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HIP FACTS FROM THE LITERATURE #90

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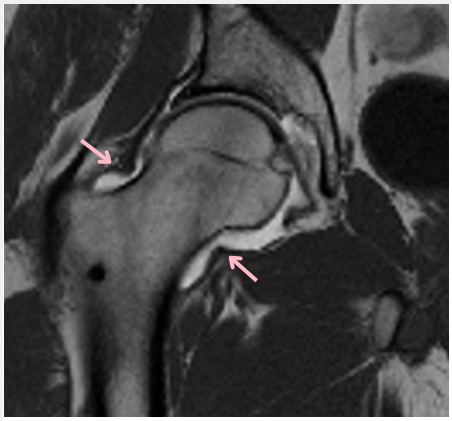
THE ZONA ORBICULARIS ENCIRCLES THE FEMORAL HEAD, PROVIDING CRUCIAL RESISTANCE TO DISTRACTION



On the MRI above, note how the ZO hugs in the capsule below the HOF

ZONA ORBICULARIS (ZO)
In hip extension, the ZO tightens to lock the femoral head into the socket.
In deep hip flexion, the anteroinferior fibres are tensioned.

The ZO is a ring or horseshoe of deep capsular fibres, concentrated posteriorly, inferiorly & superiorly.

The ZO blends intimately with the ischiofemoral ligament.

CSA: Cross Sectional Area;
HOF: Head of Femur; Ligs: ligaments.

OTHER PFL FACTS:

- *CSA: ≈ 13 mm^2*
- *More elastic than other ligs*

The ZO is also thought to play a role in facilitating synovial flow and joint health

The Zona Orbicularis (ZO) encircles the femoral head, more like a slightly twisted horseshoe rather than a complete circle, concentrated superiorly, posteriorly and inferiorly where the capsule is naturally a little thinner. It's fibres blend intimately with the ischiofemoral ligament posteriorly.

On an MRI scan, particularly a coronal image as pictured above, it can be seen cinching in the capsule to create a 'waist', or the appearance of an hourglass.

The ZO provides crucial resistance to distraction, forming a 'helical locking system', enhancing hip stability. Imagine you are holding a chupa-chup or lollipop stick loosely in your fist, with the 'ball' sitting on top of your thumb and forefinger. If you tried to pull the stick from the bottom of your fist, your thumb and forefinger, encircling the base of the ball would prevent it from moving through your fist. This is one of the roles of the ZO.

It also has an important role to play in joint health, by facilitating synovial flow - so important for cartilage nutrition! As we walk, the ZO spirals tight, then unwinds a little in a repetitive action - locking for stability and loosening for mobility. This creates a bellows effect, pumping fluid between the central (between the ball and socket) and peripheral (outside the joint but inside the capsule) compartments.

HIP FACTS FROM THE LITERATURE #90

Unfortunately the ZO can be damaged during hip arthroscopy, particularly with large capsulotomies (openings) used for femoral osteoplasties - trimming of cam morphology (a bony bump at the head neck junction).

Xu W, Ghaziani AO, Khanduja V, et al. Anatomy, biomechanics and function of the hip capsule: A narrative review from a surgeons perspective. Clin Biomech (Bristol). 2025 Jul;127:106588.