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Titanium niobium nitride knee implants are not inferior to chrome cobalt components for primary total knee arthroplasty at medium-term follow-up

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Abstract
Background: Oxidized zirconium (Oxinium), titanium nitride (TiN) or titanium niobium nitride (TiNbN) coated implants became in recent years available for an increasing amount of total knee arthroplasty (TKA) systems. The hypothesis of this study was that the use of TiNbN-coated components would not lead to inferior results compared to conventional implants and that none of the metal hypersensitivity patients receiving TiNbN-coated implants would require revision for metal allergy. Materials and methods: This retrospective study compared 53 Titanium Niobium Nitride coated TKA with 103 conventional chrome cobalt implants of the same design. Patients were evaluated at a minimal follow-up of 3 years. Results: No differences in clinical, radiological or patient-reported outcome measurements were observed between these groups. A survivorship of 96% without differences in revision rates was observed at medium-term follow-up of 6.5 years. Discussion: Metal allergy leading to contact or generalized dermatitis after TKA is very rare and usually linked to chrome or cobalt hypersensitivity. Nickel release from knee implants has not been shown to lead to cutaneous symptoms, but unexplained pain and swelling, peri-prosthetic osteolysis and component loosening remain potential issues not fully understood. The use of coated implants eliminates this factor from the diagnostic equation in case of postoperative dissatisfaction. Conclusion: The use of titanium niobium nitride coated implants for primary knee osteoarthritis in self-reported metal hypersensitivity patients shows similar outcomes and survivorship rates as conventional chrome cobalt TKA, with no revisions for allergy at medium-term follow-up. © 2023, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

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Knee arthroplasty; Metal allergy; Revision; Titanium niobium

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