ABSTRACT

Purpose. To report on 23 patients with giant cell tumour (GCT) of the femur or tibia treated with curettage, electrocautery, burring, phenol irrigation, and cementation.

Methods. Records of these 14 men and 9 women aged 22 to 38 (mean, 31) years were reviewed. The most common site involved was the distal femur (n=13), followed by proximal tibia (n=8), proximal femur (n=1), and distal tibia (n=1). The lesions were classified as grade I (n=3), grade II (n=18), and grade III (n=2). Based on histology, the tumour stage was classified as grade I (n=5) and grade II (n=18). Two of these patients had recurrences, which were initially treated with simple curettage and bone grafting of the distal femur and distal tibia.

Results. The mean follow-up period was 5.7 (range, 2.5–10.1) years. 14 of the 23 patients were followed up for over 10 years. No patient developed any local recurrence, remote metastasis, or complication related to surgery or adjuvant therapy.

Conclusion. Combined treatment entailing curettage, electrocautery, burring, phenol irrigation, and cementation was effective in treating GCT of bone.

Key words: cautery; cementation; curettage; giant cell tumor of bone; phenol

INTRODUCTION

Giant cell tumour (GCT) of bone occurs mostly commonly in an end of long tubular bones in young adults (median age, 31 years; mean age, 32 years). The lesion is soft and friable, and lacks cartilage or gross evidence of bone formation. It is composed of a vascularised network of spindle-shaped or ovoid stromal cells heavily interspersed with multinuclear giant cells.1-3 The aggressiveness of the lesions is classified into grades I, II, and III indicating no appreciable, moderate, and pronounced atypism of the stromal cells, respectively. The latter shows sarcomatous stroma and is frankly malignant. Approximately 2% of patients with grade-II or recurrent lesions develop lung metastasis after a
mean of 3 (range, 1–10) years.3,4 For grade-III lesions, resection and reconstruction is recommended; chemotherapy alone is ineffective. High-dose (>40 G) radiation therapy is effective, but about 2% of radiated GCTs become malignant.4,5 Treatment options depend on the stage and location of the tumour and the age of the patient. Radical surgery is recommended, as local recurrence is common after conservative surgery (such as simple curettage and bone grafting).6 Local recurrence is associated with aggressiveness of the tumour and inadequacy of its removal and adjuvant treatment.6–8 Combined treatment entailing curettage, electrocautery, burring, phenol irrigation, cementation, cryosurgery with liquid nitrogen, selective embolisation, and radiation is considered most effective.9–16 We report on 23 patients with GCT of the femur or tibia treated with curettage, electrocautery, burring, phenol irrigation, and cementation.

MATERIALS AND METHODS

Records of 14 men and 9 women aged 22 to 38 (mean, 31) years with GCT of the femur or tibia treated with curettage, electrocautery, burring, phenol irrigation, and cementation between March 1986 and January 2006 were reviewed. The most common site involved

Figure 1  Radiographs showing (a) a recurrent giant cell tumour of the distal femur (initially treated with curettage and bone grafting), (b) persisting radiolucency of the lesion suggestive of local recurrence after one year, (c) after combined treatment entailing radical curettage, electrocautery, burring, phenol irrigation, and cementation, and (d) no evidence of local recurrence after 9.5 years.
was the distal femur (n=13), followed by proximal tibia (n=8), proximal femur (n=1), and distal tibia (n=1). All patients presented with pain, though none had pathological fractures. According to the Campanacci radiographic grading, the lesions were classified as grade I (n=3), grade II (n=18), and grade III (n=2). Based on histology, the tumour stage was classified as grade I (n=5) and grade II (n=18). Two of these patients had recurrences that were initially treated with simple curettage and bone grafting of the distal femur and distal tibia (Figs. 1 and 2).

The patients underwent curettage of the entire bone cavity under careful protection of the subchondral bone plate, followed by electrocautery of the wall and freshening of the wall with a high-speed bur until normal bone was seen. The wall was then repeatedly washed with 85% phenol, neutralised with 80% alcohol and saline at least 3 times. The cavity was then packed with acrylic cement. Prophylactic antibiotics were given for one day preoperatively and for 2 days postoperatively. Postoperatively, non-steroidal anti-inflammatory drugs or pain medication were given. No bisphosphonates were given.

RESULTS

The mean follow-up period was 5.7 (range, 2.5–10.1) years. 14 of the 23 patients were followed up for over 10 years. No patient developed any local recurrence (enlargement of the gap between the bone and filled cement), remote metastasis, or complication related to surgery or adjuvant therapy. One patient with a recurrent lesion of the distal tibia developed osteoarthritis of the ankle 9 years after the combined treatment.

DISCUSSION

The incidence of GCT of bone has been reported to be 4 to 5% in the western populations and is higher in Asian populations. GCT of bone accounts for about 20% of skeletal tumours in the Chinese population, and similar findings have been reported in Hong Kong, Malaysian, and Singaporean populations. 40 to 55% of the lesions involve the region around the knee; <1% of the lesions are primary malignant GCT. About 2 to 10% of patients developed distant metastases.
metastasis, usually in the lung.\(^5\)

The local recurrence rate is high after conservative treatment. The rate decreases to <10% after curettage and adjuvant treatments. *En bloc* resection with a wide margin reduced the risk of local recurrence to near zero.\(^3\) Regular surveillance with radiographs is recommended at least once a year, irrespective of clinical signs of recurrence.

Heat of polymerisation of cement can sterilise the tumour wall (3 to 5 mm deep) and augment stability. Methotrexate-loaded bone cement (rather than simple cement) minimises the amount of tumour-induced osteolysis and is useful for treating pathologic fractures.\(^5\)

The histological grade of tumour has little value in predicting treatment outcome.\(^8,11\) The rate of local recurrence correlates more with the treatment method.\(^8\) Regardless of the lesion’s location, recurrence within 15 months is associated with multiple local recurrences.\(^4\) Multiple local recurrences also correlate with lung metastases. Recurettage can preserve the adjacent joints, but risks further recurrence. The risk of recurrence is lower after *en bloc* excision. Curettage combined with meticulous adjuvant treatment enables preservation of the adjacent joints, which is one of the goals of treatment.\(^4\)

There are controversies on whether the tumour cavity should be filled with bone or cement after curettage. When there is no local recurrence after cementation, cement can be replaced by bone after \(\geq 2\) years. Combination treatment entailing radical curettage, electrocautery, burring, phenol irrigation, and cementation is effective in preventing local recurrence, and can replace *en bloc* resection with a wide margin.

REFERENCES