

# Implant for Plantar Plate Repair

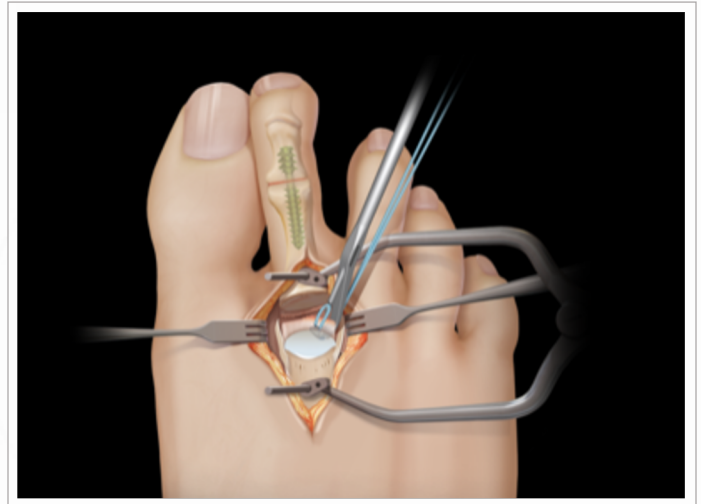
VTIP 21-106: “Novel Implant Device for Plantar Plate Repair”

## THE CHALLENGE

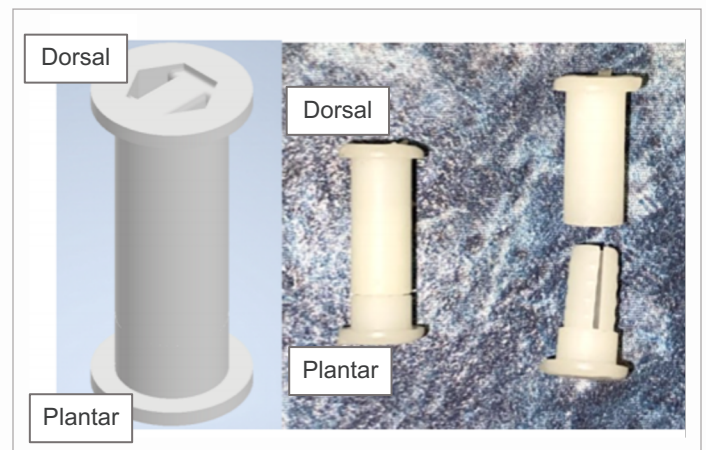
The plantar plate is a deep fibrocartilaginous structure found in the foot whose primary role is to stabilize metatarsophalangeal joints and other structures; unfortunately, it can tear when inflamed or overworked as a result of running or other activities. Other than pain and discomfort, plantar plate tears can also cause the second toe to deviate toward the big toe leading many people to seek surgical intervention. After surgery, the sutures used to repair the plantar plate can carve into the bone when under tension leading to the suture sawing effect.

## OUR SOLUTION

Researchers at Virginia Tech have developed a two-piece implant with a male/female fixation that can eliminate suture sawing after plantar plate repair. After being secured to the plantar plate, sutures will be woven up through the pieces of the implant and tied onto a bar in the dorsal piece. The implant will be made with biocompatible materials, so the device will not dissolve but rather become incorporated into the system. The team tested their device on a sawbone in a simulated procedure with extremely successful results. Overall, this device can not only improve the lives of patients but improve the ease and effectiveness of the procedure for surgeons.



Visual depiction of Plantar Plate repair surgery. (Graphic obtained from Arthrex).



CAD rendering and 3D printed prototype of the implant components.



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