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Clinical and functional outcomes of chondroblastoma located in the pelvic and extremities

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Abstract

Chondroblastoma is a rare benign bone tumor that occurs at a young age and typically affects the epiphyses or apophyses of the long bones. Its treatment is curettage and adjuvant therapy. The aim of this study is to present the results of chondroblastomas that we treat as an oncology center. The information of 26 chondroblastoma patients treated in our clinic between 2009 and 2018 were retrospectively reviewed from the archive. Surgical and functional results, complications and local recurrences were analyzed. Twenty-six chondroblastoma patients, 12 females (46%) and 14 males (53%), with a mean age of 16, were followed up for 75 (37-129) months. Twenty patients (76.9%) presented with complaints of pain, while 4 patients (15.4%) presented with swelling and 2 patients (7%) with pathological fractures. The most common site was the tibia proximal in 6 patients (23.1%). Intralesional curettage + high speed burr was applied to all patients as surgical treatment. Grafts were used to fill the defect in 20 patients. Recurrence was observed in a single patient located in the proximal humerus. The mean Musculoskeletal Tumor Society (MSTS) score was 27.7±1.9. Comprehensive curettage using high-speed burr and bone graft in the treatment of chondroblastoma has good local control, low recurrence rate and excellent functional long-term result.

Keywords: Chondroblastoma, curettage, bone tumor

Introduction

Chondroblastoma is a rare benign bone tumor located in the epiphysis or apophysis of the long bones in young adults [1]. Chondroblastoma constitutes 1-2% of all bone tumors, is more common in men and manifests itself with pain and swelling in the affected joint. Its treatment is intralesional curettage. Graft or cementum can be used to fill the gap formed [2]. Although rare, recurrence and pulmonary metastasis can be seen [3,4].

Since it is a rare tumor in the literature, there are limited publications on chondroblastoma treatment and results. With this study, we aimed to present the clinical and functional results of extremity and pelvic chondroblastoma cases that we operated as an oncology center.

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Materials and Methods

In this study, patients with chondroblastoma located in the pelvic and extremity who underwent surgical treatment in our hospital's orthopedic oncology clinic between January 2009 and January 2018 were retrospectively evaluated.

Our hospital's oncological orthopedic clinic database was scanned for patients with chondroblastoma located in the pelvic and extremity. A total of 29 patients were found. Inclusion criteria in these screening results are patients with chondroblastoma located in the pelvic and extremity and the histopathological diagnosis of this lesion. Histopathological diagnosis was made by fine-needle aspiration biopsy or incisional biopsy. Exclusion criteria were patients whose histopathological diagnosis was not confirmed and patients whose records were not available from archives. According to these criteria, 3 of 29 cases were excluded from the study.

Long-term clinical results and complications of surgical treatment were reviewed. The study protocol was approved by the local institutional review board. A written informed consent was obtained

from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical analysis

Statistical analysis was performed using the IBM SPSS version 22.0 software (IBM Corp., Armonk, NY, USA). In statistical analysis, categorical variables were given as numbers and percentages and continuous variables were presented with mean±standard deviation and median (min-max) for descriptive analyses. P<0.05 was considered statistically significant.

Results

Twenty-six chondroblastoma patients, 12 females (46%) and 14 males (53%), with a mean age of 16, were followed up for 75 (37-129) months. The most commonly involved bone was femur with 8 patients (30.8%). Twenty patients (76.9%) presented with complaints of pain, while 4 patients (15.4%) presented with swelling and 2 patients (7%) with pathological fractures. Intralesional curettage + high speed burr was applied to all patients as surgical treatment. Grafts were used to fill the defect in 20 patients. According to the Enneking staging system, 15 patients (57.7%) were stage 1, 8 patients (30.8%) stage 2 and 3 patients (11.5%) stage 3. Recurrence was observed in a single patient located in the proximal humerus. The mean Musculoskeletal Tumor Society (MSTS) score was 27.7±1.9. (Table 1)

Table 1. Beseline Demographics (n=26)

Characteristic		N	(%)	Mean±SD
Age	(year)	16		16.03±5.25
Sex	Female	12	(46.2)	
	Male	14	(53.8)	
Side	Right	13	(50)	
	Left	13	(50)	
Application complaint	Pain	20	(76.9)	
	Swelling	4	(15.4)	
	Pathological fracture	2	(7)	
Location	Femur	8	(30.8)	
	Tibia	7	(26.9)	
	Humerus	4	(15.4)	
	Atypical	7	(26.9)	
Surgical Treatment	Curettage	6	(23.1)	
	Curettage + grafting	20	(76.9)	
Enneking	Stage 1	15	(57.7)	
	Stage 2	8	(30.8)	
	Stage 3	3	(11.5)	
Recurrence	Yes	1	(3.8)	
	No	25	(96.2)	
Follow-up period	(months)	75		72.5±21.6
MSTS score		28	(92.3)	27.7±1.9

Table 2. Localization of Chondroblastoma

Location		n	(%)
upper limb (19.2) n=5	Humerus proximal	3	(11.5)
	Humerus distal	1	(3.8)
	Acromion	1	(3.8)
lower limb (80.8) n=21	Tibia proximal	6	(23.1)
	Femur proximal	5	(19.2)
	Femur distal	3	(11.5)
	Talus	2	(7.7)
	Acetabulum	2	(7.7)
	Tibia distal	1	(3.8)
	Calcaneus	1	(3.8)
	Cuneiform	1	(3.8)

While 19.2% (n: 5) of the patients were located in the upper extremity, 80.8% (n: 21) were located in the lower extremity. The most common site was the tibia proximal in 6 patients (23.1%). There were no complications (Table 2).

Discussion

Chondroblastoma is a rare benign bone tumor that manifests itself with pain and swelling in young adults [5]. Zerky et al. In their study, they stated that 95% of the patients presented with pain [6]. Similarly, in this study, 76.9% of patients presented with pain and the most common complaint was pain. The main finding of this study is that patients treated with intralesional curettage + high speed burr in chondroblastoma treatment have good functional outcomes and low recurrence potential.

When we look at the patient series in the literature, chondroblastoma is more common in young male patients. Zekry et al [6]. In his study, the average age was 20 years and male patients were 75% of all patients. Similarly, Laitinen et al [7]. In his study, the average age was 18, and male patients comprised 70%. Although it was seen in young patients (median age=16) in this study, there was no male dominance. We think that the reason for this is the low number of patients.

Zekry et al. In a study they conducted in 2019, they stated that the most common site of involvement was the proximal femur (35%). [6] In the study of Suneja et al., The most common location was the proximal humerus (26.4%) [8]. Atalar et al. showed that the most common sites of involvement in patients with chondroblastoma were proximal humerus (32%), proximal tibia and proximal femur, respectively [5]. Laitinen et al. In a large patient series study, the most common sites of involvement were proximal tibia (20.2%), proximal humerus and proximal femur, respectively [7]. Likewise, in our study, the most frequently affected sites were tibia proximal (23.1%), femur proximal (19.2%) and humerus proximal (11.5%), and were consistent with the literature.

Recurrence may occur after chondroblastoma intralesional curettage treatment [3]. Tomić et al. reported a recurrence rate of up to 30% after a simple curettage. [9] Suneja et al. [8] While the recurrence rate was 13.2% in their study, Laitinen et al. [7] this rate was 14% in his study. Zekry et al. They reported that only two

(10%) of the 20 chondroblastoma cases, which they followed up for 63 months, had recurrence and in these two patients the lesion was located proximal to the acetabulum and tibia [6]. Unclosed epiphysis, hip / pelvic chondroblastoma and aggressive lesion behavior can be shown as the most important risk factors for local recurrence [8]. In this study, high-speed burr and aggressive curettage were applied to all patients as adjuvant therapy, and recurrence was observed in only one (3.8%) of 26 patients we followed up for an average of 75 months. The recurrent patient was a 12-year-old female patient located proximal to the humerus. Aggressive curettage + high speed burr was used as treatment. We attributed our low recurrence rates to aggressive curettage and our surgical experience as an oncology center.

Long-term follow-up is recommended for recurrence. There are cases of chondroblastoma recurring after the third year in the literature [10]. Lin et al. They reported recurrence at 43rd, 51st, and 84th month [11]. In this study, the only patient with relapse relapsed at 14 months, but all patients were followed up for an average of 75 months for long-term recurrence.

Although preventing local recurrence is one of the important goals in treatment, the most important goal is to achieve a functional result. Chondroblastoma typical occurrence may be associated with limitation of movement due to the proximity of the joint. Suneja et al. After a mean follow-up of 84 months, the mean MSTS score of the survivors was 94.2% [8]. Similarly, in this study, the MSTS score was 92.3%.

Conclusion

In conclusion, comprehensive curettage using high-speed burr and bone graft in the treatment of chondroblastoma has good local control, low recurrence rate and excellent functional long-term result.

Conflict of interests
The authors declare that they have no competing interests.

Financial Disclosure
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Ethical approval
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