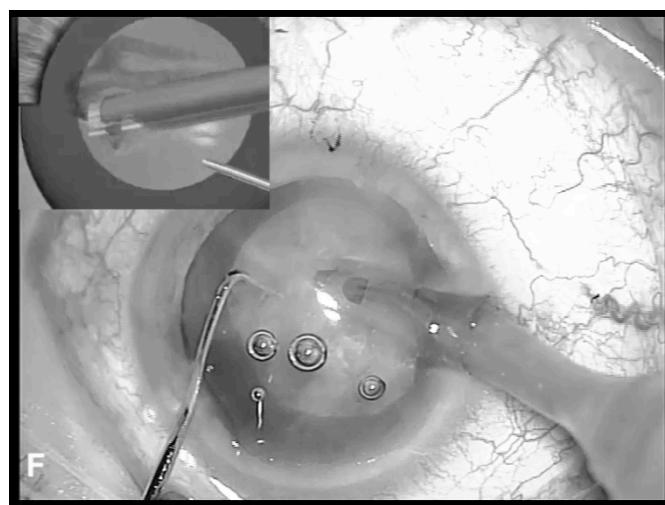


Lens implantation

## Current cataract surgery incision - capsulorhexis



## Current cataract surgery phacoemulsification



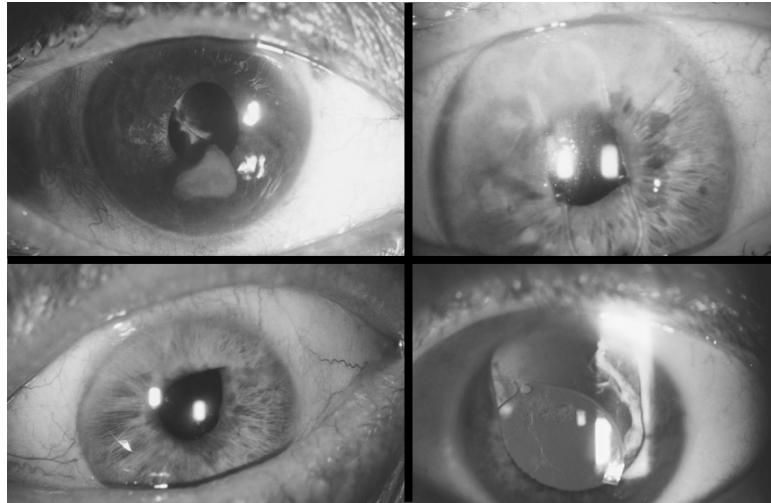
## Current cataract surgery foldable IOL implantation



## Current cataract surgery results & complications

- **Excellent recovery**
  - ONLY if the rest of the eye is OK
  - ONLY in the absence of complications
- **Complications**
  - surgeon-dependent
  - eye-dependent
  - patient-dependent in case of topical anesthesia

## Current cataract surgery complications



## Poor compliance in cataract surgery (local anaesthesia)

- **Hearing loss (or foreign language)**
- **Desorientation, confusion, Alzheimer**
- **Uncontrolled movements (Parkinson), blepharospasm**
- **Respiratory decompensation (cough)**
- **Cardiac decompensation, vertebral problems...**

## Current cataract surgery complication PCO or after cataract



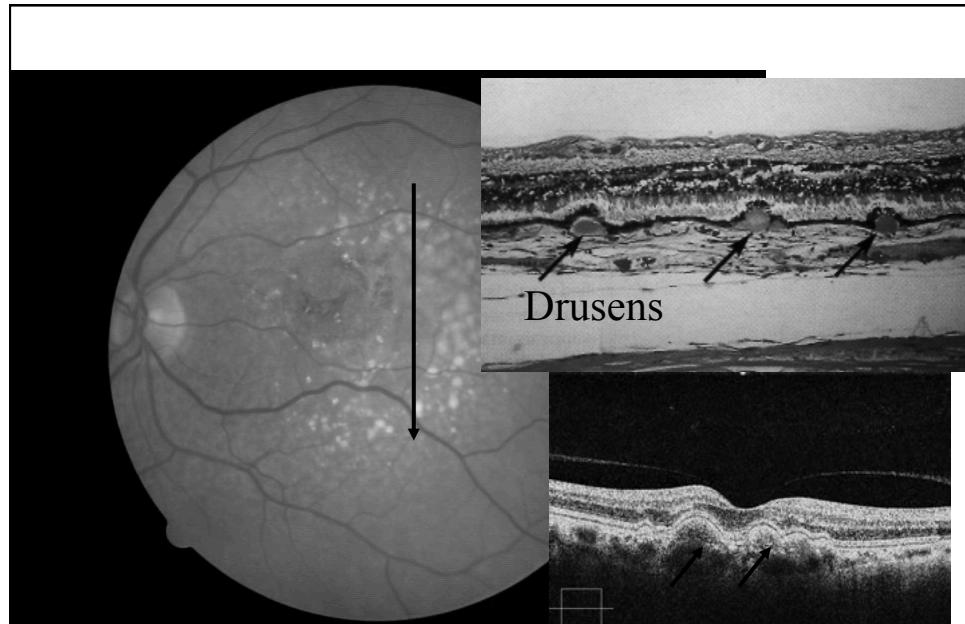
### Cataract surgery

- Don't make futile operations
- Too late...

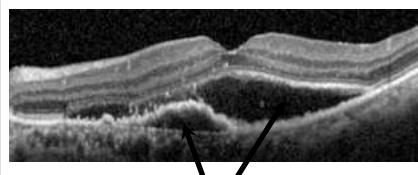
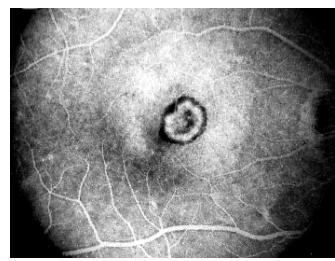
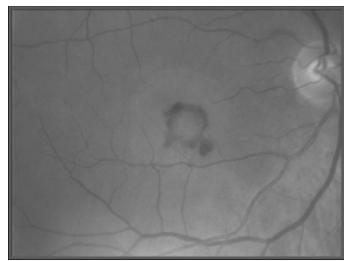
## Cataract surgery bad visual prognosis

### 1. Retinal pathology

- AMD
- Diabetic retinopathy
- Retinal vasculopathy

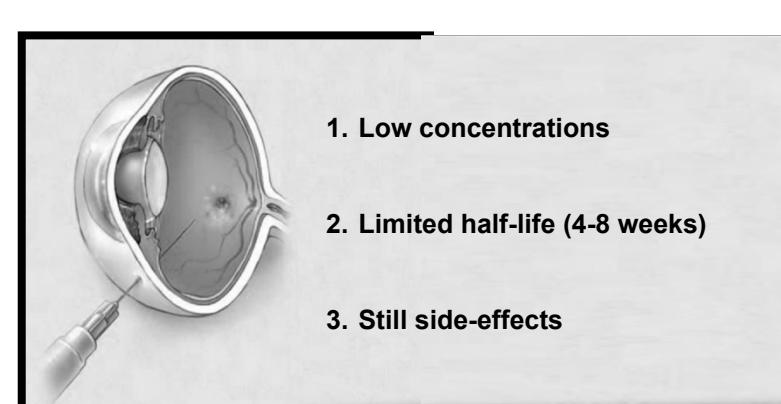


Early stage of AMD



- acute loss of vision
- metamorphopsia
- treatment
  - Anti-VEGF (Lucentis, Eylea)
  - Triamcinolone
  - (Laser / Photodynamic)

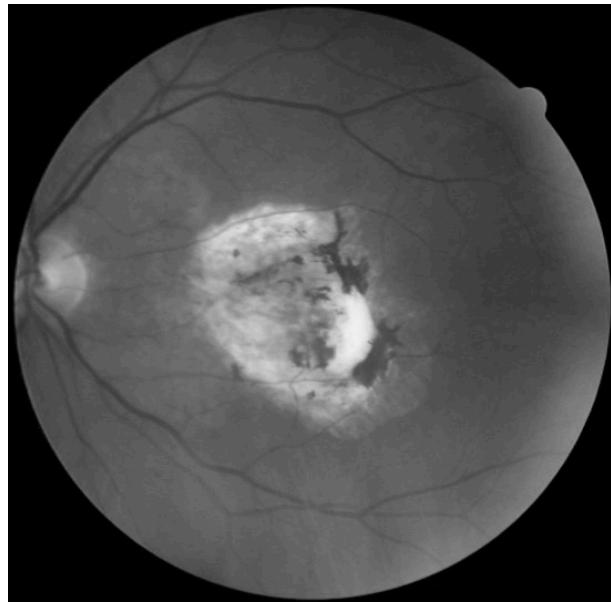
### **Neovascular or exudative AMD**



**1. Low concentrations**

**2. Limited half-life (4-8 weeks)**

**3. Still side-effects**

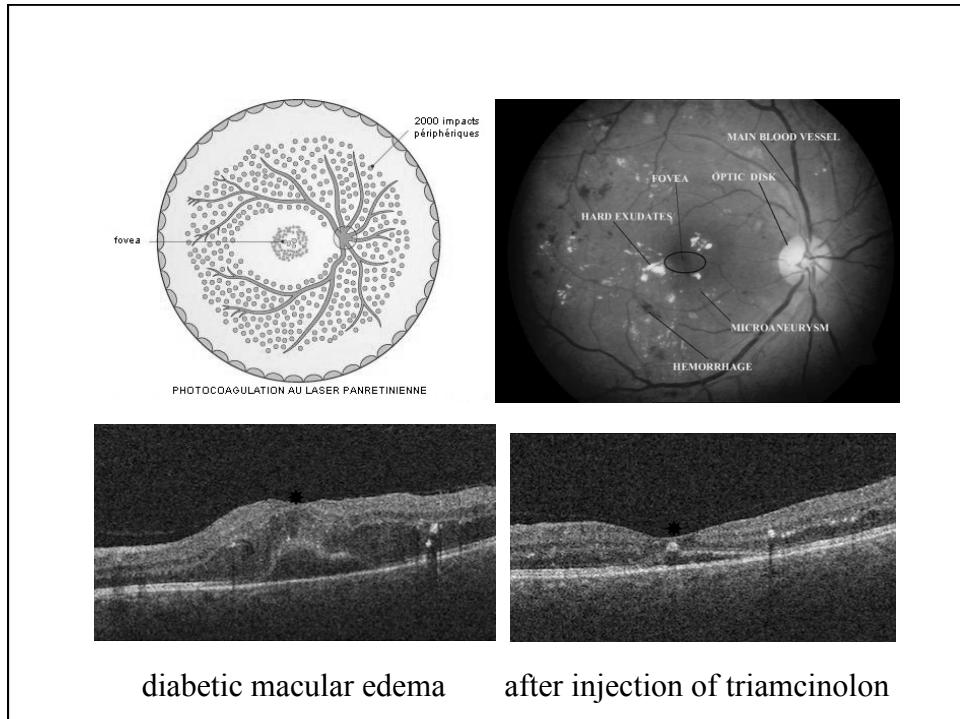


**Advanced stage = disciform scar**

## Cataract surgery bad visual prognosis

1. Retinal pathology
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  - Diabetic retinopathy
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## Cataract surgery bad visual prognosis

### 1. Retinal pathology

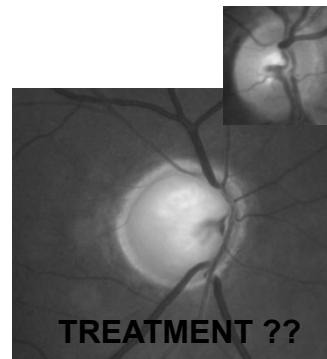
- AMD
- Diabetic retinopathy
- Retinal vasculopathy



## Cataract surgery bad visual prognosis

### 2. Optic nerve pathology

- Chronic glaucoma
- Optic neuropathy
  - Ischemic
  - Horton's disease



### Incidence of glaucoma in different age groups

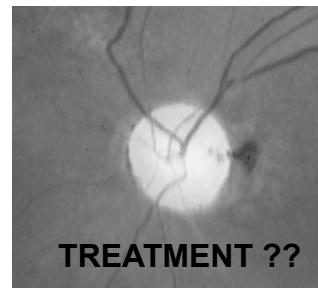
Glaucome chronique à angle ouvert fréquence (%)		
Age	caucasiens	afro-américains
40-49	0.18 (543)	0.95 (632)
50-59	0.32 (618)	3.58 (699)
60-69	0.77 (915)	5.05 (614)
70-79	2.85 (631)	7.74 (349)
80	1.94 (206)	10.89 (101)
Total	1.10 (2913)	4.18 (2395)

X 10

## Cataract surgery bad visual prognosis

### 2. Optic nerve pathology

- Chronic glaucoma
- Optic neuropathy
  - Ischemic
  - Horton's disease



TREATMENT ??

## Conclusion

- Many problems arise with increasing age
- A few may be treated
  - depending of the correct and full diagnosis
  - depending of the systemic context