Arthroscopic Curettage of Benign Bone Tumors

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9.1 Introduction

Benign bone tumors are often treated with open surgery, local curettage, or bone grafting, especially in the process of exposing the lesion by injuring the normal anatomical structure firstly, thereby resulting in large surgical trauma and bleeding. The arthroscopic minimally invasive technique can precisely remove the lesion with little trauma to the tissues surrounding the lesion. For benign bone tumors, arthroscopic curettage and bone grafting and carbonated hydroxyapatite filling the lesion can achieve good results [1].

9.2 Preoperative Preparation

Preoperative X-ray (Fig. 9.1), CT scan and CT value (Fig. 9.2), and MRI (Fig. 9.3) are helpful in the initial diagnosis of the lesion, further understanding of the extent of the lesion, and assessment of the amount of bone graft is benefited to guide surgery. It is necessary to use a fluoroscopy machine for positioning during the operation. General or epidural anesthesia was routinely carried out, and the sheets were routinely disinfected.

9.3 Operative Technique

Under fluoroscopy, drill the K-wire percutaneously into the bone lesion (Fig. 9.4). The hollow drill penetrates the bone wall along the guidewire (Fig. 9.5) [2, 3]. Apply a circular drill with a diameter of 5 mm to drill the lesion for pathological examination (Fig. 9.6). Insert the arthroscope into the lesion to observe the lesion (Fig. 9.7), [4] and use curettes to curette the bone tumor tissue (Fig. 9.8), and then grind of tumor bone wall with burr (Fig. 9.9), and the bone wall of the tumor lesion was cauterized under radiofrequency (Fig. 9.10) to reduce the chance of tumor recurrence [5, 6].

After debridement, carbonated hydroxyapatite may be implanted arthroscopically into the bone tumor lesion to prevent pathologic collapse fractures from thinning of the bone wall after tumor curettage (Fig. 9.11).

The advantage of implanted carbonated hydroxyapatite is that it can fill bone defect areas of arbitrary shape and size [6–8]; and out-of-bed activity may occur early after surgery (Fig. 9.12), thus reducing complications of bed rest. Small scope bone defects may also be treated arthroscopically with autogenous bone or allograft (Fig. 9.13).

9.4 Critical Points

1. The nature of the lesion must be clearly defined before surgery for benign bone tumors before arthroscopic surveillance surgery.
2. Fluoroscopy should be used to locate the bone tumor lesion before the operation, and the guide needle should be employed to impact the bone tumor lesion. A trephine should be used to open the window before inserting the arthroscope into the lesion.
3. The amount of bone graft and material was selected according to the size of the lesion cavity, and carbonated hydroxyapatite could fill lesions of any shape and size.

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Fig. 9.1 Lesion in distal Femur under X-ray

Fig. 9.3 MRI T1-weighted image exhibiting low signal intensity in the lesion

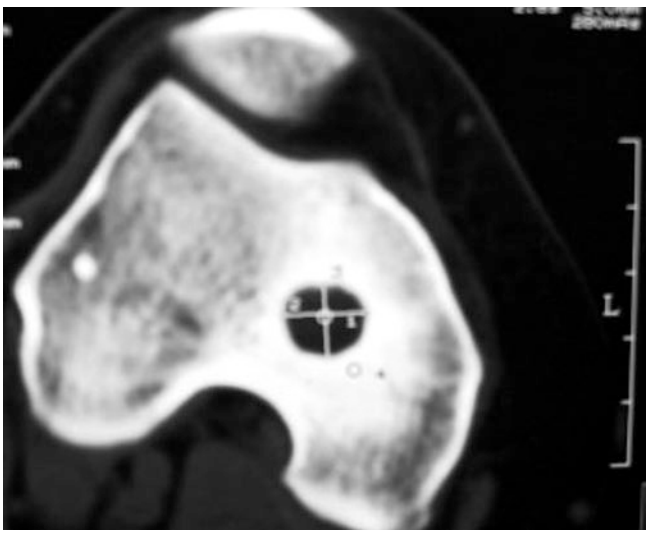

Fig. 9.2 Location, shape, and size of lesions on CT scan

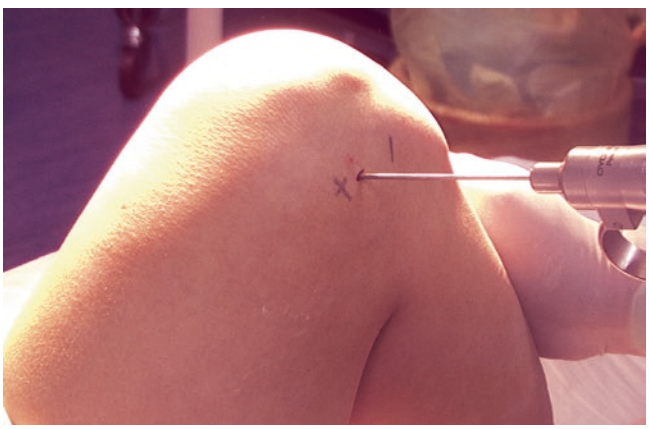

Fig. 9.4 Percutaneous drilling of bone lesions by Kirschner needles under fluoroscopy (X-ray)

Fig. 9.5 Hollow drill drilling bone tumor lesion along guidewire

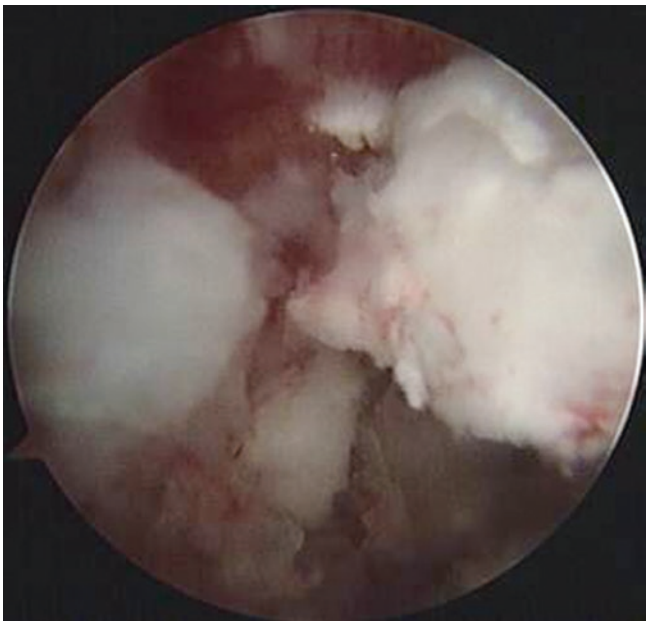

Fig. 9.7 Arthroscopic insertion into tumor lesion for observation

Fig. 9.6 Drilling tissue of tumor lesion with ring drill

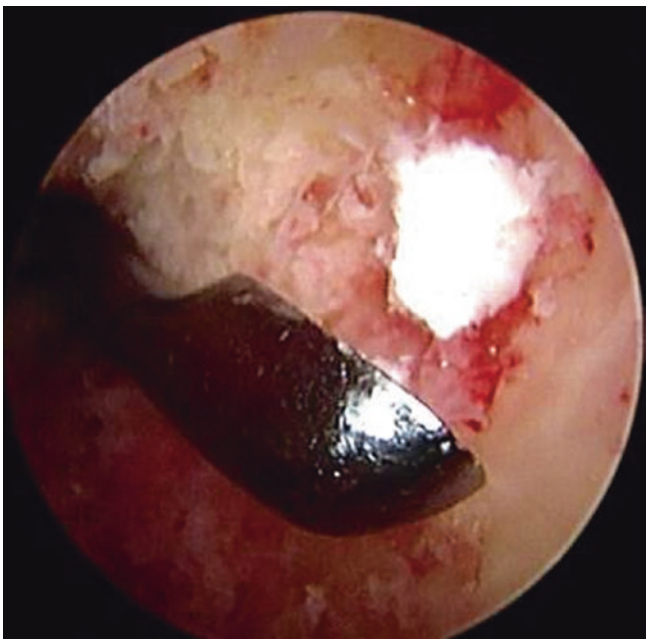

Fig. 9.8 Curettage of bone tumor tissue

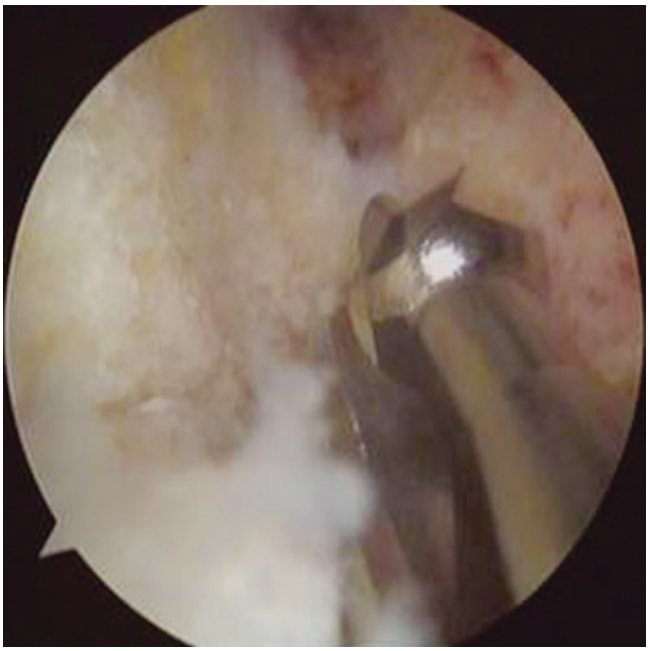

Fig. 9.9 Grinding of tumor bone tissue under arthroscopic surveillance

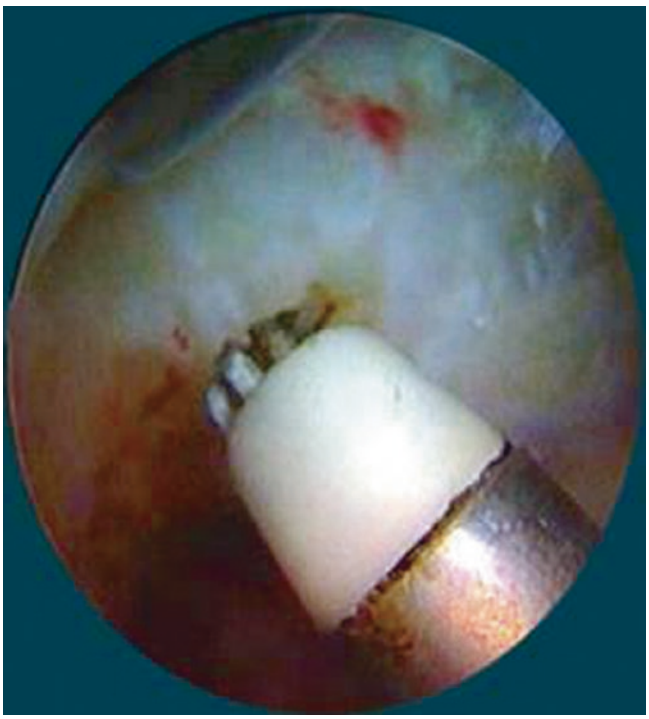

Fig. 9.10 Cauterizing of the bone wall of lesion with radiofrequency

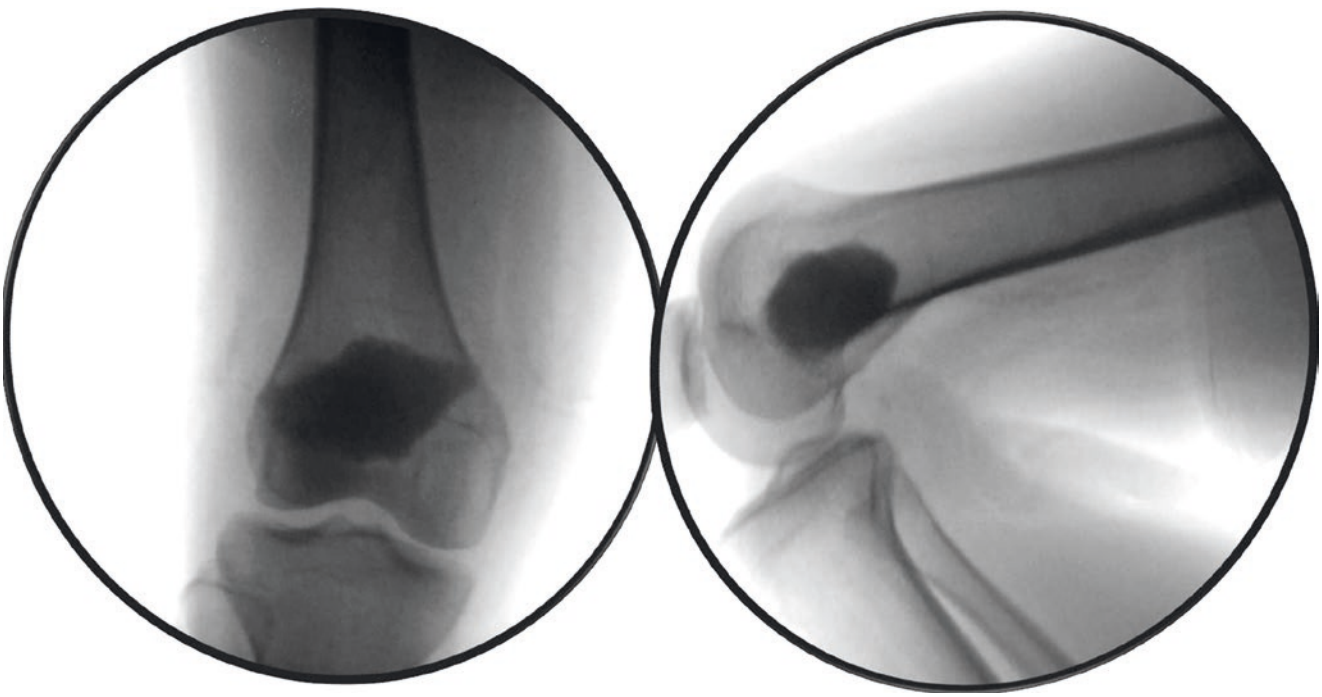

Fig. 9.11 Carbonated hydroxyapatite filled in bone defect area after removal of bone cyst lesion at lower end of femur

Fig. 9.12 Carbonated hydroxyapatite filled after arthroscopic curettage of calcaneal bone cysts

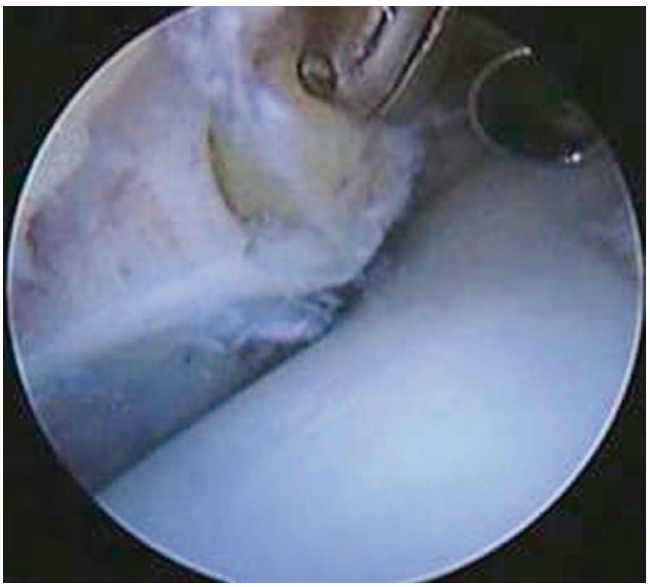

Fig. 9.13 Bone cyst in distal tibia of ankle joint. Implanted autogenous bone block after lesion curettage under arthroscopy

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