

Full skin thickness burn injury of a knee joint in an 81-year-old patient

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Summary

An example of a full skin thickness burn injury on the medial aspect of the knee joint with exposed joint cavity is presented. Adequate coverage was possible using a cranially based medial gastrocnemius muscle flap. A specially manufactured plaster cylinder was applied to the joint to enable early mobilization of the 81-year-old patient. The treatment of deep burns in weightbearing joints is discussed.

INTRODUCTION

EVEN small burn injuries can be life threatening in an old patient. A long period of immobilization is accompanied by dangerous complications such as pneumonia. Therapy includes early excision of necrotic tissue and adequate coverage to prevent sepsis and restore function. One aim of therapy is early mobilization. A case is particularly difficult when excision of necrotic tissue and coverage are inadequate, when infection has already occurred and when a weightbearing joint has been affected. In our patient all these problems were overcome by the method hereby presented.

CASE REPORT

An 81-year-old lady sustained a 10 per cent full skin thickness burn injury affecting the medial aspect of the thigh, the knee joint and the lower leg when she became trapped under a stove. Her weight on admission was 39 kg. Three days after the accident necrotic tissue was excised and mesh grafting was performed. The grafts failed postoperatively as massive infection with acinetobacter and enterococcus occurred. Excision of necrotic tissue over the knee joint was found to have been inadequate.

On day 5 postoperation the joint cavity was ex-

posed. In a second operation on day 6 after the first operation the necrotic patella and its ligament, the medial epicondyle of the femur, the capsule and the medial ligaments of the knee joint and some tendons were removed (*Fig. 1*). Refobacine palacos chains were inserted into the joint cavity. The resulting defect was closed by a cranially based medial gastrocnemius muscle flap. The muscle was detached from its lower insertion and then being turned upwards it was laid over the defect with its original outer surface towards the joint cavity (*Fig. 2*). Mesh grafts were applied over the muscle flap. After an uneventful postoperative course (*Fig. 3*) a specially manufactured 400 g plaster cylinder was applied to the joint (*Fig. 4*). Medial instability was prevented and extension of the joint was maintained (*Fig. 5*). The extremely light plaster cylinder enabled mobilization of the patient on day 4 postoperation.

DISCUSSION

Burn injuries into a major joint cavity are rare. This type of injury was caused by exposure to heat over a long period, either the patient is unconscious or, as in our case, trapped somehow.

Prognosis for this injury is critically dependent upon continuing functioning of the joint and can be a matter of survival. Infected joints may act as a focus for septicaemia. Affected weightbearing joints delay mobilization and therefore complications such as bronchopneumonia may result. Consequently, the aim of therapy is excision and if possible restoration of function. The type of therapy depends on the joint affected, the extent of the injury and the general condition of the patient. Conservative treatment was considered to be irrelevant in this patient. Arthrodesis and concomitant shortening of the extremity would

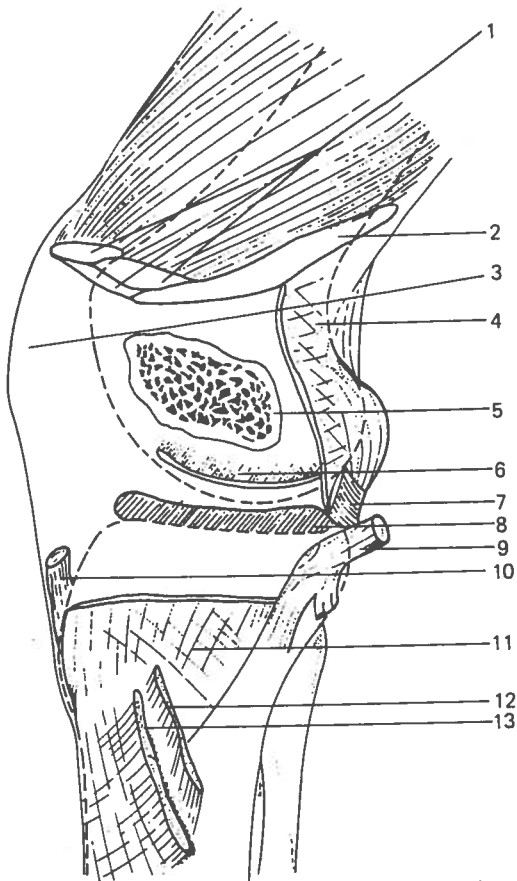


Fig. 1. Medial aspect of the knee joint, and borders of necrosis. 1. Tendon of quadriceps femoris; 2. vastus medialis; 3. patella resected; 4. medial patellar retinaculum; 5. partial necrosis of the medial condyle; 6. medial meniscomfemoral ligament; 7. oblique popliteal ligament; 8. partial necrosis of the medial miniscus; 9. partial necrosis of the semimembraneous tendon; 10. ligamentum patellae; 11. medial patellar retinaculum; 12. medial collateral ligament; 13. pes anserinus.

have made mobilization more difficult and furthermore the healing period following this type of treatment is very long.

The ideal treatment for burns occurring in joints is excision of the dead tissue and closure of the defect with flaps (Jackson, 1976). In burn patients it is possible to achieve excellent results using a free latissimus dorsi flap for reconstruction of the anterior surface of the lower leg (Hammer et al., 1986). In elderly patients coverage by pedicled flaps appears to be a safer procedure as far as blood supply, postoperative treatment and healing of the flap are concerned.

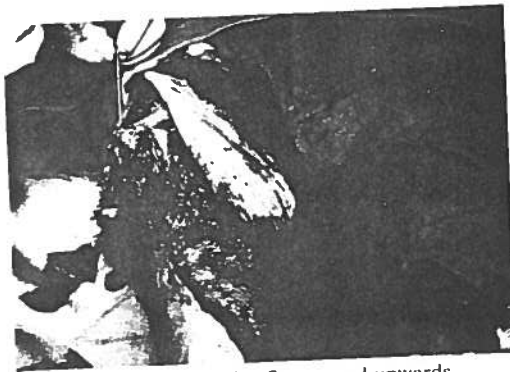


Fig. 2. The gastrocnemius flap turned upwards.

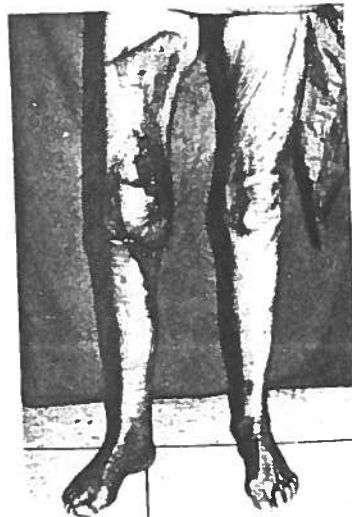


Fig. 3. Postoperative aspect of the knee joint.

In the past different case reports about coverage with a sartorius muscle flap have been presented in detail (Ger and Efron, 1972; Pethy and Hogue, 1978).

Because of the extent and localization of the defect in our patient in relation to the extent of the muscle required for coverage, we selected a cranially based medial gastrocnemius muscle flap. It is well known that numerous vessels produce an excellent blood supply in this muscle. Because the pulses of the popliteal and dorsalis pedis artery were palpable and the patient had no intermittent claudication, we were able to dispense with angiography. In this patient immediate treatment was impossible due to her advanced age. The initial surgical treatment proved to be insufficient as not only had infection set in

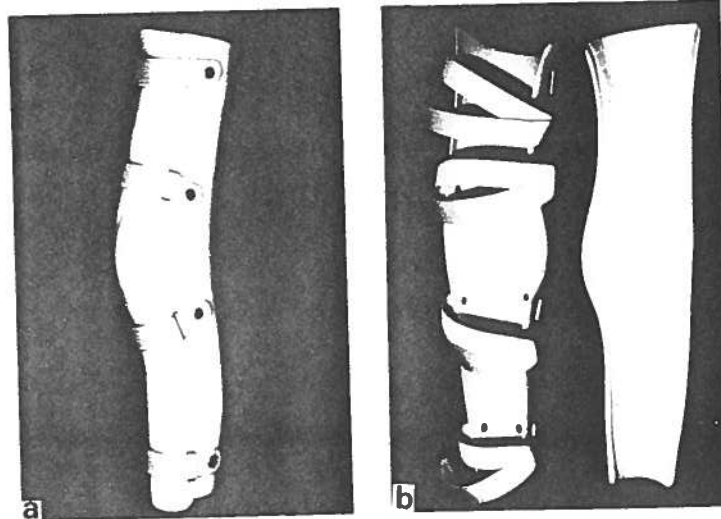


Fig. 4. Specially manufactured 400 g plaster cylinder.

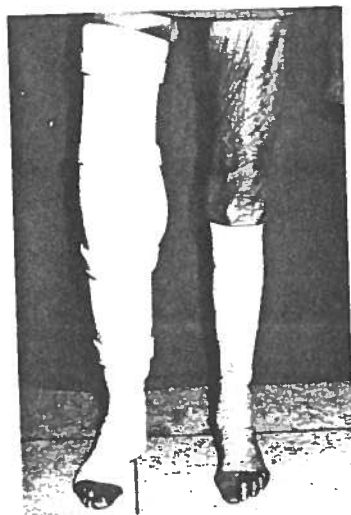


Fig. 5. Patient with applied plaster cylinder to prevent medial instability and maintain extension of the knee joint.

during this delay, but some necrotic tissue remained. After the removal of all necrotic and infected tissue it was necessary to cover the open joint with a well-vascularized muscle. However this treatment did not fully solve the problem of early mobilization of the patient and, therefore, the application of an extremely light plaster cylinder was necessary.

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