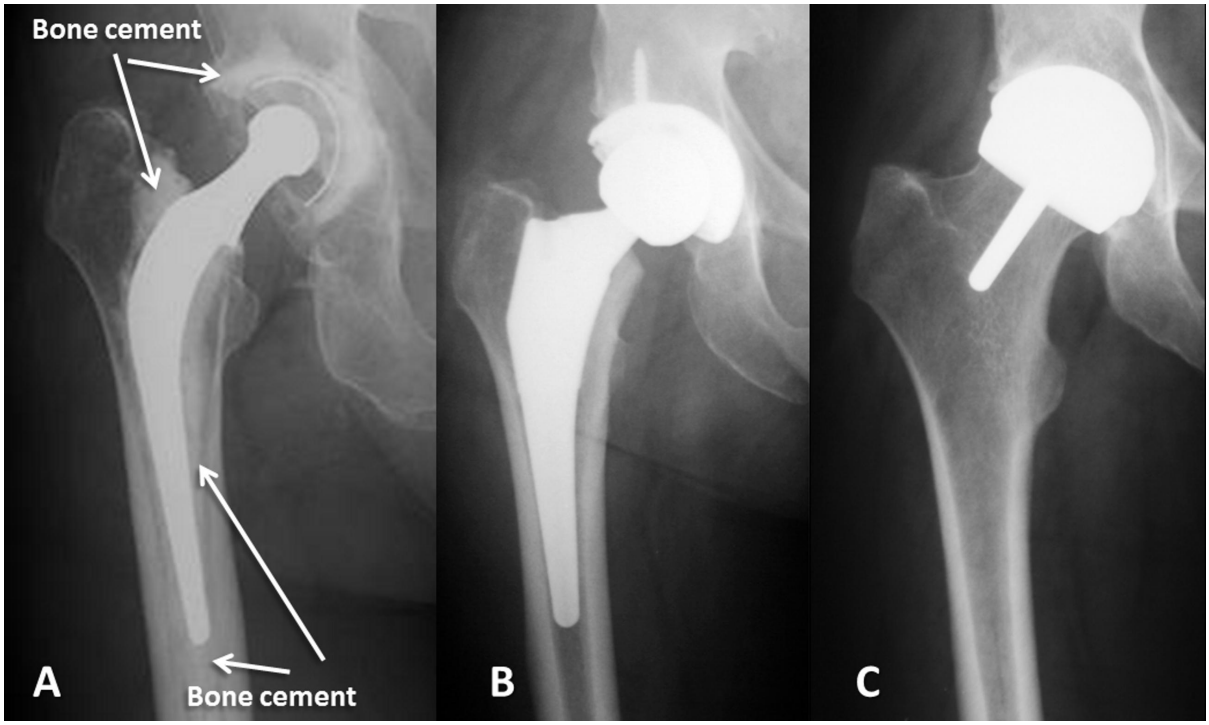
Appendix: Bone Cement, Hip Replacements and Hip Resurfacings [posted as supplied by author]

Primary hip arthritis is essentially a disease of the articulating surfaces. Therefore it has always been an attractive concept to offer artificial surfaces as a solution. Earlier attempts to resurface hips starting in the 1960s were hampered by the absence of appropriate materials which could be manufactured as thin components offering both mechanical strength and wear resistance.

Therefore total hip replacements (THRs) were developed as an alternative, employing a small femoral head component on a long femoral stem fixed in the medullary canal of the femur (Figure). In order to fix the implants to bone, acrylic bone cement[1] [2] (which was then being used in dental surgery) became the favourite choice (Figure A) and has continued to be the most widely used fixation in the United Kingdom until recently. However, cement disease[3] [4] was blamed for implant failures and cement fell out of favour in certain regions. This led to the development of fixation methods without the use of cement[5] [6] [7] (Figure B) and over 90% of implants in the United States are now fixed without cement. Sometimes one component is fixed without cement while the other is cemented and these are called 'hybrid' or 'reverse hybrid' depending on which component is cemented.

Although hip arthritis is common in relatively older patients, it occurs in young and active patients too. In the young the performance of all types of THRs is poor. Charnley warned against the use of THRs in young patients, unless there were other overbearing restraining factors which would limit their activities even after their hip replacement. The Swedish Hip Register[8] [9] showed that even with improved THR technology being available now,[10] 10-year implant survival in young men for cemented and uncemented THRs is as low as 66%, leading them to suggest the use of conservative methods in the young.

It is for such young men that modern metal-on-metal hip resurfacing (Figure C) was developed in Birmingham, England, as a conservative alternative. This was made possible by advances in manufacturing methods and improved tolerances. With the Birmingham Hip Resurfacing (BHR) the Australian Register[11] (94% implant survival at 10 years) and other reports[12] [13] [14] show excellent results in predominantly young patients offering better function and better survivorship than THRs at 10 years and more.



Images of a cemented THR (A), an uncemented THR (B) and a Birmingham Hip Resurfacing (C)

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