

# **Defining the “mediolateral widening of tibial plateau” as a guide for reduction in tibial plateau fractures**

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# Introduction

- **Widening of tibial plateau = insufficient buttressing, deformation of the condyle due to manipulation**
- **Pathological widening = >5 mm >> early posttraumatic arthritis + worse functional outcomes**
- **WHY?** - non uniform weight distribution - **altered biomechanics** of meniscii and collateral ligaments
- **What is normal mediolateral tibial plateau width?** - **Very limited literature**
- **AIM** – To study **normal tibial plateau width**, compare the **relative extent of tibial plateau to that of distal femur in normal AP radiographs**



# Methods

- Tertiary Care centre - electronically saved data
- 1 year consecutive AP radiographs of uninjured knee joints (age group between 18 years and 65 years)- True AP radiographs, pathological excluded
- Software analysis - Stradus ® PACS

Articular width of tibial plateau (TA)

Extraarticular width tibial plateau (TE)

Articular width distal femur (FA)

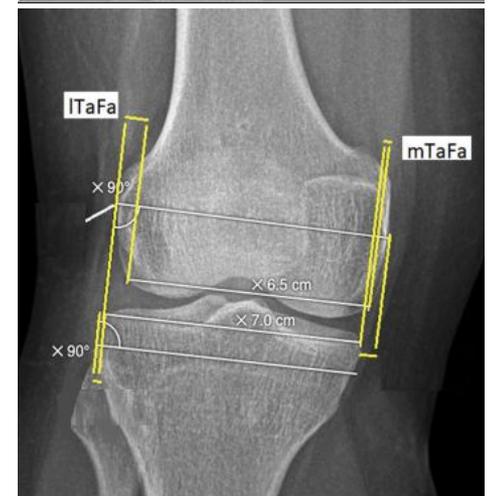
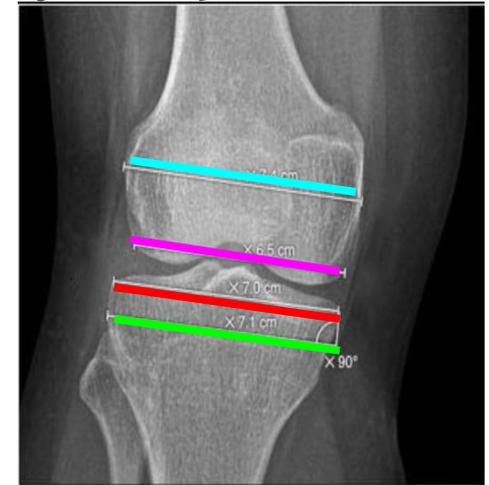
Extraarticular width distal femur (FE)

Articular Ratio TA/FA

Extra-articular ratio TE/FE

Medial articular mismatch (mTaFa)

Lateral articular mismatch (lTaFa)



# Results

## 101 true AP radiographs

- 49 male cases: 52 female cases
- Male = 37.34 years, female = 42.48 years
- Tibial articular surface = **4% wider than the distal femoral articular surface**
- **Medial articular rim of tibial plateau matched closely** to the medial articular inflection point of the **distal femur**
- Overall bony extents of **the distal femur and proximal tibia** were found to be **smaller in females.**

However, No difference in relative parameters ( TA/FE and TE/FE )

Measurements	All	Male	Female
TA	78.37	82.48	74.34
TE	80.65	85.41	76.39
FA	75.09	79.14	71.13
FE	84.36	88.72	80.25
TA/FA	1.04 (104%)	1.04 (104%)	1.04 (104%)
TE/FE	0.96	0.96	0.95
mTaFa	-0.01	-0.29	0.32
lTaFa	3.49	3.77	3.16

## Discussion and Conclusions

- Parameters which can be measured by surgeons intraoperatively on fluoroscopic images in a standardized manner
- Individual variations of tibial width can be overcome by the application of ratios or percentage measurements
- 4% of extra width relative to femoral articular surface can be considered normal for the tibial plateau.

**CONCLUSION :** Differential extent of tibial plateau relative to distal femur would be a more reliable parameter than an absolute measurement. The articular surface of tibial plateau is wider (4%) than the distal femoral articular surface.