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Title

The use of Osseointegrated titanium implants to treat trans-tibial amputees

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Summary

This paper represents the first pilot study to examine the results of performing osseointegration in the tibia.

Introduction

Osseointegration has emerged as a novel approach to resolve persistent socket prosthetic issues by attaching the prosthetic limb directly onto the skeletal residuum. Until recently, this procedure has been performed mostly in trans-femoral amputee (TFA) patients. However, since August 2012, osseointegration has been performed on eligible trans-tibial amputee (TTA) patients in our centers. This paper represents the first pilot study to examine the results of performing osseointegration in the tibia. The objective of this study is to describe the reconstruction strategy and clinical management protocol used in the treatment of TTA patients with osseointegrated implants, as well as to report preliminary assessment of the safety and efficacy of the protocol in this particular group of patients.

Methods

This is a prospective pilot study of 15 patients, consisting of 8 males and 7 females, aged 37-77 (mean 55.1) years at surgery, with minimum two-year follow-up. Selection criteria included age over 18 years, unilateral TTA patients who had socket-related problems. All patients received osseointegrated implants which were press-fit into the amputated limb. Principle outcome measures included the Questionnaire for persons with a Trans-Femoral Amputation (Q-TFA), Short Form Health Survey 36 (SF-36), Six Minute Walk Test (6MWT), Timed Up and Go (TUG). Adverse events recorded included infection, revision surgery, fractures, and implant failures.

Results

Comparisons were made using differences between the mean pre-operative and mean post-operative values for each outcome measure. Significant improvements for all outcome measures were observed. The occurrence levels of adverse events including the infection rate and revision rate were similar to trans-femoral osseointegration cases.

Conclusion

These preliminary results suggest that osseointegration surgery for trans-tibial amputees is a safe and effective alternative treatment for amputees experiencing socket-related discomfort. This protocol has the potential to expand the application of osseointegration to help patients who have below the knee amputations.

References

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