

Improved identification of aseptic loosening using dynamic CT with alternated rotations of the femur: experience from 72 THA patients

Per Wretenberg¹, Olof Sandberg², Sofia Carlsson¹, Ellen Harbom¹, Vendela Capellen³, Simon Tholén¹, Henrik Olivecrona⁴

¹ Örebro University Hospital

² Sectra

³ Örebro University

⁴ Karolinska Institutet

Background and purpose: The diagnosis of aseptic loosening can be a challenge. Postponing intervention can simplify the diagnostic process, but can also degrade the prognosis and instil further pain. Dynamic CT with alternated rotations of the femur offers a visual and quantitative assessment of the mechanical situation. The aim of this study was to report in a clinical setting the accuracy and adaptability of this method.

Methods: This was a retrospective single centre study of 72 cases of suspected aseptic loosening were the surgeon after reviewing a standard planar X-ray saw a need for more information. The dynamic CT and planar X-ray were compared either to intraoperative findings or a 1-3 year follow up questionnaire for patients that did not have revision surgery. Patients reporting degradation in status since the time of the dynamic CT were called for a follow up planar X-ray. Sensitivity and specificity were assessed and user experience gathered.

Results: Out of 72 enrolled patients 15 were lost to follow up. Of the remaining 57, 17 were deemed by intraoperative findings or follow up to have had loosening. Dynamic CT had an accuracy, sensitivity, and specificity of 93%, 77%, and 100% respectively. For planar X-ray the corresponding values were 77%, 59%, and 85%. The tool was possible to adapt to clinical routine.

Interpretation: Dynamic CT with alternated rotations of the femur is a viable option to improve the diagnostic process for identifying aseptic loosening in clinical THA cases where more information is needed.