Total knee replacement with an Oxidised Zirconium femoral component: ten year survivorship analysis

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INTRODUCTION:

Total knee replacement (TKR) is a highly effective procedure in producing good functional outcomes and long term survival rates of greater than 90%. Despite these excellent results polyethylene wear leading to osteolysis remains a common cause of failure. In an attempt to reduce wear and improve long term survival rates there has been considerable interest in the use of alternative bearing surfaces to improve the wear characteristics of the femoral component. Oxidized zirconium has been shown in numerous in vitro and retrieval studies to have better wear properties than cobalt chromium and cause less surface damage on the polyethylene component.
We performed a retrospective review of a prospectively collected database to assess the ten year survival and clinical and radiological outcomes of the oxidized zirconium TKR with the Genesis II prosthesis. We hypothesised that the use of this implant would produce comparable clinical outcomes and survivorship to those reported at mid term follow up.

METHODS:

We performed a retrospective review of a prospectively collected database to assess the ten year survival and clinical and radiological outcomes of the oxidised zirconium total knee replacement (TKR) with the Genesis II prosthesis. Outcome measures included the Western Ontario and McMaster Universities Osteoarthritis Index, Knee Injury and Osteoarthritis Outcome Score (KOOS) and a patient satisfaction scale.

RESULTS:

A total of 303 consecutive TKRs were performed in 278 patients with a mean age of 68 years (range 45 to 89 years). The ten year survival rate from the Kaplan–Meier predicted survivorship was 97% (95% CI 94 - 99) with revision for any reason as the endpoint. There were no revisions for loosening, osteolysis or implant failure. There was a significant improvement in all components of the WOMAC score at final follow up ($p<0.001$).

CONCLUSIONS:

Our study supports the hypothesis that over the long term TKR with an oxidised zirconium femoral component gives comparable survival rates and functional outcomes to conventional implants as reported from several national joint registries. However whether this implant leads to fewer revisions for polyethylene wear and osteolysis compared to a conventional CoCr implant to justify its selective use in younger patients and its increased costs is yet to be determined.

Table 1. Functional outcomes scores and range of movement

Parameter	Pre operative (n=303)	10 years postop (n=216)	p
Mean WOMAC score			
Pain	49 (5-95)	90 (5-100)	0.001
Stiffness	44 (0-100)	83 (25-100)	0.001
Function	47 (7-88)	85 (15-100)	0.001
Total	48 (13-84)	85.7 (15-100)	0.001
Mean KOOS scores			
Symptoms	n/a	82.4 (36-100)	n/a
Pain	n/a	87.5 (6-100)	n/a
ADLS	n/a	84.9 (15-100)	n/a
Quality of life	n/a	71.4 (6-100)	n/a
Mean Range of flexion (range)	116 (70 to 140)	114 (70 to 130)	0.012