



O10:105

Osseointegration is a viable solution for rehabilitating patients post tumor-related amputations

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BACKGROUND

Transcutaneous osseointegration is an innovative technology that has been successfully used for amputees since the 1990s to overcome the problems associated with the conventional socket prosthesis. Between 1999 and 2011 we performed one hundred operations using this technology, 10% of these patients were amputated due to musculoskeletal tumors.

METHODS

Between 1999 and 2011 we performed one hundred osseointegration procedures in 94 patients. These surgeries were performed in two centers: Lübeck, Germany and Sydney, Australia by the two principle surgeons acquainted with this technology. It involves the insertion of a transcutaneous intramedullary implant into the remaining bone; the implant's most distal external aspect then serves as a hard point for further prosthetic attachment rather than the entire soft tissue mantle of the remaining limb.

Altogether there were 74 males and 20 females. The age range was between 17 to 76 at time of implantation. Ten of our patients had amputations due to tumors with an age range from 32 to 73 at time of implantation. Preoperative assessments included medical, psychological and radiological examinations. All patients underwent the standardized two-stage procedure with a six-week interval. All patients were allowed early mobilization and full weight bearing two weeks after the second stage surgery.

RESULTS

Overall, there was a high level of patient satisfaction. All patients except one returned to pre-amputation activities. All patients except one have retained the implant up to date. In the remaining patients gait improved. No infections to date occurred in the patients that underwent surgery after 2009 since a new implant design was used. All patients regained osseoperception and reduced phantom pain. Skin irritations due to the old socket prosthesis have completely recovered in all patients.

CONCLUSION

Osseointegrated prostheses are an excellent alternative and potentially will be the first choice for many amputees in the near future. We have demonstrated that this technology enables patients to regain much of their freedom in mobility without compromising the mechanical stability of osseointegration. The technique constitutes a versatile option for people suffering limb loss secondary to malignancy due to the relative young age of these patients at time of amputation.

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