#SpartanDO

Total Hip Arthroplasty (THA)

In a case of Osteogenesis Imperfecta

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What is THA

- Surgical procedure in which a diseased or damaged hip joint is removed and replaced with an artificial prosthesis

Common indications include:

- Primary osteoarthritis
- Osteonecrosis/AVN
- Post-traumatic arthritis
- Displaced femoral neck fractures (in some patients)
- Developmental dysplasia of the hip (DDH)
- Failed prior hip surgery

X-ray normal pelvis



Image: “Normal” Hip AP X-ray

Primary Osteoarthritis

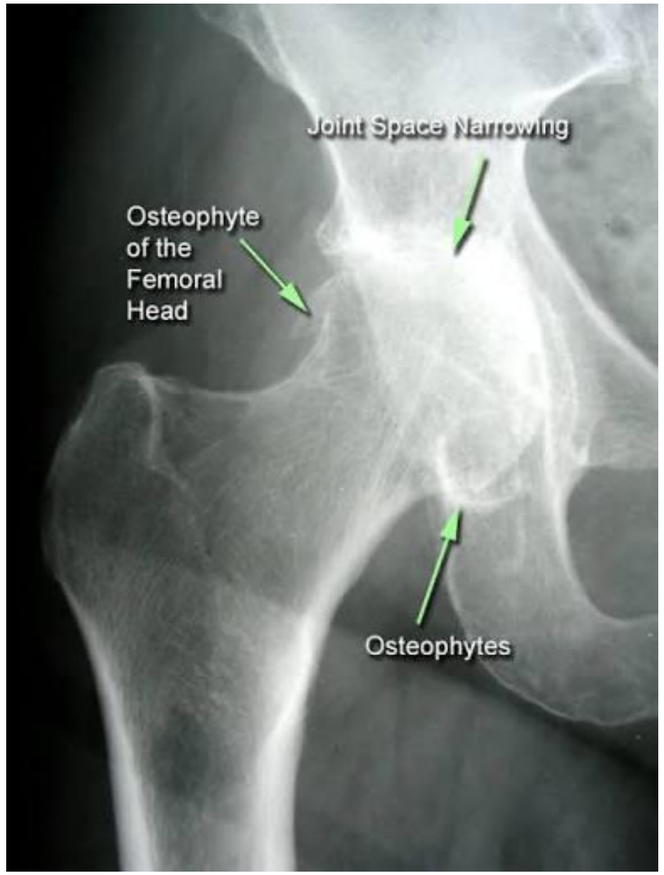


Image: “Osteoarthritic” Hip AP X-ray

4 cardinal signs: joint space narrowing, osteophytes, subchondral sclerosis, subchondral cysts

Common contraindications include:

- Active infection
- Severe medical comorbidity (e.g. prohibitive cardiopulmonary risk)
- Severe obesity
- Immunosuppression
- Patient non-compliance (etc.)

Common complications include:

- Infection
- Dislocation (7.1%). (Descamps et al. 2023)
- Periprosthetic fracture
- Loosening
- Leg length discrepancy (88%). (Descamps et al. 2023)
- Nerve Lesion. Sciatic nerve- posterior, Femoral nerve- anterior.

Surgical Approaches

- **Posterior (Moore/Southern)**: Splits gluteus maximus and detaches the short external rotators through a posterior capsulotomy, sparing the abductors

- Direct Lateral (Hardinge): Detaches the anterior third of the gluteus medius and minimus off the greater trochanter to access the joint anteriorly

- Anterolateral (Watson-Jones): Uses the interval between gluteus medius and tensor fascia lata to reach the hip

- **Direct Anterior (DAA/Smith-Petersen/Hueter)***: Entering between sartorial/rectus femoris and TFL with the patient supine (on an Hana table) for a muscle-sparing exposure. Better early functional outcomes with shorter mean length of stay. (Ang et al. 2023)

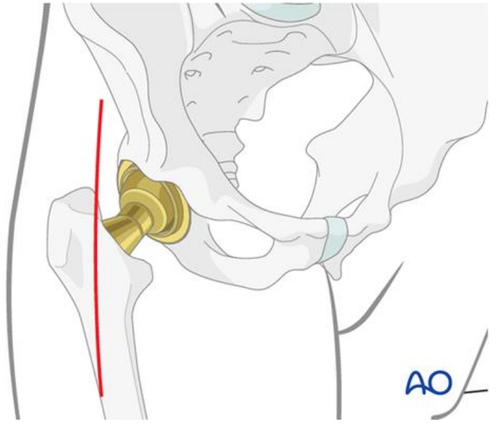


Image: Incision for DAA

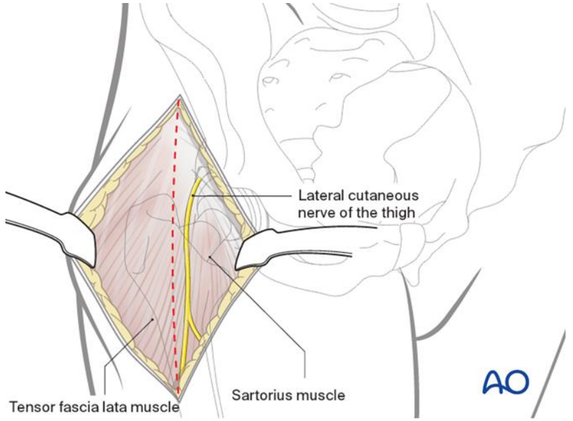


Image: Deep Dissection for DAA

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GENERAL REVIEW

Comparing direct anterior approach versus posterior approach or lateral approach in total hip arthroplasty: a systematic review and meta-analysis

James Jia Ming Ang[1] · James Randolph Onggo[1,2] · Christopher Michael Stokes[2,3] · Anuruban Ambikaipalan[2,3]

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Conclusion The DAA has better early functional outcomes with shorter mean length of stay but was associated with a longer operative time than PA. There was no difference in risk of dislocations, neurapraxias, periprosthetic fractures or VTE between approaches. Based on our results, choice of THA approach should ultimately be guided by surgeon experience, surgeon preference and patient factors.
Level of evidence I Meta-analysis of randomised controlled trials.

Relevant Anatomy

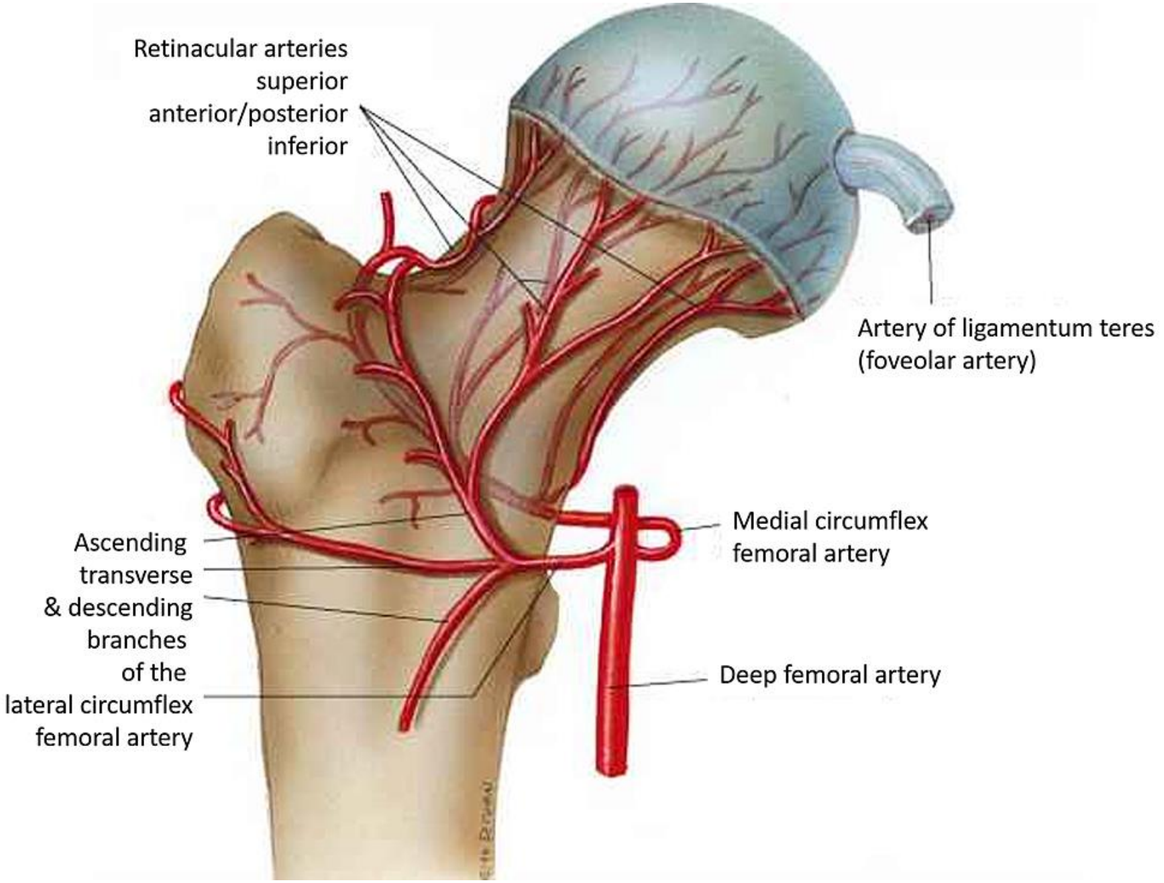


Image: Femoral Head Anatomy

Key Vascular sources

- Medial Femoral Circumflex Artery
- Ascending branch of Lateral Femoral Circumflex Artery

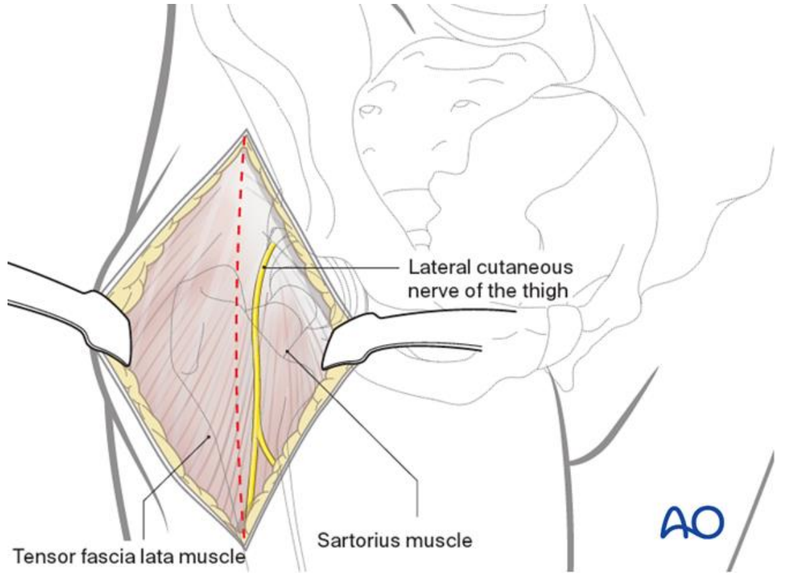


Image: Proximity of LFCN to DAA incision

Lateral Femoral Cutaneous Nerve Lesion

- Tingling, numbness, or a burning sensation on the outer part of the thigh. Not uncommon
- Does not affect leg muscle strength

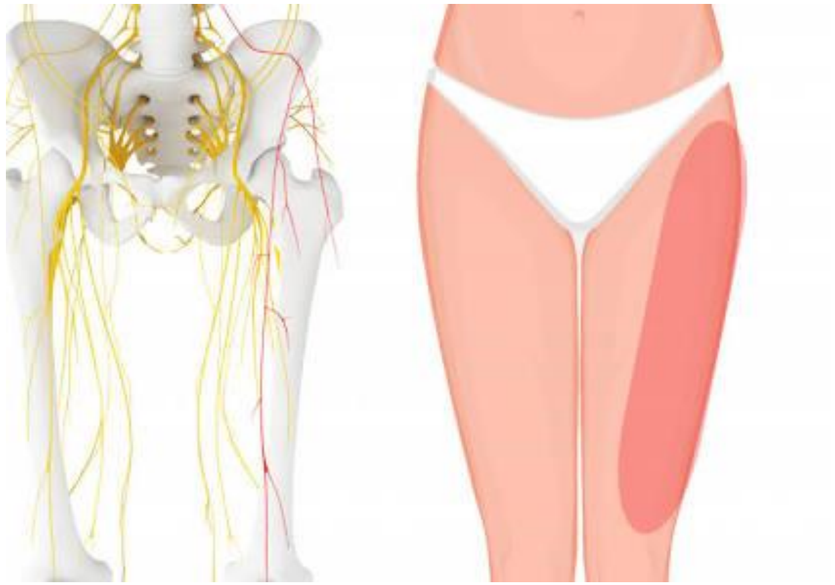


Image: LFCN Palsy

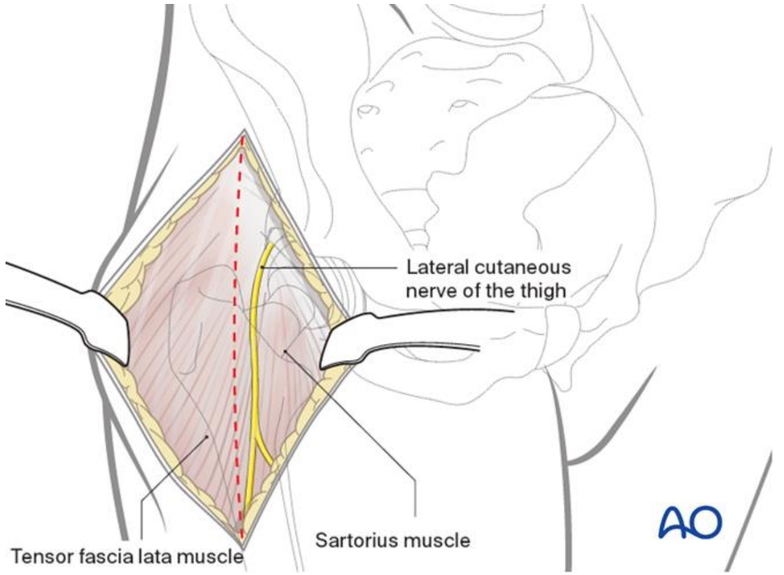


Image: Proximity of LFCN to DAA incision

Post-Op X-rays



Image: Bilateral Hip replacement post-op X-ray

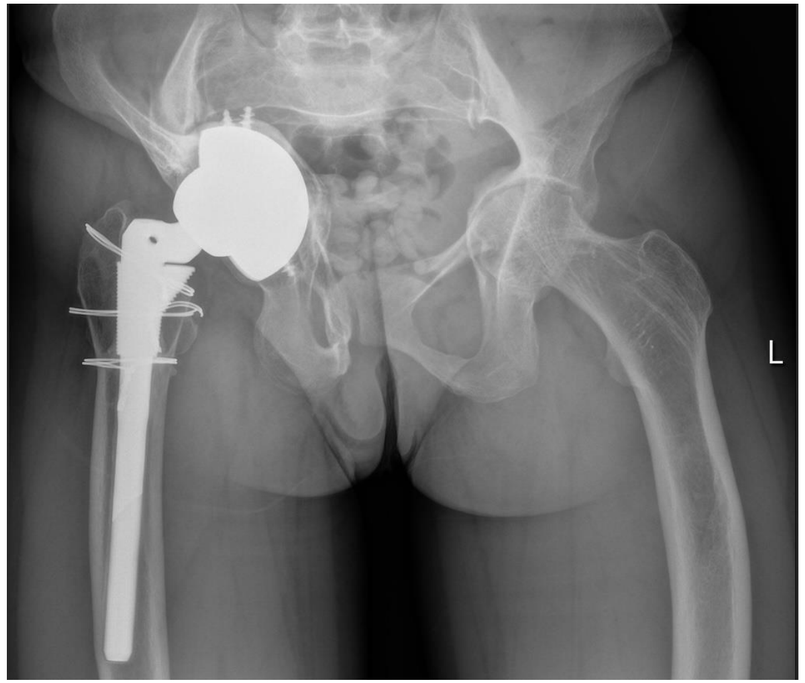
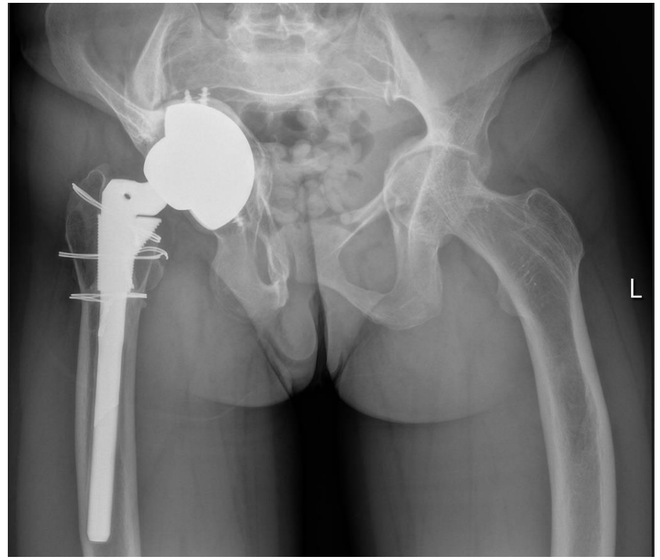


Image: Post-op X-ray: Patient “Jane Doe”

What’s Different?

Our patient (46y F) presents with a rare condition known as Osteogenesis Imperfecta

- Osteogenesis imperfecta is a heritable disorder of type I collagen causing brittle bones and frequent fractures.
- Most cases stem from autosomal dominant COL1A1/COL1A2 mutations affecting collagen quantity or quality.
- Common features include recurrent low-trauma fractures, bone deformity, blue sclerae, dentinogenesis imperfecta, and hearing loss.
- Sillence types I–IV span mild (Type I) to perinatal lethal (Type II), guiding prognosis and management.
- Decades of fragility fractures and bone deformity drive early degenerative joint disease, which likely explains why our 46-year-old patient needed a THA in her 30s.



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Primary Hip

Total Hip Arthroplasty in Patients With Osteogenesis Imperfecta

Check for updates

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Conclusion: THA in patients with OI is associated with high revision rates and low survivorship at long-term follow-up. Although this is a very challenging patient population, THA provided these patients with improved functional outcomes. To the authors' knowledge, this is the largest series of primary THA in patients with OI reported in the literature and therefore provides surgeons with important data regarding the expected outcomes following THA in this unique patient population.
Level of Evidence: Level IV.

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Implant type:

- S-ROM Modular cementless femoral stem (from DePuy)
- Independently sized proximal metaphyseal sleeve and distal stem
- Especially useful in patients with dysplasia as this implant can allow the surgeon to dial in the version they actually want as a Z1 stem has a fixed version and could cause an unstable hip in these patients



Image: S-ROM Modular cementless femoral stem



Image: Post-op Xray Z1 femoral stem



Image: Z1 femoral stem



Image: Post-op X-ray: Patient “Jane Doe”

What do we see on the other side of this X-ray?



Patient Update

- 10 years post revision surgery
- No dislocation or second revision needed
- Happy with her implant!!

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- All surgical team

Such an amazing summer!



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