ANSWERS: CHAPTER 21

MATCHING

1. d  4. i  7. a  10. d  13. c  16. d
2. f  5. c  8. g  11. c  14. c  17. a
3. b  6. h  9. e

IMAGE LABELING

1A. Sylvian fissures
1B. Choroid plexus/lateral ventricles
1C. Roof of the third ventricle
1D. Cerebellum
1E. Cisterna magna
1F. Tentorium
2A. Thalami
2B. Choroid plexus
2C. Quadrigeminal cistern
2D. Cerebellum
3A. Periventricular matter
3B. Choroid plexus
4A. Corpus callosum
4B. Third ventricle
4C. Pons
4D. Fourth ventricle
4E. Medulla
4F. Cisterna magna
4G. Vermis of the cerebellum
5A. Caudate nucleus
5B. Lateral ventricle
5C. Choroid plexus
5D. Thalamus

MULTIPLE CHOICE

1. b  6. b  11. c  16. d
2. c  7. d  12. a  17. a
3. d  8. b  13. c  18. b
4. b  9. a  14. c  19. c
5. a  10. d  15. d  20. a

FILL-IN-THE-BLANK

1. 9 months; 15 months
2. Posterior; mastoid; coronal; sagittal
3. Brain; spinal cord; cerebrospinal
4. Meninges; dura; pia; arachnoid
5. Cerebrum; cerebellum; brainstem
6. Lateral; third; fourth
7. Frontal; occipital; right
8. Medial; lateral; anterior
9. Echogenicity; peririgonal blush or periventricular halo; posterior
10. First 3 days; 1,500 g; 32 weeks
11. Four; caudothalamic
12. Intraventricular hemorrhage; thickened; echogenic; hydrocephalus
13. Noncommunicating; communicating
14. Top of the skull; infant’s face
15. Periventricular leukomalacia; echogenicity; bilateral; symmetric
16. Linear; brain surface; cranial vault; brain surface; crossing vessels
17. Fourth ventricle; tentorium; vermis; cerebellar
18. II; myelomeningocele; posterior fossa; cerebellum; medulla; fourth ventricle
19. Vein of Galen malformation; midline; third ventricle; turbulent
20. Cerebral hemispheres; craniofacial

SHORT ANSWER

1. The transducers and cables must be cleaned between each patient. Proper hand-washing technique and isolation protocols must be used. Single-use gel packets reduce the risk of cross-contamination between patients. Limiting head and neck movement in patients with endotracheal tubes and keeping the isolette doors closed whenever possible limits stress to the infant. Using light pressure on the fontanelle and using prewarmed gel can also help.

2. The brain changes significantly from 26 weeks gestation until term. In very premature infants, a posterior extension of the cavum septum pellucidum called the cavum vergae is often seen. In late gestation infants, only the anterior cavum septum pellucidum may be appreciated. The sulci and gyri are not fully developed in the very premature infant and so the brain appears smooth and featureless. The sylvian fissures are widely separated in the very premature infant. Nearly all premature infants demonstrate a peritrigonal blush that should not be confused with periventricular leukomalacia. The ventricles in the preterm infant are relatively larger than in the term infant.

3. Most bleeds originate in the germinal matrix, which lies between the head of the caudate nucleus and the thalamus at the caudothalamic groove. This is a very vascular network composed of fragile blood vessels susceptible to hemorrhage. This area is only present until about 36 weeks gestation and so infants born after this time are not susceptible to hemorrhage in this area.

4. Clinical signs of hydrocephalus include: increasing head size, bulging of the anterior fontanelle, separation of the cranial sutures, bradycardia, apnea, and increased intracranial pressure.

5. Using the anterior fontanelle, a spectral Doppler tracing is obtained from the pericallosal branch of the anterior cerebral artery. A tracing is obtained without any compression of the fontanelle. Next, another tracing is obtained with gentle compression applied to the fontanelle. An RI is obtained from each of the waveforms. An RI increase of > 0.1 above the baseline measurement or reversal of flow in diastole is indicative of elevated ICP.
**IMAGE EVALUATION/PATHOLOGY**

1. This image was taken in a term infant because the gyri and sulci are well formed. A premature infant’s brain would appear smoother, without the prominent gyri and sulci.

2. The arrows are pointing to a clot filling the lateral ventricle. This is a Grade III GM-IVH as there is intraventricular hemorrhage with ventricular dilatation.

3. Echogenic areas bilaterally at the caudothalamic groove indicating germinal matrix hemorrhage. Grade I GM-IVH is the mildest form of IVH and occurs anterior to the caudothalamic groove.

4. The occipital horns of the lateral ventricles are dilated with a teardrop shape and are orientated more parallel. This, along with the other findings, is consistent with agenesis of the corpus callosum.

5. A large, single ventricle is seen with fused thalami and very little cerebral cortex along the edges. The most likely diagnosis is alobar holoprosencephaly.

**CASE STUDY**

1. Cystic spaces are seen in the parenchyma, representing areas of necrosis and cavitation. The most likely diagnosis is periventricular leukomalacia.

2. A large, cystic structure is seen in the posterior fossa. The cystic structure appears to communicate with the fourth ventricle. The cerebellar hemispheres are small. This is consistent with Dandy-Walker malformation.