CASE REPORT

Squamous Cell Carcinoma Involving the Tibia Treated by Reimplantation of Autoclaved Resected Bone

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Summary

We present an elderly patient with a squamous cell carcinoma over the subcutaneous aspect of the leg involving the tibia. En bloc resection of the tumour together with a 10 centimetre segment of the tibia was done. The resected bone was autoclaved; replaced in its original position and stabilized with bone cement and a locked nail. This allowed early ambulation with minimal cost.

Key Words: Squamous cell carcinoma, Tibia, Reconstruction with autoclaved bone

Case Report

A 75-year-old man was seen with a chronic ulcer over the anterior, subcutaneous aspect of the right tibia of six months' duration. The ulcer was 10cm x 8cm and the edges were everted. In the centre of the ulcer, the tibia was exposed. A two centimetre defect was seen, filled with necrotic material. Plain radiographs of the tibia showed erosion of the bone with a large cortical defect. (Fig 1) CT scans showed that the medullary cavity was also involved. A biopsy of the soft tissue at the edge of the ulcer was done and squamous cell carcinoma was diagnosed.

A wide excision of the tumour was carried out with a surrounding two centimetre margin, including a segment of the tibia measuring 10 centimetres. The resected specimen was debrided of gross tumour tissue and the remaining bone was autoclaved at 131 degrees centigrade for 10 minutes. It was then washed with five litres of saline and replaced in its original position in the leg. The segment was stabilized with an interlocking nail. (Fig 2) The anterior defect and distal fragment were filled up with bone cement, creating a stable construct. The soft tissue defect was covered by an anterolateral fasciocutaneous free flap harvested from the thigh. The resected tumour (not including the bone) was submitted for further histopathological examination and this confirmed the original diagnosis of squamous cell carcinoma.

Postoperatively, a large haematoma collected after removal of the drain, which resulted in minor flap necrosis at the distal edge. This was debrided in the ward. The defect granulated well and was covered by a split skin graft. With a secure intramedullary nail, the patient was allowed to gradually ambulate and was discharged four weeks later with a walking frame. Living in a distant, interior village, the patient was not able to return to our hospital for follow-up.

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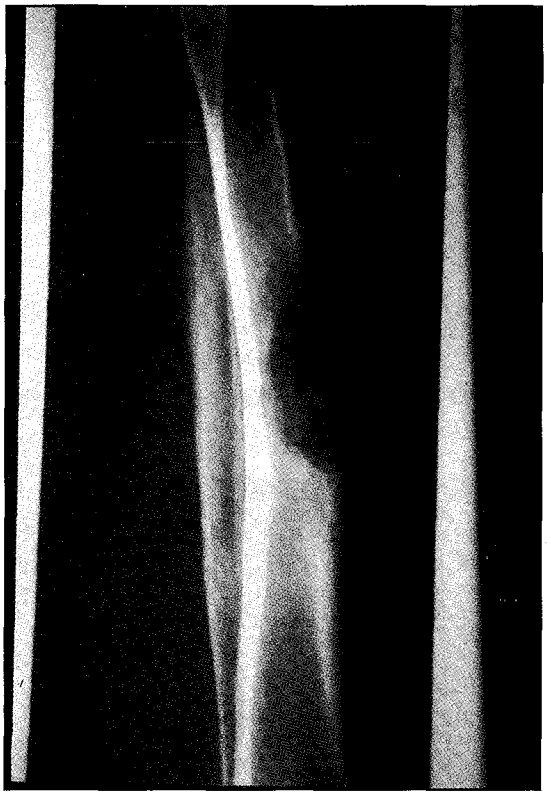

Fig. 1: efect seen in the tibia, involving almost the whole circumference of the bone

Fig. 2: Plain x-rays showing the reimplanted bone stabilized with an interlocking nail and bone cement

Discussion

Reimplantation of a resected segment of bone is one of the methods of reconstruction used in orthopaedic and craniofacial tumour reconstructive units. Harrington[1] performed wide resection of 42 bone sarcomas and reconstructed the defects with autoclaved autogeneic grafts. He found that the technique did not compromise the margins for adequate tumour resection. It also preserved a graft strong enough to support a joint arthroplasty and to allow early weight-bearing with a low risk of pseudarthrosis or late fatigue fracture. Smith[2] followed up seven patients with a similar technique done over a period of fourteen to twenty-four years. A biopsy of the autoclaved segment was done in one patient eleven years after the operation and examination of the specimen showed predominantly live bone; there were very few spicules of dead bone. Serial roentgenograms showed a continuing process of remodelling for two decades. Asada[3] performed 23 reconstructions with autoclaved bone grafts and found that incorporation of the host-graft junction was observed radiographically after a mean of 11 (6-17) months in all cases.

Cutaneous squamous cell carcinoma is commonly seen in Malaysia. With delays in seeking treatment, the tumours usually erode into the underlying bone, especially when the bone is in a subcutaneous region. When only the cortex is involved, one can get away with excising the tumour together with decortication of the bone. Involvement of the medullary cavity would require resection of a segment of the bone.

In our patient, the tumour had already invaded the medullary cavity at the midshaft of the tibia. When diagnosis was first made, he was offered an amputation; which he refused. Excision of the tumour

and reconstruction with an allograft was contemplated but was too costly for the patient. Reconstruction with a vascularised fibular graft was also discussed but this would entail non-weight bearing for many months. The technique described was performed with minimal cost to the patient and he was able to achieve reasonable mobility in a month. The patient did not return for follow-up. From the literature, we would expect host-graft junction to take place after a mean of 11 months[3].

We believe this is a useful procedure in elderly patients who refuse ablative surgery.

References

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