

CAD/CAM & scaffolds in tissue reconstruction

The loss of craniofacial bone has next to its functional meaning also a great impact on the psychological situation of the patients. We present the state of the art reconstruction methods such as CAD/CAM systems and microvascular tissue transplants but also different approaches to the problem. The use of alloplastic material such as PEEK and silk, the use of biodegradable magnesium alloy and the work on preformed ectopic bone formation, all tested in large animal trials, are presented and discussed. The reconstruction of tissue with the means of alloplastic and autogenous methods is appropriate. Tissue Engineering seems to be a favorable approach in reconstructive OMF-surgery.

Can hair substitute bone? MSC's in bone tissue regeneration

As nowadays the regenerative medicine is overwhelmingly based as cell therapy, the main challenge of the bench-to-bedside concept is presented in the need for therapeutically relevant cell numbers from as small samples as possible, harvested in minimally-to-non-invasive fashion and preferably autologous. Importantly, the cell material should provide a smooth interface with biocompatible materials used in tissue engineering and remain safe for human application.

Several sources of adult mesenchymal stem cells (MSC) offer low invasivity, small sampling, the autologous option and a possibility of preventive stocking: dental MSCs from placoid structures milk tooth, wisdom tooth and hair follicle, which present a very good base for tissue regeneration, in particular bone. In particular, MSCs from the outer root sheath of hair follicle (MSCORS) present an abundant, completely non-invasively harvested source of MSCs, technically advantageous and life-long available. Their application could, before all, result in cell therapies for osteoregeneration in dental medicine and may well provide suitable solution for multiple challenges placed before personalized regenerative medicine.