

The Utility of Bone Marrow Aspirate in Healing of Fifth Metatarsal Fractures and Return to Play in Athletes: A Systematic Review

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Introduction

Fractures of the proximal fifth metatarsal (Jones fractures) are common in athletes.¹ These fractures cause significant pain and dysfunction, especially in patients who compete in numerous sports, such as: tennis, soccer, basketball, and running. Standard of treatment options exist for this injury, but the focus of this study was centered around surgical fixation with an intramedullary (IM) screw along with the addition of bone marrow aspirate concentrate (BMAC). In conjunction with surgical fixation, BMAC has shown promising results in the early healing and successful union of Jones fractures and the early return to play for athletes. **The goal of the present systematic review is to determine if there is evidence to support the use of BMAC in the successful union of fifth metatarsal fractures and whether there is a discrepancy in the rate of refracture of those patients who do not undergo BMAC treatment.**

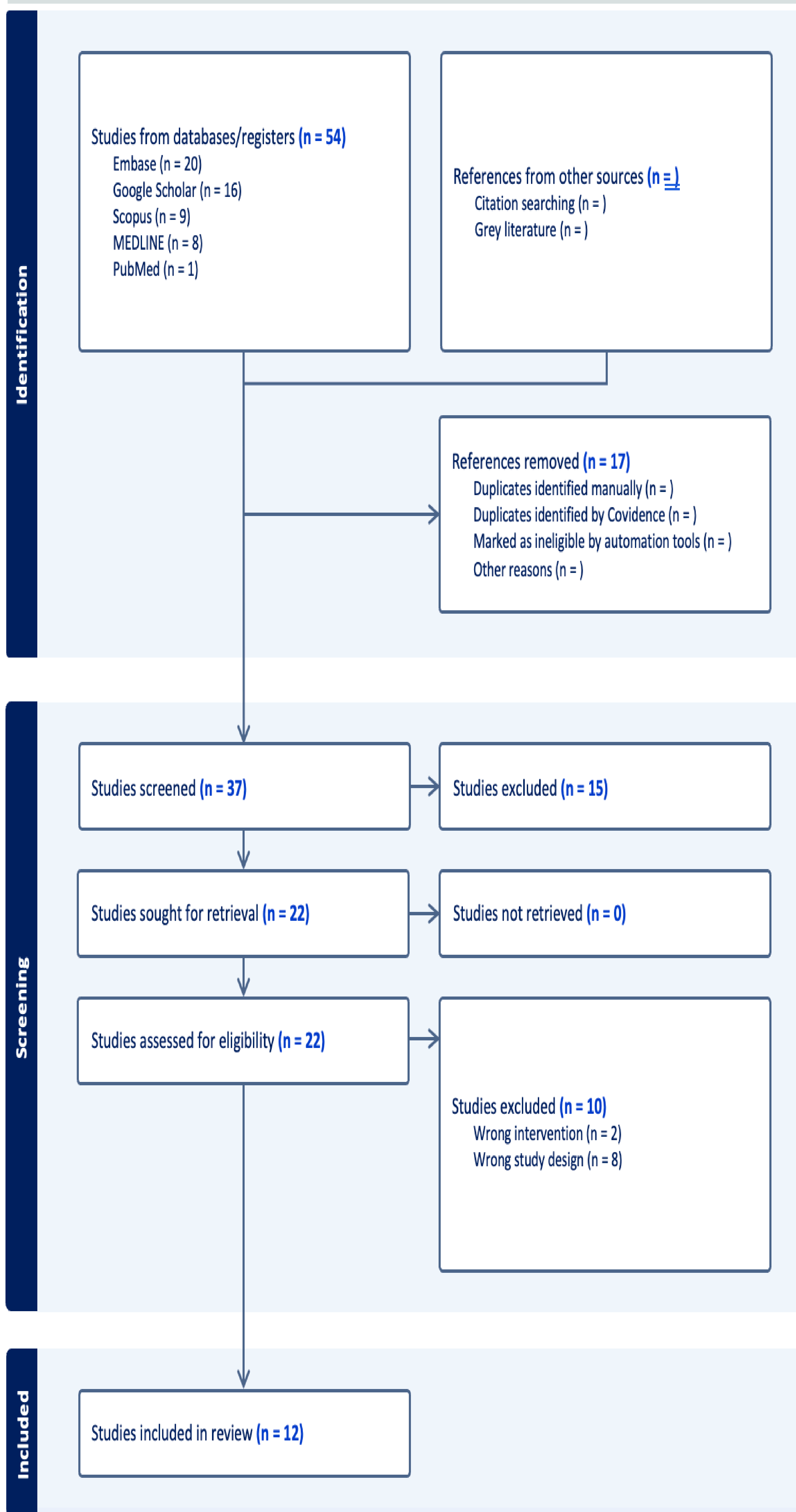
1° and 2° Outcomes

- The primary outcomes to be investigated are the return to play (RTP) in athletes, rate of refracture, and rate of nonunion after surgical fixation.
- The secondary outcomes are focused on patient reported outcomes (PROs) such as American Orthopedic Foot and Ankle Scores (AOFAS) and Visual Analogue Scale (VAS) scores.

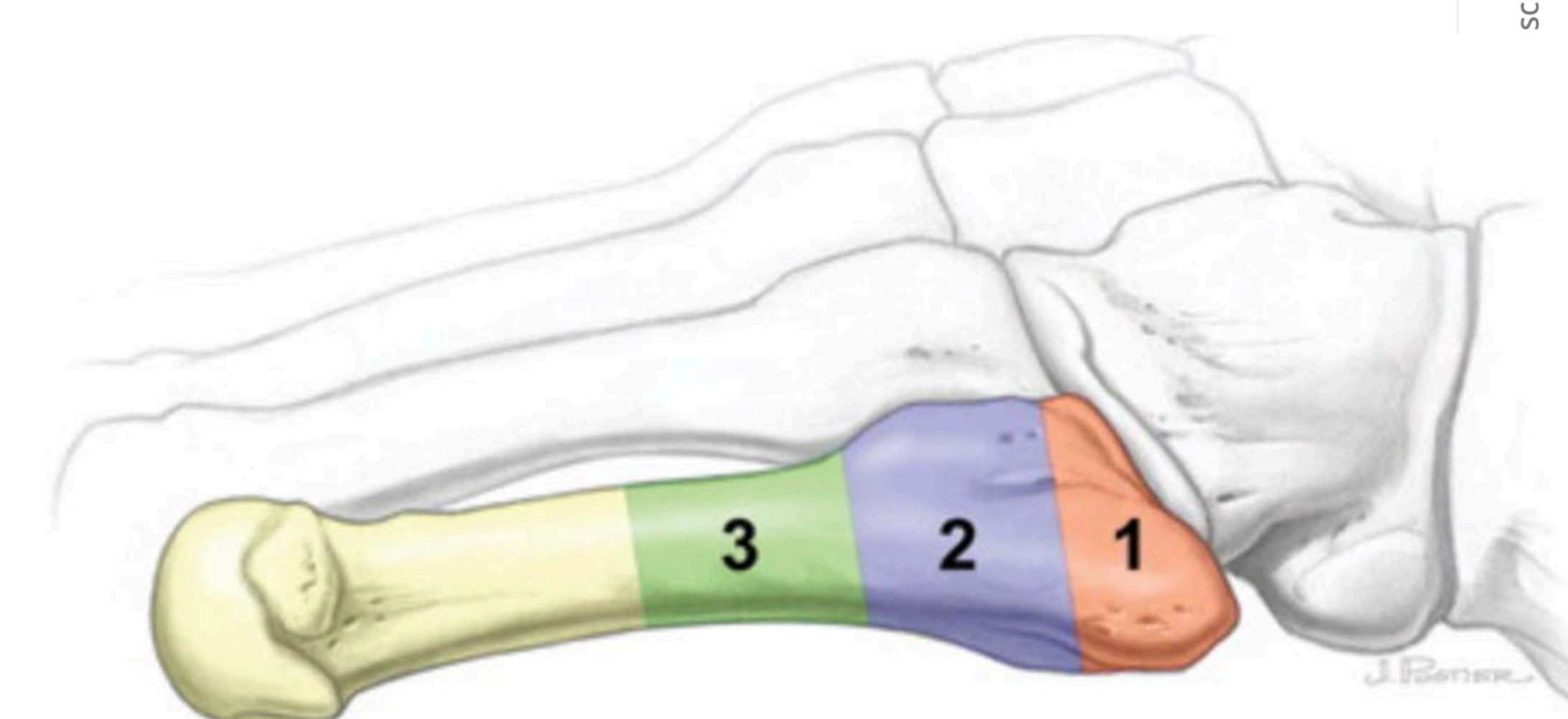
Methods

- Articles were reviewed by 4 reviewers, independently based on established criteria.
- The studies were also reviewed to determine their level of evidence and potential bias.
- Any disagreement amongst reviewers was settled with open discussion and by a third-party reviewer.
- A comprehensive review of the literature utilizing PRIMSA guidelines was performed. Search criteria was confined to studies from 2011 through January 2023 to identify clinical outcomes of operative treatment with the use of BMAC or not.
- Databases included:
 - PubMed (including MEDLINE)
 - Embase
 - Scopus
 - Google Scholar

PRISMA Guidelines



screw transfixes a healing fracture of the proximal fifth metatarsal.



Christopher D. Murawski · and John G. Kennedy, MD, FRCS (Orth)
Percutaneous Internal Fixation of Proximal Fifth Metatarsal Jones Fractures (Zones II and III) With Charlotte Carolina Screw and Bone Marrow Aspirate Concentrate: An Outcome Study in Athletes
Hanneke Weel1*, Wouter H. Mallee1 , C. Niek van Dijk1 , Leendert Blankevoort1 , Simon Goedegebuure3 , J. Carel Goslings2 , John G. Kennedy4 and Gino M. M. J. Kerckhoffs1*The effect of concentrated bone marrow aspirate in operative treatment of fifth metatarsal stress fractures; a double-blind randomized controlled trial



Covidence is a systematic review management system that has been integral to the progress of this project. It has allowed exclusive, independent review of journal articles within set PRISMA guidelines and a concise, collaborative approach to communication between reviewers. LSUHSC and the library staff have provided the opportunity to use Covidence for the first time for a medical student led systematic review project at this institution. Progress to this point would not have been possible without the paid university subscription to Covidence and the help of the library science staff at LSUHSC.

Preliminary Results

- By looking at patient demographics, post-operative radiographic images, and comparison of patient reported outcomes within the studies reviewed, it is likely that orthobiologic augmentation by way of BMAC use is beneficial to healing in patients.
- As this project progresses, future findings will be documented and assessed to contribute to the enhancement of treatment for Jones fractures. It should be noted that more prospective studies are necessary to cement the finding that healing rates are increased in fifth metatarsal fractures and subsequent RTP is reduced.