Distinct Clinical Presentations of Trunnionosis With and Without Gross Trunnion Failure Following Mechanically Assisted Crevice Corrosion in Total Hip Arthroplasty

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BACKGROUND: Mechanically assisted crevice corrosion (MACC) is a rare but serious complication of total hip arthroplasty (THA). This study evaluated differences in symptoms and clinical presentation of trunnionosis with and without gross trunnion failure (GTF) in patients revised for MACC involving the Accolade I titanium-molybdenum-zirconium-iron (TMZF) femoral stem paired with a cobalt-chromium (CoCr) low-friction ion treatment (LFIT) femoral head.

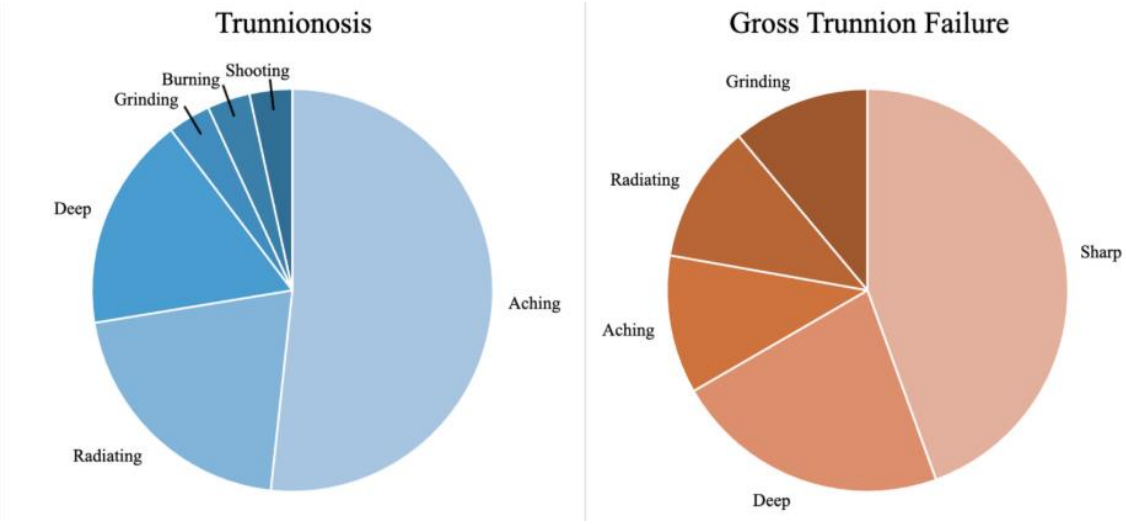
METHODS: This retrospective chart review included 73 patients (82 hips) who underwent revision THA due to MACC from the Accolade I femoral stem and LFIT CoCr femoral head. Patients were categorized into groups—trunnionosis alone (trunnionosis group) and trunnionosis with GTF (GTF group)—based on radiographic and intraoperative findings. Baseline patient demographics, implant characteristics, intraoperative findings, and postoperative outcomes were compared. Continuous variables were analyzed using Mann-Whitney U tests, and categorical variables were compared using chi-square or Fisher's exact tests. Qualitative data was collected from clinic and operative notes.

RESULTS: Overall, patients with GTF were more frequently male (77% vs. 44%), taller (177.2 vs. 171.0 cm), and had a longer interval from primary to revision surgery (10.0 vs. 7.2 years).

They reported shorter symptom duration (3.1 vs. 8.9 months) and were less likely to experience chronic pain (38% vs. 97%), with several presenting as asymptomatic until catastrophic failure. Patients with trunnionosis typically described months of aching or radiating pain, whereas patients with GTF described their symptoms as sharp or deep when present at all, reflecting sudden mechanical failure. Despite differing presentations, postoperative patient reported outcomes and metal ion levels improved similarly in both groups.

CONCLUSIONS: These findings demonstrate that trunnionosis and GTF have distinct clinical presentations. Trunnionosis tends to present earlier with persistent, radiating pain and prolonged symptoms, while GTF tends to occur later, with minimal or no pain, and an increased risk of sudden mechanical failure. Recognizing these contrasting presentations is critical for early diagnosis and prevention of MACC events through timely surveillance and intervention.

Figure 1. Radiographic Evidence of Gross Trunnion Failure. Macroscopic notching of the right femoral neck shown; image taken after admission to the emergency department.



<u>Figure 2.</u> Patient Descriptions of Pain for Trunnionosis and Gross Trunnion Failure Groups. Descriptions of Pain for Trunnionosis and Gross Trunnion Failure Groups. The Trunnionosis group commonly described their pain as “Aching” and “Radiating”, while the Gross Trunnion Failure Group commonly described their pain as “Sharp” and “Deep”.