PAPER 10

Surgical Management of Chondrosarcoma of long bones utilizing a pre-operative radiologic aggressiveness score?

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Abstract

Background

Grading and ability to offer grade-based treatment for chondrosarcomas of bone is a difficult problem and has perplexed surgeons, radiologists as well as pathologists. Although pathology remains the gold standard for diagnosis and grading, recent advances studying the use of imaging modalities have shown promise in the ability to grade chondrosarcomas with higher accuracy than biopsies. Since the difference is primarily in the ability to determine low grade chondrosarcomas, that are amenable to intralesional tumor surgery versus “resection” grade chondrosarcomas; we evaluated the radiological parameters in extremity long bone primary intraosseous chondrosarcomas that may be used by the surgeons in an outpatient clinical setting to provide grade-based management options for these lesions.

Questions/Purposes

(1) Question / Purposes 1?

Have we achieved a radiological score to predict resection grade chondrosarcomas in primary intraosseous extremity long bone lesions?

(2) Question / Purposes 2?

What is the concordance of the radiological score across various surgeons and how does it compare with the predictive accuracy of biopsy grade for “resection” grade chondrosarcomas?

Methods

113 patients were identified from 2000 to 2021 on retrospective review with to be included in the study. Variables for radiological grading were selected a priori after literature review and the nine-parameter radiological aggressiveness score was modified for identification of radiological score. The best cut-off to predict post surgical chondrosarcoma grade was correlated to the biopsy grade. Interclass correlation provided observer variability and reproducibility assessment for the radiological scoring system.

Results

Radiological aggressiveness score of 4 parameters or more was 97.9% sensitive and 90.5% specific in predicting resection grade chondrosarcoma from a receptor operator curve and cut-off derived using Youden index.

Interclass correlation of 0.897 was observed for radiological scoring of the lesions across 4 blinded surgeon reviewers. The concordance between biopsy grade and final grade of chondrosarcoma was noted in 63. 8% patients (67 out of 105 patients); 8 patients underwent resections based on clinical and radiological presentation). When the groups were analysed based on surgical management - the ability for biopsy to differentiate low grade from “resection” grade chondrosarcomas was noted in 87 out of 105 biopsies (82.86%).

Conclusions

This large retrospective analysis suggests that the radiological evaluation score has good accuracy to be used by the surgeons to provide grade-based management of resection grade extremity chondrosarcomas, and may be relied upon in the event of a discordant biopsy grade.

Level of Evidence Level III