OVERVIEW

The distal femur (Figure 30.1) is the most common site of osteosarcoma. Patients with osteosarcoma of the distal femur have traditionally been treated with a high above-knee amputation or hip disarticulation. Today, with earlier diagnosis and induction chemotherapy, approximately 95% of osteosarcomas can be resected with tumor-free margins. Careful preoperative evaluation and strict adherence to established criteria for resection of bone cancers are required to minimize the risk of local recurrences. Prosthetic reconstruction of the distal femur is an option that must be considered in all these patients. Use of the modular segmental replacement system (MRS) can provide limb salvage in many patients. The functional results are excellent, and patient satisfaction is high. The prosthesis has an excellent long-term survival rate, is reliable, and presents minimal problems of breakage or dysfunction.

This chapter describes in detail the preoperative staging, use of imaging studies, and the surgical technique of popliteal exploration, femoral resection, and prosthetic and soft-tissue reconstruction.
Figure 30.1 Plain radiograph showing a large osteolytic osteosarcoma arising from the posterior medial aspect of the distal femur. The distal femur is the most common location for osteosarcomas. A purely osteolytic lesion represents approximately 25% of all osteosarcomas. Most radiographic studies underestimate the extent of these lesions. (A) Anterior–posterior view of distal femur; (B) lateral view showing a large posterior component.

INTRODUCTION

Many recent studies have demonstrated a low risk of local recurrence (<5%) following limb-sparing surgery of osteosarcomas. The continuous disease-free survival rates in patients who have undergone resection are the same as or better than those of patients undergoing amputation; presumably because of the use of appropriate selection criteria. Eckardt et al. reported their experience at the University of California at Los Angeles with Stage IIIB osteosarcoma for the period 1972–84. Seventy-eight of 116 patients (67%) were treated by a limb-sparing procedure and the local recurrence rate was 8%. Simon et al. compared results of limb-sparing procedures with those of amputation in 277 patients with osteosarcoma of the distal femur and found no difference between the two groups in the rate of metastasis or local recurrence. Malawer et al. reported a 6% local recurrence rate following limb-sparing resections.

Because of the encouraging results reported in these and other studies, limb-sparing surgery is now considered the preferred treatment for carefully selected patients with osteosarcomas and other high-grade sarcomas involving the distal femur. Amputations are reserved principally for patients whose primary tumor is unresectable. The most common factors necessitating an amputation are significant contamination of the tumor site resulting from a poor biopsy, fracture, or extensive neurovascular involvement. The size and extent of the tumor are important only to the degree that they affect these three factors and influence the amount of soft tissue required to be resected, and thus the functional outcome. Even tumors with large