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Enhancement of Syndesmotic Fusion Rates in Total Ankle Arthroplasty with the Use of Autologous Platelet Concentrate

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ABSTRACT

Background: **One of the challenges of total ankle arthroplasty continues to be achieving a solid distal fusion of the tibiofibular joint. Delayed union rates of 29% to 38% and the nonunion rates of 9% to 18% for syndesmotic fusion have been documented. The risk of tibial component migration has been reported to increase 8.5 times if a solid syndesmotic fusion is absent. Growth factors have been shown to accelerate bone healing and may enhance the fusion of the syndesmosis and, thereby, decrease the frequency of nonunion and subsequent tibial component migration.** ***Methods:*** **An autologous platelet concentrate was used to increase the amount of growth factors at the site of the distal tibiofibular joint fusion in 20 total ankle arthroplasties.** ***Results:*** **Our 6-month fusion rate was 100%. When compared to historical controls (6-month fusion rate of 62%) the difference was statistically significant ($p < 0.0001$).** ***Conclusion:*** **The improved rate of distal tibiofibular fusion may be attributable to the increased presence of growth factors provided by an autologous platelet concentrate.**

Key Words: Arthrodesis; Autologous Platelet Concentrate; Total Ankle Arthroplasty; Syndesmosis

prosthesis fixation, surgical technique, and patient selection led to early failures.[9,21] Some recommended complete abandonment of total ankle replacement in favor of ankle arthrodesis.[5,10,11,22] During the mid to late 1980s, second generation systems corrected many of the flaws associated with their predecessors. These ankle replacement systems are still undergoing modifications as new technologies and research data are evaluated.[15,23] With improved surgical techniques and new component materials, total ankle arthroplasty (TAA) has returned as a viable option in the treatment of patients with debilitating ankle arthritis in whom conservative management has failed.

Since 1984, when the first Agility Ankle (DePuy Corp. Warsaw, Indiana) was used, this system has undergone five phases of development.[23,24] These modifications have improved function and ease of insertion. Distal tibiofibular joint arthrodesis is essential to the support of the tibial component and ultimately to the success of this ankle arthroplasty. In a review of the first 100 Agility ankle arthroplasties, the nonunion rate of the syndesmosis was found to be 9% and the delayed-union rate (defined as more than 6 months) was 29%.[23] Migration of the tibial component was related