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## Pathologic evaluation of cystic lesions of bones

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### Abstract

**Background:** Cystic lesions of the bones refer to fluid-filled or air-filled cavities within the bone tissue. The present study was conducted to assess pathologic evaluation of cystic lesions of bones.

**Materials & Methods:** 94 cystic lesions of bones of both genders were selected. From a macroscopic perspective, the samples showed signs of bleeding and irregularities, with some places exhibiting bone-like firmness. Each sample was embedded in paraffin and fixed in 10% buffered formalin and the pathological assessment using standard hematoxylin- eosinstained slides, guided by radiological images and clinical data was performed.

**Results:** Out of 94 patients, males were 54 and females were 40. 45 lesions were in lower extremities. Pelvis was involved in 16, vertebrae in 4, femur in 8, tibia in 7, fibula in 11. Upper extremities were involved in 30 cases. Humerus in 14, radius in 10, ulna in 6 and others in 19 cases. Intraosseous lipoma in 4, ossifying fibroma in 3, concurrent lesions in 6, giant cell tumor in 3, reparative granuloma in 1 and fibrous dysplasia in 2 cases. The difference was significant ( $p < 0.05$ ).

**Conclusion:** Maximum cystic lesions were seen in males. The most common lesion was seen in pelvis, fibula, humerus and radius. Other lesions were intraosseous lipoma, ossifying fibroma, concurrent lesions, and giant cell tumor.

**Keywords:** Cystic lesions, pelvis, hematoxylin

### Introduction

Cystic lesions of the bones refer to fluid-filled or air-filled cavities within the bone tissue <sup>[1]</sup>. Simple bone cysts (Also known as unicameral bone cysts) are fluid-filled cysts that typically occur in the metaphysis (The wider portion of the long bones) of children and adolescents. They are often asymptomatic but can cause pain or fracture <sup>[2]</sup>. Aneurysmal bone cysts are vascular lesions that contain blood-filled spaces separated by fibrous tissue. They often occur in the metaphysis of long bones and can cause pain, swelling, and pathological fractures While not a true cyst, fibrous dysplasia is a benign bone disorder characterized by the replacement of normal bone with fibrous tissue, leading to the formation of cyst-like lesions <sup>[4]</sup>. Simple or traumatic bone cysts may develop as a result of trauma to the bone, leading to the formation of a fluid-filled cavity. Cystic lesions of the bones may be asymptomatic and incidentally discovered on imaging studies performed for other reasons <sup>[5]</sup>. However, symptomatic cysts can cause localized pain, swelling, tenderness, and, in some cases, pathological fractures. The clinical presentation may vary depending on the location, size, and aggressiveness of the cystic lesion <sup>[6]</sup>. The present study was conducted to assess pathologic evaluation of cystic lesions of bones.

### Materials and Methods

The present study consisted of 94 cystic lesions of bones of both genders. Data such as name, age, gender etc. was recorded. From a macroscopic perspective, the samples showed signs of bleeding and irregularities, with some places exhibiting bone-like firmness. Each sample was embedded in paraffin and fixed in 10% buffered formalin and the pathological assessment using standard hematoxylin- eosinstained slides, guided by radiological images and clinical data was performed. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

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## Results

**Table 1:** Distribution of patients

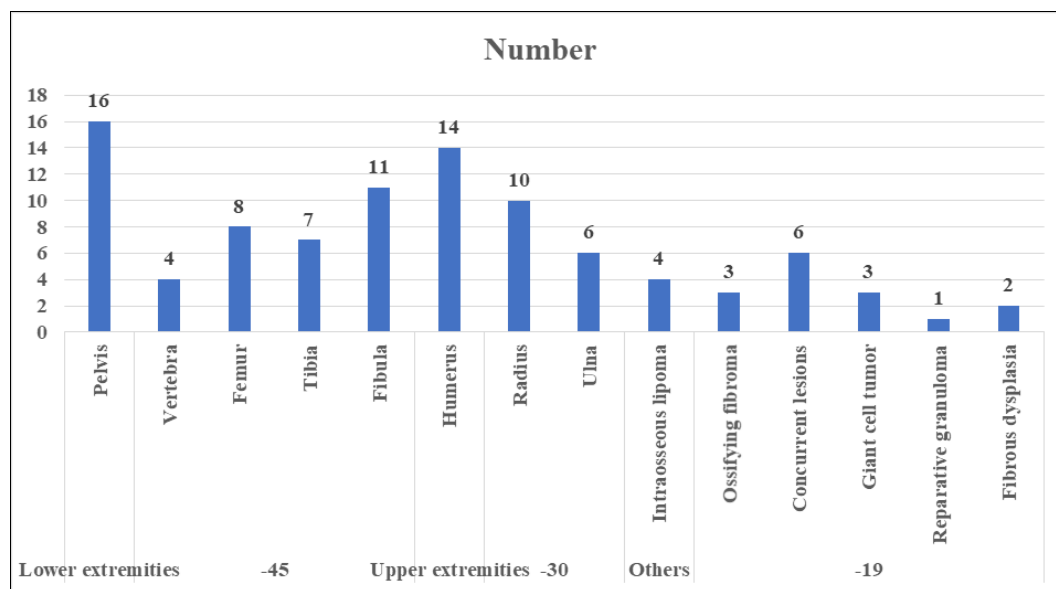
Total- 94		
Gender	Male	Female
Number	54	40

Table I shows that out of 94 patients, males were 54 and females were 40.

Table II, graph I shows that 45 lesions were in lower extremities. Pelvis was involved in 16, vertebrae in 4, femur in 8, tibia in 7, fibula in 11. Upper extremities were involved in 30 cases. Humerus in 14, radius in 10, ulna in 6 and others in 19 cases. Intraosseous lipoma in 4, ossifying fibroma in 3, concurrent lesions in 6, giant cell tumor in 3, reparative granuloma in 1 and fibrous dysplasia in 2 cases. The difference was significant ( $p < 0.05$ ).

**Table 2:** Assessment of parameters

Parameters	Variables	Number	P value
Lower extremities (45)	Pelvis	16	0.01
	Vertebra	4	
	Femur	8	
	Tibia	7	
	Fibula	11	
Upper extremities (30)	Humerus	14	0.05
	Radius	10	
	Ulna	6	
Others (19)	Intraosseous lipoma	4	0.82
	Ossifying fibroma	3	
	Concurrent lesions	6	
	Giant cell tumor	3	
	Reparative granuloma	1	
	Fibrous dysplasia	2	



**Graph I:** Assessment of parameters

## Discussion

The management of cystic bone lesions depends on various factors, including the type of cyst, location, symptoms, and risk of fracture [7]. Observation may be appropriate for asymptomatic or minimally symptomatic cysts that are not at risk of fracture [8]. Surgical treatment options include curettage (Scraping out the cyst contents), bone grafting, cyst decompression, or, in some cases, resection of the affected portion of the bone [9, 10]. In some instances, adjunctive treatments such as injection of bone substitute materials or sclerosing agents may be used to promote cyst healing and prevent recurrence [11, 12]. The prognosis for cystic bone lesions varies depending on the specific type of cyst, treatment approach, and individual patient factors. Most cystic bone lesions have a good prognosis with appropriate management, although recurrence rates may vary depending on the type of cyst and treatment received [13, 14]. The present study was conducted to assess pathologic evaluation of cystic lesions of bones.

We found that out of 94 patients, males were 54 and females were 40. DOĞANAVŞARGİL *et al.* [15] re-evaluated 143 patients diagnosed with aneurysmal bone cyst (n=98, 68.5%), solitary bone cysts (n=17, 11.9%), pseudocyst (n=10, 7%), intraosseous ganglion (n=3, 2.1%), hydatid cyst (n=2, 1.4%), epidermoid cyst (n=1, 0.7%) and cysts demonstrating “mixed” aneurysmal-

solitary bone cyst histology (n=12, 8.4%), and compared them with nonparametric tests. Aneurysmal bone cyst, solitary bone cysts and mixed cysts were frequently seen in the first two decades of life while the others occurred after the fourth decade. Aneurysmal bone cysts, intraosseous ganglion and pseudocysts were more common in women contrary to solitary bone cyst and mixed cysts (the female/male ratio was 1.22, 2 and 1.5 versus 0.7 and 0.5, respectively). Aneurysmal bone cyst, solitary bone cysts and “mixed” cysts were mostly seen in long bones, predominantly the femur, while epidermoid, hydatid and pseudocysts were all seen in flat bones like the vertebra, pelvis and mandible ( $p=0.001$ , chi-square). Repeat biopsies were performed in 19 cases (13.3%), 84.2% of which were aneurysmal bone cyst (5 conventional, 9 solid, 1 secondary and 1 subperiosteal) and three (15.8%) were mixed cysts ( $p=0.02$ , chi-square). Notably, some of them were located in inaccessible areas of pelvis (n=3), femur (n=3) and maxilla (n=2).

We found that 45 lesions were in lower extremities. Pelvis was involved in 16, vertebrae in 4, femur in 8, tibia in 7, fibula in 11. Upper extremities were involved in 30 cases. Humerus in 14, radius in 10, ulna in 6 and others in 19 cases. Intraosseous lipoma in 4, ossifying fibroma in 3, concurrent lesions in 6, giant cell tumor in 3, reparative granuloma in 1 and fibrous dysplasia in 2 cases. Ozgun *et al.* [16] analyzed the cystic bone lesions in a

pathologic point of view. All bone cysts between 2002 and 2013 retrospectively evaluated under the guidance of clinical information and radiological images. Descriptive data such as age, gender, tumor site, symptoms, and clinical and radiological findings obtained from the hospital's database system. Results: There were 96 cystic bone lesions; 47 were aneurysmal bone cysts (ABCs), 37 were simple bone cysts (SBCs), one was a lesion with features of both ABC and SBC, four were intraosseous ganglia, four were epidermoid cysts, and three were hydatid cysts. The mean ages of the patients with ABCs and SBCs were  $18.7 \pm 12.8$  years (range, 3-75 years) and  $23.8 \pm 13.3$  years (range, 3-62 years), respectively. Most of the lesions located in the long bones. The limitation of the study is the small sample size.

### Conclusion

Authors found that maximum cystic lesions were seen in males. The most common lesion was seen in pelvis, fibula, humerus and radius. Other lesions were intraosseous lipoma, ossifying fibroma, concurrent lesions, and giant cell tumor.

### Conflict of Interest

Not available

### Financial Support

Not available

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