**Epidemiological and Biomechanical Influences on the Prevalence and Progression of Periprosthetic Osteolysis after Total Hip Replacement.**

Analysis with Magnetic resonance imaging.

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**Introduction**

There is an increasing interest in knowing the factors related to the wear particle-induced disease in total hip replacement (THR), after long-term follow up. Numerous studies have analyzed the development and the destruction patterns of the osteolysis. The objectives of this study were to determine the factors associated with major frequency and severity of this disease, and the influence in the osteolytic progression pattern, using magnetic resonance imaging (MRI).

**Materials & Methods**

Our study included 86 consecutive THR of the same model, with a circumferential porous hydroxyapatite-coating, implanted between 1990 and 2007. The mean follow up were 13.20 years. We performed a clinical and radiological analysis recording epidemiological and biomechanical variables including the polyethylene (PE) wear, using a specific software. In each case a MRI was performed, applying special protocols in order to reduce artifacts. We evaluated the location, size and osteolytic progression pattern (Figures 1 and 2). Finally, we made a statistical analysis. Pearson correlation and multiple regression techniques were used to analyze the data.

**Discussion**

We found statistically significant differences (p<0.05) between the osteolytic size and many variables: patients age at primary surgery (r = -0.239) [Table 1], physical activity (r = 0.325) [Table 2], acetabular inclination (r = 0.231) [Table 3] and rate of PE wear (r = 0.484) [Table 4].

**Conclusions**

The severity of osteolytic damages is larger in young patients, with more postsurgical physical activity. These factors, as well as acetabular inclination, are associated with increased PE wear rate and larger progression of the osteolytic disease. Higher wear rate and large osteolytic lesions were related with peripheral and continuous destruction patterns.