Answers and Additional Information for the Orthopaedic Quiz

Quiz 1

A. Abnormalities include extensive involvement of the tibia with mixed lytic and sclerotic areas and coarse trabeculations. These features, in an elderly person, may indicate metastatic lesion or Paget's disease, which may be polyostotic.
B. The bone scan show high intake in many of the long bones, clavicle, skull and pelvis. High turnover indicates Paget's disease.
C. In the early phase, (A) there is increased osteoclastic absorption with large empty spaces lined with osteoclasts (arrow head) adjacent to many osteoblasts (arrow). Later (B) there is reactive bone formation with numerous osteoblasts (arrow) with pale osteoid deposition (arrow head). Newly formed bone with cement lines results in a mosaic pattern. Often there is a mixed pattern with bone destruction and formation as shown by both osteoblast and osteoclast fronts.
D. Sir James Paget (11 January 1814- 30December 1899), was a British surgeon and pathologist who is best remembered for Paget's disease and who is considered, together with Rudolf Virchow, as one of the founders of scientific medical pathology. His famous works included Lectures on Tumours (1851) and Lectures on Surgical Pathology (1853). While most people recall that Paget's disease refers to bone, there were actually three diseases named after him – Paget's disease of bone, Paget's disease of the nipple (a form of intraductal breast cancer spreading into the skin around the nipple), and Extramammary Paget's disease. Also named for him is Paget's abscess.

Quiz 2

A. The radiograph shows fracture dislocation of the head of radius with fracture of the ulna shaft.
B. Treatment should consist of plating of the ulna and screw fixation of the head of radius with reduction of the dislocation. A cast should be applied in the fully supinated position. The head of the radius must be preserved in a young adult.
C. This is an Essex- Lopresti fracture dislocation, a more extreme version of the Monteggia fracture dislocation as described by Essex-Lopresti. This type of fracture involves the head of the radius, with an associated dislocation of the distal radioulnar joint. Peter Gordon Lawrence Essex-Lopresti was born in 1918 and trained at the London Hospital in 1937 and commenced a DA the following year. He joined the Royal Army Medical Corps (RAMC) and served with an airborne division during World War II. During this time he was admitted as a Fellow of the Royal College of Surgeons of England (RCSE) in 1942, and worked as a trauma surgeon at the Birmingham Accident Centre where he was awarded a Hunterian Professorship. He died on 13 June 1951 at the tragically young age of 36.

Quiz 3

A. There is indurated swelling around the ankle and foot with multiple sinuses.
B. Actinomadura madurae: Large (1 - 5 mm) and multilobular, with interlacing hyphae embedded in interstitial brownish matrix; there is peripheral basophilia and central eosinophilia or pale staining; filaments are growing from the peripheral zone
C. Mycetomas are chronic, subcutaneous infections characterized by a clinical triad of chronic induration, draining sinuses, and discharge of granules. The granules, which can be yellow ('sulphur granules'), pale or white, are composed of colonies of either actinomycotic bacteria or eumycotic fungi. The infection develops after traumatic inoculation with contaminated soil and progresses to adjacent tissues or bone. The foot, hand, and lower-leg regions are the most commonly affected areas. Mycetomas are primarily found in tropical and subtropical areas of the world.
D. Treatment can be difficult and includes surgical debridement with prolonged antibiotic or antifungal treatment.
E. George Ballingall qualified with the Licentiate Diploma of the Royal College of Surgeons of Edinburgh in December 1805 and joined the Army Medical Department in May of the following year, spending the majority of his army career in India. He also served in Java. Eventually, he was awarded his MD Edinburgh degree in 1819, and the FRCS Edinburgh and Fellowship of the Royal Society of Edinburgh during the following year. He was appointed to the Regius Chair of Military Surgery at the University of Edinburgh in November 1822, succeeding John Thomson, its first holder, and he held this post until his death in December 1855. Ballingall was the first to describe 'Madura Foot', sometimes called 'Ballingall's disease.'

Quiz 4

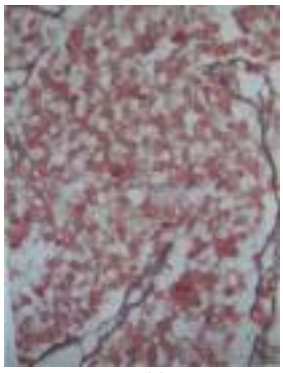
A. Widening of metaphyseal areas of the radius and ulna and also of metacarpi and phalanges are seen in this patient.
B. A full skeletal survey including skull and cranial bones should be performed.
C. The diagnosis is congenital hereditary metaphyseal dysplasia or Pyle's disease.

D. Pyle's disease, named after Edwin Pyle, is a rare congenital syndrome of metaphyseal dysplasia affecting both sexes. It is characterised by genu valgum, occasional joint pain, muscular weakness, mild scoliosis, limited elbow extension, malocclusion, and increased tendency to fractures but is often asymptomatic. Major x-ray findings include expansion of the ribs, clavicles, pubic and ischial bones as well as metaphyseal flare of the tubular bones, extending into the diaphysis producing Erlenmeyer flask like appearance of the diaphyses in the femur and tibia. No growth retardation or mental deficiency is noted. Inheritance is autosomal recessive. This must not be confused with cranio-metaphyseal dysplasia with severe neurological problems.

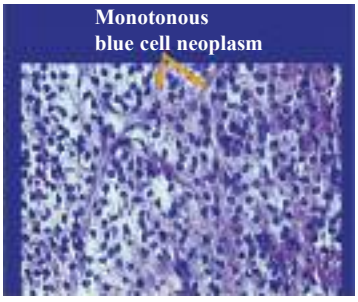
Edwin Pyle attended Columbia University College of Physicians and Surgeons, New York City. He trained in orthopaedic surgery and after service in World War I practised in New York City. He was associated with St. Luke's Hospital and was later a member of the staff of the Waterbury Hospital, Connecticut. While occupying this latter post he published the account of the condition, which now bears his name. Pyle died in 1961 from Listerella meningitis and acute staphylococcic endocarditis.

Quiz 5

F5 (A)



F5 (B)



F5 (C)

A. There is a lytic area over the distal femur with periosteal elevation (onion-peel like), Codman's triangle and cortical destruction.
B. These symptoms are seen in primary malignancy, particularly Ewing's tumour and osteomyelitis. In both, high ESR, raised WBC and fever are possible.
C. Slide A shows uniform round cells with large nuclei ('blue cells'). Possible conditions include plasmacytoma, lymphomas, metastatic neuroblastoma and Ewing's tumour.
D. When stained with PAS, slide B (Figure 5b) shows abundant intra-cellular glycogen granules together with a paucity of reticulin slide C (Figure 5c). A chromosomal study may show translocation of a part of 11 to 22.
E. Ewing's sarcoma was first described by James Ewing. Ewing's tumour includes a spectrum of malignant tumours, affecting mostly males under age 20, characterized morphologically by the presence of small round cells. Ewing sarcoma and peripheral primitive neuroectodermal tumour represent both ends of a spectrum, with Ewing sarcoma lacking evidence of neural differentiation and the markers that characterize the peripheral primitive neuroectodermal tumour. Ewing sarcoma and peripheral primitive neuroectodermal tumour may share cytogenetic abnormalities, proto-oncogene expression, cell culture and immunohistochemical abnormalities. These tumours may occur in the soft tissues or in the bones. Histopathology of the tumour shows uniform haematoxylin stained round cells with thin strands of reticulum.

James Ewing, was born in 1866 to a prominent family in Pittsburgh, Pennsylvania. He first completed his M.A. in and developed a strong interest in pathology. He returned to the College of Physicians and Surgeons as an instructor in histology (1893-1897), and clinical pathology (1897-1898). After a brief stint as a surgeon with the US Army, he was appointed in 1899 as the first professor of clinical pathology at the Medical College of Cornell University in New York. In 1902, Dr. Ewing helped to establish one of the first funds for cancer research, endowed by P. Huntington. With his discoveries, Ewing became an important experimental oncologist and helped to founded, in 1907, the American Association for Cancer Research, and in 1913 the American Society for the Control of Cancer, now the American Cancer Society. He was also responsible for the creation of present-day Memorial Sloan-Kettering Cancer Center in New York City, one of the most important multidisciplinary centers devoted to oncology in the world. He worked at that centre until his retirement in 1939. James Ewing died from bladder cancer at the age of 76. Ewing was active in many fronts, including haematology as well as oncology.

A scientific breakthrough came in 1906, when Ewing and his collaborators proved for the first time that a cancer (lymphosarcoma in dogs) could be transmitted from one animal to another. In 1920 he published his first work on a new kind of malignant osteoma (cancer of the bone), which later received his name. Ewing also became known as one of the first proponents of radiation therapy for cancer.