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# Tibial Derotation Osteotomies are Effective in Improving Hip Pain and Function

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No financial interests  
or relationships to  
disclose



# Aim

**Tibial Rotational profile is widely accepted as a contributor to anterior knee pain. However, it is less well understood in relation to hip symptoms.**

The aim is to investigate:

- Clinical outcomes following Distal Tibial Derotation Osteotomy (DTDO) performed to manage hip pain in the presence of tibial maltorsion
- Review how co-existent pathomorphology affected the management.

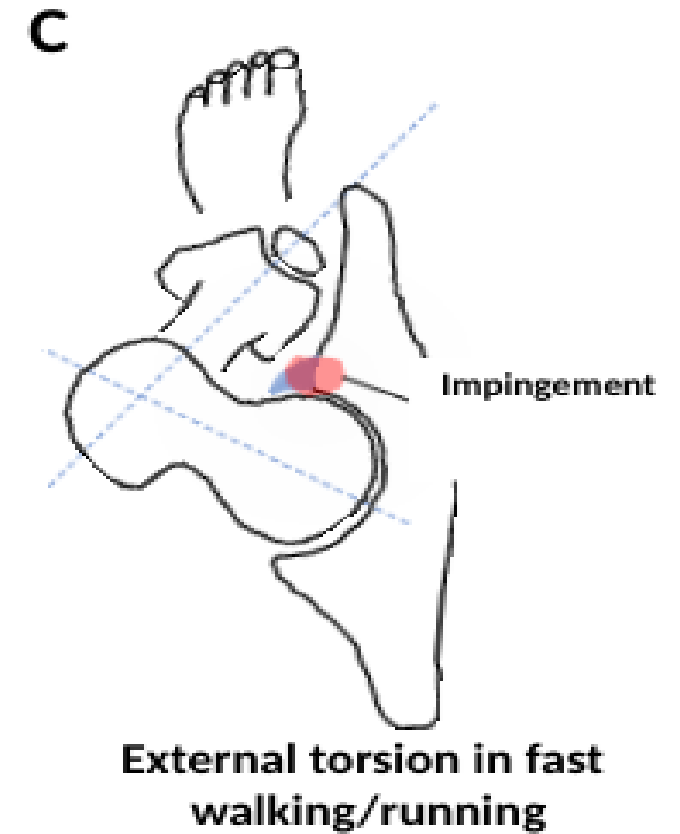
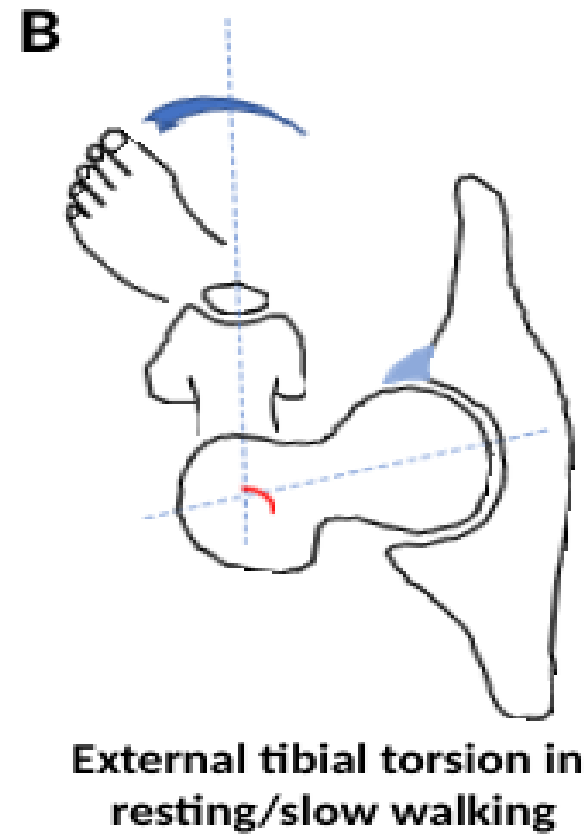


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# Tibial Malrotation as Contributor to Hip Pain



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# Methods

## Review of all patients undergoing DTDO between 2018-2020 in a Joint Preservation setting

### Inclusion criteria

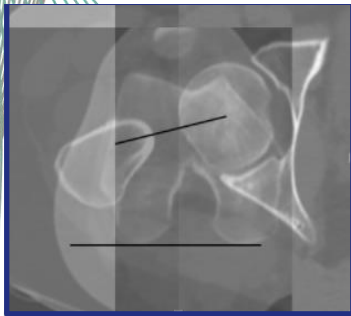
- Hip pain
- Tibial rotational deformities – predominant aetiology
- Tibial maltorsion – excessive torsion  $>40^\circ$
- Minimal follow-up 24 months or complete symptom resolution

### Exclusion Criteria

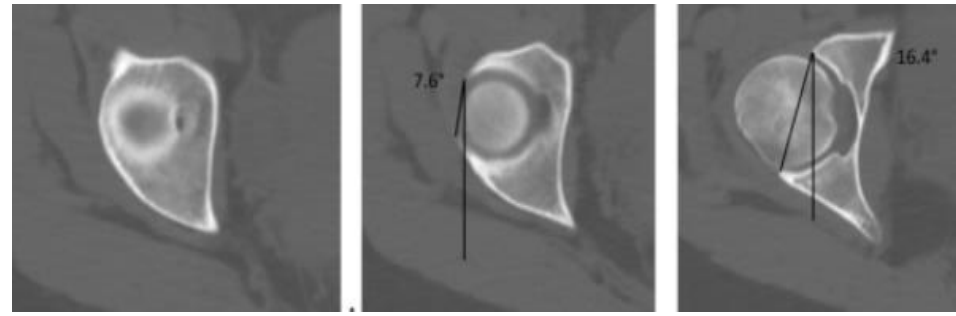
- $>50$  years old
- Presenting with degenerative joint changes
- Neuromuscular conditions



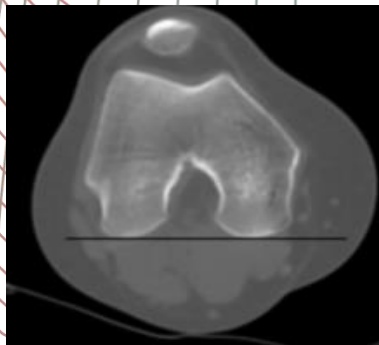
# Methods



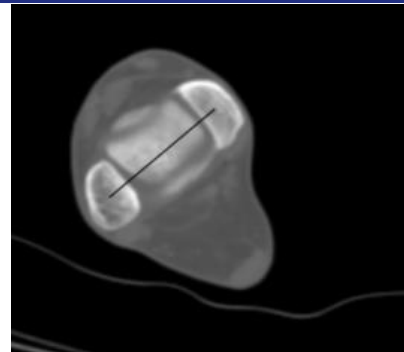
**Hip Block 1: Measurement of femoral anteversion in relation to posterior femoral condyles**



**Hip Block 2: (A) First the dome of the acetabulum was identified. (B) 5 mm distal to the dome the cranial acetabular version was measured. (C) The centre of the femoral head was identified, and the central acetabular version was measured.**



**Knee Block: First reference line at the most prominent part of the posterior femoral condyle**



**Ankle Block: second reference line between the centre of the medial and lateral malleoli, just distal to the joint line**

## **Lower limb rotational profile was routinely evaluated clinically**

If clinically suspected abnormalities:

Computed tomography (CT) rotational profile assessment, including three blocks

- 1st block – the pelvis and hip joints
- 2nd block – the knee joints
- 3rd block – the ankle joint

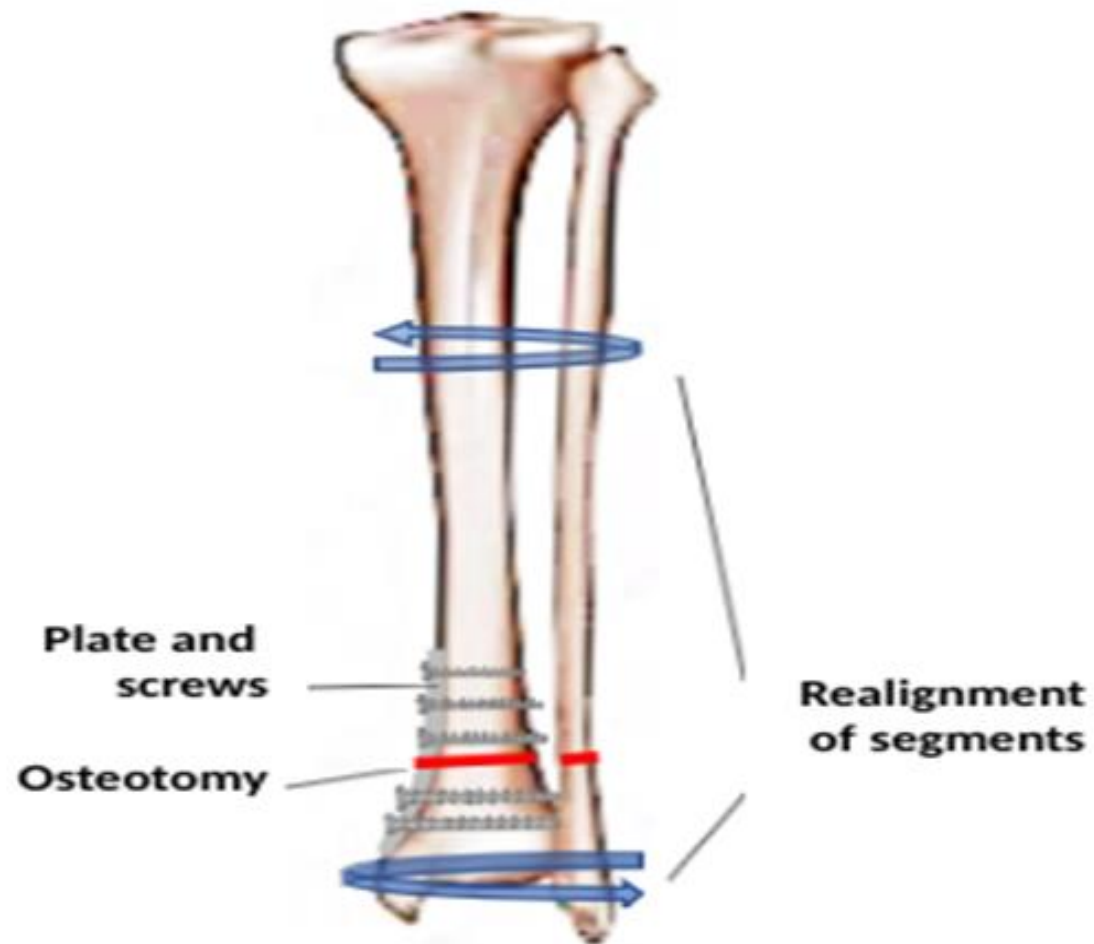


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# Methods



## Distal Tibia Derotational Osteotomy

- Oblique fibular osteotomy
- Tibial Osteotomy through distal metaphyseal region
- Parallel to tibial plafond
- Stabilised with low profile 2.7mm Evos plate (Smith&Nephew, Watford, UK)



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# Methods

## PROM functional assessments (Pre-operative, Interval post-operative at 12 and 18 months)

- International Hip Outcome Tool (iHOT12 – percentage of 0-68 points)
- Knee Outcome Score Activities of Daily Living Scale (KOS ADLS – percentage of 0-70 points) and Sport Scale (KOS SS – percentage of 0-55 points)
- KOS scores included additional graphical scores (percentage on a scale)
- Anterior Knee Pain or Kujala score (AKP – 0-100 points).





# Results

Thirty-two patients underwent DTDO. Mean tibial torsion  $-48.8^\circ$  (41-63 $^\circ$ ). Average age  $-27$  years (18-44), average follow-up  $-30$  months (16-45). Nine patients (28%) had a co-existent Cam/pincer and 8 (25%) – excessive MI (51-76 $^\circ$ ).

Overall, 63% of all patients (including 54% of patients with co-existent pathology) experienced significant hip functional improvement following DTDO alone.

Pre-operative vs 18 months post-operative scores were:

- iHOT-12  $-38$  vs  $96$  ( $p=0.0001$ );
- HOS-ADLS  $-54$  vs  $91$  ( $p=0.0009$ );
- HOS-ADLS graphical  $-46$  vs  $93$  ( $p=0.0005$ );
- HOS-SS  $-40$  vs  $87$  ( $p=0.0005$ );
- HOS-SS graphical  $-44$  vs  $85$  ( $p=0.001$ ).

Statistically significant difference in all PROMs was attained at 12 months.



# Conclusion

- Patients with hip pain and lower limb rotational malalignment frequently present with multi-level deformity and co-existent Cam/pincer.
- Malrotation correction should be prioritised.
- Significant proportion of symptomatic hip impingement patients (>50%) improve with tibial derotation alone even in the presence of co-existing pathomorphology.
- Functional recovery to near normal level is expected within a maximum of 12 months post-DTDO

