Comparison of CT and Plain Film Assessment of Osteolysis Following Total Ankle Joint Arthroplasty

Foot & Ankle Category: Ankle Arthritis

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Introduction
Introduction: Third generation Total Ankle Prosthesis have seen an improvement in short and intermediate term clinical results. However radiologic surveillance reveals high rates of early, progressive, asymptomatic osteolysis. This raises concerns regarding long term implant survivorship and future management of such lesions. Aim: To describe the incidence, and patterns, of peri prosthetic osteolysis in Total Ankle Joint Replacement (TAJR) using fine slice Cat Scan (CT). To develop a CT based classification system to standardise the routine assessment and monitoring of osteolysis in TAJR.

Methods
Method: Ct and plain films were reviewed from a total of 55 patients (57 ankles) following implantation of a third generation ankle arthroplasty performed by a single surgeon between 2001 and 2010. All 55 patients were assessed radiographically, with serial CT scans over an average of 5 years follow up (18months -10years). A 10 zone classification system (previously used by Besse et al for plain film assessment) was adapted to fine slice CT imaging producing a reproducible assessment protocol. The CT assessment was compared to the plain film assessment.

Results
Results: 98% of patients had some form of osteolysis, with 77% of patients having tibial and 80% talar lesions. Talar zone 5 was the most frequently affected area with 68% of patients having zone 5 lysis. Talar zone 9 lysis was present in 58% and tibial zone 7 in 54%. Talar lesions were also observed to be larger than their tibial counterparts. The vast majority of these lesions were progressive, however rates of progression varied highly. On two occasions lesions were seen to regress and fill in with bone. Heterotrophic ossification is a common finding especially posteriorly and may account for unexplained pain through impingement and reduced range of motion.

Conclusion
Discussion/Conclusion: Early and progressive periprosthetic osteolysis is a common problem which is generally asymptomatic. CT assessment has been shown to be more sensitive at detection and more accurate in quantification of such lesions. Long term consequences of such lesions are uncertain but remain concerning. CT scanning of TAJR should be part of the routine post operative surveillance for osteolysis, loosening and subsidence. Yearly clinical and /or radiologic assessment should be carried out until the natural history of TAJR has been established more clearly. Accurate assessment of osteolytic lesions can be performed so that timely intervention can be carried out to prevent catastrophic failure of the prosthesis.