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Robert E. Campbell, MD, Editor

Lesson 26: Systematic Approach to the Interpretation of Pelvis and Hip Radiographs: How to Avoid Common Diagnostic Errors Through a Checklist Approach
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Question 26-1. This question speaks to radiographic findings on an AP radiograph of the pelvis that are consistent with possible osteolytic metastatic disease. The radiologist should include osteolytic metastatic disease in a differential diagnosis in the presence of destruction of an ilioischial line (A); destruction of multiple sacral foraminal lines (B); destruction of a supra-acetabular line (D); and an avulsion of a femoral lesser trochanter in a nontraumatized adult (E); but not thickening of an iliopectineal line (C), which would more likely suggest Paget disease of bone or rarely hypophosphatasia rather than osteolytic metastatic disease. So (A), (B), (D), and (E) are true, but (C) is false and the exception; and (C) is the correct answer.

Question 26-2. This question refers to a clinical and radiographic vignette in which an afebrile 14-year-old boy presents with worsening pain in his left hip. A frog-leg lateral view of the pelvis reveals an abnormal line of Klein and subtle widening of the left femoral physis. The line of Klein, which is drawn along the long axis of the superior aspect of the femoral neck on a frog-leg lateral view of the hip, normally intersects the proximal femoral epiphysis. A left hip joint effusion (B), a stress fracture of the left femoral neck (C), septic arthritis of the left hip (D), and a fracture of the left acetabulum (E) should not cause an abnormal line of Klein. However, a left slipped capital femoral epiphysis (A) does cause both an abnormal line of Klein and subtle widening of the femoral physis of the involved hip. So (A) is the most likely diagnosis, and (A) is the correct answer.

Question 26-3. This question concerns several important parts of the authors’ systematic approach of the radiographic evaluation of the pelvis and hips, which include an intact teardrop or radiographic U (A); sacroiliac joint width of 2 to 4 mm (B); intact iliopectineal line (C); and intact supra-acetabular line (D). Since (A), (B), (C), and (D) are true; (E), all of the above, is the correct answer.

Question 26-4. This question refers to causes of disruption of the Shenton arc on an AP radiograph of the pelvis. Shenton arc represents the smooth curvilinear line connecting the medial aspect of the femoral neck with the undersurface of the superior pubis ramus. Hip dislocation (A), femoral neck fracture (C), and chronic developmental dysplasia of the hip with superior and lateral subluxation of the femoral head (D), but not a nondisplaced acetabular fracture (B), can cause disruption of the Shenton arc. So (A), (C), and (D) are true, but (B) is false and the exception; and (B) is the correct answer.
Question 26-5. This question regards another clinical and radiographic vignette in which after severe injury to the pelvis of a 35-year-old man the width of the symphysis pubis on an AP radiograph of the pelvis is greater than 25 mm. Normally, the width of the symphysis pubis should not be greater than 5 mm. When the width of the symphysis pubis is greater than 25 mm after pelvic trauma, the radiologist also should evaluate the sacroiliac joints for a concomitant sacroiliac joint diastasis (D). So (D) is the correct answer.

Question 26-6. This question highlights differential considerations for widening of the teardrop distance. The normal teardrop distance should be bilaterally symmetric and measure less than 1 cm. Asymmetry of the teardrop distance greater than 2 mm may be caused by a hip joint effusion (A); developmental dysplasia of the hip (B) with superior and lateral subluxation of the femoral head; intra-articular body from recent fracture dislocation of the hip (C); and an intra-articular mass (D); but not osteoarthritis of the hip, which results in hip joint space narrowing and, therefore, a decrease or narrowing in the teardrop distance. So (A), (B), (C), and (D) are true, but (E) is false and the exception; and (E) is the correct answer.

Question 26-7. This question refers to the location of sacral foraminal lines identified on an AP radiograph of the pelvis. Sacral foraminal lines represent the superior margin of the sacral foramina (B). Radiographically, they should be continuous, symmetric, and smooth. Unless obscured by overlying gas or bowel contents, the upper 3 sacral foraminal lines should be visible. However, when sacral foraminal lines are absent, traumatic or insufficiency fractures or a destructive process should be considered. So (B) is the correct answer.

Question 26-8. This question calls attention to the location of the Duverney fracture, which is an isolated compression fracture of the iliac wing (A), named after French surgeon Joseph-Guichard Duverney (1648–1730). On an AP radiograph of the pelvis, the Duverney fracture is identified as irregularity of the white cortical line of the iliac wing compared with the normal white cortical line of the contralateral iliac wing. So (A) is the correct answer.

Question 26-9. This question alludes to the imaging examination that should be performed initially for the evaluation of hip or pelvic pain. According to the authors (MAJ Minor and COL (Ret) Bui-Mansfield), the initial imaging examination should be radiography (D). So (D) is the correct answer.

Question 26-10. This question emphasizes the best radiographic projection to visualize the posterior column of the pelvis, which is the Judet view (C). The Judet view is a 45-degree oblique view of the pelvis that allows for improved visualization of the anterior and posterior columns of the pelvis and the acetabular rim. So (C) is the correct answer.

Answer Key for Volume 37 # 26:

1. C
2. A
3. E
4. B
5. D
6. E
7. B
8. A
9. D
10. C