6.1 A Bibliography of Published Literature on Bioceramics for THR

G. Willmann

Bioceramics

Since the 1970's when first it was realizied that the properties of alumina ceramics (Al_2O_3) could be exploited to provide better implants for orthopaedic applications, the field has expanded enourmously. Initial applications depended on the fact that alumina ceramics were bioinert and provided wear characteristics suitable for bearing surfaces.

Resultant orthopaedic use has enjoyed more than 20 years' clinical success, e.g. BIOLOX forte alumina femoral heads, sockets, and acetabular liners for total hip replacement. About 10 years ago zirconia (ZrO_2) was approved for use as femoral ball heads articulating against polyethylene cups.

The bioactive hydroxyapatite ($Ca_5(PO_4)_3OH$) offers attractive tissue reactions. It is well established as coating on metal implants to enhance osseointegration. Hydroxyapatite (HA) is used for bone grafting, too.

The application of bioceramics is no R & D anymore. The field of bioceramics became interdisciplinary. There are still open questions, but bioceramics are commercially used in Northern America, Japan, and Europe. There are lots of publications, reviews, and books about application of bioceramics. Papers are evolved by engineers, clinicians, biologists, material scientists etc. Some publications just cover technical aspects, e.g. processing, manufacturing, and testing. More important for the surgeon are the reports about clinical results which become available now and have been collected in this proceedings and the ones of 1997 and 1998.

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