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Clinical Characteristics of Giant Cell Tumour of Bone in Makassar, Indonesia

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Abstract

Giant Cell Tumor of Bone is a bone tumor that is classified as a benign tumor but is locally aggressive and can transform into malignant. Identification of the characteristics of GCTB is rarely done in Indonesia, especially in Makassar. This study determined the clinical characteristics of GCTB in Makassar from 2016 to 2021. This study used a descriptive method with total sampling and took samples from medical record data. We grouped GCTB clinical data which included patient age, gender, tumor location, tumor location distribution, histopathological examination then were grouped into benign and malignant GCTB. From 59 samples, most were at the age of 20-40 years (52.5%), especially in males (59.3%), the most common locations were in the long bones as many as 48 samples (81.4%) mainly in the distal radius, distal femur and proximal tibia. Benign cases were 56 samples (94.9%) and malignant cases were 3 samples (5.1%).

Keywords: Giant cell tumor of bone; GCTB; clinical characteristics.

1. Introduction

Giant cell tumor of bone (GCTB) is a benign tumor that is rarely found but is locally aggressive and tends to develop into local recurrences, can transform into malignant [1,2].

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GCTB is a benign tumor consisting of mononuclear cells, and osteoclast-like giant cells. From epidemiological data, it was found that the incidence of GCTB was higher in East Asia and Southeast Asia, especially in China and Japan with a fairly high prevalence of 20% of all primary bone tumors [3]. The prevalence of GCTB is about 5% of all primary bone tumors and about 20% of benign bone tumors [4,5].

GCTB is often found in East Asia and Southeast Asia with an incidence of about 20% compared to in Western countries around 4-5%, especially in China with a fairly high prevalence of about 20% of all primary bone tumors [6,7,8].

Although the terms "giant cell tumor" and "osteoclastoma" may imply that giant cells are responsible or capable of being a component of the neoplasm, there is evidence that cells such as the stroma, a major component of the mononuclear cell population, are the true neoplastic component [8,9,10].

2. Materials and Methods

2.1. Number of Samples

This study was a retrospective study based on medical record data and histopathology. We collected fifty-nine samples that had been diagnosed as Giant Cell Tumor of Bone. We used the total sampling method**,** then we classified as benign and malignant GCTB based on medical records and histopathological examinations from 2016 to September 2021 which were taken from three places, include the Anatomical Pathology Laboratory of Hasanuddin University Hospital, Wahidin Sudirohusodo Hospital, and the Laboratory of the Diagnostic Center for Pathology in Makassar. Incomplete medical records and incomplete histopathological preparations were excluded.

2.2. Data processing

The data were processed using descriptive statistical techniques which were carried out with SPSS 20 for Windows software. Clinical characteristics of Giant Cell Tumor of Bone classified by age, gender, tumor location, distribution location, histopathological examination classified into benign and malignant GCTB.

3. Results

A total of fifty-nine samples were evaluated in this study. Distribution Giant Cell Tumor of Bone can be seen in the table. More than half of patients are between the ages of 20-40 years. This study showed that GCTB was slightly more in males than females, namely 59.3% in males. The most locations were in long bones as many as 48 samples or 59.3% and non-long bones as many as 11 samples or 18.6%. The distribution of GCTB locations was found to be 27.1% in the distal radius, followed by the distal femur 18.6%, proximal tibia 13.6%, proximal humerus 8.5%, proximal femur and distal ulna 5.1%, distal tibia 3.4 % and other site (in short bones and flat bones) were found in 18.6%. There were 56 samples or 94.9% benign and malignant GCTB in 3 samples or 5.1%.

Table 1

Sample Characteristics	GCTB	
	n	**%**
Age		
<20 Years	3	5.1
20-40 Years	31	52.5
>40 Years	25	42.4
Gender		
Male	35	59.3
Female	24	40.7
Bone Type		
Long Bone	48	81.4
Non Long Bone	11	18.6
Location Distribution		
Proximal Humerus	5	8.5
Distal Radius	16	27.1
Distal Ulna	3	5.1
Proximal Femur	3	5.1
Distal Femur	11	18.6
Proximal Tibia	8	13.6
Distal Tibia	2	3.4
Other site	11	18.6
Histopathological Diagnosis		
Benign	56	94.9
Malignant	3	5.1

4. Discussion

The purpose of this descriptive study is to assess the characteristics of GCTB patients using five parameters: age, gender, bone type, tumor distribution, and histopathological diagnosis. According to the distribution of GCTB samples by age and sex, there were 3 samples or 5,1% in the age category 20 years, 31 samples or 52.5% in the age category 20-40 years, and 25 samples or 42.4% in the age category >40 years. This is consistent with previous research, which found that the peak incidence occurs between the ages of 20 and 40, with approximately 5% of cases occurring in young adults [1,11,12].

The incidence of GCTB is higher in males than in females, with as many as 35 males samples and 24 females samples, or 59.3% in males and 40.7% in females, with a 1.5:1 ratio. This contradicts the literature, which shows that the incidence of GCTB is slightly higher in females, with a ratio of 1.2:1, but the difference is not statistically significant [13,14]. According to this theory, females mature their bones faster than males. Previous studies in China and Indonesia, however, found that the prevalence of GCTB was slightly higher in males than in females [15,16].

The distribution of GCTB incidence by location revealed that GCTB was more common in long bones 48 (81,4%) than in non-long bones 11 (18,6%). The ratio of long bone locations to non-long bone locations was 4:1. The distal radius had as many as 16 samples (27,1%), followed by the distal femur with 11 samples (18,6%), the proximal tibia with 8 (13,6%), and the proximal humerus with 5 samples (8,5%). According to the literature, approximately 90 percent of GCTBs occur in the epiphyses of the long bones, with the distal femur (35%), proximal tibia (30%), distal radius (12%), and proximal humerus being the most commonly involved

(10%) [14,17]. Giant cell tumors are most commonly found at the ends of long bones (epiphysis), but they can also spread to the metaphysis, penetrate the cortex, invade the intermuscular septa, and even invade the joint cavity. Approximately 46.2% of the lesions occurred near the knee joint, with the distal femur being the most common site of the lesion. These tumors can develop in almost any bone, both long and short, and frequently involve the joints [10].

The most common histopathological diagnosis of GCTB is benign lesion rather than malignant lesion. There were 56 samples, 94.9% of which were benign, and 3 samples, 5,1% of which were malignant. GCTB accounts for approximately 5% of all primary bone tumors and 20% of benign bone tumors [4,5]. Sarcomatous changes are typically thought to occur in patients with preexisting GCTB, particularly those who have previously received radiation therapy. The identification of sarcoma tissue associated with conventional GCTB characterizes the sarcomatous changes in GCTB histologically. Identification of conventional GCTB areas is critical for this diagnosis to avoid confusion with other cancers that contain a large number of giant cells. The presence of atypical mitoses and cytologic anaplasia in the mononuclear spindle cell component of GCTB was used to identify malignancy [1,8]. Malignant GCTB is uncommon and is classified as primary or secondary. Primary malignancy accounts for about 1-3% of all GCTB cases, while secondary malignancy accounts for 5-10% of cases [18].

The study's limitations were that medical records were collected from January 2016 to September 2021, limiting the time for follow-up and the number of samples collected. However, more research with a larger sample size and more diverse variables is required.

5. Conclusion

Most cases of GCTB occur at the age of 20-40 years and slightly increase in males rarely seen in younger population. The tumor location generally in the long bones and most commonly in the distal radius.

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