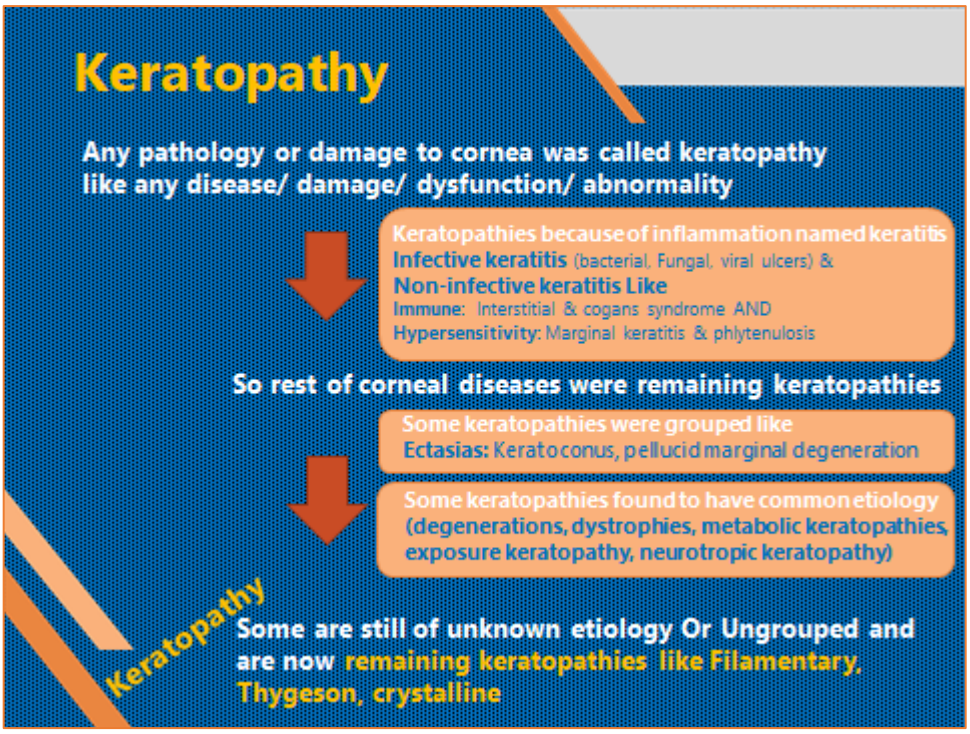
2.2 Cornea: Keratopathies

Plan

Red in module Red eye

Black in module decrease vison

Anatomy
General terms
Keratopathy
- Inflammatory (Keratitis)
  - Infective (Bacterial, fungal, viral & amoeba ulcers)
  - Non infective (Immune & hypersensitivity)
- Corneal ulcer treatment
- Corneal ulcer complications & their management
- Ectasias: (Keratoconus; Etiology, Features, Investigations, Treatment- keratoplasty)
- Dystrophies
- Degenerations
- Metabolic keratopathies
- Exposure keratopathies
- Neurotropic keratopathies
- Ungrouped keratopathies



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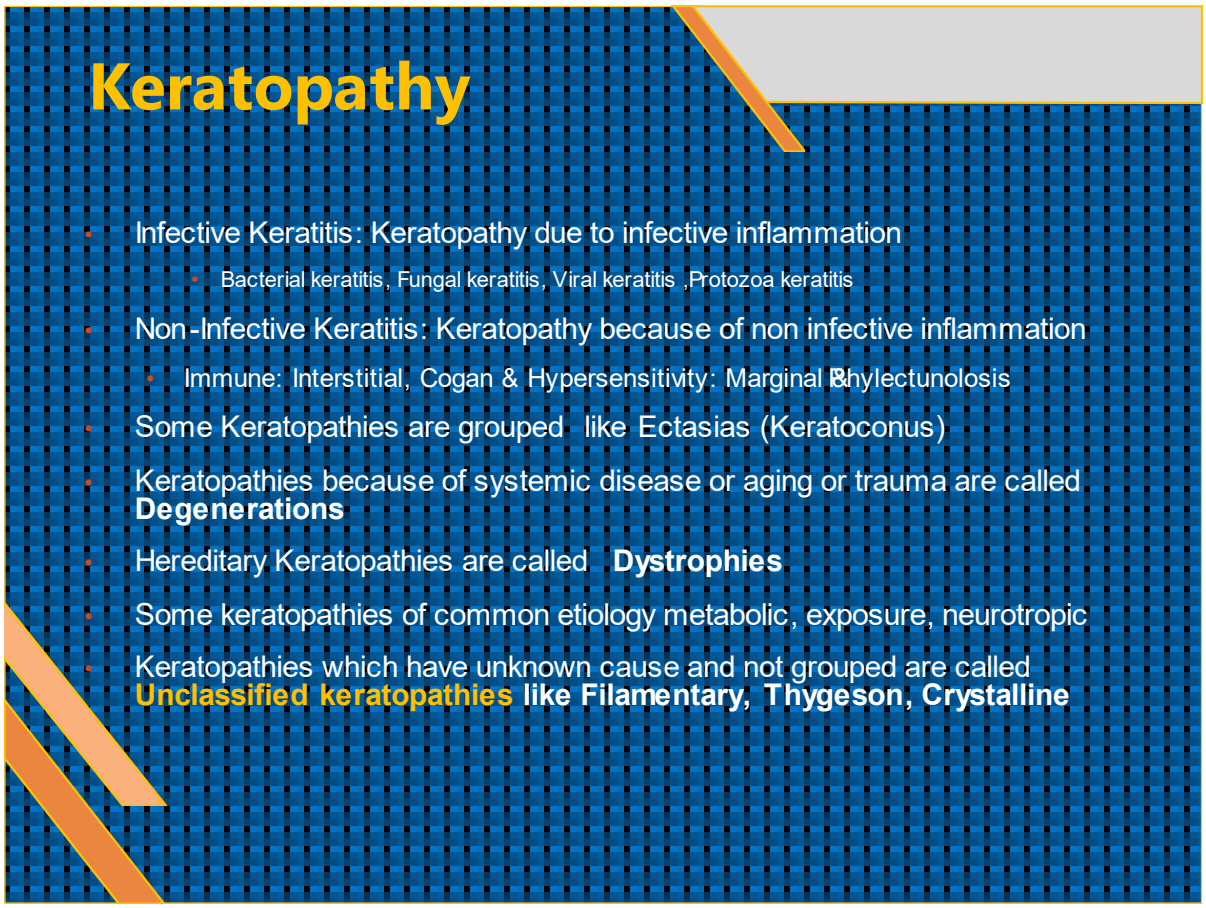
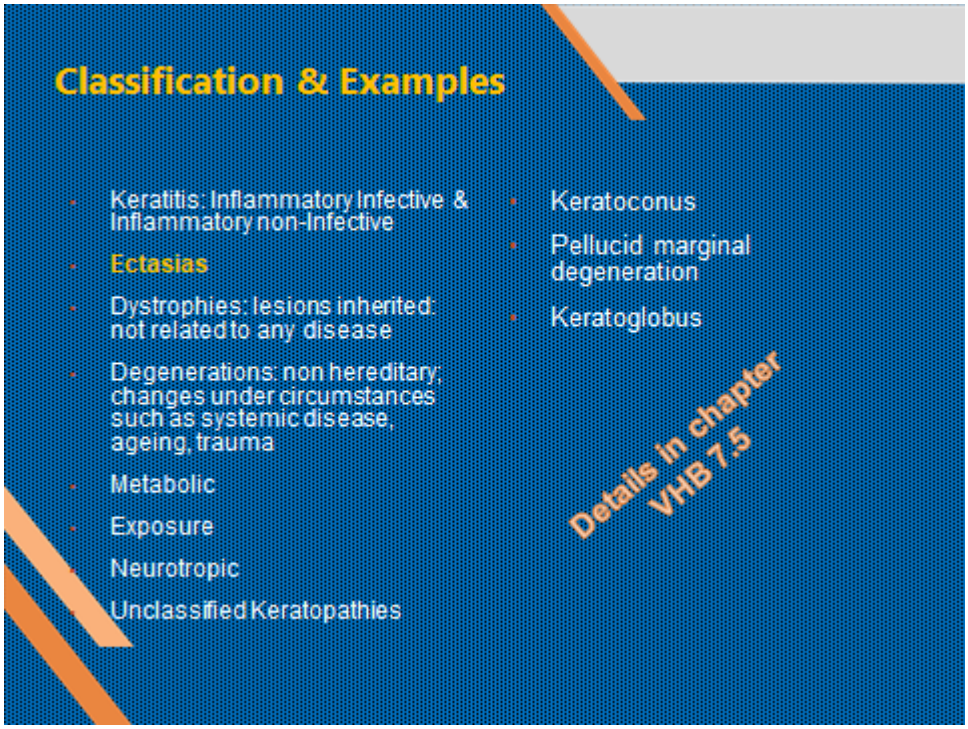
Keratopathy is any pathology, disease, dysfunction or abnormality of cornea

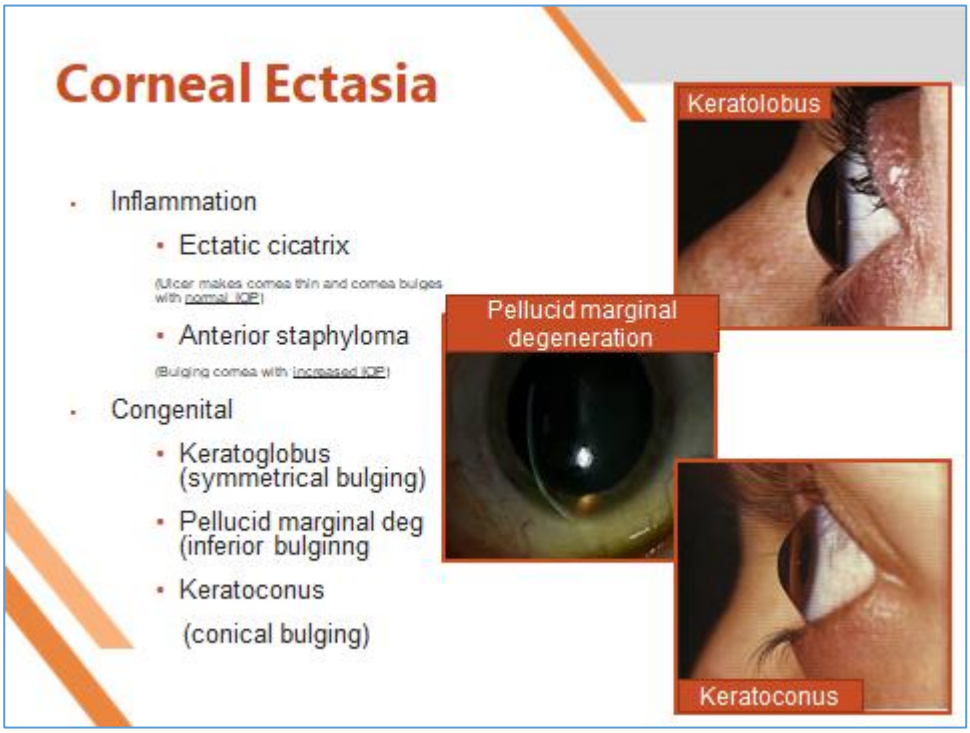


General terms:

Keratopathy: Any disease, damage or pathology of cornea was initially called keratpathy.
Keratitis: Keratopathy because of inflammation is called keratitis. Keratitis may be infective (bacterial, fungal, viral or amoeba) or non-infective (Immunogenic or hypersensitivity).
Corneal ulcer: Usual clinical name for infective keratitis like bacterial ulcer, fungal ulcer and viral ulcer.

Ectasias: Keratopathies causing protrusion of cornea





Keratoconus

Introduction

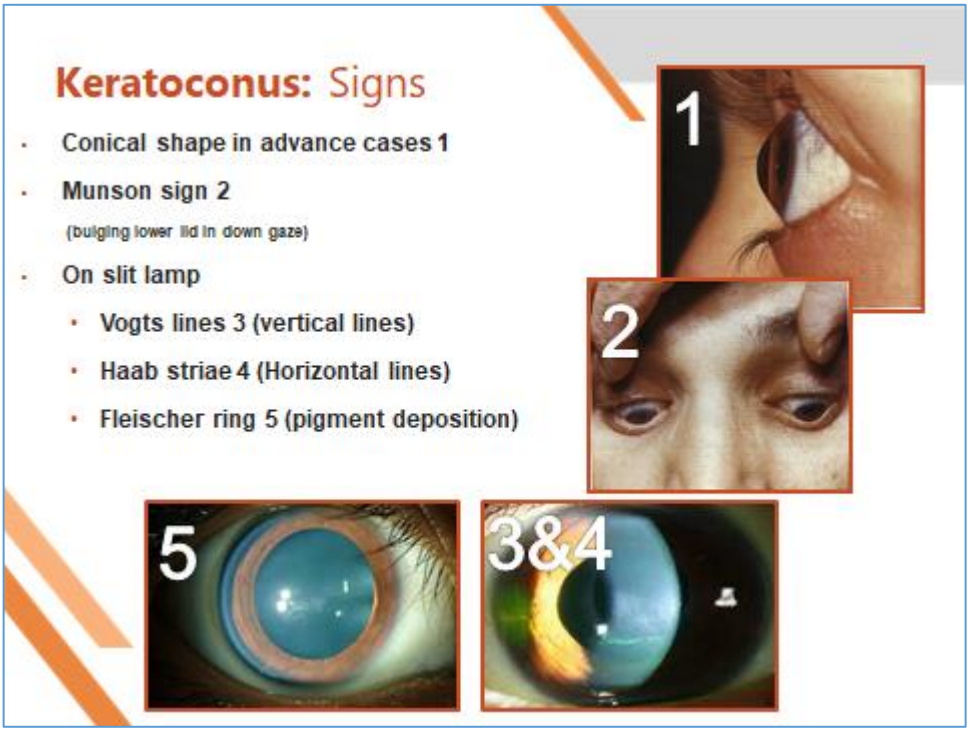
Keratoconus presents in early teens or twenties.
It is progressive thinning of central or paracentral cornea.
Usually, one eye is involved followed by other eye.
Keratoconus occurs mostly without systemic involvement but It is also associated with systemic diseases like Downs's syndrome, Marfan's syndrome and Ehlers-Danlos syndrome and also associated with ocular diseases like vernal keratoconjunctivitis, blue sclera, retinitis pigmentosa and aniridia.

Etiology

Exact etiology is not known but defective collagen causes weakness of cornea which results in bulging forward of cornea which is called keratoconus.

Symptoms & signs

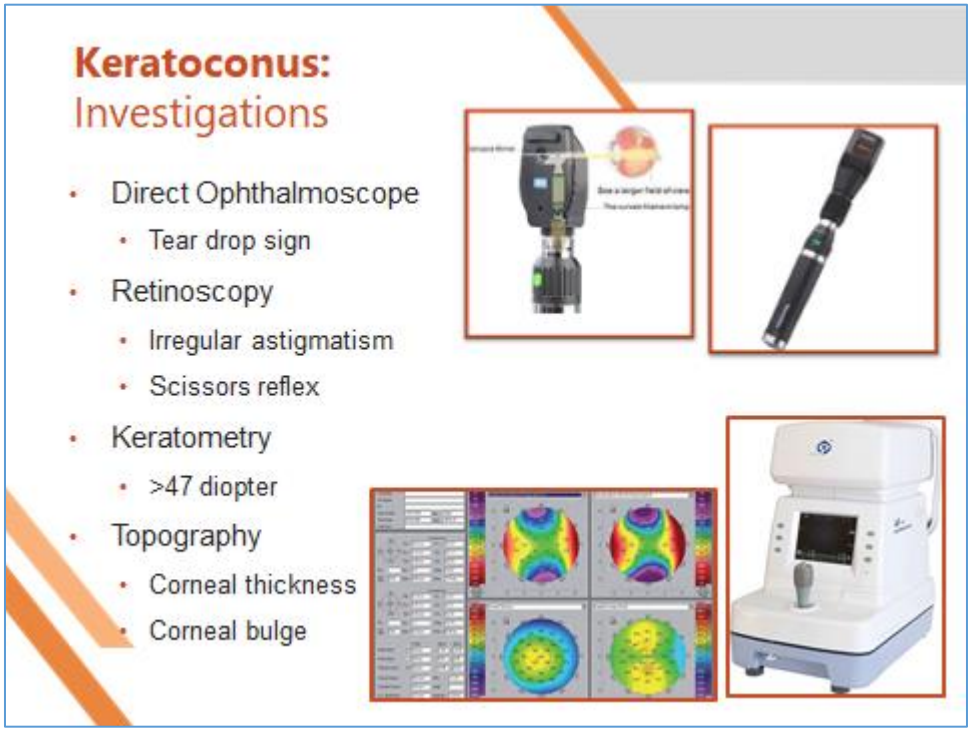
1. Less than normal visual activity
2. Frequently changing glasses prescription
3. Irregular astigmatism



Investigations

Direct ophthalmoscope and retinoscopy are clinical tests.
Best investigation is corneal topography.
Corneal topography has four colored maps.
Parameters to look for on topography are

- Red colors on map show abnormality
- Increased anterior elevation
- Increased posterior elevation
- More than 470 micron thin cornea
- K-max more than 47 diopter



Treatment

Treatment of keratoconus may be one of following or combination of following.

1. Glasses: Glasses are simple answer to keratoconus in early cases. Astigmatism is usually unstable and keeps changing.

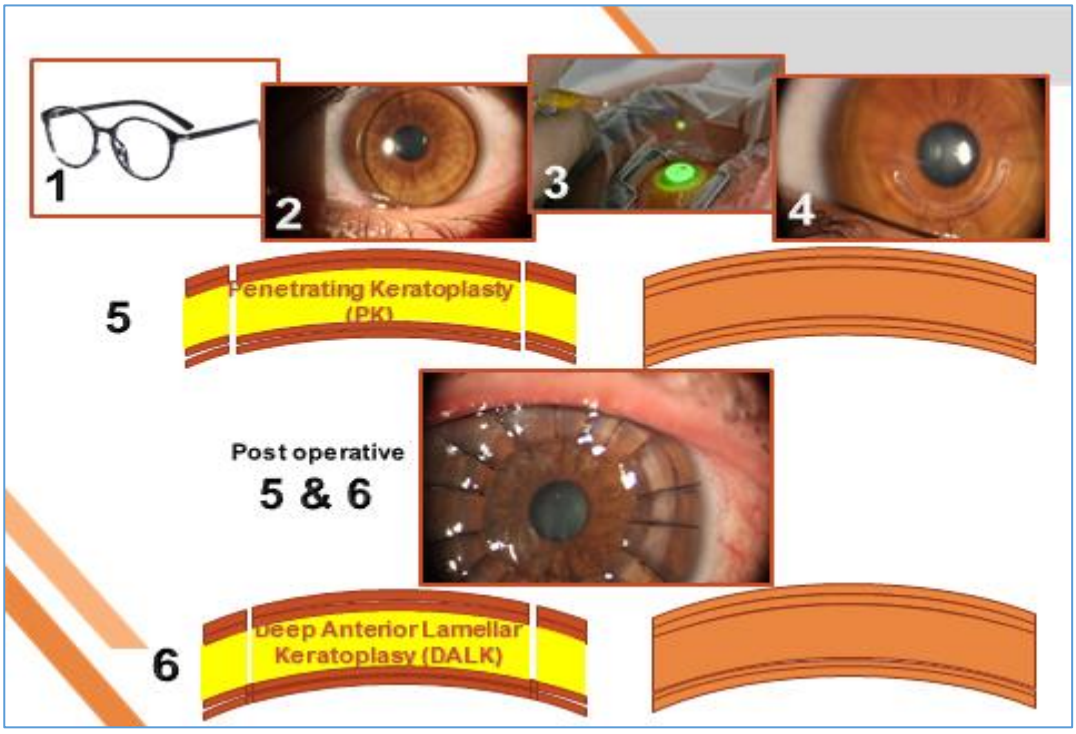
2. Contact lenses: When glasses do not work properly because of irregular astigmatism then contact lenses may be tried. Contact lenses are soft and hard. Initially soft contact lenses are tried which easy and comfortable to wear. Hard contact lenses are next option.

3. Collagen cross linking (CXL): Keratoconus is progressive disease because of defective collagen which weakens cornea. To strengthen cornea CXL procedure is done. It involves putting riboflavin eye drops on cornea. Then ultraviolet light is focused on cornea which causes cross linking of collagen fibers and hence strengthens cornea.

4. Intra stromal ring segment: These are half circle rings which are surgically placed in corneal stroma to improve vision by making cornea regular.

5. Penetrating keratoplasty (PK): PK is replacing all five layers of cornea. It is further explained in keratoplasty section.

6. Deep anterior lamellar keratoplasty (DALK): Pathology is cornea stroma and ALK replaces top three layers with donor tissue. It is latest surgery and carries less risk of rejection.



Keratoplasty

Definition

Keratoplasty is replacing abnormal host cornea with healthy donor cornea.
There are different indications for replacing cornea.

Indications

1. Optical Keratoplasty:

Optical Keratoplasty is only to improve vision like in keratoconus, corneal dystrophies, endothelial decompensation.

2. Therapeutic Keratoplasty:

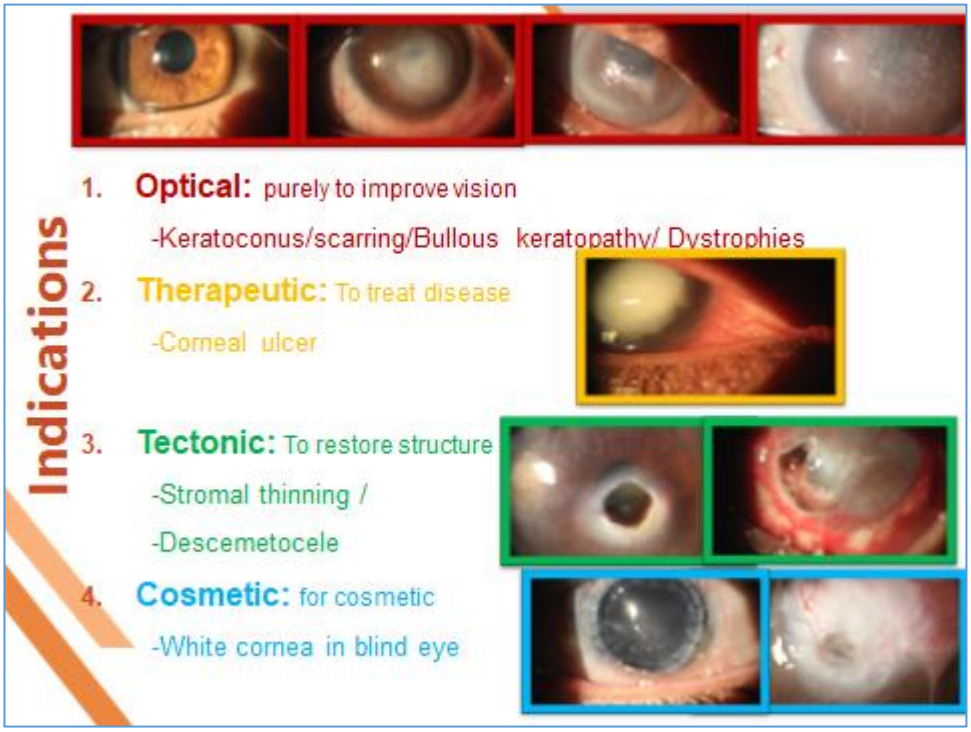
This is for therapeutic purpose like in non-responding corneal ulcer.

3. Tectonic Keratoplasty:

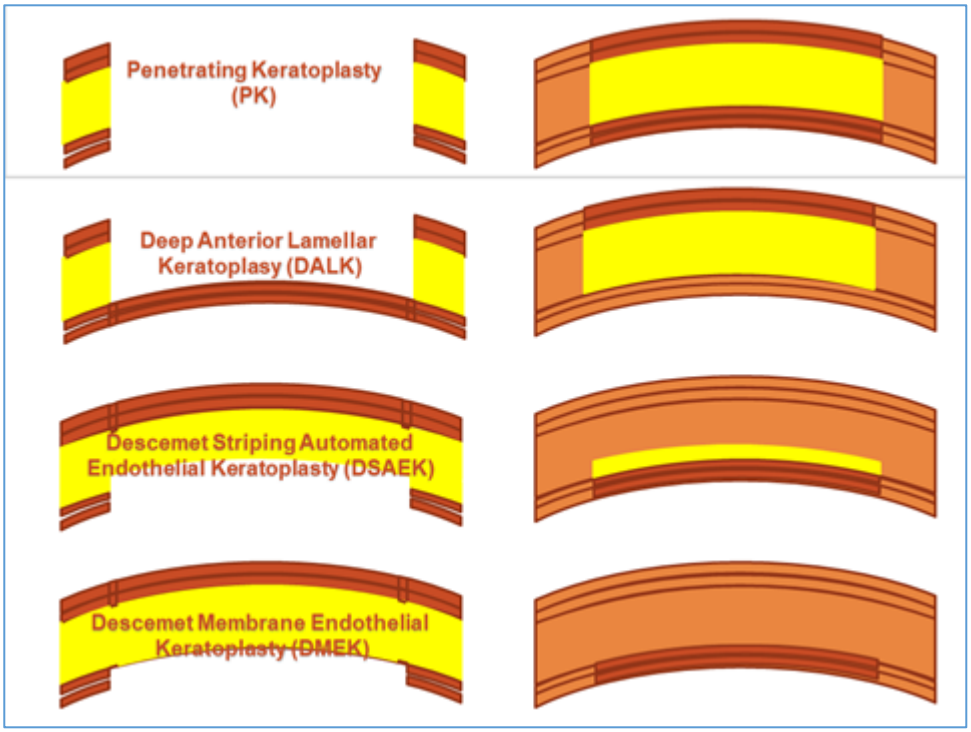
This is regain integrity of eye ball in corneal perforations or threatening perforations like in descematocele and stromal thinning.

4. Cosmetic Keratoplasty:

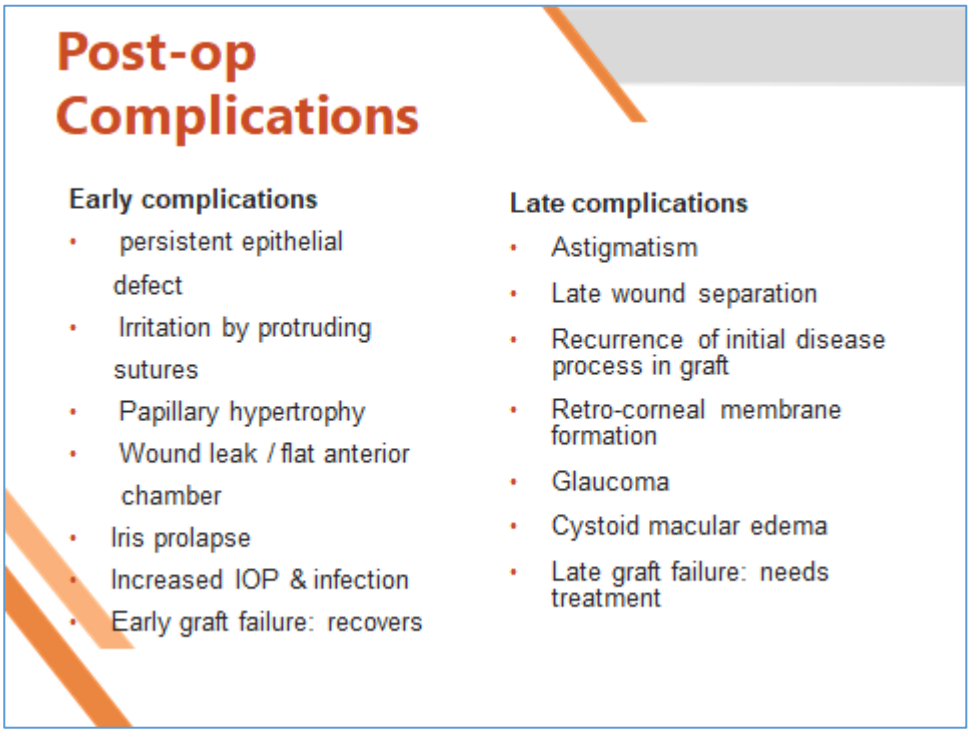
In cosmetic Keratoplasty white scarred cornea is replaced with transparent cornea only to improve cosmetic look. It is neither for improving vision nor for therapeutic or tectonic purpose.



Types of keratoplasty

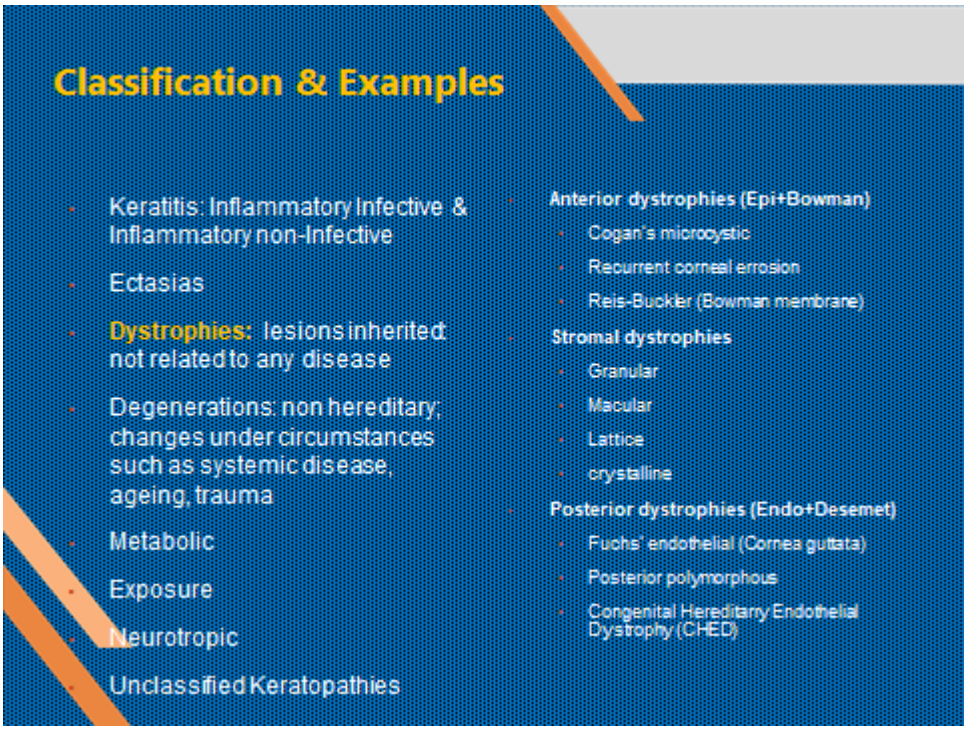


Postoperative complications



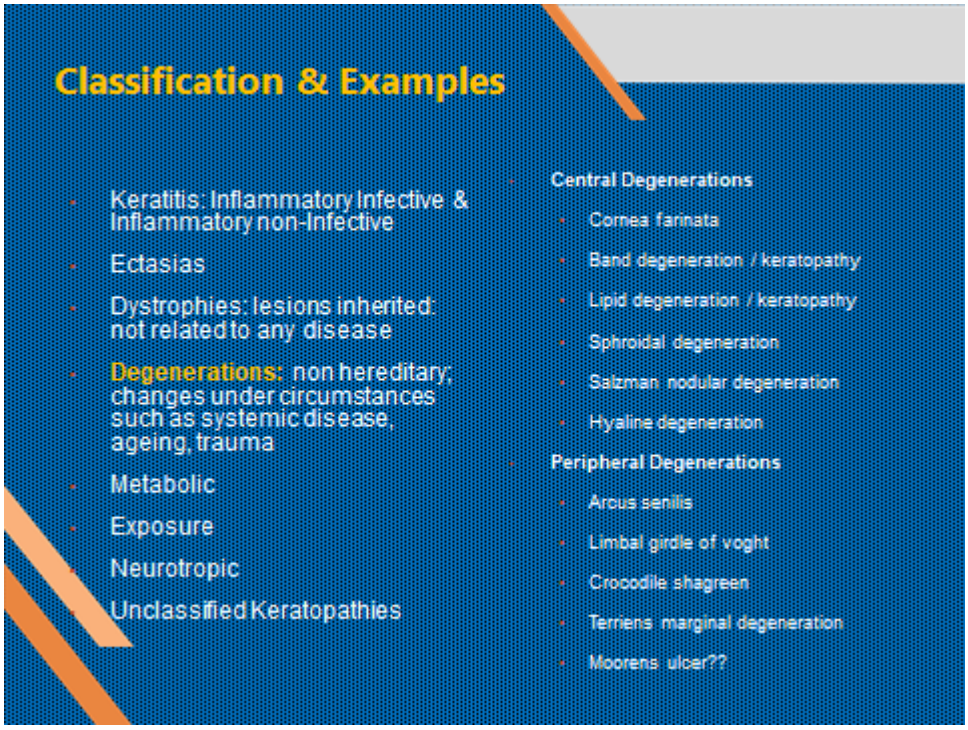
Dystrophies: Inherited keratopathies

This is a group of corneal dystrophies which are inherited and associated with disease.
Dystrophies are classified in to **anterior, stromal and posterior dystrophies**.
Anterior dystrophies involve epithelium and bowman membrane.
Stromal dystrophies involve corneal stroma.
Posterior dystrophies involve descemet membrane and endothelium
Treatment depends on vision and symptoms.
In early disease nothing needs to be done but in advanced cases Keratoplasty in done to replace diseased tissue with healthy tissue.



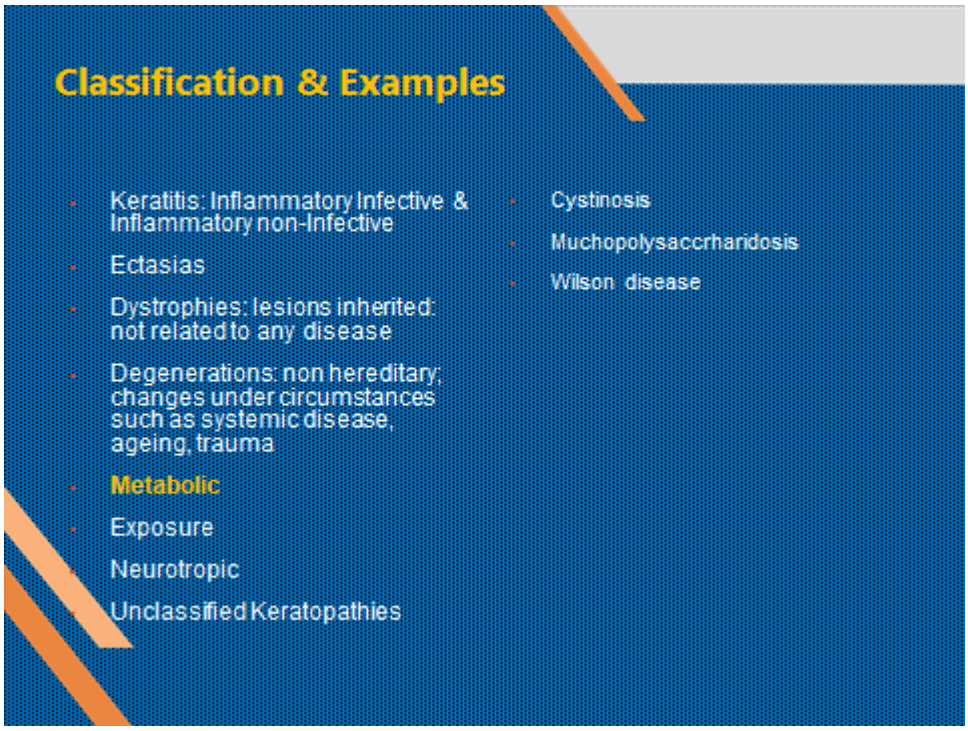
Degenerations: Keratopathies under circumstances

This is group of keratopathies which is Keratopathy because of local or systemic circumstances or aging or trauma.
Depending on location degeneration are classified in to central and peripheral degeneration.
Treatment depends on location and severity.
Peripheral degeneration do not obstruct vision so do not need treatment.
Central degenerations my need keratoplasty.



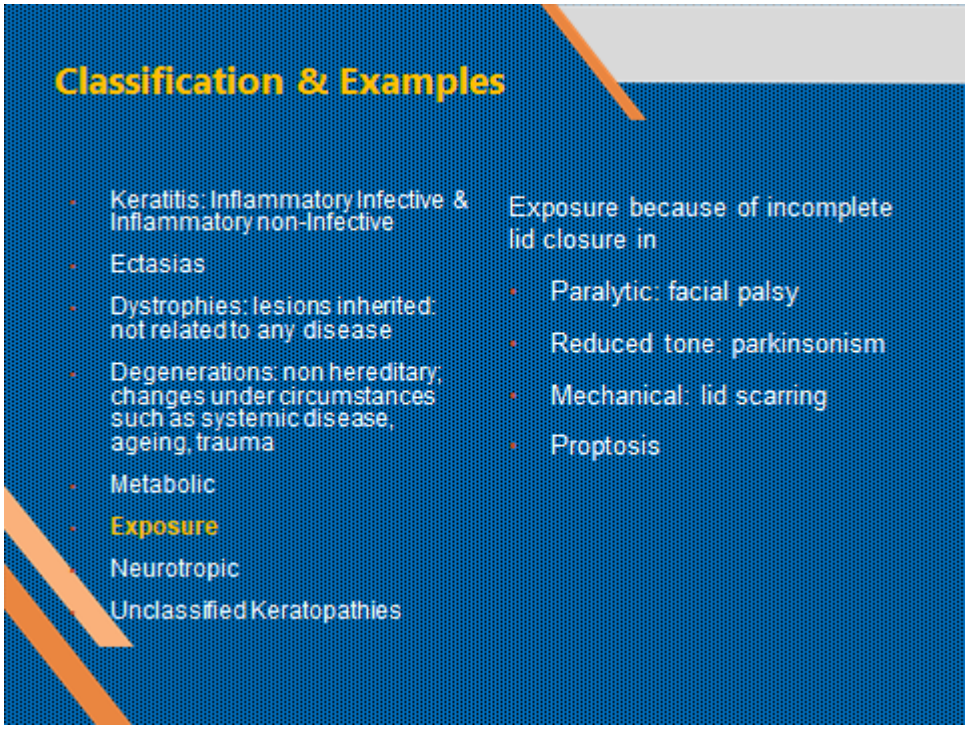
Metabolic Keratopathy because of metabolic diseases

This group of keratopathies is because of metabolic diseases. Metabolic diseases cause deposit of metabolic materials in cornea.
Treatment is treating cause. No specific eye treatment usually needed.



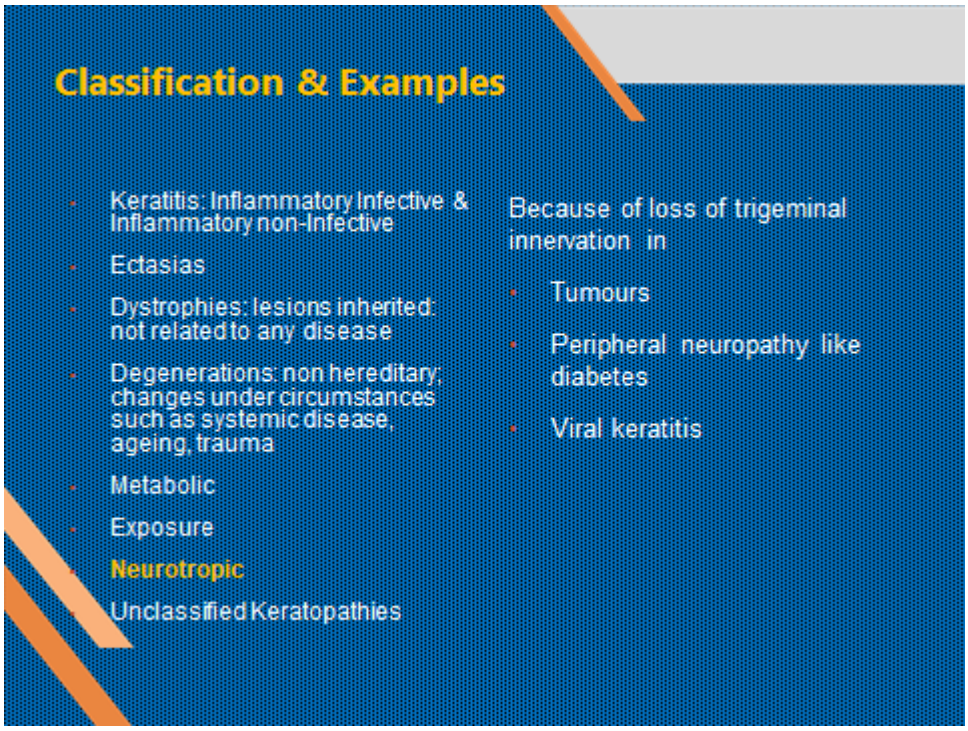
Exposure Keratopathy because of exposure

This is group of keratopathies because of exposure of cornea.
It occurs when lids cannot close in diseases like facial palsy or when cornea is protruded out in proptosis.
Treatment is lubrication of cornea and closing lids.



Neurotropic keratopathies because of sensory loss

This group of keratopathies is because of loss of corneal sensations. This happens in lesions or diseases which cause damage to sensory trigeminal nerve.
Treatment is usually treating cause and lubrication.



Ungrouped keratopathies

This group of keratopathies is those keratopathies which can not be grouped on basis of inheritance (dystrophies), circumstances (degenerations), metabolic disease (metabolic diseases), exposure of cornea (exposure Keratopathy), loss of sensation (neurotropic). These remaining ungrouped keratopathies are filamentary Keratopathy, thygeson Keratopathy and crystalline Keratopathy.