

### NEWCLIP-TECHNICS

MEDIAL OPENING WEDGE HTO LATERAL HINGE LOCATION

# LATERAL HINGE LOCATION

- → Medial Opening HTO increases Posterior Tibial Slope (PTS) (Ducat et al. 2012)
- $\rightarrow$  To not change PTS:
  - $\rightarrow$  Cutting plane should be normal to tibial Frontal plane
  - $\rightarrow$  Hinge axis should be normal to tibial Frontal plane (Wang et al. 2009)
- $\rightarrow$  Wang et al. 2009:
  - → "Location of the intact cortical hinge affects the posterior tibial slope"
  - → With a posterolateral hinge location, change of PTS is larger than with lateral hinge location

2412 Wang et al





#### **PSI: 3D HTO SIMULATION**

- $\rightarrow$  Visualization of the correction: Frontal and Sagittal
- → Frontal and Sagittal corrections included into the PSI
- → Hinge location included into the PSI
- $\rightarrow$  Limitation of cut depth with the Hinge K-wire

 $\rightarrow$  PTS management and Hinge protection





### CASE 1: FRONTAL CORRECTION ONLY

- $\rightarrow$  To avoid any PTS correction:
  - $\rightarrow$  Cutting plane normal to Frontal plane
  - $\rightarrow$  Lateral Hinge normal to Frontal plane





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### CASE 2: FRONTAL AND SAGITTAL CORRECTIONS

→ Posterior opening  $10^{\circ}$ :





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### CASE 2: FRONTAL AND SAGITTAL CORRECTIONS

 $\rightarrow$  Posterior opening 10°: the Hinge not remains strictly lateral





#### HINGE K-WIRE POSITIONNING ADAPTED

→ Posterior opening 10°: the Hinge not remains strictly lateral ⇒ Modification of Hinge K-Wire positioning in the preoperative planning





#### HINGE K-WIRE POSITIONNING ADAPTED

- → Tibial slope correction up to 5°:
  - → Trabecular bone material properties will allow to get the correction without significant changes for the Hinge K-wire positioning
- → Tibia slope correction superior than 5°:
  - $\rightarrow$  Changing the Hinge K-wire positioning is mandatory

### MEDIAL OPENING AND ANTERIOR CLOSING OSTEOTOMY

- $\rightarrow$  Surgery:
  - $\rightarrow$  Medial opening wedge HTO to correct the frontal plane alignment
  - $\rightarrow$  Anterior closing wedge HTO to correct the tibial slope







### EXAMPLE

### MEDIAL OPENING AND ANTERIOR CLOSING OSTEOTOMY

- $\rightarrow$  Hinge and Hinge K-wire positioning:
  - $\rightarrow$  Postero-lateral





### CONCLUSION



No Tibial Slope correction

Tibial Slope decrease

Tibial Slope increase

# CONCLUSION

