

# Bioabsorbable Versus Titanium Screws in ACL Reconstruction Using Hamstring Autograft: A Prospective, Blinded, Randomized Controlled Trial With 13-Year Follow Up.

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## INTRODUCTION:

Bioabsorbable screws for anterior cruciate ligament reconstruction (ACLR) have been a popular choice with theoretical advantages in future imaging and surgery. The outcome of ACL reconstruction with Titanium and poly-L-lactic acid with hydroxyapatite (PLLA-HA) screws have been compared only with less than a decade follow-up.

In this prospective randomized controlled study of hamstring tendon graft ACL reconstruction, we compare outcomes of a metal interference screw to a screw made of PLLA (70-80%) and hydroxyapatite (20-30%). The outcome of ACL reconstruction comparing a PLLA-HA screw to a titanium screw with MRI and CT scan over 13 years has not previously been reported.

## METHODS:

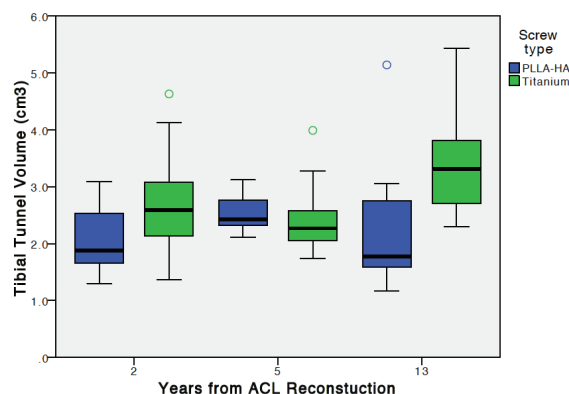
40 patient who met the inclusion and exclusion criteria below were recruited to participate in the trial after giving their signed informed consent.

Patients were randomised to receive either the titanium RCI or HA-PLLA screw for tibial fixation of the ACL graft. Subjects were assessed at 1 week, 6 weeks, 12, 2, 5 and 13 years following surgery with the IKDC Evaluation, KT1000 arthrometer, Lysholm Knee Score, effusion, and kneeling pain. MRI

was performed at 2, 5 years and 13 years to evaluate tunnel volumes, peri-screw ossification, graft integration and cyst formation. CT of PLLA-HA patients was performed at 13 years to evaluate tunnel volumes and intra-tunnel 24 ossification.

## RESULTS:

There was no difference in clinical outcomes at 2, 5 or 13 years between the two groups. At 13 years, tibial tunnel volumes were smaller for the PLLA-HA group, 2.17cm<sup>3</sup>, 28 compared with the titanium group, 3.33cm<sup>3</sup> (p=0.004). By 13 years, the PLLA-HA group 29 had complete or near complete resorption on MRI or CT.



**CONCLUSION:** There were equivalent clinical results between PLLA-HA and titanium groups at 2, 5 and 13 years. While PLLA-HA screws had complete or near complete resorption by 13 years, tunnel volumes remain largely unchanged, with minimal ossification.

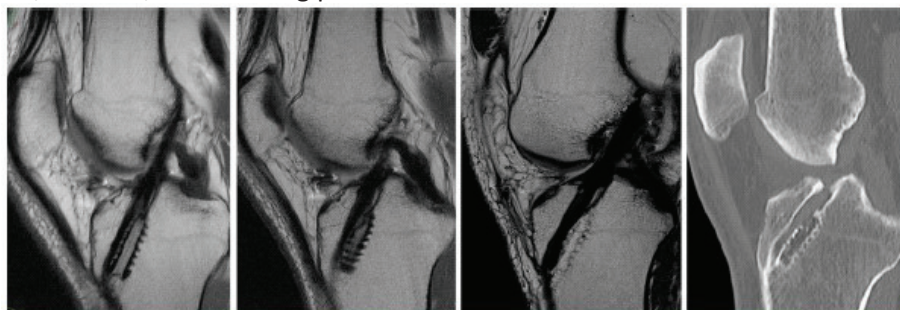


Figure 1. The tibial PLLA-HA screw on the same participant on MRI at (A) 2-years, (B) 5 years (C) 13 years, and CT scan at 13 years. The images shows progressive screw resorption and grade 1 ossification (little or none) at 2 years to complete screw resorption with grade 4 ossification (good) on MRI at 13 years. The CT scan of the same subject demonstrates the 'ghost' outline of the tibial screw which has not ossified.