# Bone-anchored leg prostheses also prove to be a valuable procedure after five-year follow-up

6 August 2020

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After above-knee amputation, there is the option of a prosthesis that is placed directly in the thigh bone (osseointegration). Despite the fact that bone-anchored prostheses have been used for thirty years, researchers at the Radboud University Medical Center have now published the first long-term evaluation of such a prosthesis. It turns out that the procedure is not without stoma problems, but that these can usually be treated with simple measures and that the osseointegration implant system leads to a permanent improvement in mobility and quality of life.

This study was published in the latest edition of *Journal Of Bone And Joint Surgery*.

**Options for the attachment of the prosthetic leg after amputation**

Bone-anchored prostheses offer a number of important advantages over traditional 'socket' prosthetics, which must fit snugly over the stump and be held in place by a suction or suspension system. To place a bone-anchored prosthesis, a 14 cm steel pin must first be inserted into the remaining portion of the femur bone. In a few weeks this coated pin grows into the bone, after which an adapter is attached that protrudes a few centimeters through the skin (via a stoma). The wearer can attach or detach the artificial leg to this part with a quick coupling connector.

**Strong improvement in mobility and quality of life despite complications**

In this study, clinical researcher David Reetz and surgeon Jan Paul Frölke, along with their colleagues from the rehabilitation and orthopedics department at Radboudumc, looked at 42 patients who had received such a prosthesis, and performed a follow-up study of the five years after surgery. A full follow-up was obtained in 39 of the 42 patients. The most common complication was infection, in 77% of patients—mostly superficial and in the first two years. The vast majority (95%) were mild to moderate infections that did not require surgical treatment. Fourteen patients experienced irritation around the stoma where the pin protrudes through the skin, and they underwent minor surgery to re-shape the soft tissue.

After receiving their implants, patients increased the number of hours per week they could use their prosthesis: from an average of 56 hours with their previous socket prosthesis to 101 hours with the bone-anchored prosthesis. The bone-anchored prostheses also improved health-related quality of life (HRQoL): on a 100-point scale, the average score increased from 33 to 75.

Frölke: "We received a lot of skeptical reactions from colleagues who didn't believe in it, even after we published excellent results after 2 years of follow-up. Thanks to the trust that patients placed in

us, we have continued and we can now conclude that this is the new gold standard in people with sleeve-related problems including about half of all people with a leg amputation. "

**Next steps**

This study adds to existing evidence showing other benefits of bone anchored prostheses, including more natural and stable control of the prosthesis, improved walking and sitting conditions and avoidance of the many problems associated with the sleeve prosthesis, such as blisters.

Reetz notes, "Next steps in clinical research should include studies aimed at optimizing the stoma using a unified registry system, and further developing the implant design and safety of bone-anchored prostheses in patients with vascular disease. This is by far the largest group but has not been taken into account in this study. "

**More information:** D. Reetz et al, Safety and Performance of Bone-Anchored Prostheses in Persons with a Transfemoral Amputation, *Journal of Bone and Joint Surgery* (2020). DOI: 10.2106/JBJS.19.01169

Provided by Radboud University