

SEPTIC ARTHRITIS IN ASSOCIATION WITH PRIMARY LYMPHOEDEMA

J. E. SCOTT & D. H. HARRISON

The Middlesex Hospital, London, U.K.

The association between b-haemolytic streptococcal arthritis of the knee and primary lymphoedema is reported. This condition appears to resolve slowly using conventional methods of treatment, in the form of immobilisation and antibiotic therapy. However, the penetration of penicillin into the joint in these two patients was adequate, suggesting that there is no place for the intra-articular injection of antibiotic in the treatment of this condition.

Key words: infectious arthritis; lymphoedema

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Septic arthritis is a rare condition, usually presenting as a complication of rheumatoid arthritis. The commonest causative organism is a staphylococcus. Diagnosis by joint aspiration and bacteriological culture with appropriate antibiotic treatment and splintage of the joint usually results in resolution of the infection within a few days or weeks.

Two cases of septic arthritis in association with primary lymphoedema have recently been seen at the Middlesex Hospital. In both cases the organism grown was b-haemolytic streptococcus. This association has not previously been described. The infection was slow to resolve in both cases. The difficulties experienced in the management of these cases are discussed with particular reference to the role of antibiotics.

CASE REPORTS

Case A: Six months after a right Thompson medial buried dermis flap procedure (Thompson

1967) had been performed on a 69-year-old woman with an 8 year history of primary bilateral lower limb lymphoedema, she was re-admitted with a 1 week history of pain and swelling of the right knee. On aspiration of the knee 20 ml of purulent fluid was obtained, which on culture grew b-haemolytic streptococci. The joint was immobilised and antibiotic treatment started in the form of 4 mega-units of penicillin 1 gm orally q.d.s. Four days later she was afebrile and the antibiotic regimen was changed to penicillin G 2 mega-units intramuscularly for a further 2 weeks, after which maintenance therapy (penicillin V 500 mgm orally q.d.s.) was continued for 4 months. The knee, however, remained painful and swollen for several weeks and was still causing discomfort 6 months later (Figure 1).

Case B: A 64-year-old woman with longstanding primary bilateral lower limb lymphoedema was admitted with a 1 week history of pain and swelling of the right knee. Forty ml of purulent fluid, obtained on aspiration, grew b-haemolytic streptococci. The knee remained clinically infected and a low grade pyrexia continued for 1 month, despite immobilisation of the knee and the administration of penicillin G 2 mega-units intramuscularly q.d.s. Five months later she also reported persistent discomfort in the knee (Figure 2).



Figure 1. The lower limbs in Case A with a lymphangiogram showing primary lymphatic hypoplasia are illustrated.



Figure 2. The same features as in Figure 1 are illustrated in Case B.

Diagnosis and Management

Septic arthritis of the knee was suspected clinically by the usual signs of heat, swelling and severe pain on attempted movement of the joint. The assessment of joint effusion was dif-

ficult, as the circumference of the knee was already increased by lymphoedema. Blood cultures were negative. Intra-articular injections of antibiotic were not given, nor was joint aspiration used to monitor the bactericidal activity of

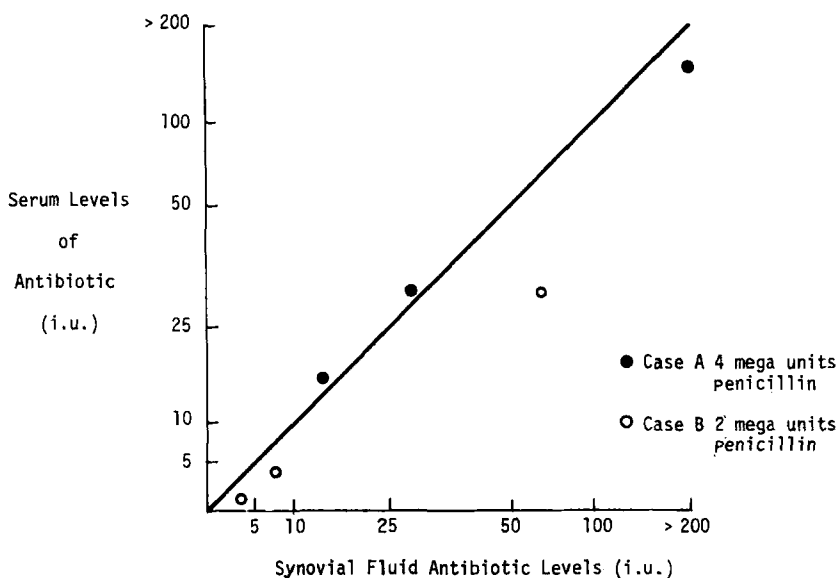


Figure 3. The relationship between the levels of benzyl penicillin in the serum and that in the synovial fluid of the affected knees.

penicillin within the joint, because of the risk of re-introducing organisms into the joint. Despite adequate antibiotic cover and immobilisation, the knees remained clinically infected for 1 month and were still painful and stiff 6 months later.

DISCUSSION

The *b*-haemolytic streptococcus seldom causes septic arthritis—about 7 per cent in most series (Russell & Ansell 1972, Kelly et al. 1970, Baitech 1962). It is, however, the commonest causative organism of cellulitis in patients with lymphoedema (Yoffey & Courtice 1956). In both the reported cases the septic arthritis was preceded by cellulitis. In the first patient the entry of the organism into the joint may have been facilitated by the Thompson buried dermis flap procedure (Thompson 1967) as the shaved flap is rolled into the deep compartment of the leg and sutured to the capsule of the knee joint. This complication has not, however, been previously noted. In the second patient the deep fascia was intact, but it is possible that the organ-

ism entered by direct invasion, as the superficial lymphatics on the lateral side of the knee joint, albeit extra-fascial, pass close to the joint; or alternatively, the patient may have been one of the 30 per cent in whom it is known that lymph from the short saphenous system drains into the deep popliteal group of lymph nodes which lie close to the posterior aspect of the joint (Pflug & Calnan 1971).

Parker & Schmid (1971) showed a linear relationship between the antibiotic level in synovial fluid and that in the blood. Although there is no evidence that giving intra-articular antibiotics with concentrations of over 100 times the minimum bactericidal concentration renders greater benefit than the 5–20 times that can be achieved parenterally, it was felt that in the cases described, the slower resolution of the infection might be due to impaired penetration of antibiotic into the knee of a lymphoedematous limb. Therefore, 6 months after the infection had settled, the serum benzyl penicillin levels were measured and related to the

levels in the synovial fluid of the affected knees (Figure 3). The results show that even under these circumstances the bactericidal activity within the knee was in a 1:1 ratio to that in the blood.

In neither case was there a recurrence of infection. The duration of symptoms before starting treatment was 7 days in both patients. Russell & Ansell (1972) noted a high recurrence rate if there was a delay in diagnosis of more than 2 weeks.

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REFERENCES

- Baitech, A. (1962) Recent observations on acute suppurative arthritis. *Clin. Orthop.* **22**, 157-167.
- Kelly, P. J., Martin, W. J. & Coventry, M. B. (1970) Bacterial (suppurative) arthritis in the adult. *J. Bone Jt Surg.* **52-A**, 1595-1601.
- Parker, R. H. & Schmid, F. R. (1971) Antibacterial activity of synovial fluid during therapy of septic arthritis. *Arthr. Rheum.* **14**, 96-104.
- Pflug, J. J. & Calnan, J. S. (1971) The normal anatomy of the lymphatic system in the human leg. *Brit. J. Surg.* **58**, 925-930.
- Russell, A. S. & Ansell, B. M. (1972) Septic arthritis. *Ann. rheum. Dis.* **31**, 40-43.
- Thompson, N. (1967) The surgical treatment of chronic lymphoedema of the extremities. *Surg. Clin. N. Amer.* Vol. 47, No. 2, 445-503.
- Yoffey, J. M. & Courtice, F. C. (1956) *Lymphatics, lymph and lymphoid tissue*, p. 463. Edward Arnold Ltd.

Correspondence to: J. E. Scott, Senior Registrar in Orthopaedic Surgery, The Middlesex Hospital, London W.1., U.K.