Is computer navigation of pelvic tumours safer for the patient?

Introduction: Due to the complex anatomy of the pelvis, limb-sparing resections of pelvic tumours achieving adequate surgical margins, can often be difficult. The advent of computer navigation has improved the precision of surgical resections of the pelvis, though little evidence exists comparing resection with or without the assistance of navigation. The aim of this study was therefore to assess the accuracy of navigation assisted surgery, as defined by the margin achieved at resection, and how this affected local control, to assess any differences in overall survival that may exist when compared to non-assisted surgery, and to identify any benefit to the patient in terms of peri and post operative morbidity through the use of navigation.

Materials and Methods: Using our prospectively updated institutional database, we conducted a retrospective case control study of 21 patients who underwent a resection of the ilium and sacrum, for treatment of a primary sarcoma of bone, between 1987 and 2015. In 9 patients resection was performed with the assistance of navigation and in 12 without navigation. We assessed the accuracy of navigation assisted surgery, as defined by the margin and how this affects local control, disease specific survival and the possible benefit in terms of peri and postoperative morbidity.

Results: The mean age was 36.4 years. The mean tumour size was 10.9 cm. In the navigation-assisted group, the margin was wide in 2 patients (16.7%), marginal in 6 patients (66.7%), wide-contaminated in 1 (11.1%) with no intralesional margin. In the non-navigated-assisted group; the margin was wide in 2 patients (16.7%), marginal in 5 patients (41.7%), intralesional in 3 patients (25.0%) and wide-contaminated in 2 patients (16.7%). Local recurrence occurred in 2 patients in the navigation-assisted group (22.2%) and 6 in the non-navigation assisted group (50.0%). In the navigation-assisted group, the 5-year disease-specific survival was 100% and in non-navigation assisted group 52.9% (p=0.061). Estimated blood loss and operating time were less in navigated-assisted group as was the risk for unplanned foot drop.

Conclusion: The beneficial effects of navigation when applied to tumour resection of the posterior ilium and sacrum, on reducing surgical time and intraoperative blood loss, as well as the more accurate placement of osteotomies with reduction in intralesional margins and fewer local recurrences as well as fewer complications, is clearly an advantage.

Keywords : Pelvis, Sarcoma, Navigation
Authors : Parry Michael 1, Laitinen Minna 2, Albergo Jose 1, Grimer Robert 1, Jeys Lee 1,

1. Oncology, Royal Orthopaedic Hospital, Birmingham, UNITED KINGDOM
2. Unit of Musculoskeletal Surgery, Tampere, FINLAND

Authors (raw format)

Michael Parry - email : michael.parry3@nhs.net Institution : Royal Orthopaedic Hospital Department : Oncology City : Birmingham Country : UNITED KINGDOM Speaker : Yes
Minna Laitinen - email : minna.laitinen@fimnet.fi Institution : Unit of Musculoskeletal Surgery Department : City : Tampere Country : FINLAND Speaker : No
Jose Albergo - email : Institution : Royal Orthopaedic Hospital Department : Oncology City : Birmingham Country : UNITED KINGDOM Speaker : No
Robert Grimer - email : Institution : Royal Orthopaedic Hospital Department : Oncology City : Birmingham Country : UNITED KINGDOM Speaker : No
Lee Jeys - email : Institution : Royal Orthopaedic Hospital Department : Oncology City : Birmingham Country : UNITED KINGDOM Speaker : No