

One hundred patients treated with osseointegrated transfemoral amputation prostheses —Rehabilitation perspective

Kerstin Hagberg, RPT, PhD;1–2* Rickard Brånemark, MD, PhD1

1Centre of Orthopaedic Osseointegration, Department of Orthopaedics, Sahlgrenska University Hospital, University of Gothenburg, Gothenburg, Sweden;

2Department of Prosthetics and Orthotics, Sahlgrenska University Hospital, University of Gothenburg, Gothenburg, Sweden

Abstract

Treatment with osseointegrated transfemoral prostheses has been shown to improve quality of life. The treatment has been performed in Sweden since 1990 and consists of two surgical procedures followed by rehabilitation. During the first years, the rehabilitation process was not standardized. In 1999, a treatment protocol called OPRA (Osseointegrated Prostheses for the Rehabilitation of Amputees) was established. This article describes the current rehabilitation protocol and illustrates the overall results. The OPRA rehabilitation protocol is graded to stimulate the process of osseointegration and prepare the patient for unrestricted prosthetic use. It includes initial training with a short training prosthesis followed by gradually increased prosthetic activity. Between May 1990 and June 2008, we treated 100 patients with 106 implants (6 bilaterally; 61% males, 39% females; mean age 43 years; mean time since amputation 11.5 years.) The majority had amputations due to trauma (67%) or tumor (21%) (other = 12%). Currently, 68 patients are using their prostheses (follow-up: 3 months– 17.5 years) and 32 are not (4 are deceased, 7 are before second surgery, 6 are in initial training, 4 are not using prosthesis, and 11 had the implant removed). The majority of treatment failures occurred in patients before we established the OPRA protocol. The implementation of graded rehabilitation is considered to be of utmost importance for improved results.

Conclusion

This article presents the development and description of our present rehabilitation protocol and a brief overview of the results. Further details describing the surgical aspects of this treatment and the complications, failures, and success rates will be published in a separate article. We treated several of the 100 patients before we introduced the OPRA protocol. Retrospectively, if the present meticulous rehabilitation program had been followed, we believe that some of these patients might have been successful and that the current rehabilitation protocol might decrease the frequency of complications. In a few years, the OPRA study will give us prospective data to verify this. The early results of the first 18 patients following the OPRA protocol are very promising, with improved quality of life reported and a 94 percent success rate at the 2-year follow-up [30]. We believe it is reasonable to assume that the present method can make everyday life easier for the increasing number of patients experiencing war casualties, traffic accidents, tumors, and other causes of TFA at younger ages, and we hope this article supports rehabilitation development for patients treated with different boneanchored prosthetic solutions in the future.



Figure 3. Axial weight bearing on short training prostheses and controlling weight with bathroom scale. Short training prosthesis connects to abutment with attachment device. "Soft tissue support" is supplied to keep soft tissues stable around skin penetration area.



Figure 5. Crawling on all fours using short training prosthesis.



Figure 4. Example of hip-strengthening exercise with short training prosthesis using elastic band resistance.



Figure 6. Donning osseointegrated prosthesis with Allen key.