

## **Reconstruction Of The Distal Tibia Following Resection Of Aggressive Bone Lesions Using A Custom-Made Megaprotheses**

Orthopaedics / Musculoskeletal Tumors / Malignant Tumors

**Scott Evans**, Zeeshan Khan, Lee Jeys, Robert Grimer

ROH, Birmingham, United Kingdom

Keywords: Distal Tibia, Endoprosthesis, Reconstruction

### **Introduction**

Patients with aggressive benign and malignant bone tumours affecting the distal tibia have traditionally been offered amputation as the treatment of choice to control their disease. The ability to achieve a wide resection margin in this region is thought to be limited due to the subcutaneous nature of the distal tibia and the close proximity of vital neurovascular and musculo-tendinous structures. Indeed, any involvement of neurovascular structures, ankle joint or important tendons of the foot and ankle are contraindications to limb preservation surgery.

The best method of reconstruction following resection of the distal tibia remains undecided. Various methods have been postulated including free vascularised or non-vascularised fibula autograft with arthrodesis, osteoarticular allograft, and endoprosthetic replacement (EPR). EPR offers the attractive options of an earlier return to ambulation with preservation of ankle motion without the need for prolonged immobilisation and the significant risk of non-union and infection associated with a biological solution to a distal tibial defect.

### **Objectives**

We report the largest, single-centre, retrospective study of clinical and functional outcomes in patients who underwent excision of the distal tibia with subsequent endoprosthetic reconstruction.

### **Methods**

Between 1977 and 2012 8 patients underwent distal tibial resection for aggressive bone lesions. There were 4 females and 4 males. Median age at presentation of 33 years (range 14-76). There were 4 cases of osteosarcoma, 1 Ewing's sarcoma, 1 leiomyosarcoma of bone, 1 dedifferentiated chondrosarcoma and 1 giant cell tumour (Campanacci 3).

All were managed by a multidisciplinary team (MDT).

Clinical and radiological records of the patients were reviewed retrospectively.

Functional assessment was made using the MSTS criteria.

### **Results**

The median follow-up for all cases was 77 months (range 13-276 months). All patients had clear resection margins on analysis of their post-operative histology. 3 patients died as a result of metastases (one of whom had lung metastases at presentation) at 10, 41 and 44 months respectively following surgery. 2 patients developed local

recurrence; one patient 6 months following surgery for a dedifferentiated chondrosarcoma, the other 33 months following resection of Ewing's sarcoma. The patient with dedifferentiated chondrosarcoma underwent an above knee amputation but later developed lung metastases. The Ewing's sarcoma patient had widespread metastasis at the time of presentation with local recurrence and, therefore, they were treated palliatively. Of the patients who have survived their disease, the median follow-up was 120 months (range 72-276 months).

One patient developed deep infection that required washout and prolonged antibiotics. One patient developed a superficial wound infection in the immediate post-operative period that resolved with oral antibiotics. One patient developed subtle radiological evidence of aseptic loosening of the talar component 55 months after implantation. The patient was asymptomatic.

No patient has required revision surgery. The median MSTS score at last follow up was 66% (range 50-90%).

### **Conclusions**

Careful patient selection is the key to limb reconstruction surgery when patient presents with an aggressive lesion affecting the distal tibia. Of the 508 patients treated at our institute over a 30 year period for a malignant distal tibial lesion, only eight (1.6%) underwent a distal tibial endoprosthetic reconstruction.

This review suggests that distal tibial EPR is a viable option.