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The role of routine pathologic assessment after pediatric osteochondroma excision

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Background: Osteochondromas are benign osseous lesions often excised for pain, growth abnormalities, and aesthetic concerns. These lesions demonstrate characteristic clinical and radiographic features leaving little diagnostic ambiguity in most cases of osteochondroma. While osteochondromas are capable of malignant transformation, the actual frequency of this phenomenon is controversial and exceedingly rare in the pediatric population. However, pathologic analysis to confirm the diagnosis and screen for malignancy is routinely performed following surgical resection of osteochondromas. We sought to explore the clinical value of routine pathologic analysis after osteochondroma excision in a pediatric population.

Purpose: The purpose of this study was to determine the clinical and economic utility of routine pathologic evaluation after osteochondroma resection in pediatric patients.

Methods: A retrospective review of a single pediatric orthopedic specialty hospital identified 284 osteochondroma lesions surgically resected from 65 patients. Patients with solitary and multiple lesions were included. Clinical, radiographic, and surgical data including lesion location and surgical indication were recorded for each resection surgery. Pathologic reports were evaluated and diagnosis and histologic features including lesion and cartilage cap size were recorded. Costs incurred for routine pathologic assessment was also noted.

Results: 11 patients were treated with surgical resection of a solitary osteochondroma lesion, while an additional 273 lesions were resected from 54 patients with multiple lesions. Average age at the time of surgical resection was 12.7 years (2.1 – 17.9). The most common anatomic locations of excised lesions included the proximal tibia/fibula (60, 21.1%), distal radius/ulna (52, 18.3%), and distal femur (50, 17.6%). All resected specimens were sent for pathologic analysis. The average size of the resected lesions was 19.9 mm³ (0.02 – 385.0 mm³). In all cases, the histologic diagnosis confirmed benign osteochondroma. The total cost of pathologic analysis including processing and interpretation fees was approximately \$755.00 for each lesion assessed, for a total of \$214,420.

Conclusion: Malignant transformation of osteochondroma lesions is a rare phenomenon in pediatric patients. In this series, pathologic assessment confirmed a diagnosis of benign osteochondroma in all cases. Surgical resection of suspected typical osteochondromas without formal post-operative pathologic analysis is a safe practice to minimize surgical costs in the pediatric population.

Level of Evidence: Level IV: case series.