

Prevalence of Anterior Femoral Neck Osteophyte in a Total Hip Arthroplasty Population

Adam M. Katchky¹, Mitchell L. Smith², Andrew J. Shimmin², Stephen J. McMahon³, Jeremy Latham⁴, Jonathan Baré²

¹University of Vermont Medical Center, Burlington, VT, USA, ²Melbourne Orthopaedic Group, Melbourne, VIC, Australia,

³Malabar Orthopaedic Institute, Melbourne, VIC, Australia, ⁴Southampton General Hospital, Southampton, UK

Background

- Periarticular osteophytes are one of the hallmark pathoanatomic features of osteoarthritis (OA), including hip OA
- If not resected at the time of total hip arthroplasty (THA), residual osteophytes may cause impingement and subsequent instability, restricted range of motion, edge loading, accelerated wear & pain
- The surgical approach selected may affect the surgeon's ability to visualize and address osteophytes at various anatomic locations
- No studies have been identified which assess prevalence and size of anterior femoral neck osteophytes (AFNO) in THA patients

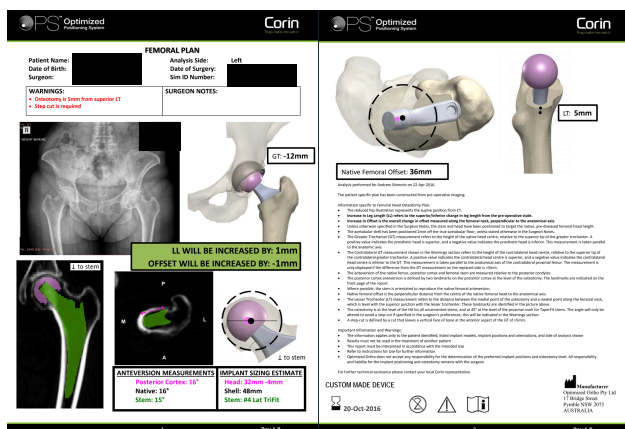


Figure 1: Case example of a pre-surgical plan developed using the OPST™ system, analyzed to assess for anterior femoral neck osteophytes

Methods

- Retrospective analysis of prospectively-collected database
- 413 consecutive THA procedures at a single Australian private hospital (Nov 2015 - Dec 2016)
- All patients underwent routine pre-operative planning with plane x-rays and low-dose CT of pelvis and operative hip, and lateral pelvic x-rays in 3 stances (standing, seated, contralateral step-up)
- Pre-operative plans generated taking into account spinopelvic motion to select optimal component positioning
- Each pre-operative plan analyzed by 4 independent blinded raters
- Osteophytes rated as absent, minor, or extensive

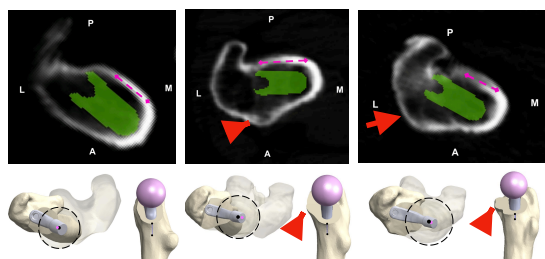


Figure 2: Case examples showing axial CT scan slices (at planned femoral neck osteotomy), corresponding 3D reconstructions (red arrows indicate anterior femoral neck osteophyte):
a) no anterior femoral neck osteophyte; b) minor osteophyte; c) extensive osteophyte

Results

- 413 cases analyzed (0 excluded)
- Analysis repeated with and without 1 outlying rater
- All raters reported AFNO in a majority of patients (range 78-86%)
- Large or extensive AFNO reported in 23-31% of cases
- Inter-rater reliability = 70%

Parameter	N = 413
Age (years) [mean, range]	63 (32-91)
Gender [n, %]	
Male	216 (52%)
Female	197 (48%)
Laterality [n, %]	
Right	227 (55%)
Left	186 (45%)

Table 1: Descriptive statistics of patient cohort

Rater	Absent [n, %]	Minor [n, %]	Extensive [n, %]	Any osteophyte [n, %]
#1	56 (14%)	230 (56%)	127 (31%)	357 (86%)
#2	128 (31%)	224 (54%)	61 (15%)	285 (69%)
#3	75 (18%)	243 (59%)	95 (23%)	338 (82%)
#4	89 (22%)	210 (51%)	113 (27%)	323 (78%)

Table 2: Summary of ratings for presence of AFNO, by assessor. Analysis repeated with rater excluded due to divergence from others

Limitations

- Resolution not optimized for AFNO - Moderate IRR
- Outlying assessor was most junior - training factors may impact ability to identify AFNO
- Australian cohort may not represent global THA population

Discussion & Conclusions

- Large majority of THA patients exhibit anterior femoral neck osteophytes - up to 1/3 may have large or extensive AFNO
- Ability to visualize osteophytes may vary by surgical approach; impingement risk varies based on pelvic motion
- Osteophyte resection may be incorporated into operative plan to decrease risk of post-operative impingement