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Interest of navigation for the treatment of pertrochanteric fractures with the Gamma 3 nail

Interêt de la navigation dans le traitement des fractures pertrochantériennes par clou Gamma 3

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Introduction

Per trochanteric fractures are frequent among the geriatric population and their number is increasing. Intra-medullary nailing of these fractures is a safe and reliable procedure, the main postoperative complication being the cut-out of the cervical screw through the femoral head estimated around 2% in previous studies. Baumgartner et al. previously demonstrated the relation between the odds of a cut-out and a Tip-Apex distance superior to 25 mm. The aim of our study was to evaluate the use of a navigation system (Adapt System, Stryker) in improving the TAD and subsequently reducing the rate of postoperative cut-out.

Material and methods

From May 2015 to April 2016, we included all the adult patients with a per trochanteric fracture who accepted to participate in this randomized, monocentric, [prospective study](#). People were allocated in the conventional or “navigation” group with the help of dedicated software. The first group was operated with a standard [fluoroscopy](#) and the second one with the Stryker Adapt System, also known as the FluoroMap, allowing a 3D reconstruction of the proximal femur from the standard 2D images of the fluoroscopy. Patients were operated either by senior residents or head surgeons. The post-operative TAD was measured on the first [radiographs](#), before

patient's discharge. At 6 weeks, 3, 6 and 12 months and the TAD was measured independently by 2 different examiners on digital AP and axial radiographs.

Results

Fourteen men and 61 women were included in the study and randomized in one of the two study groups. The groups were similar in age (83.4 vs. 85.9 y.o), sex (82 vs. 80% of women) and death ratio (15 vs 14.3%) and the TAD was measured at each endpoint on [digital radiographs](#) independently by two examiners. A significant difference was observed in favor of the FluoroMap group with a mean TAD of 16.75 mm (95% CI: 15,33–18.17) versus 20,75 mm (95% CI: 19.36–22.15) in the standard group. Two cut-outs were observed in the standard group versus none with the FluoroMap but this was not statistically significant.

Discussion

As it was previously demonstrated in a cadaveric study, the FluoroMap helps surgeons to reduce the [intra-operative](#) TAD by offering better tri-dimensional visualization of the femoral head surface.

Conclusion

The use of the FluoroMap seems to help surgeons in achieving the best cervical screw placement.

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