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Bone Anchored Prosthesis with the Osseointegration Technique in Transfemoral Amputees. Results from the Prospective OPRA Study

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Background. Transfemoral amputations due to trauma or tumor surgery often cause problems with conventional socket prostheses. In 1999 we initiated the prospective OPRA study (Osseointegrated Prosthesis for Rehabilitation of Amputees) using standardized surgery, equipment and rehabilitation program.

Methods. The surgery consists of a two-stage procedure. First a titanium screw (fixture) is inserted into the remaining skeleton (S1 operation). Six months later a second implant (abutment) is inserted into the first, allowing it to penetrate the skin (S2 operation). Gradual increase of loading are done over a 6-month period.

Results. The OPRA study includes 51 patients with 55 implants (1999–2010). Follow up is 2 years. Four implants have been removed due to loosening (3) or infection (1). One patient was lost to follow-up, two were excluded. The implant survival was 92 % (48/52). The patients had an average of one superficial infection every two years, successfully treated conservatively in all cases. There were 6 deep infections in 4 patients. All but one were successfully treated by conservative means. Four patients had 9 mechanical complications (bent or fractured implant parts) and 3 skeletal fractures occurred. Prosthetic use, prosthetic functions and global quality of life were all significantly improved ($p < 0.001$) and prosthetic problems were reduced ($p < 0.001$).

Conclusion. The implementation of a standardized osseointegrated surgical technique and the graded rehabilitation protocol is of importance for the promising results. The benefits are related to the removal of the socket as attachment of the prosthesis to the stump. The amputee no longer has skin ulcers, pain when loading, and problems with stump volume changes. Normal sitting comfort and normal hip range of motion can be expected. All these changes lead to a significantly improved quality of life for the individual with a transfemoral amputation.

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