

Paper #95

Are Increased Serum Ions Following Less Complex Revision Knee Arthroplasty with a Metal-on-Metal Hinge a Concern at Mid-Term Follow-Up?

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Summary:

Elevated serum ion levels are a frequent finding following hinged TKA that may deserve monitoring but are not primarily responsible for failure.

Abstract:

Background

The elevation of serum level of chromium and cobalt in metal-on-metal (MoM) pairing is a well-known phenomenon from revision hip arthroplasty. However, only three studies have addressed this issue in knee revision arthroplasty using a MoM hinged mechanism and no study investigated MoM hinges in a less complex revision setting or in a difficult primary setting, where megaprotheses are not primarily used.

Questions/Purposes: (1) What are the serum metal ion levels at a median of 27.5 months (range 13-61)? (2) What is the proportion of radiolucent lines in this follow-up? (3) Is there any correlation between metal ion levels and the Knee Society Score (KSS) or radiolucencies at this follow-up?

Methods

A serum ion, clinical and radiological follow up of 23 patients with 24 latest generation MoM hinged revision TKA was performed. Serum ion levels of chromium (III) and cobalt were assessed using mass spectrometry. Ion levels above 5 ppb were considered pathological. Presence of radiolucent lines was determined on antero-posterior and lateral view using The Knee Society total knee arthroplasty roentgenographic evaluation and scoring system. Clinical outcome was assessed using the KSS.

Results

There were 11 men and 12 women with an average age at the time of surgery of 69 ± 10 years. Mean chromium serum level was $7.39 \text{ ppb} \pm 6.95 \text{ ppb}$ (range 0.6 – 31.9) and mean cobalt serum level was $11.23 \text{ ppb} \pm 9.5$ (range 1.0 – 47.5). Out of the 23 patients, 16 had elevated serum ion levels (70%). Radiolucent lines were present in 67% of the patients. There was no correlation between serum ion levels and radiolucent lines. There was a negative correlation of the overall KSS with both chromium ($p = 0.029$) and cobalt ($p = 0.012$) levels.

Conclusions

Elevated serum ion levels and radiolucent lines are a frequent finding following this type of MoM hinged TKA in this

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follow-up timeframe. So far, in none of the cases did the serum levels and the radiolucent lines lead to revision. We recommend that a serum ion analysis should become a standard part of the follow-up after any hinged TKA.