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Osseointegration: An overview

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Osseointegration has been in successful clinical practice for dental applications since 1965. The method of osseointegration is also successfully used for permanently skin-penetrating applications in the head and neck area including treatment with bone-anchored hearing aids and for anchorage of prosthetic ears and eyes.

Treatment with osseointegrated amputation prostheses has been performed in Sweden since 1990. More recently centers in the United Kingdom, Australia, Spain, Hungary, France, Chile, Denmark, Belgium and Holland have started to use the treatment. In 1999, a prospective clinical investigation was started at the Sahlgrenska University Hospital in Gothenburg, Sweden on patients treated with transfemoral OI-prostheses. The patients are treated in two surgical sessions followed by rehabilitation with a total treatment period of approximately 12 months. At the first surgery a titanium implant (fixture) is inserted in the residual bone and left unloaded for about six months. At the second surgery a titanium rod (abutment) is inserted into the distal end of the fixture and is then penetrating the skin. The external prosthesis is connected to the abutment with an attachment device. After surgeries the patient undergoes a period of rehabilitation during six months with gradually increased weight bearing and prosthetic activities.

The risks with the treatment are loosening, deep infection, superficial infections, skeletal fracture and mechanical failures. The benefits are in many instances related to the removal of the socket as attachment of the prosthesis to the stump. The amputee no longer has skin sores, pain when loading, and problems with stump volume changes. Further, normal sitting comfort and normal hip range of motion is regained. All these changes lead to a significantly improved quality of life for the individual with transfemoral amputation.

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