

Potential accuracy of navigated K-wire guided supra-acetabular osteotomies in orthopedic surgery: a CT fluoroscopy cadaver study

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BACKGROUND

The aim of this study was to evaluate the accuracy of supra-acetabular pelvic tumor resections in human, full-body cadavers and under realistic operation room conditions with the help of a navigation system and K-wires as guidance for the oscillating saw.

METHODS

Seven hemipelvises from fresh, human, male, full-body cadavers were used. A preoperative and a postoperative CT was performed. Under control of the navigation system K-wires were inserted and served as guidance for the oscillating saw to reduce the error by vibration and jerking movements. The accuracy of the computer aided resections was compared with the accuracy of freehand resections in customized 3D printed pelvises with geometries identical to the cadavers used.

RESULTS

The mean deviation of the navigated osteotomies was 1.9 mm (standard deviation 1.0 mm) significantly ($P < 0.001$) lower than the mean deviation of freehand osteotomies at 9.2 mm (standard deviation 3.7 mm).

CONCLUSION

Navigated K-wires for supra-acetabular osteotomies allow significantly higher accuracy than freehand procedures under simulated operation room conditions. Copyright © 2016 John Wiley & Sons, Ltd.

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