Corneal Emergencies

Key Points
1. Corneal anatomy: Epidermal layer → stroma → Descemet’s membrane → endothelium
2. Indolent ulcers (and especially spontaneous chronic nonhealing ulcers) require debridement and time for recovery
3. Surgical intervention
   a. Progressive stromal ulcers >50% depth of the cornea
   b. Desemetocoele
   c. Most corneal perforations
   d. Most corneal lacerations
   e. Penetrating corneal foreign bodies

1. Corneal anatomy

Fig. 1. Diagram of a canine cornea consisting of (A) tear film layer, (B) epithelium, (C) stroma, (D) Descemet's membrane, (E) endothelium, and (F) limbus.
2. Indolent ulcers
Dry Q-Tip debridement: https://youtu.be/smwhxp1fYRM
Grid keratotomy: https://youtu.be/WFVU7iAvZIU
Diamond burr debridement: https://youtu.be/flzNu18f1XA

Ulcer healing takes 2-3w, though normal adhesion complexes are not formed for at least 1 year

3. Surgical intervention
   a. Progressive stromal ulcers >50% depth of the cornea
   b. Desemetocle
      i. Conjunctival graft, synthetic graft, corneal transposition graft
   c. Most corneal perforations
      i. If perforation >1-2mm, iris prolapse, leakage of the anterior chamber
   d. Most corneal lacerations
      i. If a stable fibrin plug is present, surgery may not be needed
   e. Penetrating corneal foreign bodies
      i. General anesthesia and a surgical microscope are recommended as leakage of the anterior chamber is likely and sutures may be necessary
Questions
1. Fill in the blank:
   The __________ layer is the thickest layer of the cornea, and takes up __________ stain readily.
2. T/F: Descemet’s membrane is the deepest layer of the cornea.
3. Indolent ulcers require ________, and are expected to heal in ________ with appropriate concurrent medical therapy
   a. Surgical intervention, 1-2 weeks
   b. Bacterial/fungal culture and sensitivity, 2-3 weeks
   c. Blunt debridement, 2-3 weeks
   d. Sharp debridement, 6-8 weeks
4. T/F: A 6 month old male castrated mixed breed dog presents to you following altercation with a cat: you note his left eye has a mild presence of hyphema and a punctate (0.5mm) perforation in the central corneal with no discharge and a stable lens. Your recommendation is for emergency Ophthalmology evaluation.

Answers
1. Fill in the blank:
   The STROMAL layer is the thickest layer of the cornea, and takes up FLUORESCEIN stain readily.
2. FALSE: Descemet's membrane is the deepest layer of the cornea.
3. Indolent ulcers require BLUNT DEBRIDEMENT, and are expected to heal in 2-3 WEEKS with appropriate concurrent medical therapy
4. FALSE: A 6 month old male castrated mixed breed dog presents to you following altercation with a cat: you note his left eye has a mild presence of hyphema and a punctate (0.5mm) perforation in the central corneal with no discharge and a stable lens. Your recommendation is for emergency Ophthalmology evaluation.