High Recurrence Rates of Osteoid Osteoma Treated with Open Surgery

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INTRODUCTION: Osteoid osteoma (OO) is a benign bone lesion typically treated with radiofrequency ablation (RFA), though open surgery is an option in select cases. However, the rates of recurrence and reoperation between these treatments vary in the literature. This study aims to quantify the recurrence and reoperation rates of OO following initial treatment.

METHODS: A retrospective review of patients with a pathologically confirmed OO at a tertiary pediatric hospital from 2004 to 2024 was conducted. Patient demographics, operative reports, and clinic notes were collected. Statistical analysis was performed using Fisher's Exact and Wilcoxon Rank Sum Tests.

RESULTS SECTION: Twenty-four patients were included, with a median age of 9.9 years (range 5.8-13.5) and a median follow-up of 1.4 years (range 0.8-2.7). The cohort consisted of 16 females (66.7%) and 8 males (33.3%). Fifteen patients (62.5%) were treated with RFA, eight (33.3%) with excision and curettage, and one (4.2%) with en-bloc resection (Table 1). The most common tumor location was the femur (10 patients), followed by the tibia (six patients), and the spine (three patients). (Table 1)

Fourteen (58.3%) patients experienced symptomatic tumor recurrence, with a median time to recurrence of 0.81 (0.1-1.3) years. Recurrence rates were similar between patients treated with excision and curettage (5/8, 62.5%) and those treated with RFA (9/15, 60.0%). Of the 14 patients with recurrence, four of the five (80.0%) who initially underwent excision and curettage and six of the nine (66.7%) patients who initially underwent RFA underwent reoperation (Figure 1). There was no significant correlation between surgical intervention and recurrence (p=0.638).

There was no significant correlation between lesion location (p=0.420), sex (p=0.673), and age at initial surgery and recurrence (p=0.689). Four of 24 (16.7%) patients developed a skeletal complication at the tumor site that persisted at final follow-up, with a median time to last follow-up of 2.58 (1.0-4.2) years. Three of these patients initially underwent excision and curettage, while the remaining patient had an en-bloc resection. None of the patients who underwent RFA developed a skeletal complication.

DISCUSSION: Our study observed a recurrence rate of 58%, which is higher than previous reports. Although there was no significant link between treatment type and recurrence, it is noteworthy that none of the RFA patients experienced a post-procedural skeletal complication.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): These findings highlight the importance of considering both recurrence risk and the complication profile when selecting a treatment method and counseling patients and families.

IMAGES AND TABLES:

Table 1. Patient Demographics

	N=24
Age (years)	9.92 (5.8-13.5)
Follow-up (months)	1.41 (0.8-2.7)
Sex	
Male	8 (33.3%)
Female	16 (66.7%)
Tumor Location	
Femur	10 (41.7%)
Tibia	6 (25.0%)
Spine	3 (12.5%)
Fibula	1 (4.2%)
Hip	1 (4.2%)
Talus	1 (4.2%)
Skull	1 (4.2%)
Phalanx	1 (4.2%)

All categorical values are presented as *n (%)* and continuous values as *median (interquartile range)*

Figure 1. Recurrence and Surgical Intervention