

To Evaluate Excess Anteversion In Patients With Avascular Necrosis Of Hip Treated With Total Hip Arthroplasty.

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Abstract

Background : Normal femoral anteversion contributes to stability of hip, maintaining normal femoral version in association with acetabular version allows the hip stability and unimpeded functional range of motion. The aim was to evaluate excess anteversion in post Total Hip Arthroplasty patients.

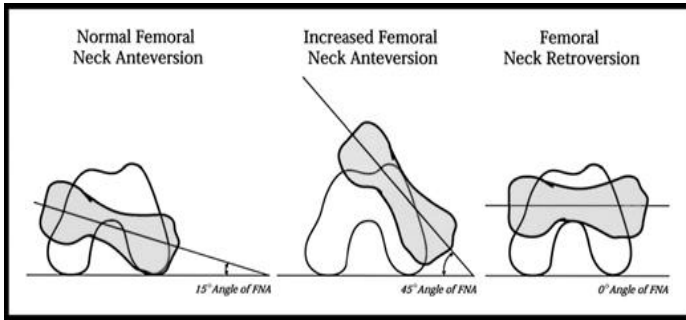
Materials And Methods: This study was conducted on patients who were admitted in Orthopaedic ward and underwent Total Hip Arthroplasty in MGM medical college and hospital , Kamothe , Navi Mumbai. 15 patients were taken up for the study. Patients were followed up for a period of 6weeks , 2months , 3months at each visit. Patients were assessed by HARRIS HIP SCORE.

Results : This study was conducted on patients who were admitted in Orthopaedic ward and underwent Total Hip Arthroplasty in MGM medical college and hospital , Kamothe , Navi Mumbai. Out of 15 Patients, 13 were male and 2 female. The mean age was 44.06 years. The mean Harris hip score was calculated pre-operatively and at 6weeks, 2months and 3 months and was found to be 46.04, 75.2, 85.9, 89.9 respectively

Conclusion: Patients with excessive anteversion can have significant internal rotation of the hip and may have anterior pain with instability testing and posterior pain with posterior impingement testing.

Keywords : Hip Arthroplasty, Hip Avascular Necrosis, Femoral Anteversion

Introduction: The hip joint is a ball and socket type synovial joint. The hip joint is the articulation of the pelvis with the femur ,which connects the axial skeleton with the lower extremity. The concept of femoral anteversion was first described in 1868 by the anatomist **Julius Wolff**¹. Femoral anteversion is defined as the angle that the femoral neck subtends with the transcondylar plane. If the plane of the femoral neck axis points anterior to the frontal plane, the femoral neck is anteverted. If the plane of the femoral neck axis points posterior to the frontal plane, the femoral neck is retroverted. Femoral anteversion averages between 30-40° at birth, and between 8-14° in adults². with males having a slightly less femoral anteversion than females³. Some authors will distinguish **femoral neck version** as the angle of the femoral neck relative to the pelvic horizontal (interischial line), with a normal range of 5-25 degrees of anteversion⁴ and **femoral neck torsion** as the angle between the femoral neck and posterior condylar axis of the distal femur, with a normal range of 10-20 degrees of antetorsion⁵. The angle that the tibia subtends with the horizontal plane in this position represents the combined femoral-acetabular anteversion. Normal combined anteversion should be maintained between 30⁰-45⁰.



An increased femoral anteversion is often seen in patients with developmental dysplasia of the hip⁶. Moreover, it has been shown that abnormal femoral anteversion can contribute to the development of femoroacetabular impingement (FAI); reduced femoral anteversion is associated with cam-type FAI⁷. Some Researchers suggest that femoral neck version angles more than 15-20degrees is one of the contributing factors leading to lower limb orthopedics problems.⁸ An abnormal Femoral version angle has been seen in cases , including hip osteoarthritis, coxa plana, SCFE, CDH, acetabular labral tears, and in-toeing and out-toeing of the lower limbs.⁹ Maintaining the Femoral anteversion and acetabular version should be considered as utmost important during total hip arthroplasty (THA) to reduce the risk of postoperative dislocation.¹⁰ Femoral neck anteversion usually diminishes with age. Between three and 12 months of age, the anteversion average value is 39°, reaching adult life with a value close to 16degrees¹¹. Hence the aim of this study is to assess femoral anteversion in unilateral and bilateral total hip replacement patients.

Reider Test:

- 1) Prominence of the greater trochanter indicates axis of the femoral neck
- 2) Noting the position of the patella, an accurate determination of the femoral anteversion can be determined.

Hip Avascular Necrosis

Death of the bone tissue due to cessation of blood supply is called Avascular Necrosis. Without adequate blood supply, the bone in the head of the femur dies and gradually collapses. Most common age group being 40-65 (M>>F).Risk Factors being injury, Excessive alcohol Use, Corticosteroid Abuse, Other medical conditions like Caissons disease, Sickle cell Disease, Myeloproliferative disorders, Gaucher's disease, SLE, Crohns disease, Arterial embolism, thrombosis and Vasculitis.

Aims and Objectives:To assess Femoral Anteversion in patients with AVN undergoing unilateral and bilateral Total hip Replacement.

Material and Methods: This study will be conducted on patients who were admitted and underwent Total Hip Arthroplasty in MGM medical college and hospital ,kamothe , Navi Mumbai

Study type : Retrospective study

Source of data : Patients admitted in orthopaedic ward in MGM Medical college and Hospital, Navi Mumbai

Study duration: JUNE 2017-2018

Method of collection of data:Sample Size – 15 cases were taken for the study who underwent Total Hip Arthroplasty. Cases satisfying the inclusion criteria and exclusion criteria admitted in MGM hospital, kamothe, Navi Mumbai

Inclusion Criteria

1. Age 30-80 yrs with diseased hip joint
2. Unilateral as well as bilateral hip involvement
3. Failure of conservative treatment
4. They have to be able to understand the informed consent
5. Avascular Necrosis of hip
6. Osteoarthritis of hip

Exclusion Criteria

1. Infected hip pathologies

2. Inability to fulfill follow-up criteria
3. Significant cardiovascular, renal or hepatic disease, pregnancy, malignancy
4. Systemic comorbidities of vascular insufficiency or neuropathy
5. Superficial Skin condition on incision site
6. Varicose Veins, DVT

Follow up: Those patients will be assessed preoperatively and on post operative and at intervals of 6 weeks, 2 months, 3 months

Parameters for evaluation: The patient will be assessed based on HARRIS HIP SCORE

Harris Hip Score	Hip ID: _____ Study Hip: <input type="checkbox"/> Left <input type="checkbox"/> Right Examination Date (MM/DD/YY): / / Subject Initials: _____ Medical Record Number: _____
Interval: _____	

Harris Hip Score	
Pain (check one) <input type="checkbox"/> None or ignores it (44) <input type="checkbox"/> Slight, occasional, no compromise in activities (40) <input type="checkbox"/> Mild pain, no effect on average activities, rarely moderate pain with unusual activity; may take aspirin (30) <input type="checkbox"/> Moderate Pain, tolerable but makes concession to pain. Some limitation of ordinary activity or work. May require Occasional pain medication stronger than aspirin (20) <input type="checkbox"/> Marked pain, serious limitation of activities (10) <input type="checkbox"/> Totally disabled, crippled, pain in bed, bedridden (0)	Stairs <input type="checkbox"/> Normally without using a railing (4) <input type="checkbox"/> Normally using a railing (2) <input type="checkbox"/> In any manner (1) <input type="checkbox"/> Unable to do stairs (0)
Limp <input type="checkbox"/> None (11) <input type="checkbox"/> Slight (8) <input type="checkbox"/> Moderate (5) <input type="checkbox"/> Severe (0)	Put on Shoes and Socks <input type="checkbox"/> With ease (4) <input type="checkbox"/> With difficulty (2) <input type="checkbox"/> Unable (0)
Support <input type="checkbox"/> None (11) <input type="checkbox"/> Cane for long walks (7) <input type="checkbox"/> Cane most of time (5) <input type="checkbox"/> One crutch (3) <input type="checkbox"/> Two canes (2) <input type="checkbox"/> Two crutches or not able to walk (0)	Absence of Deformity (All yes = 4; Less than 4 = 0) Less than 30° fixed flexion contracture <input type="checkbox"/> Yes <input type="checkbox"/> No Less than 10° fixed abduction <input type="checkbox"/> Yes <input type="checkbox"/> No Less than 10° fixed internal rotation in extension <input type="checkbox"/> Yes <input type="checkbox"/> No Limb length discrepancy less than 3.2 cm <input type="checkbox"/> Yes <input type="checkbox"/> No
Distance Walked <input type="checkbox"/> Unlimited (11) <input type="checkbox"/> Six blocks (8) <input type="checkbox"/> Two or three blocks (5) <input type="checkbox"/> Indoors only (2) <input type="checkbox"/> Bed and chair only (0)	Range of Motion (*indicates normal) Flexion (*140°) _____ Abduction (*40°) _____ Adduction (*40°) _____ External Rotation (*40°) _____ Internal Rotation (*40°) _____
Sitting <input type="checkbox"/> Comfortably in ordinary chair for one hour (5) <input type="checkbox"/> On a high chair for 30 minutes (3) <input type="checkbox"/> Unable to sit comfortably in any chair (0)	Range of Motion Scale 211° - 300° (5) 61° - 100 (2) 161° - 210° (4) 31° - 60° (1) 101° - 160° (3) 0° - 30° (0)
Enter public transportation <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)	Total Harris Hip Score _____

Result : This study was conducted on patients who were admitted in Orthopaedic ward and underwent Total Hip Arthroplasty in MGM medical college and hospital, Kamothe, Navi Mumbai. Out of 15 Patients, 13 were male and 2 female. The mean age was 44.06 years. The mean Harris hip score was calculated pre-operatively and at 6 weeks, 2 months and 3 months and was found to be 46.04, 75.2, 85.9, 89.9 Respectively. The mean Preop version was 31.3 and postop version was 18.8. Out of 15 patients, 3 patients have developed excess anteversion postoperatively.

Demographic Data

	MALES	FEMALES	MEAN AGE YEARS
THR	13	2	44.06

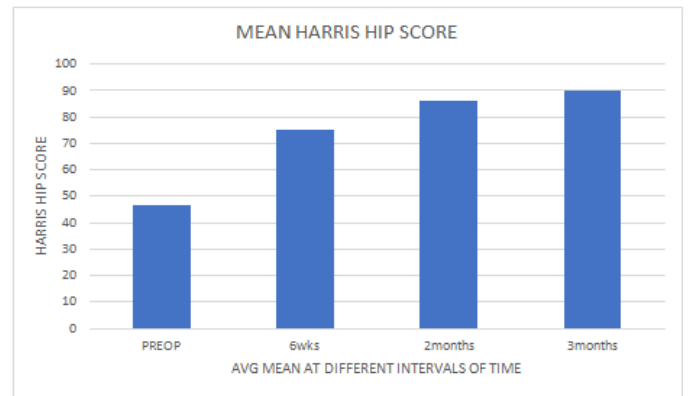
Avg Mean Harris Hip score and anteversion

Avg mean HARRIS HIP SCORE

Preop	6wks	2months	3months
46.4	75.2	85.9	89.9

Avg mean anteversion

Preop	Postop
31.3	18.8



Discussion: Gohar Naqvi, Kuldeep Stohr and Andreas Rehm studied Proximal femoral derotation osteotomy for idiopathic excessive femoral anteversion and intoeing gait and Concluded Excessive femoral anteversion can present with unexplained hip or knee pain

refractory to conservative treatments. Careful assessment of lower limb malalignment is a valuable tool in such circumstances and derotation proximal femoral osteotomy can certainly be a procedure of choice in carefully selected cases.¹⁵

Stambough, Jeffrey, B., MD Davis, et al studied Knee Pain and Activity Outcomes After Femoral Derotation Osteotomy for Excessive Femoral Anteversion. Concluded For adolescents with symptomatic excessive femoral anteversion, derotational osteotomy over an IMN offers a reliable surgical option that provides predictable deformity correction and significant improvements in both function and pain scales.¹⁶

PS Maini, Gagan Chadha, Naveen Talwar, Kiran Ramesh studied Comparison of angle of femoral anteversion after total hip replacements through the anterior and posterior approaches. Concluded Operating surgeon had a better control on femoral neck anteversion through the posterior approach as he can position the femoral neck in significantly lesser degrees of anteversion.¹⁷

Timothy J. Jackson, M.D., Dror Lindner, M.D., Youssef F. El-Bitar, M.D., Benjamin G. Domb, M.D studied Effect of Femoral Anteversion on Clinical Outcomes After Hip Arthroscopy and concluded On the basis of patient-reported outcome scores without accounting for diagnoses and treatments, the amount of femoral anteversion does not appear to affect the clinical outcomes after hip arthroscopy.¹⁸

Complications: Femoral version poses potential complications during hip reconstruction.

Either excessive or insufficient version may lead to component impingement, subluxation, dislocation, or limited range of motion. Complications also include abductor lurch, foot drop etc.

Limitations : Our study is limited by a small patient population, which reduces the statistical analysis.

We require extensive study preferable cohort study to give an accurate result.

Conclusion: This study was conducted on patients who were admitted in Orthopaedic ward and underwent Total Hip Arthroplasty in MGM medical college and hospital , Kamothe , Navi Mumbai. Out of 15 Patients, 13 were male and 2 female.

The mean age was 44.06 years. The mean Harris hip score was calculated pre-operatively and at 6weeks, 2months and 3 months and was found to be 46.04, 75.2, 85.9, 89.9 Respectively.

The mean Preop version was 31.3 and postop version was 18.8.

Out of 15 patients, 3 patients have developed excess anteversion postoperatively.

Excessive anteversion leads to following complications which include dislocation, restricted internal Rotation, intoeing of gait, decreased range of motion at the hip joint.

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Declarations:

Funding: No Funding Sources

Conflict of interest: None Declared

Ethical approval: The study was approved by institutional ethics committee

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