Reviewer’s report

Title: Validation of a measuring technique with computed tomography for cement penetration into trabecular bone underneath the tibial tray in total knee arthroplasty on a cadaver model.

Version: 3 Date: 4 June 2014

Reviewer: Ken Mann

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Minor essential revisions

Line 131. What is the difference between distributed and penetrated cement? And how do you differentiate between the two?

Line 144-145. Does this mean that the image in Figure 2 is for a slice just below the tray?

Line 146-148. Why not use the silicone on all three cases? That way you would have a larger sample size.

Line 162-166. Experiments above are all done with femoral heads. Now there is a switch to tibia for assessing the HU for tibial bone. What if the two are very different? Would the results still be relevant?

Line 237-238: What was the area to which the cement area was compared (to determine the %)? Do you subtract out the metal from the calculation? Maybe augmenting a figure with masks identifying each component and the corresponding calculation would help.

Line 284-286. The amount of penetrated cement assumes that trabecular bone is located in every location where there is cement, correct? That is, you cannot discriminate between regions that have bulk cement and regions that have cement interlocked with trabecular bone. This should be discussed.

Discretionary revisions

Two related MS:

The Morlock group has estimated penetrated cement for postmortem retrievals with some success (Gebert de Uhlenbrock A, Püschel V, Püschel K, Morlock MM, Bishop NE. Clin Biomech (Bristol, Avon). 2012 Nov;27(9):929-35.)

The Mann group has measured interlock between cement and bone using microCT, showing how trabeculae interlock and resorb (Mann KA, Miller MA, Pray CL, Verdonschot N, Janssen D. J Biomech. 2012 Feb 23;45(4):711-5.)
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

No competing interests.