

## Jones Fracture in the Elite Athlete: Patient Reported Outcomes following Fixation with BMAC

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**Objectives:** Jones' fractures, 5<sup>th</sup> metatarsal metaphyseal-diaphyseal junction fractures, are a debilitating injury for the elite athlete, particularly in cutting/pivoting sports. These injuries are usually managed surgically due to the high rate of nonunion and re-fracture. Despite primary screw fixation, delayed union and nonunion are not uncommon. Bone marrow aspirate concentrate (BMAC), an autologous source of hematopoietic and mesenchymal stem cells, has been used to augment healing due to the poor healing potential in the watershed region. We hypothesize that open reduction internal fixation (ORIF) augmented with BMAC will improve patient-reported outcome measures following Jones' fractures in athletes.

**Methods:** This study was a prospectively collected and maintained review of elite athletes that underwent intramedullary screw fixation augmented with BMAC for Jones' fractures at an academic medical institution. All patients were evaluated preoperatively and postoperatively to assess differences in patient reported outcomes including VAS, PROMIS, FAAM, SF-12 scores, return to play, and complications. Student's t test was used in statistical comparison of the preoperative and postoperative outcome scores.  $P < 0.05$  was considered significant.

**Results:** A total of 41 elite athletes were treated with ORIF with BMAC for a Jones fracture with a mean age of 25.59 years (range 19-42). There were 26 (63%) males and 15 females included in the study. Type of athlete ranged across the following sport activities: football, basketball, soccer, volleyball. Of note, patients had significantly improved with lower visual analog score for pain (mean  $\Delta 3.56$ ,  $p = 0.001$ ), higher FAAM scores (mean  $\Delta 43.6$ ,  $p < 0.001$ ), and PASS scores (increased from 11% to 85%,  $p < 0.001$ ) at 6 months. Additionally, patients showed improvement in SF12, PROMIS10, and FAAM scores at 12 months, although this was not statistically significant due to insufficient follow up at this time. The average numbers of days lost to competition was 131 days. All patients that have returned to elite competitive sport activity report minimal to no pain.

**Conclusion:** Intramedullary screw fixation of Jones' fractures with BMAC results in optimal surgical outcomes in the elite athlete. The use of patient reported outcomes continues to be a focus of quality measures and should guide clinical decision making for surgical intervention, return to play, and to assess impact of treatment. A higher powered and long-term study with validated patient-reported outcomes is needed to confirm our observations.

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