



The Effectiveness of the Ertl Bone Bridge Procedure: A Systematic Review

Kahle JT 1,2, Ertl JP 3, Highsmith MJ 4,5

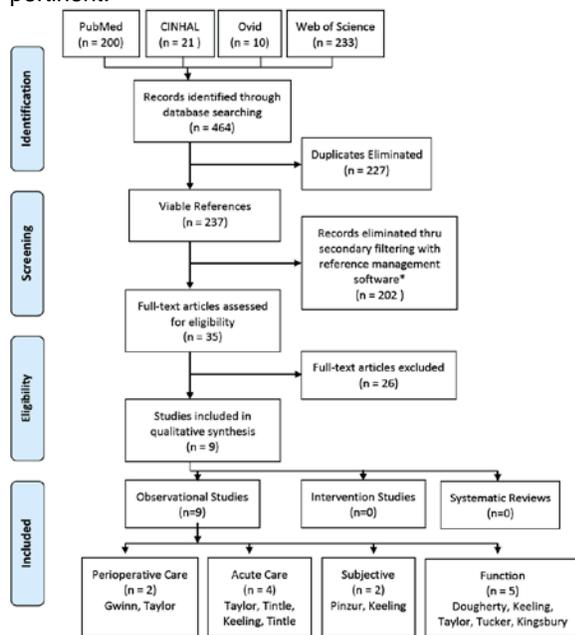
Indiana University, University of South Florida, OP Solutions, Veterans Affairs, EACE

INTRODUCTION

Physical outcomes have been reported to be equivalent to limb salvage. Amputation and use of a prosthesis could be further enhanced with an improved amputation technique. The Ertl bone bridge procedure has been reported to provide a mechanistic advantage to the prosthetic user by providing a weight bearing surface, while limiting painful tibio-fibular motion. The Ertl procedure could lead to superior outcomes compared to a traditional amputation technique. However, there also may be complications associated with this technique. This systematic literature review (SR) was undertaken to determine if commonly held views regarding the benefits of the bone bridge procedure are supported by the literature.

METHOD

Four databases were searched for articles pertaining to surgical strategies specific to a bone bridge, Ertl or osteomyoplastic procedures of the transtibial amputee. A total of 35 articles were identified as potential articles. Authors included methodology that was applied to the separate topics. Following identification, articles were excluded if they were determined to be low quality evidence or not pertinent.



RESULTS

Nine articles were identified to be pertinent to one of the topics: *Perioperative Care*, *Acute Care*, *Subjective Analysis and Function*. Two articles sorted into multiple topics. Two articles sorted into the

Perioperative Care topic, 4 articles sorted into the *Acute Care* topic, 2 articles sorted into the *Subjective Analysis* topic and 5 articles sorted into the *Function* topic.

DISCUSSION

There are no high quality (level one or two) clinical trials reporting comparisons of the bone bridge procedure to traditional methods. There is limited evidence supporting the clinical outcomes of the bone bridge procedure. There is no agreement supporting or discouraging the perioperative and acute care aspects of the bone bridge procedure. There is no evidence defining an interventional comparison of the bone bridge procedure. Most articles in this SR identified the bone bridge procedure to be equivalent to a traditional technique. This SR is currently under review for publication. This group is pursuing funding to conduct a randomized clinical trial (RCT) to compare the Ertl bone bridge to the standard of care technique. The proposed RCT will include physical functional long-term outcomes.

CONCLUSION

The Ertl bone bridge procedure may have physiological and functional merit. The bone bridge technique is reported to increase tourniquet and surgical time. There is not agreement on acute complications related to a bone bridge technique. Perspective measure of function was reported as equivalent to traditional measures. No physical functional performance outcomes have been used to compare the bone bridge to traditional amputation. Formal level one and two clinical trials will need to be considered in the future to guide clinical practice.

CLINICAL APPLICATIONS

Amputation is currently a viable (and could be an improved) outcome to limb salvage, when amputation is considered. Mechanistic advantage is an important first step to validating any procedure. However, higher-level evidence must be identified and sought to substantiate that procedure. It is clinically imperative for a prosthetist to know evidence based outcomes regarding procedures they may recommend to their patient populations and surgeons with whom they collaborate and support. The Ertl bone bridge is a procedure that could improve outcome, but knowing the current state of and quality of evidence is the starting point to clinical understanding and practice guidelines.

REFERENCES

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Keeling JJ, Comparison of functional outcomes following bone bridge in TTAs, JBJS, 2013

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