HIPGRID® NINE
BY ORTHOGRID®

# TEARDROP TARGET™

## DESIGN RATIONALE & SURGICAL TECHNIQUE

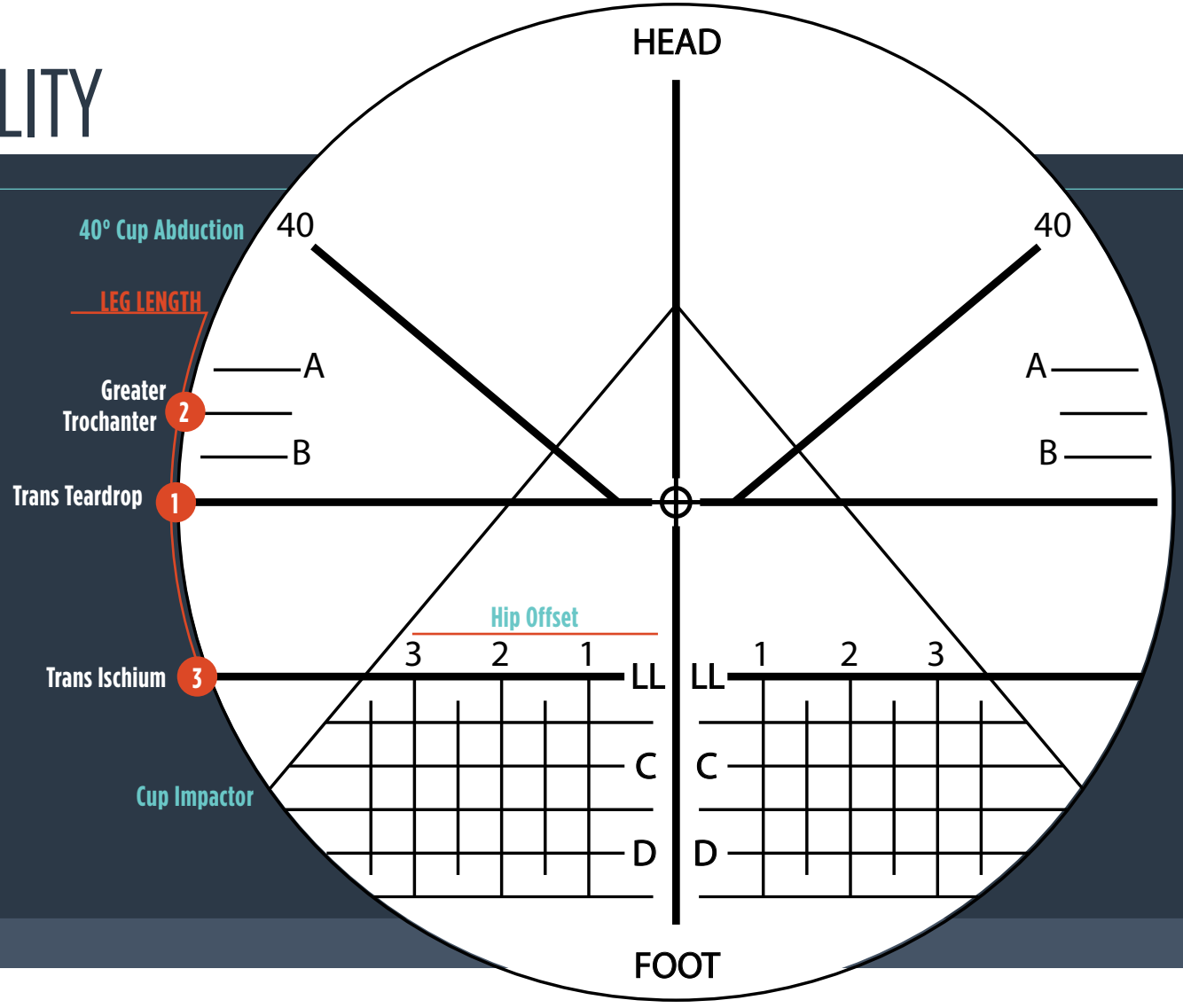
# DESIGN RATIONALE


Designed to be used with a 9-inch C-arm when both lesser trochanters are not visible in the field of view and the surgeon desires to compare 2 AP hip views.

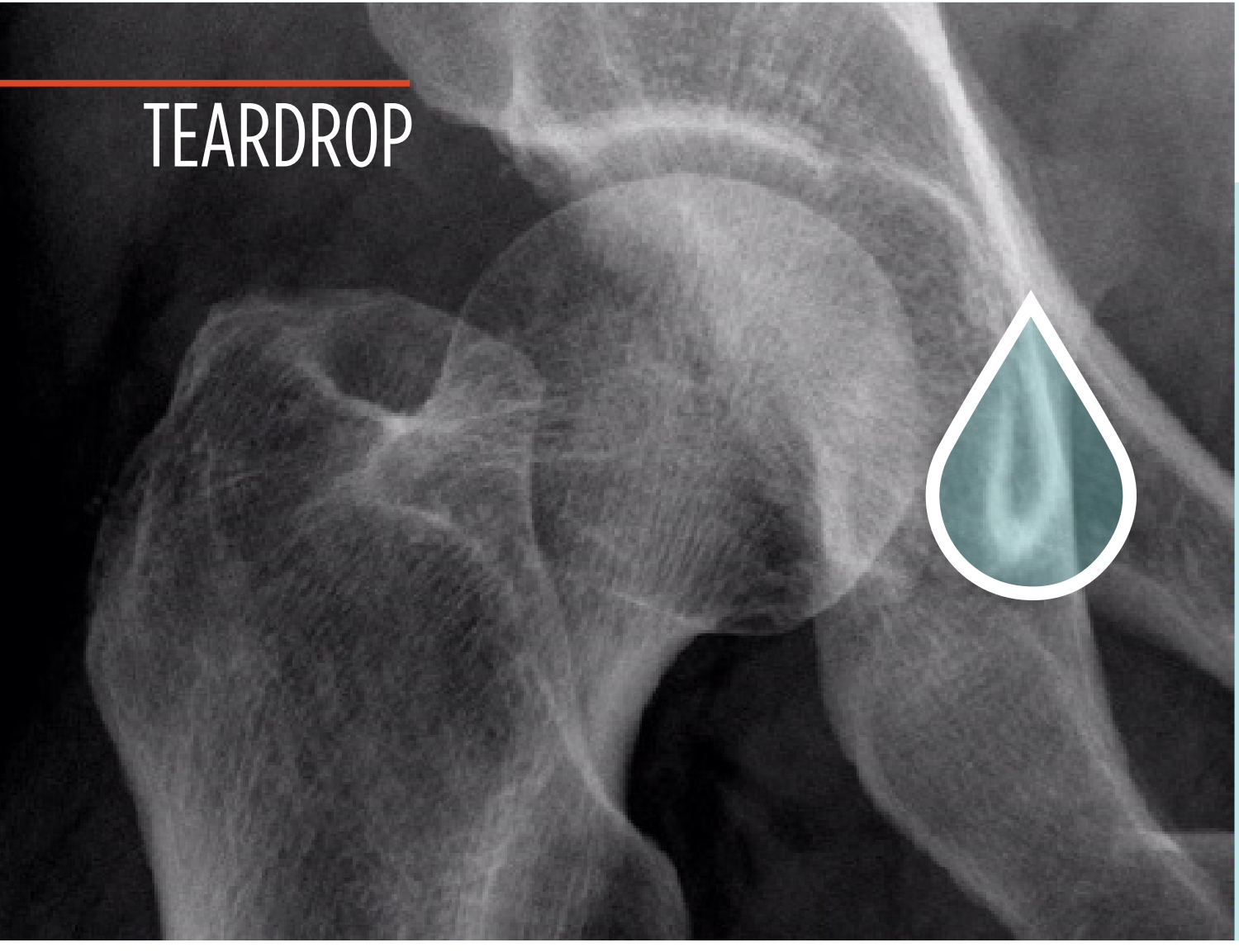
HipGrid NINE reveals fluoroscopic image distortion and utilizes the TearDrop Target™ surgical technique for providing information regarding:

- Pelvic Pitch™
- Pelvic Obliquity
- Acetabular Cup Position
- Hip Offset
- Leg Length Restoration

# GRID FUNCTIONALITY



# TEARDROP



The pelvic teardrop is a radiographic feature seen on pelvic x-rays and results from the end-on projection of a bony ridge running along the floor of the acetabular fossa.

Highly visible and recognizable anatomical landmark

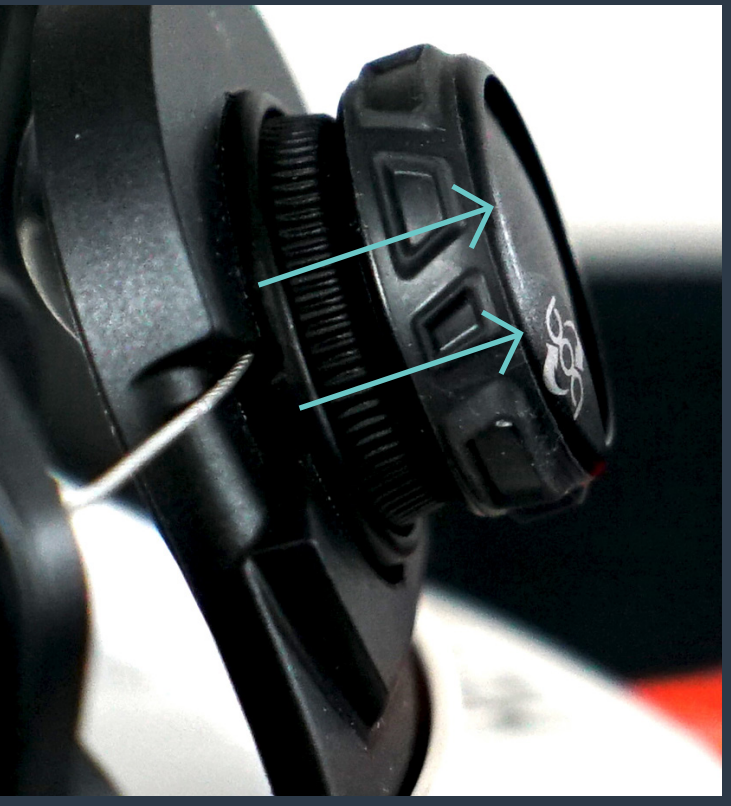
Rarely subjected to deformities or fractures

Close to coronal plane of lesser trochanter and of center of rotation

# SYSTEM SETUP

# UNLOCK

1



2


1 Unlock the Boa® cable tightening device by pulling out on the circular knob until it clicks.

2 Free movement clockwise and counter clockwise.

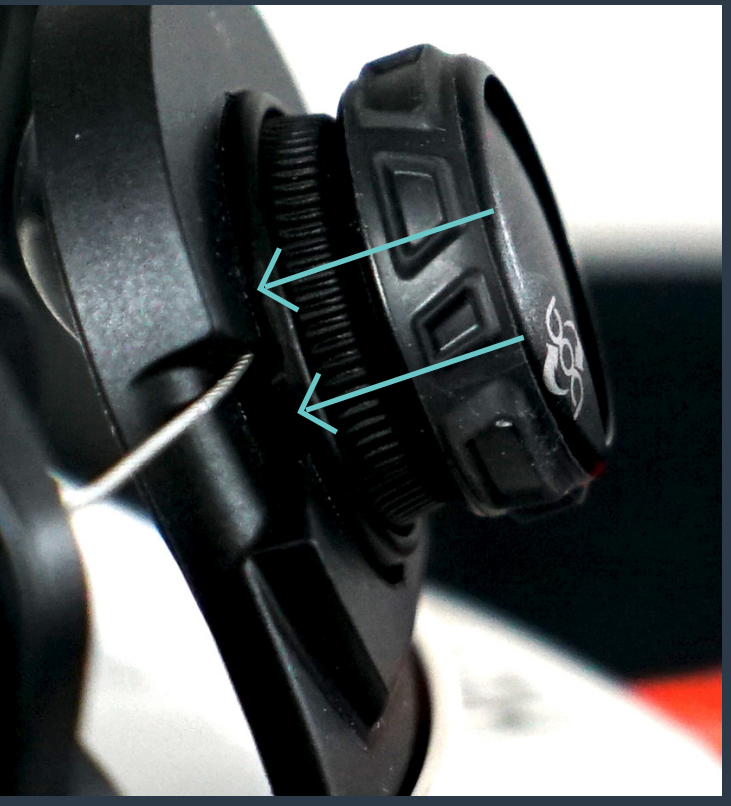
# INSTALL

3

3 Spread the attachment paddles and slide the HipGrid NINE, over the 9” C-arm image intensifier until it is flush with the input window.

# SECURE

4



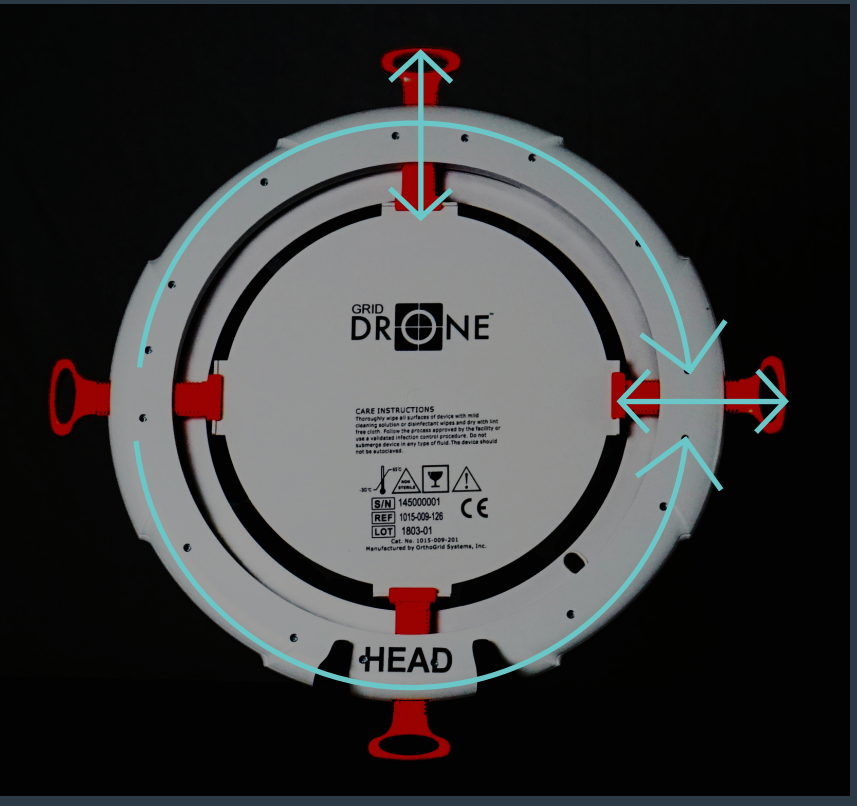
5

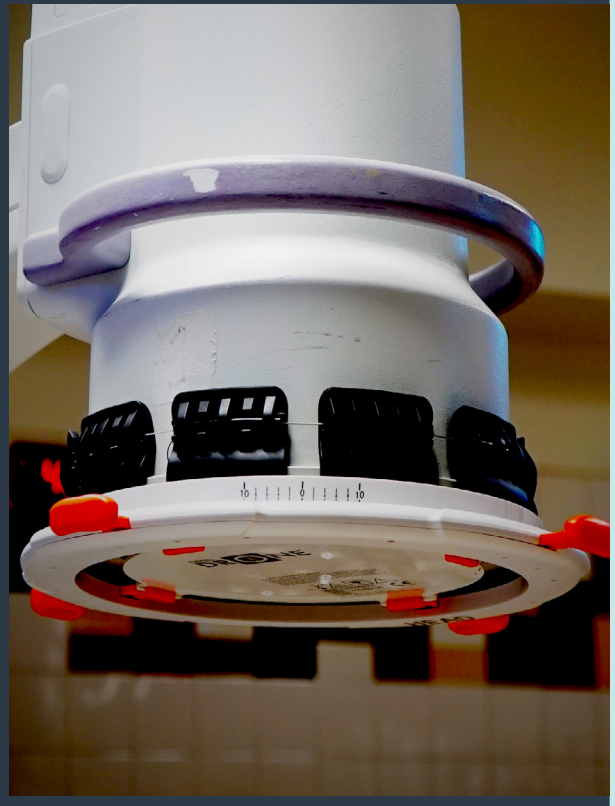

4 Secure the HipGrid NINE by pressing in the Boa® knob until it clicks, locking the ratchet mechanism allowing clockwise movement only.

5 Turn the Boa® knob clockwise tightening the cable, cinching the paddles around the image intensifier.

# ORIENTATION

6



6 Orient the HipGrid NINE, so the “HEAD” marking on the outer ring matches the patient’s head when the C-arm is moved into appropriate position for surgery.

Use the handles to translate and the dial to rotate HipGrid NINE into proper alignment during the procedure.

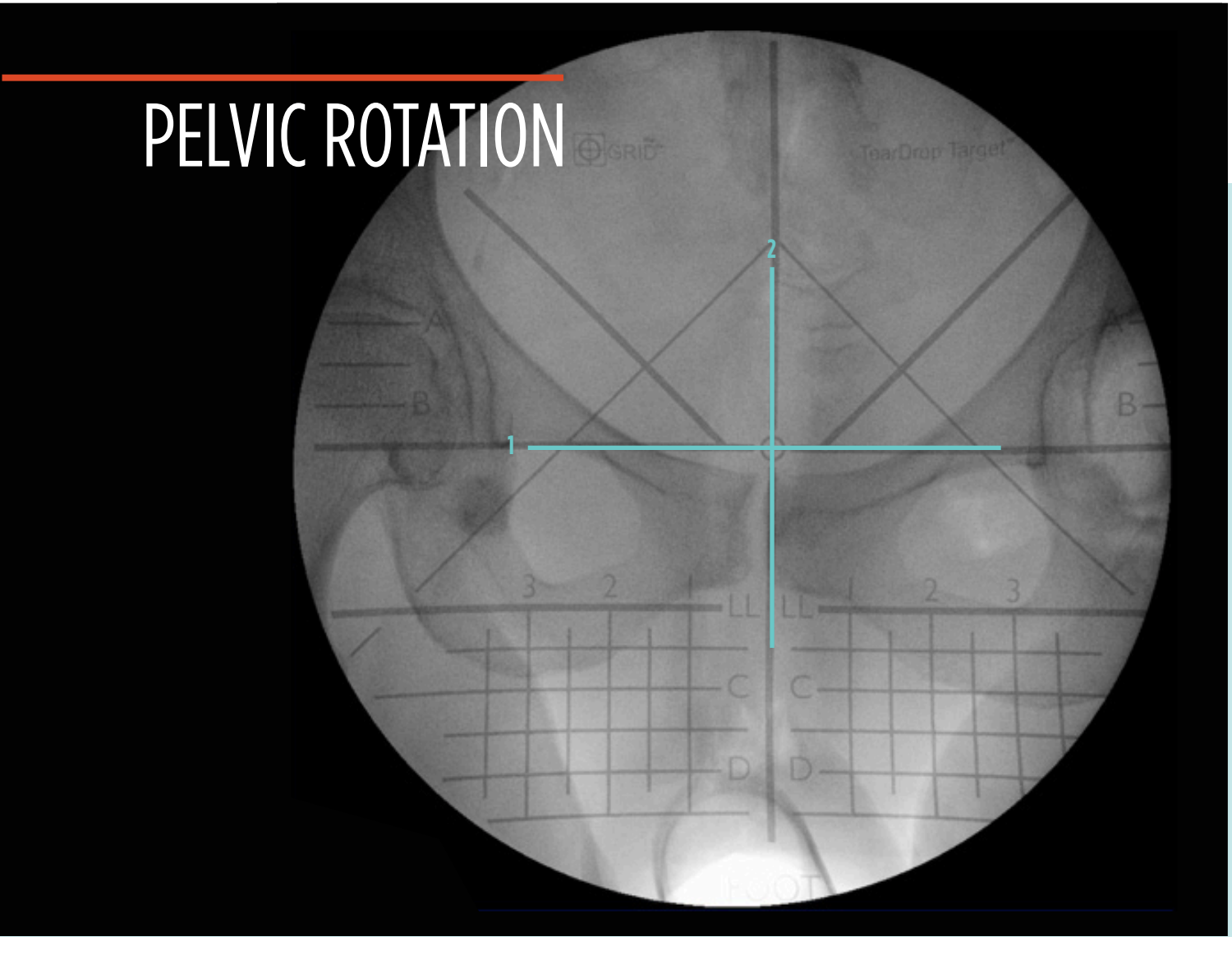
VIEWING ANATOMY

# TEARDROP TARGET™

## SURGICAL TECHNIQUE

HIPGRID NINE

# PELVIC ROTATION




## OBTAIN AP PELVIS VIEW

Align HipGrid NINE by:

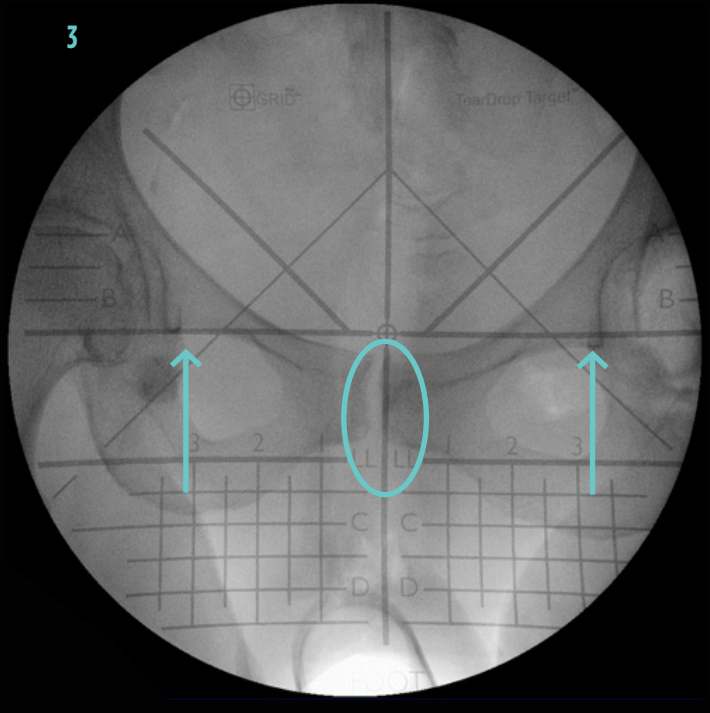
1 Placing Trans TearDrop Line at the base of each teardrop.

2 Align the middle perpendicular line with the center of the pubic symphysis.

**NOTE** C-arm must be positioned perpendicular to the patient for image intensifier to maintain a consistent relationship with the anatomy.

# PELVIC OBLIQUITY

3

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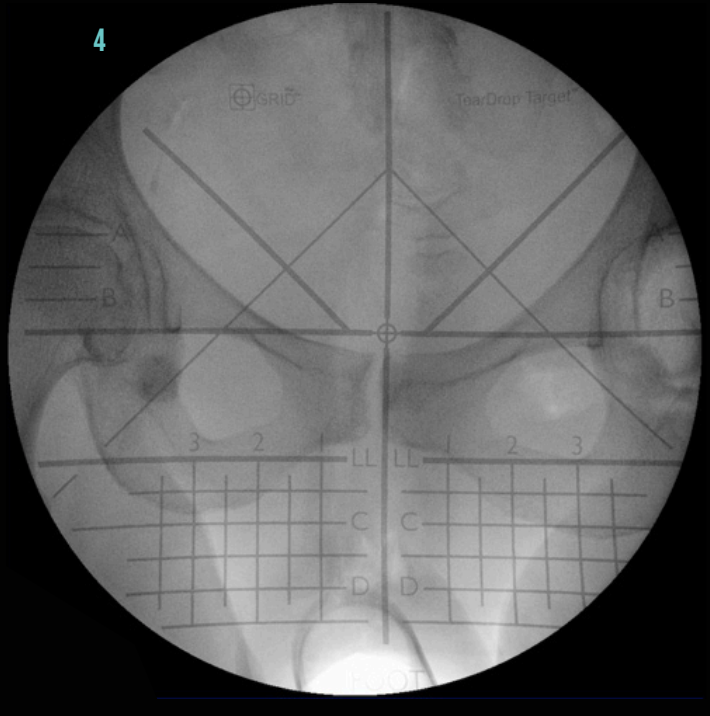


3 Determine pelvic obliquity by utilizing the HipGrid lower leg length/ offset grid to determine side to side pelvic symmetry.

4 If obliquity exists, rainbow the C-arm image intensifier toward the smaller obturator, or tilt the operating table toward the C-arm and adjust the grid as needed until symmetry is achieved.

# PELVIC PITCH™

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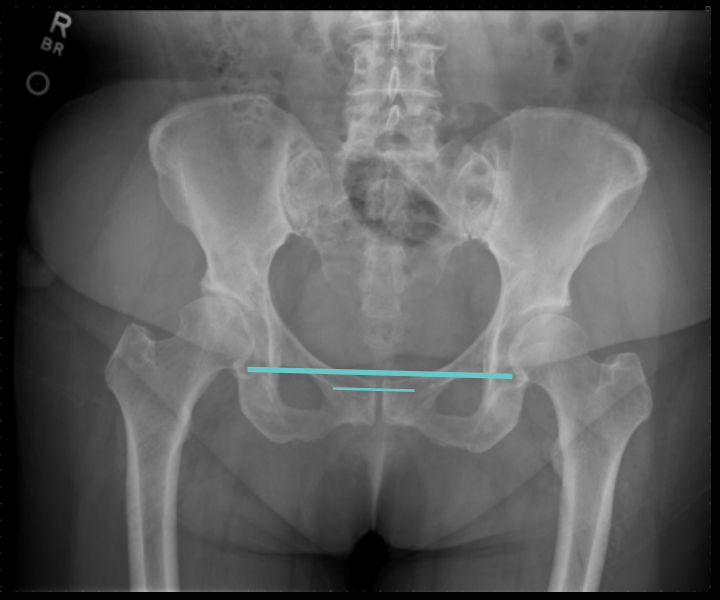


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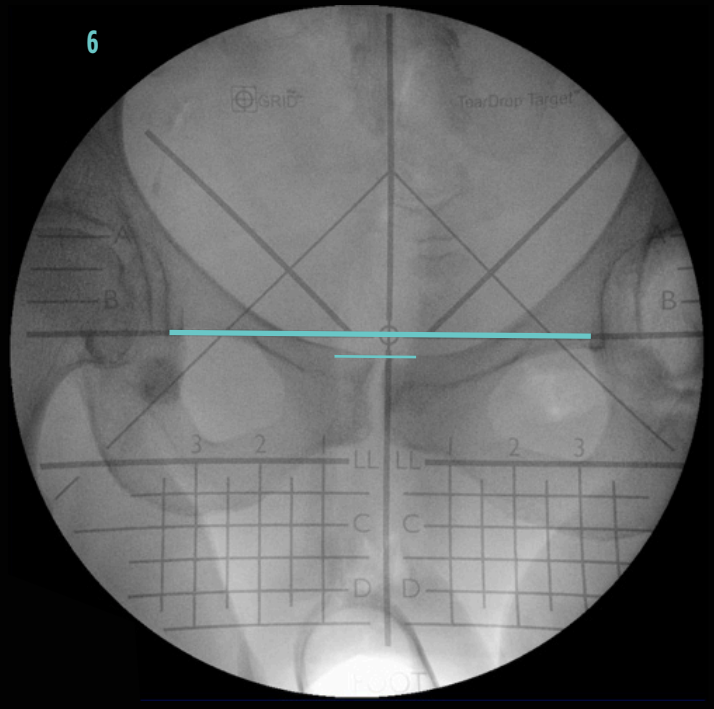
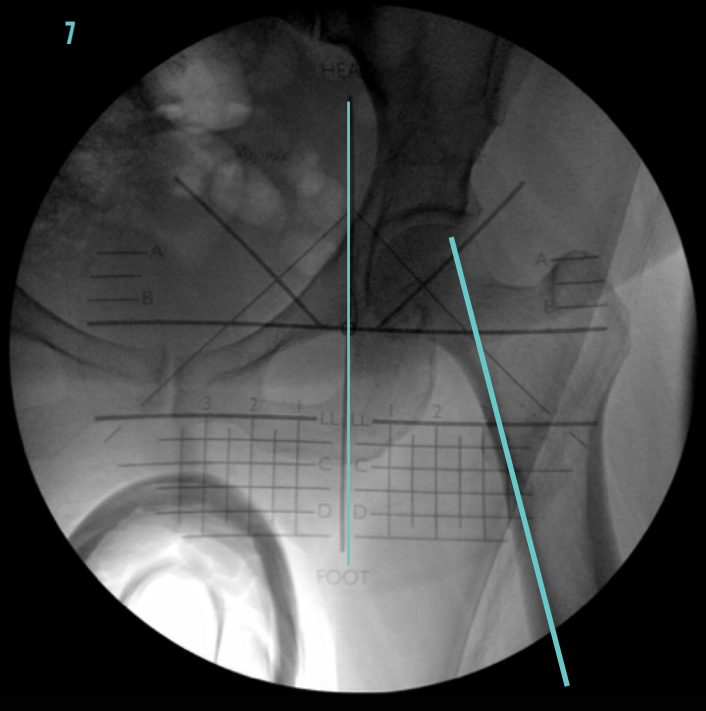



5 Determine pelvic pitch by examining the relationship between Trans Teardrop line and the top of the pubic symphysis on the preoperative AP pelvic x-ray.

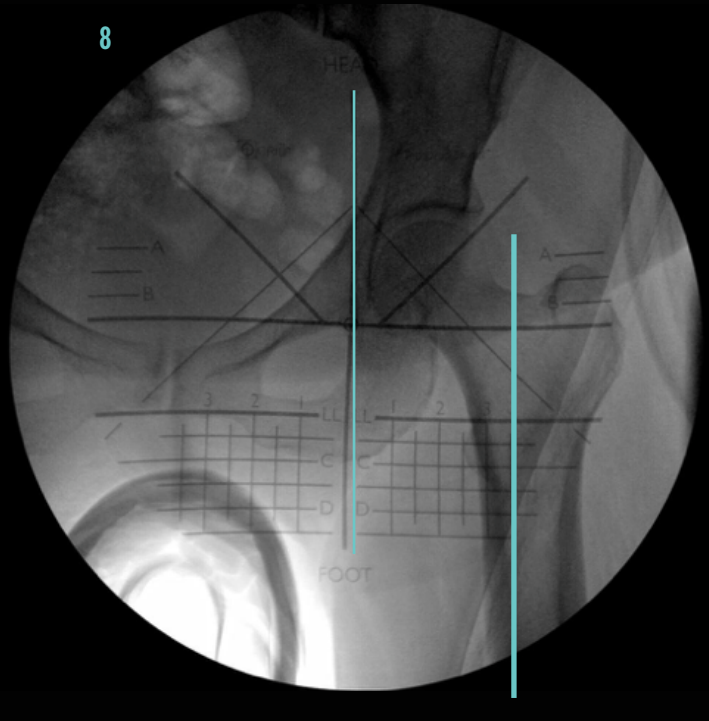
6 Adjust the tilt of the C-arm to recreate the relationship between the Trans TearDrop line and top of the pubic symphysis intra-operatively.

# FEMORAL ABDUCTION

7




8

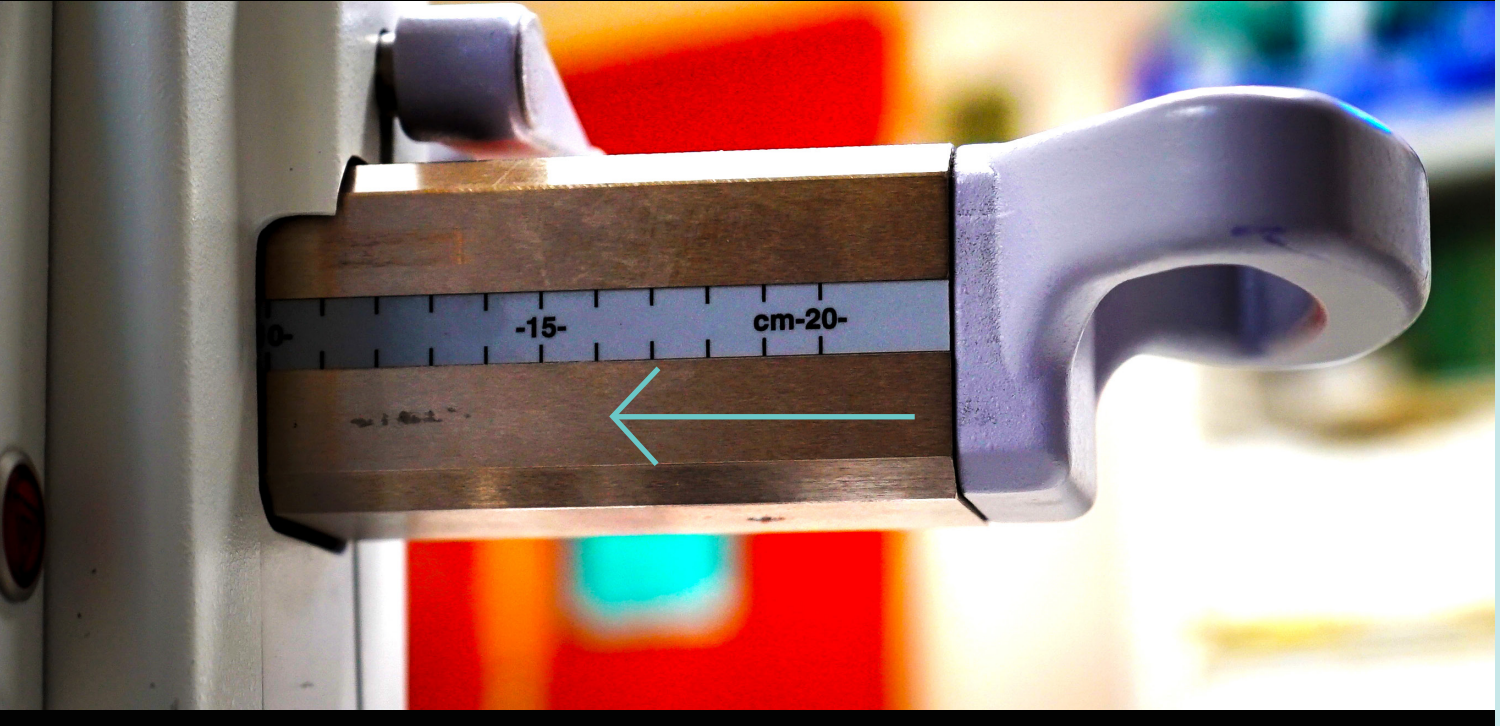



**7** Repeat steps previously described to confirm neutral pelvis rotation and obliquity. Transition to AP hip view, and align grid by placing the center target on the teardrop. The surgeon should check that the long axis of the femur is parallel with the vertical lines of the grid.

**8** This step should be repeated for surgical and nonsurgical leg to ensure continuity. Variations from neutral in leg position can change the perception of leg length and offset calculation.

# BASELINE LEG LENGTH AND OFFSET
## *PRE NECK CUT*

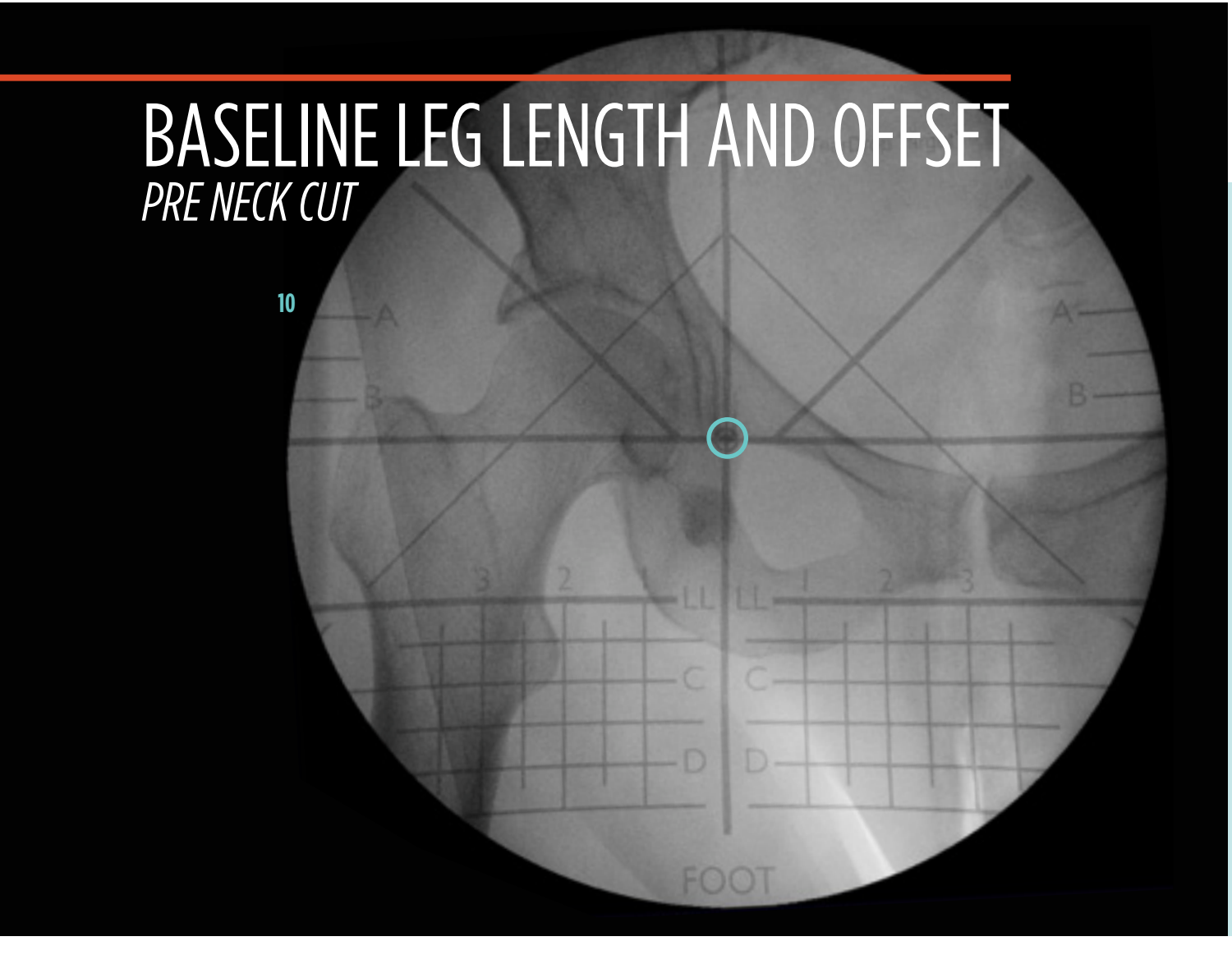
9




9 From AP pelvis view, translate the C-arm to AP hip view of the comparative hip (operative or nonoperative) by repositioning the translation arm approximately 5 cm until the center target is on the teardrop.

# BASELINE LEG LENGTH AND OFFSET

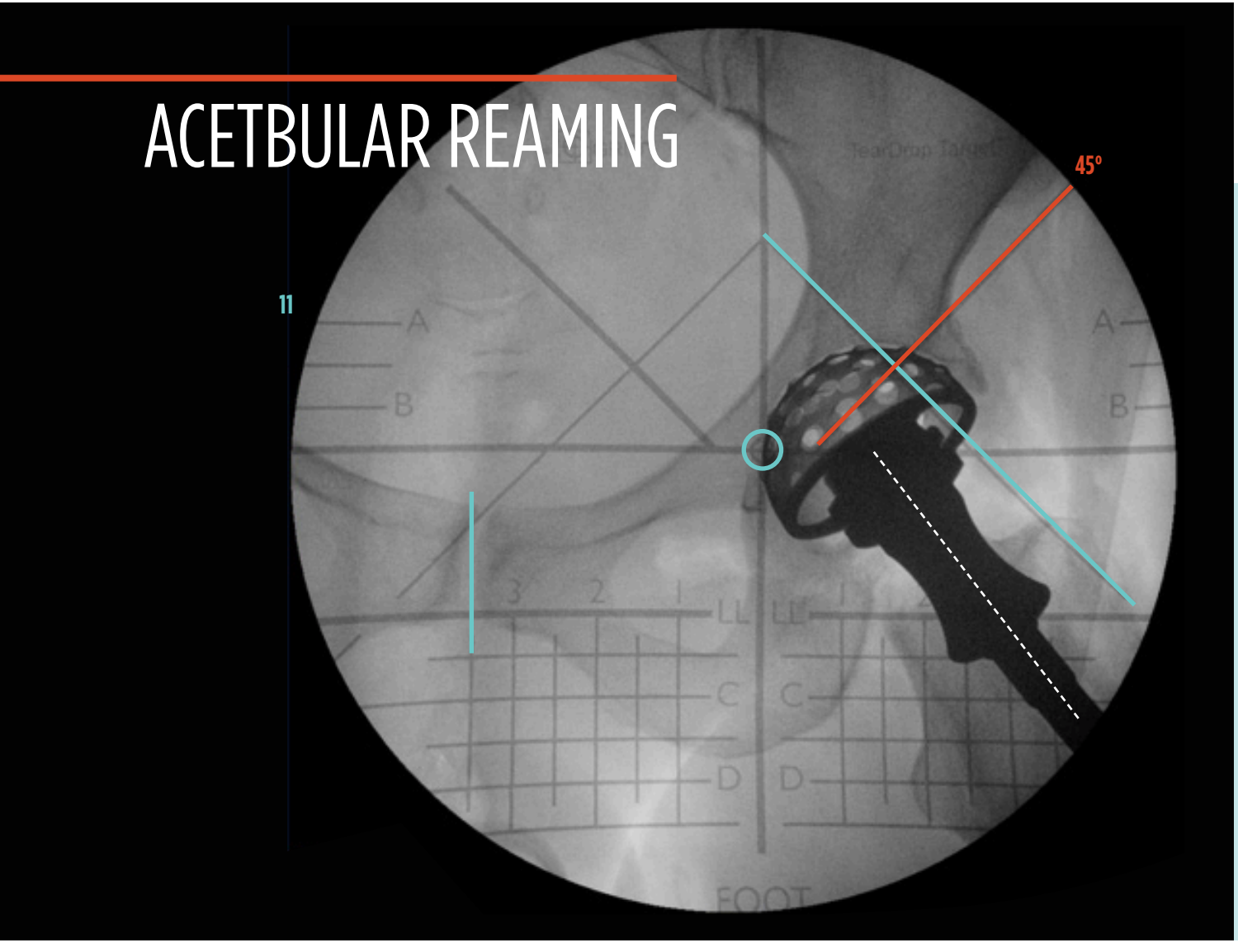
*PRE NECK CUT*




10 Adjust the grid until the center target is on the teardrop. Save this image, it will be utilized as the comparator to the operative hip during implant trial for adjustment of Leg Length and Offset.

**TIP** Do not adjust C-arm or table height once procedure has begun, this will affect image magnification and may provide inaccurate information when evaluating for anatomic restoration.

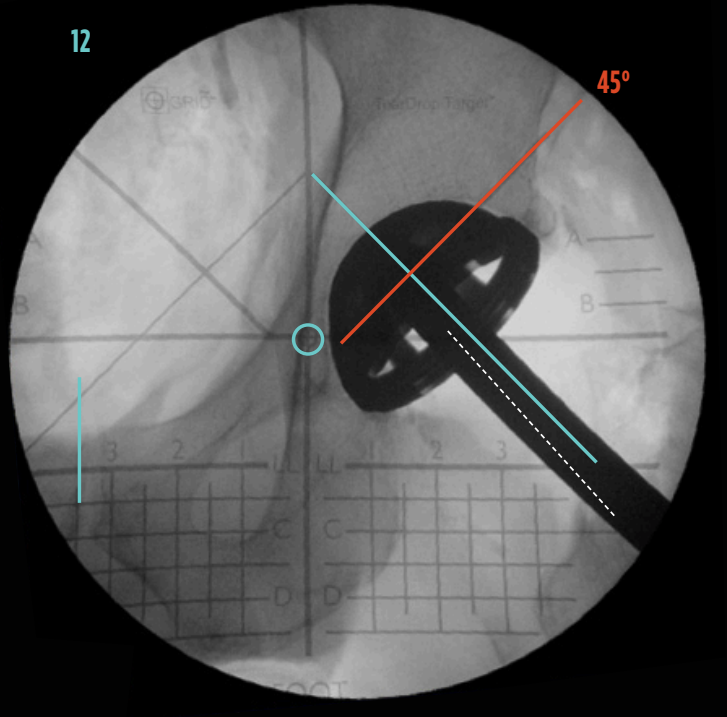
# ACETBULAR REAMING




11 From AP hip view, with the grid's center target positioned on the operative teardrop and the pubic symphysis aligned vertically, utilize the 45° line and cup impactor line for reamer inclination.

# CUP PLACEMENT

12



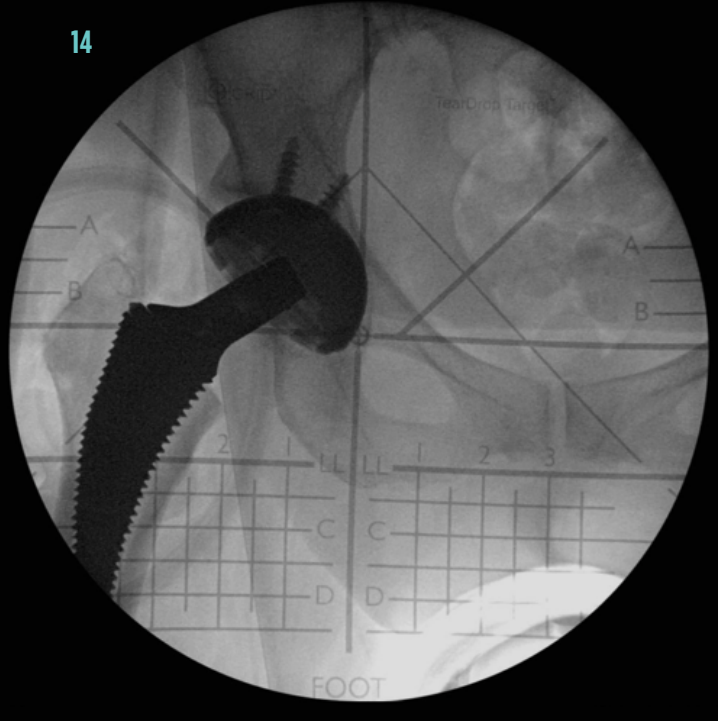

13


12 From AP hip view, with the grid's center target positioned on the operative teardrop and the pubic symphysis aligned vertically, utilize the 45° line and cup impactor line for acetabular cup inclination.

13 To assess component anteversion, rainbow the C-arm back approximately 15 to 20 degrees. The cup profile should become hemispherical as the C-arm rainbow degree approaches the actual anteversion of the cup.

# LEG LENGTH AND OFFSET

14



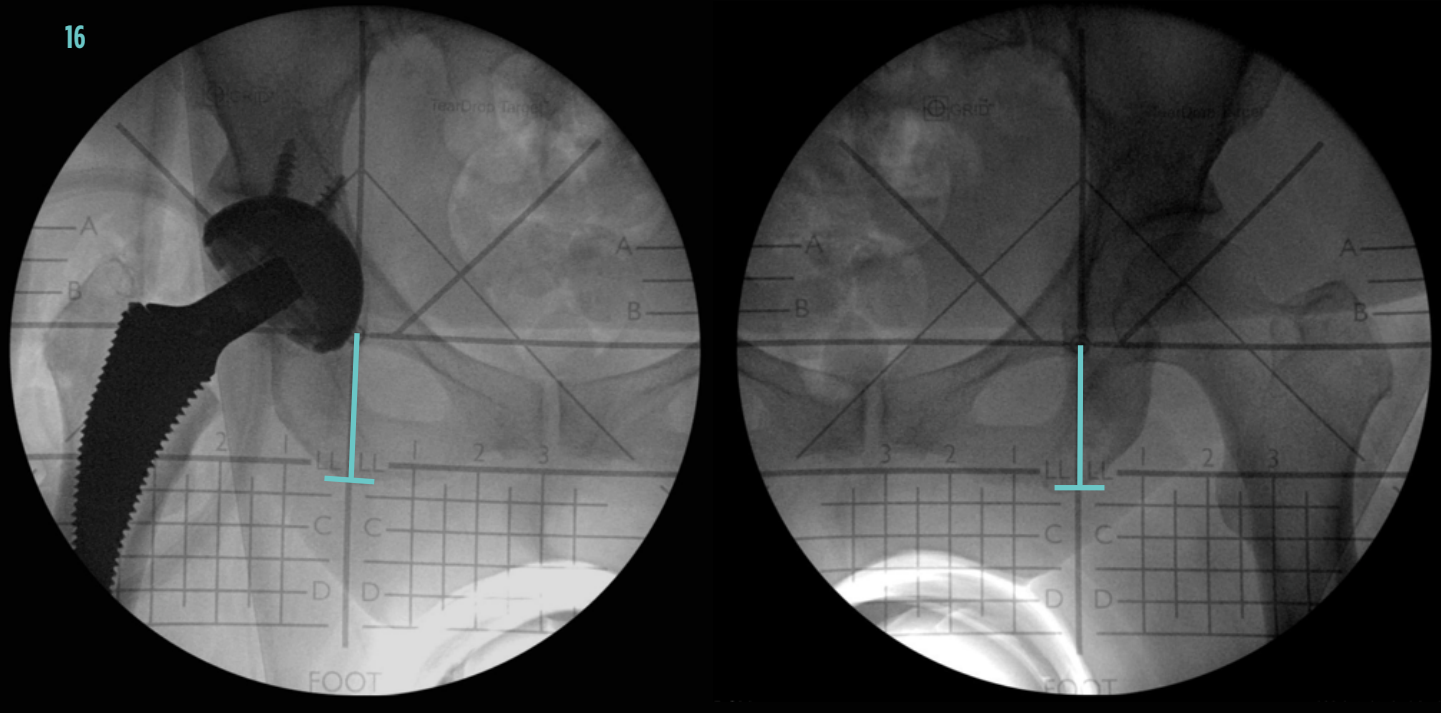

15


14 Repeat steps previously described to confirm neutral pelvis rotation, obliquity and femoral abduction. Adjust femoral abduction to preoperative position using the femoral offset lines as femoral abduction reference lines.

15 From AP pelvis view, translate the C-arm approximately 5 cm over the operative side to achieve an AP hip view with the center target placed on the teardrop.

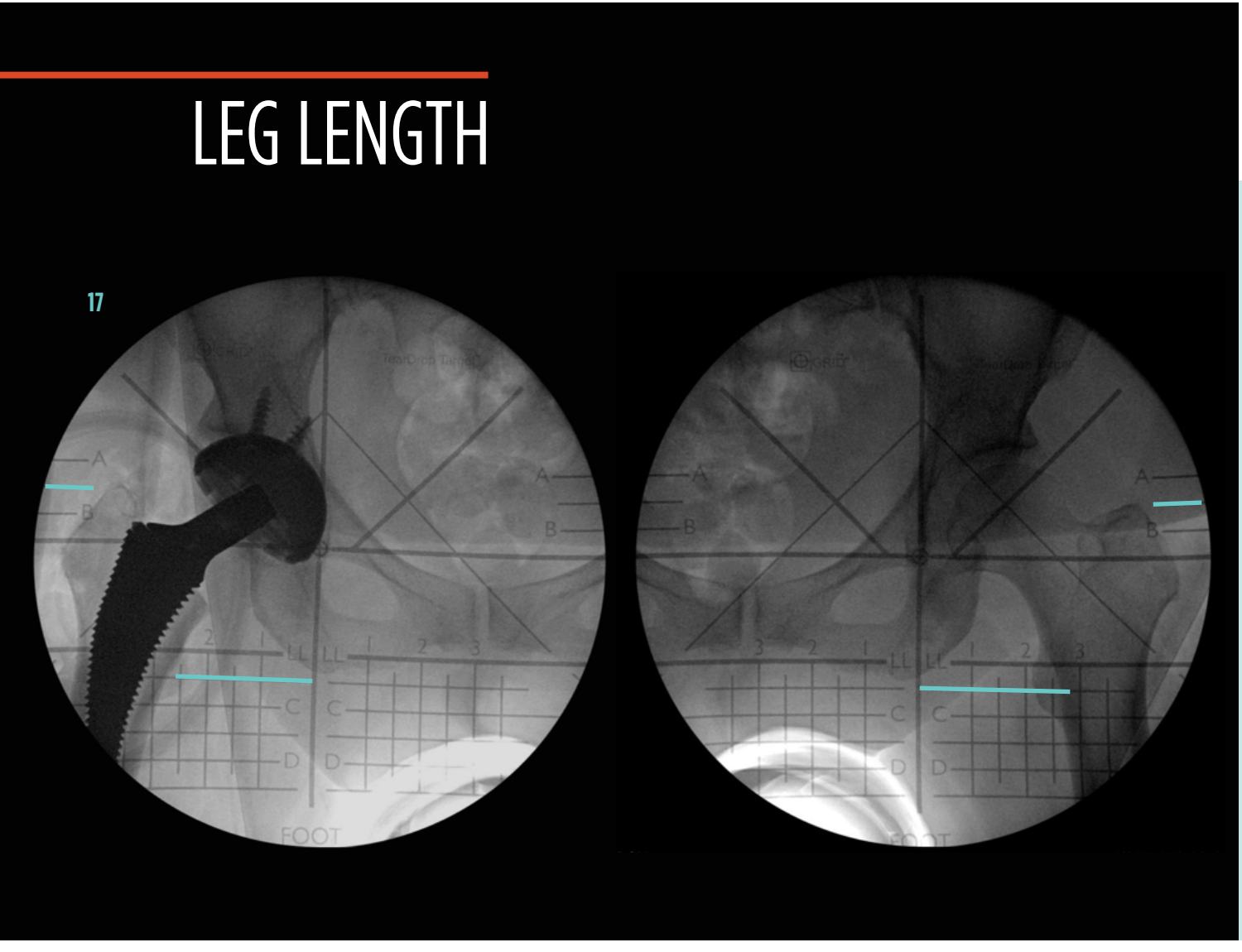
# MAGNIFICATION CHECK

16




16 Use anatomical landmarks to verify that C-arm magnification has not changed. This is imperative if the C-arm and/or operative table height has been adjusted.

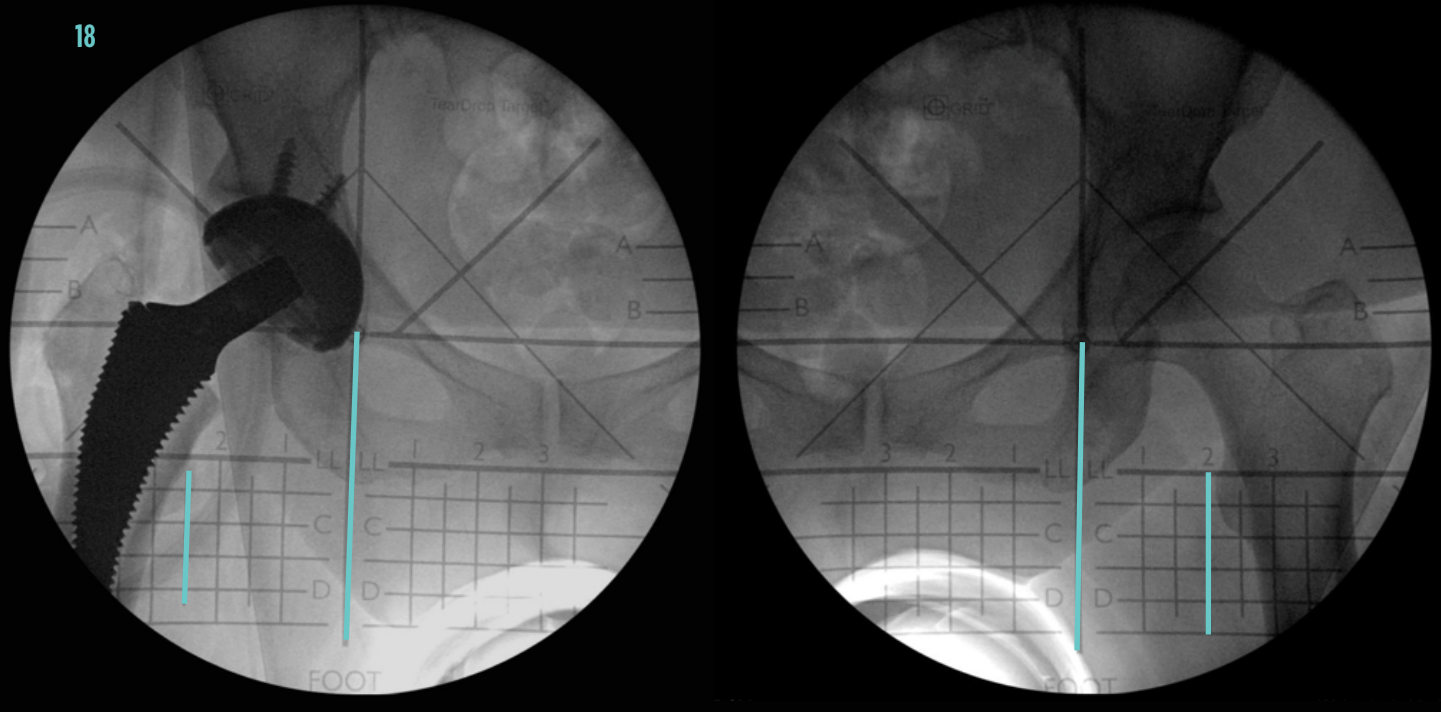
# LEG LENGTH




17 Using the lettered leg length horizontal lines (greater and lesser trochanter references) compare leg length to the comparative hip image captured at the beginning of the case.

# LATERAL OFFSET

18




18 Using the numbered vertical offset lines compare hip offset to the comparative hip image captured at the beginning of the case. Make any required implant trial adjustments until anatomical restoration has been achieved.

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