

Examination for MD Degree in:

Commentary

October-2016

Time allowed: one hour



Tanta University

Faculty of Medicine

Department of Ophthalmology

Comment on the following case study:

12 years old boy was admitted to the hospital with low grade fever, vomiting and diabetic ketoacidosis. He had omitted insulin dose the previous day. 2 days later he developed a pea-size swelling near the left medial canthus with slight pain and tenderness. After another 2 days he developed ptosis Visual acuity and fundus were normal. On 15th day x-ray revealed cloudy ethmoidal sinuses. He was diagnosed as a case of ethmoiditis and was treated with oral antibiotics for one week without improvement.

On the 21st day he complained of sudden diminution of vision of left eye and was transferred to the Eye clinic. Ocular examination revealed no perception of light and pupil was dilated. Direct reaction to light was absent but consensual reflex was present. In addition, he had full-blown left orbital apex syndrome (cranial nerves II, III, IV, V-1, 2), VI N palsy and infranuclear facial palsy. Fundus showed occlusion of the central retinal artery. Ophthalmodynamometry showed left ophthalmic artery insufficiency. Left preauricular lymph nodes were enlarged and tender. A small ulcer with cheesy greyish crust was seen on the septum of nose on left side. Lacrimal sac washings, conjunctival smear and scrapings from septum of nose and nasopharynx were taken. Gram, Geimsa, KOH and H&E staining were performed. Appropriate treatment was started immediately.

After one month of hospitalization, patient developed cord-like supraorbital and supratrochlear veins. A small and firm swelling, 10X5 mm with irregular margins and fixed to the underlying bone was felt in the superomedial rim of left orbit which increased in size and became fluctuant and tender and later burst forming a sinus. The patient was kept on the same regimen and Ampicillin capsule 500 mg 6 hourly for one week was also given. The sinus healed in 2 weeks' time. After three months, he was discharged. X-ray of paranasal sinuses was normal. Extraocular muscle movements became normal after one year and there was no residual facial palsy. Direct reaction to light in the left pupil was still absent. The retina showed degenerative changes consequent to the central retinal artery occlusion. Now 3 years after his treatment was stopped, the patient has had no relapses or complications.

Good Luck

Chairman of Department

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Tanta University
Faculty of Medicine

Doctorate degree
Basic sciences in Ophthalmology

Number of Questions: 4

Ophthalmology Dept.
18 October 2016



Answer the following questions:

- 1- Discuss the anatomy of ocular sulci. (25 marks)
- 2- Describe Optical principles of low vision aids. (25 marks)
- 3- Discuss the physiology of various drug absorption through ocular tissues and their passage through different ocular barriers. (25 marks)
- 4- Mention the pathology of posterior uveitis and microbiology of one of its common causative organisms. (25 marks)

Good Luck



All question should be attempted

Marks

- 1- Discuss differential diagnosis of masquerade syndrome. (15)
- 2- Summarize the role of optical coherence tomography (OCT) angiography in management of macular disorders. (15)
- 3- Describe the role of ultrasound biomicroscopy (UBM) in management of angle closure glaucoma. (15)
- 4- Describe the role of corneal biomechanical properties in management of chronic open angle glaucoma. (15)
- 5- Outline scleritis related to systemic disorders. (10)
- 6- Summarize differential diagnosis of quadrantanopia. (10)
- 7- Discuss in brief management of Fuchs' corneal dystrophy. (10)
- 8- Describe herpetic anterior uveitis. (10)

Good luck

Optics Examination
MD Degree in Ophthalmology
August 2016
Date: 5/10/2016
Time allowed: 3 hours
Total marks: 45 marks



ANSWER ALL QUESTIONS

ILLUSTRATE WITH DIAGRAMS WHENEVER APPLICABLE

Discuss the following: (6 Marks EACH)

1. Optical principle of polarization and clinical applications of prisms
2. Critical angle
3. Complications of high myopia
4. Douchrome test
5. High order aberrations

Multiple Choice Questions (0.5 Mark Each. Single answer applies)

1. The following is true about prisms:
 - a) They form real images of objects.
 - b) Light is deviated towards the apex.
 - c) Light with longer wavelength is deviated more than light with shorter wavelength.
 - d) The angle of the prism apex is called the refracting angle.

2. For an object situated between the center of curvature and the principal focus of a concave mirror, the image is:
 - a) Erect.
 - b) Virtual.
 - c) Magnified.
 - d) Found within the centre of curvature.

3. The focimeter:
 - a) Contains a collimating lens that converge the incoming light.
 - b) Uses green light to eliminate spherical aberration.
 - c) Contains a telescope system for viewing.
 - d) Gives a ring of dots if the lens has no cylindrical power.

4. The following is true about the prismatic effect of lenses:
 - a) If the optical center of a myopic lens is moved nasally, a base out prism will be induced.
 - b) If the optic center of a myopic lens is moved inferiorly, a base down prism will be induced.
 - c) If the optic center of a hyperopic lens is moved temporally, a base in prism will be induced.
 - d) If the optic center of a hyperopic lens is moved superiorly, a base down prism will be induced.

5. The following prescription has against-the-rule astigmatism:
 - a) $+1.00 / -0.25 \times 180$.
 - b) $+1.00 / -0.25 \times 90$.
 - c) $+1.00 / -0.25 \times 135$.
 - d) $-1.00 / +0.25 \times 90$.

6. Jackson's cross cylinder:
 - a) Does not alter the spherical equivalent of an ametropic eye.
 - b) Does not blur the image when placed before an emmetropic eye.
 - c) Does not change the interval of Sturm.
 - d) Is used to check the power of cylinder before its axis.

7. The Hruby lens:

- a) Is a powerful biconcave lens.
- b) Gives a virtual, erect and diminished image.
- c) Requires a coupling solution in order to visualize the retina.
- d) Forms retinal image between the lens and the observer.

8. The following is true about anti-reflective coatings:

- a) The principle of destructive interference applies to anti-reflective coatings.
- b) They cause the lenses to grow dark in bright light.
- c) They absorb ultraviolet light.
- d) They can only be used on plastic lenses.

9. Spherical aberration in human eye is reduced by the following:

- a) The cortex of the lens has a higher refractive index than the nucleus.
- b) The lens has variable anterior surface curvature.
- c) The anterior surface of the cornea is flatter peripherally than centrally.
- d) The vitreous reduces spherical aberration.

10. The crystalline lens:

- a) Has an in-situ effective power less than its power in air.
- b) Contributes more power than the cornea towards the refraction of the eye.
- c) If extracted without implant can correct myopia that needs spectacle correction of -15.00D.
- d) Has a uniform refractive index.

Multiple Choice Questions (1 Mark each. Multiple answers apply)

1. During retinoscopy:

- a) Low power trial lenses should be placed at the back of the trial frame, high power lenses at the front.
- b) The examiner should take care not to obstruct the view of the distant fixation object.
- c) It is always necessary to use a +1.5 DS lens in the trial frame before starting retinoscopy.
- d) The "with" movement of the retinoscopy reflex should be corrected with convex lenses.
- e) The power of the cylinder must be corrected first.

2. The following statements are true about gonioscopy:

- a) Gonioscope contact lenses overcome total internal reflection by neutralizing the cornea/air refracting surface.
- b) Gonioscopes contain plain mirrors.
- c) The Zeiss goniolens is used with a viscous coupling agent.
- d) The Goldman gonioscope has a curvature flatter than the cornea.
- e) The Koeppe goniolens is an indirect goniolens.

3. For a particular patient, A-scan biometry and keratometry were performed before cataract surgery, and IOL was selected with the intention of producing emmetropia:

- a) If the axial length was under-estimated by 1.0 mm, the patient would be about 1 D myopic following surgery.
- b) If the IOL was placed posterior to the desired position, the patient would be hyperopic following surgery.
- c) If an appropriate anterior chamber lens was used in the right eye, and an appropriate posterior chamber lens in the left eye, the patient may experience images in the left eye as being slightly larger.
- d) A change of 1.0 mm in axial length would have less effect on refraction than a change of 1.0 mm in corneal radius.
- e) Astigmatism after surgery could be due to the A-scan being performed significantly off-axis.

4. A patient with 1.5 diopter of with-the-rule astigmatism:
- Would be expected to have an uncorrected visual acuity of no better than 6/18.
 - Will require a correcting lens with negative axis vertical.
 - Cannot be corrected with contact lenses.
 - Will usually complain of vision which is more blurred at distance than at near.
 - Will have a blurred retinal image for objects at all distances.
5. If a 6-year-old patient has a manifest strabismus measuring 20 prism diopters esotropia:
- One eye should be occluded during retinoscopy.
 - The minimum positive power that gives good distance acuity should be prescribed.
 - The pinhole test cannot usually be performed with a child of this age.
 - Cycloplegia should be used to obtain the most accurate objective results.
 - The Snellen's letter chart cannot usually be used with a child of this age.
6. The following statements are true:
- The far point of an emmetrope is at infinity
 - The far point of a hyperope is nearer than that of a myope.
 - The difference between the far and near points, expressed in diopters, is equal to the amplitude of accommodation.
 - If a patient's refractive error is wrongly prescribed, the difference between the far and near points, expressed in diopters, is not equal to the amplitude of accommodation.
 - The near point of a myope, expressed in diopters, is equal to the distance refractive error.
7. The indirect ophthalmoscope:
- Is used with a powerful concave lens, usually 13D to 20 D.
 - Light refracted by the condensing lens forms a virtual image between the lens and the observer.
 - The field of view is limited by the observer's pupil and the aperture of the condensing lens.
 - Presbyopic observers may need to use their own glasses in addition to the viewing piece.
 - Is advantageous in viewing the hyperopic fundi compared with the direct ophthalmoscope.

8. The retinoscope:

- a) Consists of a mirror with a central aperture and a light source.
- b) With the condensing lens at the top, the effect is that of a plane mirror.
- c) It is usually used with a concave mirror effect.
- d) As the neutralization point is reached, the reflex slows down.
- e) An image of the illuminated retina is formed at the patient's far point.

9. The following statements are true:

- a) Goldmann is an indentation tonometer.
- b) Applanation tonometry is based on the Imbert Fick principle.
- c) The IOP is read when the area of corneal contact is 3.6 mm diameter.
- d) The Perkins is a portable tonometer of similar principle to the Schiøtz tonometer.
- e) The Goldmann tonometer head contains two base out prisms.

10. The direct ophthalmoscope:

- a) Can be used to view the anterior segment.
- b) Contains a concave mirror with a hole in it permitting the observer to view the subject.
- c) The field of view does not depend on the patient's refractive error.
- d) Mydriasis enhances the field of view.
- e) The field of view decreases with close proximity to the subject.

Good luck