immune corneal ulcers

a deeper look into corneal tissue reaction

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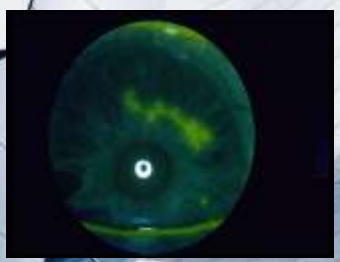
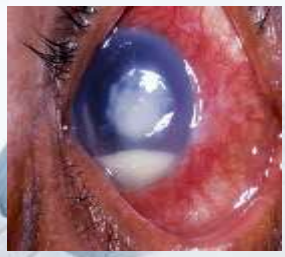
Typical ulcers

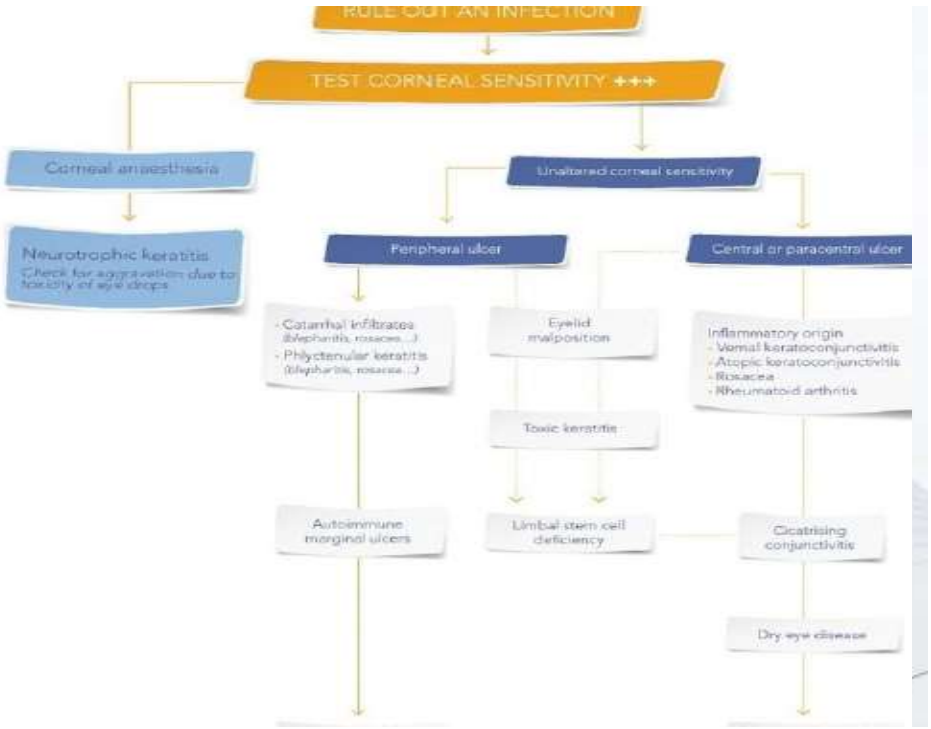
- Rapid treatment response
- Classical appearance



Atypical ulcers

- PED after cataract or refractive surgery
- Negative culture
- Stromal infiltration more than epi defect
- Post surgical corneal ulcer

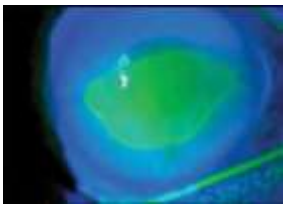


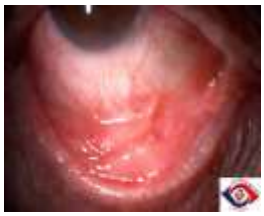
Systemic autoimmune vasculitic diseases	Rheumatoid arthritis
	Wegener granulomatosis
	Systemic lupus erythematosus
	Polyarteritis nodosa
	Sjögren syndrome
Dermatological disorders	Acne rosácea
	Cicatricial pemphigoid
	Stevens–Johnson syndrome
Inflammatory bowel disease	Crohn disease
Local ocular immunity	Mooren ulcer

PUK = peripheral ulcerative keratitis.

Presentation

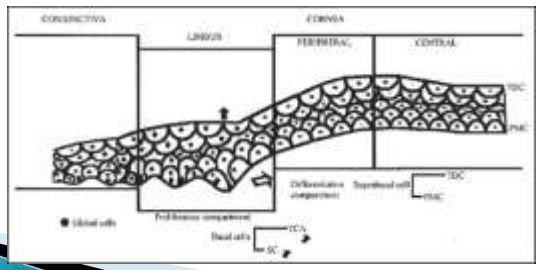
crescent-shaped inflammatory damage , epithelial defect and the destruction of the peripheral corneal stroma that occurs in the limbal region of the cornea.



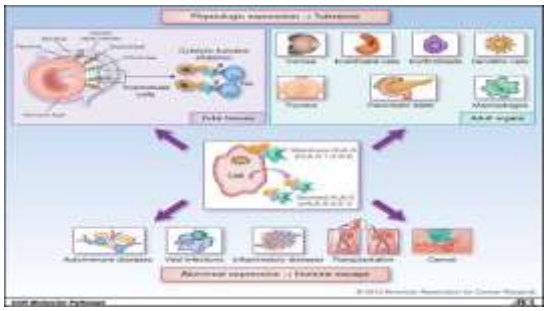


Why peripheral?

Peripheral cornea, unlike the avascular central cornea is vascularized and available for the deposition of circulating immune complexes via the capillary network……the pathological manifestations are more likely to be present in the periphery..



Macrophages express human leukocyte antigen DR (HLA-DR) in the corneal matrix, facilitating the direct antigenic stimulation and/or production of local inflammatory mediators.



Pathogenesis

Both cell mediated and humoral immune response

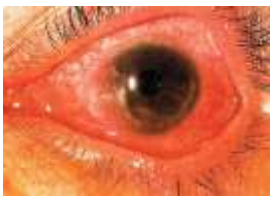
Autoantigens lead to the activation of antigen-specific T and B cells, Then, immune complexes and cytokines are formed.

collagenases and other proteases eventually contribute to damage in the joints and on the ocular surface

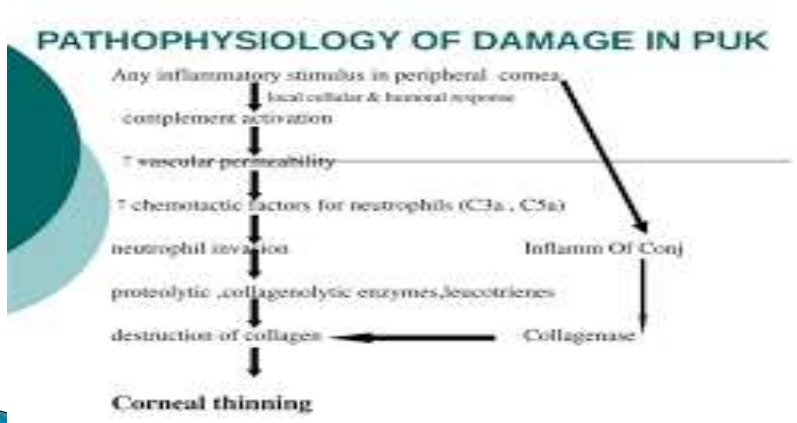
Reactions to corneal antigens, circulating immune complex deposition, and hypersensitivity reactions to exogenous antigens are mechanisms implicated in the pathogenesis of PUK.

A hypersensitivity reaction to exogenous antigens induces catarrhal infiltrate, marginal ulcer, and phycten development, and has a more favorable prognosis than immune disease-related PUK





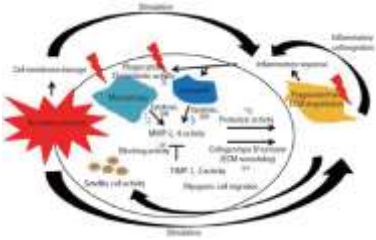
- The vascular architecture of the limbus is suitable for accumulation of IgM, the first component of complement cascade C1, and other high molecular weight molecules and immune complexes in the limbus and corneal periphery. Deposition of immune complexes activates the classical pathway of the complement system, which in turn results in chemotaxis of inflammatory cells, in particular, neutrophils and macrophages in the peripheral cornea. causing dissolution and degradation of the corneal stroma.



Role of MMPs

imbalance between MMPs and their tissue inhibitors (TIMPs) contributes to disease progression

TIMP, which inhibits collagenase activity and tissue destruction, was deficient when there was a lesion in the cornea



MMP-1 can clear fibrillar type I collagen, the major component of the corneal stroma and is correlated with corneal perforation in patients with PUK.
MMP-2 secreted by corneal keratocytes and MMP-9 secreted by cells from the lacrimal gland, the conjunctival epithelium, the corneal epithelium itself, or invasive inflammatory cells.it hydrolyses type IV collagen, the major component of basement membranes

These enzymes could be produced by invasive inflammatory cells conveyed from the neovascularization located in the limbic cornea

TREATMENT

Mainly systemic treatment

- oral prednisone
  - initial dose of 1 mg/kg/day to reduce inflammation rapidly
  - taper prednisone to a 20 mg/day dosage over the second week, with a subsequent slower tapering of drug over subsequent weeks
- Patients not responsive to oral prednisone may benefit from high-dose intravenous pulse methylprednisolone 1 g per day for 3 consecutive days followed by oral therapy

Immunosuppressive drugs :

Indications:

- in resistent cases of scleritis or keratitis,
- Relapse on withdrwal of steroids to avoid long term systemic side effect of steriod

Antimetabolites

include methotrexate, azathioprine, mycophenolate mofetil, and leflunomide

Oral methotrexate (15 mg/week)

Azathioprine (1–2.5 mg/kg/day)

The T-cell inhibitor :

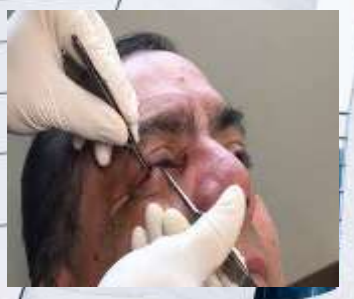
ciclosporin A

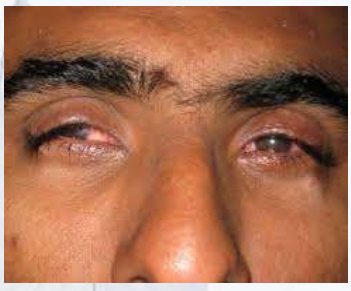
Topical and systemic

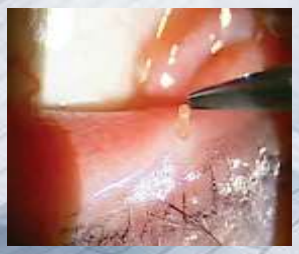
Topical treatment

topical

surgery







surgeries


THANK YOU!