Failure of total hip implants: metals and metal release in 52 cases - DTU Orbit (18/03/2019)

**Failure of total hip implants: metals and metal release in 52 cases**

**Background.** The pathogenesis of total joint replacement failure is multifactorial. One hypothesis suggests that corrosion and wear of alloys result in metal ion release, which may then cause sensitization and even implant failure, owing to the acquired immune reactivity.

**Objectives.** To assess cobalt, nickel and chromium(VI) release from, and the metal composition of, failed metal-on-ethylene total hip replacements. **Materials/methods.** Implant components from 52 revision cases were evaluated with spot tests for free nickel, cobalt, and chromium (VI) ions. Implant composition was determined with X-ray fluorescence spectroscopy, and information on the reason for revision and complications in relation to surgery was collected from the medical charts when possible (72%). For 10 implants, corrosion was further characterized with scanning electron microscopy.

**Results.** We detected cobalt release from three of 38 removed femoral heads and from one of 24 femoral stems. Nickel release was detected from one of 24 femoral stems. No chromium(VI) release was detected.

**Conclusions.** We found that cobalt and nickel were released from some failed total hip arthroplasties, and corrosion was frequently observed. Metal ions and particles corroded from metal-on-polyethylene may play a role in the complex aetiopathology of implant failure.

**General information**

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