Lateral radiographs of the knee should show good trabecular detail and include the mid shaft of the femur to the mid shaft of the tibia. Correlation of the radiographic and pathological findings is of considerable value and importance in identifying the earliest radiographic features of osteonecrosis with confidence and differentiating this from variation in normal trabecular structure.

Pathology of Caisson Disease of Bone MARY E. CATTO (*Department of Pathology, Western Infirmary, Glasgow*) While histological examination is of little help in elucidating the pathogenesis of aseptic bone necrosis in compressed air workers, it throws some light on the sequence of events and radiological changes following bone death. Revascularization of both medullary and juxtaarticular lesions may begin but halt short of completion, the revascularization front becoming collagenous. Bone trabeculae adjacent to this fibrous tissue are often greatly thickened and may give rise to a sclerotic line on clinical radiographs. When such a radio-dense line is seen traversing a bone end it is highly probable that the tissue between it and the joint surface is still dead. The necrotic bone trabeculae may later fracture, with collapse of the articular surface associated with pain. Incongruity of the joint surface is often followed by formation of osteophytes at the living joint margins. At first the joint space remains normal and the articular cartilage covering dead bone is relatively well preserved but later it and the underlying dead bone may be ground away, the end result sometimes being difficult to distinguish from primary osteoarthritis. A similar pattern of events and morphological changes may be seen following juxtaarticular bone necrosis due to other causes.

Scientific communications II

Cervical Adenitis Caused by *Mycobacterium chelonae* (*M. abscessus*) C. A. MORRIS AND G. H. GRANT (*Public Health Laboratory and Royal Salop Infirmary, Shrewsbury*) In February 1972, an 8-year-old boy presented with a painless submandibular swelling causing some neck discomfort. The swelling persisted in spite of antibiotics; it was explored surgically and a soft tissue mass excised. The wound healed uneventfully. No other abnormalities were found on clinical and x-ray examination.

Histology of the excised mass showed lymphatic tissue with a tuberculoid reaction. There were numerous large collections of epithelioid cells, some with central necrosis and giant cells. There was no anisotropic material. Very scanty acid-fast bacilli were seen. *Mycobacterium tuberculosis* was not

isolated by culture or by guinea pig inoculation. A pure growth of a non-pigmented mycobacterium was cultured, which was slow to grow on primary isolation, but rapid on subculture. Dr J. Marks of the Tuberculosis Reference Laboratory, Cardiff, examined the isolate by lipid analysis and identified it as *Mycobacterium abscessus*.

The patient showed a negative Mantoux tuberculin reaction at 1/10000 and weakly positive at 1/1000. There was marked skin hypersensitivity to an extract of sonically disrupted live organisms of *M. chelonae* (synonym *M. abscessus*) at 1/10 000, but none to that of *M. ranae* (synonym *M. fortuitum*) at 1/1000. A cat-scratch fever intradermal test was negative.

Mycobacterium chelonae has caused abscesses following the injection of contaminated drugs or vaccines. This child had an injection of dental anaesthetic four months before the appearance of the lesion; this may indicate the portal of entry of infection. This is thought to be the first recorded case of cervical adenitis caused by *M. chelonae*, and the strain has been deposited in the National Collection of Type Cultures (NCTC 10882).

Intravascular Coagulation and Renal Failure in *E. coli* Septicaemia F. E. PRESTON, R. G. MALIA, M. J. SWORN AND E. K. BLACKBURN (*Departments of Haematology and Pathology, The Royal Infirmary, Sheffield*) Although various haematological abnormalities have been described in patients with Gram-negative septicaemia, the precise pathogenesis of the reported findings has remained obscure. In the eight patients described in this study, *E. coli* septicaemia associated with oliguric renal failure showed evidence of intravascular coagulation.

Haematological evidence of intravascular coagulation was obtained in all eight patients. Thus elevated fibrin degradation products in the serum and thrombocytopenia were constant features, while plasma fibrinogen depletion was noted in six out of eight. The diagnosis of intravascular coagulation was subsequently confirmed by histological examination of necropsy material from the five patients who died: there was no constant pattern of distribution of intravascular fibrin.

A falling haemoglobin and a peripheral blood picture characteristic of a microangiopathic haemolytic anaemia was observed in five of the patients. These changes which can be attributed to mechanical damage of red cells by intravascular strands of fibrin returned to normal after successful clinical management.

Although oliguric renal failure is a recognized complication of septicaemia, the precise mechanism by which it occurs has remained obscure. Recently,

evidence has been presented which suggests that intraglomerular coagulation may play an important role in the natural history of acute ischaemic renal failure and may be the mechanism by which the septicaemia leads to oliguric renal failure. The presence of urinary fibrin degradation products would appear to support this view. An experimental model which is relevant to the clinical situation is produced by a continuous infusion of endotoxin which results in the deposition of fibrin within the glomerular vessels.

A Study of Antiheparin Activity of Serum and Platelet Factor 4

C. H. J. SEAR AND L. POLLER (*Withington Hospital, Manchester*) The hypothesis that serum antiheparin activity is due to platelet factor 4 (PF4) (Farbyszewski *et al*, 1968; O'Brien *et al*, 1970) has been investigated using biochemical fractionation techniques. Antiheparin activity was measured with a heparin plasma thrombin time system, and clotting times were determined under rigidly standardized conditions with the aid of a photometric clot detection device. Platelet lysates containing PF4 were prepared by freezing and thawing purified human platelets. A comparison of the platelet counts of human whole blood, platelet-rich plasma, and platelet-free plasma with the antiheparin activities of sera derived therefrom suggested that 70-80% of the whole blood serum activity originated in the platelets. Isoelectric precipitation studies at low ionic strength demonstrated a degree of chemical similarity between PF4 and the major serum activity and showed that the precipitation behaviour of PF4 is markedly influenced by its chemical environment. The platelet and serum activities were shown to have similar molecular sizes as judged by gel filtration through Sephadex G-200. These experiments also suggested that both activities reside with low molecular weight species (MW 25000-30000 daltons) that are incorporated into high molecular weight complexes under physiological conditions of pH and ionic strength.

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The Effects of Progestogens on Blood Clotting and Platelet Function

L. POLLER (*Withington Hospital, Manchester*) We have previously shown (Thomson and Poller, 1965; Poller *et al*, 1971a) that oral contraception with combined oestrogen/progestogen preparations results in rises in certain clotting factors and accelerated platelet aggregation and that the progestogen-only preparation, chlormadinone

acetate, a 17 acetoxysteroid, caused no observable changes in clotting factors. Changes in platelet aggregation were only noted after long-term administration (Poller *et al*, 1969, Poller *et al*, 1971b). With the withdrawal from the market of chlormadinone acetate no progestogen has been available.

We have therefore studied the effects of another progestogen, norethisterone, a 19 norsteroid, in two groups of women on clotting parameters and platelet function. The first group had been taking combined preparations previously. The second group had not previously been on oral contraceptives. Raised clotting factors and accelerated platelet aggregation from combined preparations rapidly returned to normal when norethisterone was substituted. No rises of clotting factors have so far been detected in the second group.

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Erythrocyte 2, 3-diphosphoglycerate in Diabetes and Renal Disease

PAULINE M. EMERSON AND J. DARLEY (*Department of Haematology, Radcliffe Infirmary, Oxford*) In patients with well controlled diabetes mellitus, the erythrocyte 2, 3-diphosphoglycerate (DPG) content does not differ significantly from the normal. However, in 15 patients with uncontrolled diabetes, the DPG levels were decreased below the normal range of 4.5 ± 0.5 mM to 2.2 ± 0.4 mM per litre of red cells. The lowered DPG levels counteracted the effect of pH on the oxygen dissociation curve so that the tissue oxygen supply remained unaffected.

The DPG took up to five days to return to normal, and it is suggested that this delay is secondary to a fall in plasma phosphate. Rapid correction of blood pH by intravenous bicarbonate should be avoided, as this leads to a rapid fall in the calculated P_{50} resulting from the persistently low levels of DPG and giving rise to the possibility of tissue anoxia. Preliminary studies on three patients given phosphate supplement during the first five hours of treatment suggest that this regime is not long enough to have a beneficial effect.

In 56 patients with chronic renal failure, blood collected before dialysis gave a significantly raised DPG level of 6.22 ± 1.38 . This did not correlate well with either the plasma phosphate or bicarbonate levels, but correlated fairly well with the haemoglobin concentration. Further studies are being undertaken