

**FC-166****A prospective cohort study using computer assistance during resection of musculoskeletal tumors**P. Young, **A. Mahendra***Glasgow Royal Infirmary, Glasgow, United Kingdom*

**Introduction:** The surgical management of musculoskeletal tumours is a challenging problem and has to be individualised according to anatomical location, with an aim to achieve optimum oncologic margins. This can be particularly difficult in resection of pelvic tumours and in complex geometric osteotomies as accurate determination of bony transection points is extremely important to achieve and optimise oncologic, functional and reconstructive options. The use of computer assisted navigation in these cases could improve surgical precision with the potential for optimising preservation of adjacent anatomical structures and achieving pre-planned oncological margins with improved accuracy.

**Methods:** From December 2009 onwards we resected musculoskeletal tumours in twenty patients requiring resection and subsequent reconstruction of multiplanar pelvic, geometric or diaphyseal resections, using commercially available computer navigation software (Orthomap 3D). Of the eleven pelvic tumours, three underwent biological reconstruction with extra corporeal irradiation; four endoprosthetic replacement (EPR); two underwent Harrington type reconstruction and two required no bony reconstruction. Four diaphyseal tumours had biological reconstruction. Two patients with proximal femoral sarcoma and two with proximal humeral sarcoma underwent extra-articular resection and where appropriate EPR. One soft tissue sarcoma of the adductor compartment involving the femur was resected with EPR. Results Primary outcome was assessed in terms of registration error, resection error, and reconstruction adequacy. Secondary measures included histological margins; time taken for preoperative planning; time taken for tracker insertion and intra-operative registration and completion of surgery under computer assistance as planned. Post-operative radiographs and CT show resection as planned in all cases where navigation was utilised. In two patients learning points were identified related to patient specific factors and surgical planning error. Histological examination of the resected specimens revealed tumour free margins in all cases.

**Conclusion:** The use of computer navigation in musculoskeletal oncology allows integration of local anatomy and tumour extent and thus resection margins can be identified accurately. Our experience so far has been encouraging. Further clinical trials, ideally multicentre, are required to evaluate its long-term impact including functional and oncological outcomes.