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Chondrosarcoma of the Osseous Spine: An Analysis of Epidemiology, Patient Outcomes, and Prognostic Factors Using the SEER Registry From 1973 to 2012

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Abstract

Study design: Retrospective analysis.

Objective: To determine the epidemiology and prognostic indicators in patients with chondrosarcoma of the osseous spine.

Summary of background data: Chondrosarcoma of the spine is rare, with limited data on its epidemiology, clinicopathologic features, and treatment outcomes. Therapy centers on complete en bloc resection with radiotherapy reserved for subtotal resection or advanced disease.

Methods: The Surveillance, Epidemiology, and End Results Registry was queried for patients with chondrosarcoma of the osseous spine from 1973 to 2012. Study variables included age, sex, race, year of diagnosis, size, grade, extent of disease, and treatment modality.

Results: The search identified 973 cases of spinal chondrosarcoma. Mean age at diagnosis was 51.6 years, and 627% of patients were males. Surgical resection and radiotherapy were performed in 75.2% and 21.3% of cases, respectively. Kaplan-Meier analysis demonstrated overall survival (OS) and disease-specific survival (DSS) of 53% and 64%, respectively, at 5 years. Multivariate Cox regression analysis showed that age (OS, $P < 0.001$; DSS, $P = 0.007$), grade (OS, $P < 0.001$; DSS, $P < 0.001$), surgical resection (OS, $P < 0.001$; DSS, $P < 0.001$), and extent of disease (OS, $P < 0.001$; DSS, $P < 0.001$) were independent survival determinants; tumor size was an independent predictor of OS ($P = 0.006$). For confined disease, age ($P = 0.013$), decade of diagnosis ($P = 0.023$), and surgery ($P = 0.017$) were independent determinants of OS. For locally invasive disease, grade (OS, $P < 0.001$; DSS, $P = 0.003$), surgery (OS, $P = 0.013$; DSS, $P = 0.046$), and size (OS, $P = 0.001$, DSS, $P = 0.002$) were independent determinants of OS and DSS. Radiotherapy was an independent indicator of worse OS for both confined ($P = 0.004$) and locally invasive disease ($P = 0.002$). For metastatic disease, grade (OS, $P = 0.021$; DSS, $P = 0.012$) and surgery (OS, $P = 0.007$; DSS, $P = 0.004$) were survival determinants for both OS and DSS, whereas radiotherapy predicted improved OS ($P = 0.039$).

Conclusion: Surgical resection confers survival benefit in patients with chondrosarcoma of the spine independent of extent of disease. Radiotherapy improves survival in patients with metastatic disease and worsens outcomes in patients with confined and locally invasive disease.

Level of evidence: 4.

Figures

Figure 1
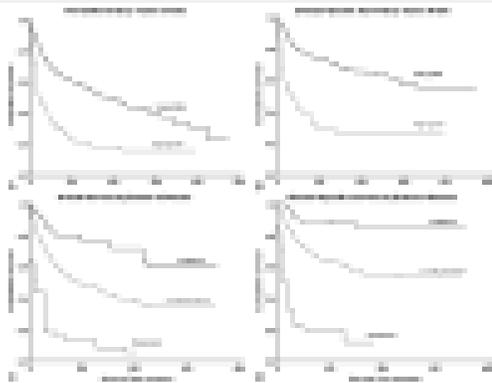
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Survival analysis of patients with…

Figure 2

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Kaplan-Meier analyses of patients with…

Figure 3

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Kaplan-Meier analyses of patients with…