Case Report

Arthroscopic Resection for Benign Fibrous Histiocytoma in the Epiphysis of the Femur

Junya Shimizu,1 Makoto Emori,1 Yohei Okada,1 Tadashi Hasegawa,2 and Toshihiko Yamashita1

1Department of Orthopaedic Surgery, Sapporo Medical University School of Medicine, Japan
2Department of Surgical Pathology, Sapporo Medical University School of Medicine, Japan

Correspondence should be addressed to Junya Shimizu; jshimizu@sapmed.ac.jp

Received 5 August 2018; Accepted 6 November 2018; Published 18 November 2018

1. Introduction

Benign fibrous histiocytoma (BFH) is a lesion that is histologically identical to nonossifying fibroma (NOF) but occurs in the nonmetaphyseal portion of long bones or in the pelvis [1–3]. However, tumors that occur in the distal femoral epiphysis are rare. Herein, we describe the first successfully treated case of BFH in the distal lateral femoral epiphysis. Arthroscopic resection may be feasible if the benign osseous lesion occurs in the lateral epiphysis of the femur.

2. Case Report

A 16-year-old woman presented to her local hospital with a few-month history of right knee pain. She was in good health and had no history of direct trauma to the knee. Upon admission, her knee motion range was not restricted and other physical examinations were nonspecific. An anteroposterior plain radiograph revealed the osteolytic lesion surrounding by the bone sclerotic lesion in the lateral femoral condyle (Figures 1(a) and 1(b)). On magnetic resonance imaging (MRI), the lesion exhibited an intermediate signal on T1-weighted (T1W) and T2-weighted (T2W) images (Figure 2). The orthopedic physician made a diagnosis of osteochondritis dissecans. After 13 months, the patient underwent MRI of the knee once more, which demonstrated that the osteolytic lesion grew larger. To achieve a definitive diagnosis, we attempted to perform a resection biopsy with knee arthroscopy. We performed biopsy, and the tumor was removed completely. The tumor occurred in an epiphysis, and the pathological findings concluded that the pathological diagnosis was benign fibrous histiocytoma. One year after surgery, she was asymptomatic. Computed tomography revealed that the previous tumor bone cavity was filled with bone formation and no evidence of recurrence.
yellow brown foci (Figure 6). The histological specimen showed a storiform pattern with giant cells (Figure 7(a)). Immunohistochemical analyses revealed that the tumor cells were negative for SOX9 and S100. The tumor did not show nuclear Histone 3.3 G34W immunoreactivity (Figure 7(b)).

The tumor occurred in an epiphysis, and the pathological findings concluded that the pathological diagnosis was BFH. Full weight-bearing was allowed soon after surgery as the tumor was located in the lateral condyle of the femur. One year after surgery, she was asymptomatic.

Computed tomography revealed that the previous tumor bone cavity was filled with bone formation and no evidence of recurrence (Figure 8).

3. Discussion

Bone tumors have a predilection for specific bones and specific sites in bones. Different diagnoses for bone tumors that develop in the epiphysis are mostly benign lesions, such as chondroblastoma, giant cell tumor of bone (GCTB), and intraosseous ganglion. Only clear cell chondrosarcoma is a differential diagnosis in malignant bone tumors. In such cases, the tumor exhibits intra-articular geographic bone destruction in the distal femoral epiphysis and shares a sharply demarcated margin with the sclerotic rim. We considered that the tumor might be a chondroblastoma. Several authors have reported cases of chondroblastoma arising from the end of the femurs that are treated with arthroscopy [4, 5]. Therefore, we performed an arthroscopic procedure that included biopsy and curettage.

BFH of the bone is rare, with approximately 40% occurring in the long bones. The most common sites of BFH of the bone include the femur and tibia. BFH grows relatively slow, and the common age of incidence is in the third and fourth decades of life. Previous reports have stated that NOF is pathologically extremely similar to BFH [2, 6, 7]. However, the most common site of occurrence differs between the two conditions. Whereas NOF usually arises from the metaphysis of long bones, BFH often arises from the epiphysis. Interestingly, in this case, the histology of
the tumor includes spindle-shaped fibroblasts that are arranged in a storiform pattern, which is similar to NOF. We concluded that the tumor was of the BFH type, on the basis of immunohistochemical analysis of SOX9, S100, and Histone 3.3 G34W. This was done to distinguish the lesion in this case from other bone tumors, such as GCTB and chondroblastoma.

Ultimately, we found that arthroscopic resection of a benign lesion was a useful form of treatment in this case because full weight-bearing was allowed soon after surgery. However, such a procedure was useful in this case as (1) the tumor was in the lateral epiphysis of the distal femur, (2) the tumor was nearly less than 10 mm in diameter, (3) the tumor did not destroy the epiphyseal plate, and (4) the tumor was not a chondroblastoma and so aggressive curettage was not necessary. However, arthroscopic procedures have some limitations. First, there is a risk of intra-articular spread if the tumor is malignant. In addition,
adequate visualization of the tumor may not always be possible and bone grafting of the tumor cavity cannot be performed through the arthroscope. Finally, curettage of epiphyseal bone tumors may damage the articular cartilage, thereby resulting in osteoarthritis [8]. However, biopsy and treatment for benign bone tumors through arthroscopy can minimize damage to cartilage and prevent osteoarthritis.

4. Conclusions

Arthroscopic resection may be an attractive procedure if it is likely that the lesion of interest in the lateral end of the distal femur is a benign tumor.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Consent

Informed consent was obtained from all individual participants included in the study.

Conflicts of Interest

The authors declare that they have no commercial associations.

References

[1] C. D. M. Fletcher, J. A. Bridge, and P. C. W. Hogendoorn, *WHO Classification of Tumours of Soft Tissue and Bone*, IARC Press, Lyon, 2013.

[2] F. Bertoni, P. Calderoni, P. Bacchini et al., “Benign fibrous histiocytoma of bone,” *The Journal of Bone & Joint Surgery*, vol. 68, no. 8, pp. 1225–1230, 1986.

[3] B. E. Clarke, J. M. Xipell, and D. P. Thomas, “Benign fibrous histiocytoma of bone,” *The American Journal of Surgical Pathology*, vol. 9, no. 11, pp. 806–815, 1985.
[4] B. S. Bal and L. Jones Jr., “Arthroscopic resection of a chondroblastoma in the knee,” Arthroscopy, vol. 11, no. 2, pp. 216–219, 1995.

[5] M. S. Thompson and J. S. Woodward Jr., “The use of the arthroscope as an adjunct in the resection of a chondroblastoma of the femoral head,” Arthroscopy, vol. 11, no. 1, pp. 106–111, 1995.

[6] T. Matsuno, “Benign fibrous histiocytoma involving the ends of long bone,” Skeletal Radiology, vol. 19, no. 8, pp. 561–566, 1990.

[7] T. Hamada, H. Ito, Y. Araki, K. Fujii, M. Inoue, and O. Ishida, “Benign fibrous histiocytoma of the femur: review of three cases,” Skeletal Radiology, vol. 25, no. 1, pp. 25–29, 1996.

[8] G. L. Farfalli, P. A. I. Slullitel, D. L. Muscolo, M. A. Ayerza, and L. A. Aponte-Tinao, “What happens to the articular surface after curettage for epiphyseal chondroblastoma? A report on functional results, arthritis, and arthroplasty,” Clinical Orthopaedics and Related Research, vol. 475, no. 3, pp. 760–766, 2017.