Effect of Gender on Migration of Cemented and Uncemented Total Knee Arthroplasty

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ABSTRACT INTRODUCTION:

To investigate the effect that gender may have on the RSA defined migration pattern of cemented and uncemented tibial components in total knee arthroplasty (TKA).

METHODS:

70 patients with primary osteoarthritis of the knee were randomized to receive a Nexgen uncemented Trabecular Metal (TM) monoblock tibial component (n=37; 20 female; mean age=66 years; mean BMI=32) or cemented cobalt chrome modular tibial component (n=33; 19 female; mean age=65 years; mean BMI=33). The same design of posterior stabilized tibial component was used in all cases. Four experienced knee surgeons followed a standardized surgical technique (PCL resection, patella resurfacing, RSA bead placement in polyethylene and tibia) and post-operative protocol (CPM as tolerated, no drains, WBAT). Within 4 days of surgery and at 6, 12 and 24 months post-operatively patients underwent bi-planar x-rays. RSA analysis was performed with MB-RSA (MEDIS, Leiden). Results were reported as maximum total point motion, and 6 degrees of freedom translations and rotations. A repeated measure ANOVA was used to test for differences and all statistical analysis was performed using Minitab V.14 (Minitab Inc, State College, PA, USA).

RESULTS SECTION:

Highly significant differences were seen in the migration patterns in females between the TM and cemented tibial components. Females with the TM implant tended to rotate internally (0.29° vs. -0.16°, p<0.0001), tilt posteriorly (-0.49° vs. 0.01°, p<0.0001) and subside (-0.357mm vs. 0.00mm, p<0.0001) compared with the female subjects with the cemented implant. In the male group, only subsidence was different between the TM and cemented groups (-0.344mm vs. -0.01mm, p<0.0001).

DISCUSSION:

Uncemented TM implants in females tended to tilt posteriorly, rotate internally and subside. Uncemented implants in males tended only to subside. The increased tilting and rotation detected in females could be due to lower BMD or to mismatching between the shape of the female proximal tibial and the tibial component. These results may have implications for the current use of uncemented implants in females and for future design of uncemented implants for the female population.