



COMMENTARY

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A Short Note on Arthrodesis

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Description

Arthrodesis is the surgical induction of joint ossification between two bones, also known as artificial ankylosis or syndesis. This is done to address intractable pain in a joint that is resistant to pain medication, splints, or other commonly prescribed therapies. Fractures that damage the joint, severe sprains and arthritis are common reasons of such pain. It is most typically used on the spine, hand, ankle, and foot joints. Arthrodesis of the knee and hip joints was once utilized as a pain-relieving operation, but with the remarkable success of hip and knee, arthroplasty, arthrodesis of these big joints has fallen out of favor as a primary procedure, and is now only used as a last resort in some failed arthroplasties. Surgeons favor bone auto graft because, in addition to avoiding the hazards associated with allografts, it has native bone-forming cells (osteoblasts), allowing the graft to produce new bone (osteoinductive) while also acting as a matrix or scaffold for new bone to grow from the bridging bones (osteoconductive). The biggest disadvantage of bone auto graft is the scarcity of available supplies. Bone allograft has the advantage of being available in far greater quantities than auto graft; however, the treatment process that the bone undergoes after harvest, which usually involves deep freezing and may also include demineralization, irradiation, and/or freeze-drying, kills living bone or bone marrow cells. This reduces immunogenicity (the likelihood of graft rejection) to the point where antirejection medications are no longer required, and when combined with proper donor screening, these processing and preservation procedures can considerably reduce the risk of disease transmission. Cancellous allograft bone retains its osteoconductive capabilities despite all of this processing. Furthermore, certain processing techniques have been demonstrated to retain acid-stable osteoinductive proteins in cortical bone grafts, making many bone allografts

both osteoconductive and osteoinductive. Commercially available synthetic bone substitutes include a wide range of options. To simulate the structure of cancellous bone, they are commonly hydroxyapatite or tricalcium phosphate-based granules formed into a coralline or trabecular structure. They have no other function than to operate as an osteoconductive matrix. To generate a synthetic product with osteoinductive qualities, several manufacturers have lately began providing these products with soluble bone-forming components such as bone morphogenetic protein. Metal implants can be used to keep the two bones together in a position that promotes bone growth. To assist bone fusion, a combination of the foregoing procedures is frequently used. The two neighboring bones are fused and no motion occurs between them after surgery and recovery, which can take anywhere from a few weeks to over a year. As with anterior cervical fusion, this can have the effect of strengthening the bones. Arthrodesis is a salvage technique performed in horses to treat severe breakdown injuries including suspensory apparatus failure, subluxation, fracture, or collateral ligament rupture. It is also used in horses with osteoarthritis, mainly of the distal hock joints, to fuse these low-motion joints so that they no longer cause pain to the horse. Commercially available synthetic bone substitutes include a wide range of options. To simulate the structure of cancellous bone, they are commonly hydroxyapatite or tricalcium phosphate-based granules formed into a coralline or trabecular structure. They have no other function than to operate as an osteoconductive matrix. To generate a synthetic product with osteoinductive qualities, several manufacturers have lately began providing these products with soluble bone-forming components such as bone morphogenetic protein. Metal implants can be used to keep the two bones together in a position that promotes bone growth. To assist bone fusion, a combination of the foregoing procedures is frequently used.

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