



What Do Neuropathologists Need to Know About Ophthalmology?

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Case-Based Questions (please see page 3 for answers)

1.	In which of the following corneal transplant procedures is a bubble artifact typically seen histopathologically in the corneal stroma?
a.	Penetrating keratoplasty (PK)
b.	Deep anterior lamellar keratoplasty (DALK)
c.	Descemet's membrane endothelial keratoplasty (DMEK)
d.	Descemet's stripping endothelial keratoplasty (DSEK)
e.	Descemetorhexis without endothelial keratoplasty (DWEK)

2.	Silicone oil can be found histopathologically in ocular tissues after which of the following procedures?
a.	Phacoemulsification with intraocular lens implant
b.	Penetrating keratoplasty
c.	Retinal detachment repair with pars plana vitrectomy
d.	Trans-scleral fine needle aspiration of a choroidal mass
e.	Trabeculectomy for glaucoma

3.	Corneal stromal deposits in Granular Corneal Dystrophy Type 2 (formerly Avellino dystrophy) can be identified with which of the following special stains:
a.	Alcian blue and colloidal iron
b.	Von Kossa
c.	Congo Red
d.	Masson Trichrome
e.	Congo Red and Masson Trichrome

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Correct Answers and Rationales

Question 1 Correct Answer and Rationale: B. Deep anterior lamellar keratoplasty (DALK)

Rationale: DALK is a partial-thickness corneal transplant where the anterior corneal structures (corneal epithelium, Bowman's layer and most of the corneal stroma) are dissected free from the deeper corneal stroma, Descemet's membrane and corneal endothelium, typically with the aid of an air bubble. An artifact of trapped air bubbles is typically seen in the corneal stroma of a DALK specimen. Answer (a) Penetrating keratoplasty (PK) is not the best answer. A PK is a full-thickness corneal transplant where the cornea is incised with a trephine. An air bubble artifact is not typically seen, except in the situation where a planned DALK procedure was aborted and converted to PK due to the DALK air bubble perforating through the posterior corneal structures. Answers (c and d) are not correct because in these procedures Descemet's membrane is manually stripped from the posterior aspect of the cornea before transplanting tissue. Answer (e) is not correct because in a DWEK procedure no tissue is transplanted.

Question 2 Correct Answer and Rationale: C. Retinal detachment repair with pars plana vitrectomy

Rationale: There are several approaches to correcting a retinal detachment. In one approach a scleral buckle is attached externally to the eye. In other approaches a pars plana vitrectomy is performed, after which the retina is flattened, sometimes lasered and then either air or silicone oil is injected into the vitreous cavity to keep the retina in place. When silicone oil is instilled in the eye, even after removal, evidence of oil can subsequently be found in various ocular tissues. Bubbles can be seen within the retina, the ciliary body, the optic nerve, conjunctiva and even the subcutaneous eyelid tissues. Answers (a, b, d and e) are incorrect because silicone oil is not used in these surgical procedures.

Question 3 Correct Answer and Rationale: E. Congo Red and Masson trichrome

Rationale: Granular corneal dystrophy Type 2 (GCD2) (Avellino dystrophy) is characterized by corneal stromal deposits that have clinical and histopathologic features of both Lattice corneal dystrophy type 1 (LCD1) and Granular corneal dystrophy type 1 (GCD1). The corneal stromal deposits in GCD2 stain bright red with the Masson trichrome stain and also stain positively with Congo red, with apple-green birefringence. Answer (a) is incorrect because Alcian blue and colloidal iron will stain nonsulfated glycosaminoglycan corneal stromal deposits that are seen in Macular corneal dystrophy. Answer (b) is incorrect because von Kossa stain will highlight calcium deposits, which are not present in GCD2. Calcium deposits can be seen in Bowman's layer of eyes that clinically display band keratopathy. Answer (c) is not the best answer. Although Congo red will highlight deposits in GCD2, it will also highlight deposits in LCD1. Deposits in LCD1 will be negative with Masson trichrome. Answer (d) is not the best answer. Although Masson trichrome will highlight deposits in GCD2, it will also highlight deposits in GCD1. Deposits in GCD1 will be negative with Congo red.