Summary of research proposal LROI

Title:
Does a bioactive coating and the structure of the bone-implant surface metal influence survival of uncemented total knee arthroplasty?

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Abstract:
The use of uncemented implants in total knee arthroplasty (TKA) has been the matter of much controversy among knee surgeons. These implants are theorized to improve outcomes by facilitating biological ingrowth and therefore provide the potential for a durable fixation to the host bone. Literature is, however, conflicting in nature and does not seem to support the superiority of uncemented fixation over traditional cemented fixation. One of the possible requirements for optimal uncemented fixation may be the presence of a bioactive layer (e.g. hydroxyapatite), which improves bony ingrowth by stimulating regenerative processes of the bone. Multiple radiostereometric analyses have shown improvements in migration patterns of uncemented implants with addition of a bioactive layer, with most coated implants performing similar to or even better than cemented implants in these analyses. Furthermore, the structure of the bone-implant surface metal (e.g. beads, fiber mesh etc.) is different between implants and may influence the necessity of an additional bioactive coating. A large study with sufficient numbers is needed to further explore the optimal fixation strategy in uncemented TKA. Therefore, the aim of the current study is to (1) compare revision rates between cemented, uncoated and bioactive coated uncemented implants, (2) assess whether the survival of bioactive coated and uncoated implants is influenced by structure of the bone-implant surface metal and (3) assess whether the survival of bioactive coated and uncoated implants is different in certain age groups.

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