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Sheffield Children's Hospital

Posterior Tibial Slope In The Paediatric Population –

What Is Normal And How Reliable Is Radiographic Measurement?

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Disclosures

O'Dowd DP – No Disclosures
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Introduction

Increased posterior tibial slope (PTS) is associated with a higher risk of anterior cruciate ligament (ACL) injury, including re-rupture.[1]

ACL injury in the paediatric population is a common injury with an increasing incidence.[2]

A few studies in the skeletally immature have associated increased PTS with tibial spine fractures and ACL ruptures. However, normal ranges for PTS do not appear within the literature for the paediatric population.[3]

Is PTS the same in the skeletally immature population and can the PTS be reliably measured on radiographs in the skeletally immature?

Methods

440 skeletally immature patients between the ages of 4-18 years old with knee radiographs were reviewed.

Key demographic data including age, gender, laterality and reason for image were recorded.

Those with underlying medical conditions that may affect development of the knee or lower limb were excluded.

PTS angle was measured using the posterior cortex method by 3 investigators who were blinded to each other's results.

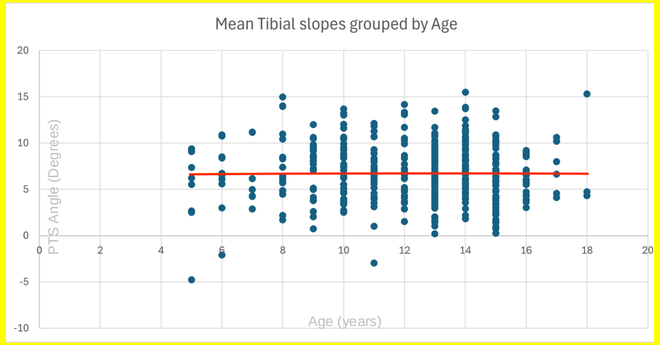
Mean PTS angles were calculated and inter-observer variability was assessed.

Results

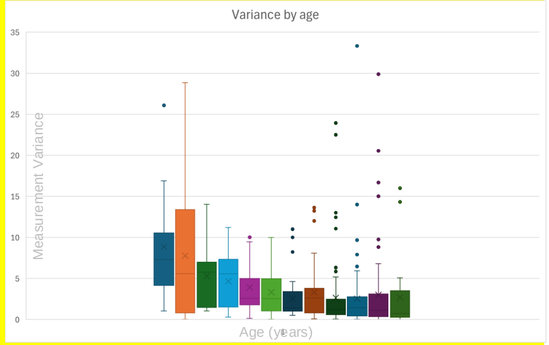
Knee radiographs of 440 patients underwent initial review, with 30 subsequently excluded.

In patients aged 4-8 years old, poor inter-observer reliability (ICC 0.389504) occurred on PTS angle measurement.

In patients aged 9-18 years old, good inter-observer reliability (ICC 0.809556) occurred on PTS angle measurement.



The mean PTS angle across all ages was 6.77° (SD 3.46°, range -8.1° to 17.4°).



Inter-observer measurement variance reduced with age from 7.5 at 5 years old to 2.1 at 16 years old.

Conclusion

PTS angle in skeletally immature patients is similar to that reported in the literature for the adult population.[4]

There is poor inter-observer reliability when measuring PTS angle on radiographs in patients aged 8 years old and younger.

Inter-observer measurement variance is similar to that reported in the literature for the adult population from 9 years old.

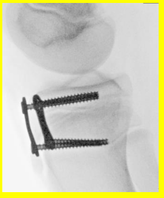
MRI may be a more reliable tool for measuring PTS angle in patients 8yrs old and younger where limited ossification has occurred.

Summary

This research provides normal values for PTS in skeletally immature individuals and recommendations on when MRI should be considered for more reliable measurement.

Posterior tibial slope correction during ACL reconstruction is gaining popularity.

Guided growth is a reliable method for correction in the skeletally immature patient.



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