Comparison of coral resorption and bone apposition with two natural corals of different porosities.


Abstract

Previous studies showed that natural coral implanted into bone tissue was gradually resorbed and progressively replaced by newly formed bone. The objectives of this study were to compare the fate of two Madreporian corals, Porites and Acropora, after implantation during 1 and 2 months into sheep and pig long bones. These materials are identical in composition (CaCo3) but differ in volume (49 +/- 2%, 12 +/- 4%, respectively) and mean size (250 vs. 500 microns) of porosities. The non-decalcified histological slices were observed under light microscopy. Implant resorption and new bone formation were quantified through an automatic image analysis system. Quantitative results showed that the larger the porosity volume, the greater was the coral resorption as well as the new bone apposition. Large differences were found between the two animal species. Histological findings were identical to those previously reported: implants were resorbed and progressively replaced by newly formed bone. Coral was found to be an osteoconductive biomaterial which acted as a scaffold for a direct osteoblastic apposition and consequently could be an interesting alternative to bone auto-, allo-, or xenografts.

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