FRETTING AND CORROSION DAMAGE OF METAL TAPERS IN REVERSE TOTAL SHOULDER ARTHROPLASTY IMPLANTS

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Purpose: Fretting and corrosion of femoral head-femoral neck interface (tapers) has been reported in retrieved total hip arthroplasty implants. Reverse total shoulder arthroplasty systems often have multiple taper locations susceptible to fretting and corrosion damage, including the metal tray-metal stem interface and the baseplate-glenosphere taper interface. There have not been reports to date documenting the possibility and extent of fretting and corrosion damage in this setting. The purpose of this poster presentation is to document the extent of fretting and corrosion damage in retrieved reverse total shoulder implants.

Methods: Twenty-five retrieved primary reverse total shoulder arthroplasty implants were evaluated and graded for fretting and corrosion damage at the taper interfaces according to the Goldberg classification system. The four possible taper interfaces (stem, tray, baseplate, and glenosphere) were compared and reported.

Results: The mean fretting and corrosion score of the humeral stem was 1.6 and 1.5 respectively. The mean fretting and corrosion score of the humeral tray was 1.3 and 1.1 respectively. The mean fretting and corrosion score of the glenoid baseplate was 2.4 and 2.1 respectively. The mean fretting and corrosion score of the glenosphere was 1.6 and 1.8 respectively. The mean fretting and corrosion score of the glenoid baseplate was significantly higher compared to all other taper interfaces at the 0.05 level.

Conclusion: The baseplate female interface experiences the highest degree of fretting and corrosion damage in the analyzed reverse total shoulder implants. This finding may be secondary to the higher shear forces experiences by the glenoid baseplate compared to the humeral stem-tray interface. Taper geometry may also play a role in the fretting and corrosion damage and should be further investigated.