Lesson 23: Radiographic Changes of Hyperparathyroidism
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Question 23-1. This question brings attention to a common location for periosteal neostosis in a patient with hyperparathyroidism, which is the distal femur (E). Radiographically, periosteal neostosis appears as a thin, lamellated bone parallel to the cortical margin of the involved bone. In addition to the femur, other common sites of periosteal neostosis are metatarsals and the pelvis. So (E) is the correct answer.

Question 23-2. This question addresses potential causes of primary hyperparathyroidism, which include parathyroid adenoma (A), parathyroid hyperplasia (B), and parathyroid carcinoma (C), but not parathyroid tuberculosis. Parathyroid adenoma is the most common cause of primary hyperparathyroidism. So (A), (B), and (C) are true, but (D) is false and the exception; and (D) is the correct answer.

Question 23-3. This question speaks to the cause of the “rugger-jersey” appearance on radiographs of the spine, which is secondary hyperparathyroidism (B). The rugger-jersey appearance is due to vertebral body endplate sclerosis with a central band of lucency (osteopenia) at multiple contiguous vertebrae. So (B) is the correct answer.

Question 23-4. This question is illustrated by an AP radiograph of the left leg (Figure 12), which demonstrates an osseous change of hyperparathyroidism. Thin, lamellated bone parallel to the lateral cortical margin of the proximal fibula, representing periosteal neostosis (A), is not identified. So (A) is false. The “salt and pepper” appearance of hyperparathyroidism involves the skull, not a portion of a long bone such as the lateral femoral condyle (B). Thus (B) is false. A well-demarcated, radiolucent, expansile osseous lesion suggesting a “brown tumor” of the medial femoral condyle (C) is not present. So (C) is false. Sclerotic thickening of the lateral tibial cortex (D) is not evident. Thus (D) is false. However, subtle subperiosteal resorption at the medial aspect of proximal tibia (E) is seen, and this radiographic finding is classically thought to be pathognomonic of hyperparathyroidism. So (E) is true, and (E) is the correct answer.

Question 23-5. This question refers to several important statements about parathyroid hormone secretion. Parathyroid hormone secretion is stimulated by hypocalcemia, not hypercalcemia (A). So (A) is false. It is responsible for increasing calcium reabsorption (B), and for decreasing phosphorus (C) and bicarbonate (D) reabsorption. Thus (B), (C), and (D) are true. Continuously elevated levels of parathyroid hormone secretion enhance osteoclastic resorption (E), which is present in untreated hyperparathyroidism. So (E) is true. Since (A) is false, (A) is the correct answer.
Question 23-6. This question calls attention to the location of the radiographic salt and pepper appearance in a patient with hyperparathyroidism, which is the skull (C). This radiographic appearance, best seen on the lateral skull radiograph, is due to resorption of trabecular bone of the calvarium that leads to areas of varying density. So (C) is the correct answer.

Question 23-7. This question concerns several important statements about brown tumors of bone, which are seen radiographically in patients with hyperparathyroidism. Brown tumors can be clinically symptomatic (A), particularly when a pathologic fracture occurs within them. So (A) is true. They can resolve with appropriate treatment of the cause of hyperparathyroidism (B). Thus (B) is true. Radiographically, brown tumors typically are expansile (C); radiolucent, not radiodense (D); and well-demarcated (E) lesions. So (C) and (E) are true, but (D) is false; and (D) is the correct answer.

Question 23-8. This question draws attention to conditions that can mimic the erosive vertebral changes seen radiographically in patients undergoing chronic hemodialysis for renal failure. The erosive vertebral changes in these patients are due to secondary hyperparathyroidism, and the radiographic mimics include discitis (A), tuberculosis (B), spondylitis (C), and the SAPHO syndrome (D), but not sarcoidosis (E). Although sarcoidosis rarely causes osseous changes, particularly in the hands, it does not cause erosive vertebral changes similar to those seen in patients undergoing chronic hemodialysis for renal failure. So (A), (B), (C), and (D) are true, but (E) is false and the exception; and (E) is the correct answer.

Question 23-9. This question emphasizes the most common location of subperiosteal resorption in the hands of a patient with hyperparathyroidism, which is the middle phalanges (A) (specifically along the radial aspects of the shafts of the middle and index fingers). So (A) is the correct answer.

Question 23-10. This question refers to the location of acroosteolysis in the hands of a patient with hyperparathyroidism, which is the tufts of the distal phalanges (E). So (E) is the correct answer.

Answer Key for Volume 37 # 23:

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