Intraoperative Use of 3D Fluoroscopy in Management of Proximal Tibial Fractures

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Purpose: Intraoperative 3-dimensional fluoroscopy (3DRX) is becoming popular in the management of fractures. Little is known about its consequences in the treatment of intra-articular proximal tibial fractures (TFs). The aim of our study is to evaluate the implementation of 3DRX in the treatment of TFs.

Methods: A retrospective, cross-sectional study was conducted between 2014 and 2018 with inclusion of all patients undergoing surgical treatment of TF. We compared patient, fracture and treatment characteristics. The number of revision surgeries within 6 weeks postoperatively was our primary end point. Secondarily we evaluated the duration of surgery, length of hospital stay, radiation exposure, and postoperative complications. Nominal data were compared using Fisher's exact test and ordinal data with the use of Mann-Whitney U. P values <0.10 were considered statistically significant.

Results: 79 patients were included, of whom 34 were treated with use of 3DRX. Patients in the conventional fluoroscopy (RX) group were significantly older (median 56 vs 47 years; P = 0.02). Remaining characteristics were comparable. Three patients of the RX group (6.8%) underwent a revision surgery within 6 weeks postoperatively. In the 3DRX group intraoperative changes were made in 7 patients (20.6%) and there were no revision surgeries within 6 weeks. A trend toward a shorter length of hospital stay was shown in the 3DRX group (0.5 day; P = 0.12). The average duration of surgery increased up to 24 minutes after the implementation of 3DRX, without a rise in postoperative wound infections (P = 0.77). The 3DRX group had an average radiation exposure of 7.897 mGy versus 0.858 mGy in the RX group (P < 0.01).

Conclusion: After the implementation of 3DRX there was a significant increase in radiation exposure and duration of surgery. Patients in the 3DRX group showed a trend towards a shorter length of hospital stay and required no revision surgery within 6 weeks. The small study population may have caused the nonstatistical significance.