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Outcome of pelvic bone sarcomas in children under 16 years of age

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Introduction: Sarcomas of the pelvis in children are rare and present a particular challenge due to their often large size, and difficulty in achieving surgical margins due to the close proximity of vital structures. The aim of this study was to assess the outcomes in children presenting with a primary sarcoma of the pelvis.
Patients: This retrospective study comprised 113 cases of pelvic sarcoma in children under 16 diagnosed between 1983 and 2014 at the Royal Orthopaedic Hospital, Birmingham, UK. Outcomes assessed included patient survival using the Kaplan-Meier method with a log-rank test for univariate analysis, and independent factors for survival using Cox regression analysis.
Results: The tumours comprised 88 cases of Ewing's sarcoma (ES) (78%) and 25 cases of osteosarcoma (OS) (22%) with a mean age at diagnosis of 12.7 years (12.4 in ES and 14.1 in OS). Sixty-one patients (54%; 63% of ES, 28% of OS) were treated with radiotherapy, 32 (28%; 23% of ES, 48% of OS) by surgery alone, 16 (14%; 14% of ES, 16% of OS) by surgery and radiotherapy and 3 (3%; 1% of ES, 8% of OS) with chemotherapy alone. Negative predictors of survival included local recurrence (LR), metastases at diagnosis, tumour location, and a poor response to chemotherapy. The choice of treatment did not affect survival in ES without metastases at diagnosis. Surgical margin and response to chemotherapy affected LR in OS but only response to chemotherapy affected LR in ES, which occurred in 44% (4 out of 9) with a poor response, regardless of surgical margin. In those with a good response to chemotherapy, LR occurred in 18% (3 out of 17) regardless of margin. Patients with ES treated by radiotherapy had a LR of 28%.
Discussion: Whilst attaining a wide surgical margin should be the aim of treatment in children with OS, in ES response to chemotherapy has a greater impact on survival and those with a poor chemotherapy response should be treated with radiotherapy. Effort should be concentrated on identifying non-histological predictors of response to chemotherapy as those who demonstrate a poor response may be better suited to radiotherapy.