IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 2 Ser.6 (February. 2021), PP 25-27
www.iosrjournals.org

Comparative study of anterolateral approach versus posterior approach for total hip replacement in the treatment of femoral neck fractures in elderly patients

Oufaska Kamal,Abdouli Smail, Kacimi Mehdi,Zaaf Mohammed ,El Idrissi Mohammed, Elibrahimi Abdelhalim, Elmrini Abdelmajid
Osteoarticular surgery service , hospital d'Étampes,ile de france, France

Abstract :
Objective: To compare the clinical outcome of anterolateral minimally invasive approach versus conventional posterior approach for total hip replacement against femoral neck fractures in elderly patients.
Key words*: Arthroplasty,replacement, hip; Surgical procedures, minimal invasive; Femoral neck fractures*

Date of Submission: 02-02-2021 Date of Acceptance: 16-02-2021

I. Methods:

The retrospective study was carried out on 40 patients- treated in our hospital from mai 2019 to septembre2020- who suffered from displaced femoral neck fractures (19 cases of Garden type III, 21 cases of Garden type IV) treated by total hip replacement via anterolateral mini- mally invasive approach or conventional posterior approach by the same experienced surgeon. The average age of the patients was 78.2 years (range: 65-89 years). They were divided into anterolateral mini-invasive group (19cases) and posterior group (21 cases). The mean time of follow-up was 11 months(range: 6-18 months). The anterolateral approach described by Hardinge goes through between anterior 1/3 and posterior 2/3 of the gluteus medius muscle, reaching the femoral neck from anterior capsule. The traditional pos- terior approach described byMoore (Southern incision) goes through the insertions of short external rotation muscles, reaching the femoral neck from posterior capsule. The related variables under observation were length of incision, operation time, postoperative limp, length of hospital stay and bed stay and dislolcation rate.

II. Results:

The length of the skin incision varied between 7 cm and 12 cm with the anterolateral minimallyinvasive technique, compared to 15-22 cm in the conventional procedure. It took less time (average 10 minutes) to complete the anterolateral minimallyinvasive approach (72min±10 min), compared with the conventional approach (82 min±10 min). The average Harris hip score was 91.23±10.20 in anterolateral approach, 90.03±11.05 in the posterior approach. The average length of hospital stay for patients with the anterolateral approach was (6.2±2.2) days (range:4-7 days), while that in posterior approach was (9.1 ±3.1) days (range: 6-13 days). The average length of bed stay was (3.2±1.1) days (range: 2-5 days) in anterolateral group and (6.2±2.7) days(range: 3-10 days) in posterior group. No patients in anterolateral group experienced dislocation. One (5%) hip in posterior approach had dislocation.

III. Discussion :

Total hiparthroplasty through minimally invasiveprocedures potentially reduces operative trauma, which is expected to improve recovery and rehabilitation. We performed total hip arthroplasty using minimally invasive techniques via anterolateral modification of the Hardinge approach. For a hip replacement procedure to be truly "mini- mally invasive", it is not necessary to perform the operation via the smallest possible skin incision, but it is essential that the procedure be performed with minimal soft tissue trauma. Tissue structures that are not divided cannot cause the pain, while over-stretched soft tissues can cause pain and delay healing. Consequently, the optimal soft tissue sparing incision for total hip replacement balances the desire to minimize the size of the entry portal with the need to provide the required intraoperative view and atraumatic access to the femur and acetabulum. Minimally invasive surgery through the anterolateral approach potentially leads to a reduction in operative trauma, less blood loss, smaller soft tissue wound, a reduction in postoperative pain, and earlier mobiliza- tion accomplished by preserving muscle insertions of gluteus medius and minimus. Theoretically, these improvements may result in shorter hospitalization, convalescence, and rehabilitation periods, as well as better cosmetic results through smaller skin incision and atraumatic wound closure.12-19 For

choosing this approach, our aim was to allow the surgeon to perform the procedure under direct vision using the usual anatomic landmarks for orientation. The results of our study showed that the minimally invasive anterolateral approach has no side effects on the position or the alignment of the prosthetic components. Safety can be defined as not placing patients at an increased risk of complications. These complications may be intraoperative, immediately postoperative, or long-term by component malposition. The long-term outcome of total hip arthroplasty may be influenced by component positioning. Component malposition may lead to decreased implant longevity and other debilitating complications such as recurrent dislocations. Any short-term benefits of a new surgical approach should not be at the cost of long-term outcomes. The previous studies have suggested that there is an increased chance of malposition using the minimal incision. The major risk is placing the acetabular component in overabduction. There was no difference between the mini- incision group and the control group with respect to acetabular and femoral component alignment. Many reports suggest that minimal incision surgery is a reproducible technique that does not compromise component positioning or increase postoperative complications. The malalignment of component positioning in minimally invasive approach may be due to less favorable field of vision. According to our experience, the appropriate abduction angle of the acetabulum can be achieved by adjusting the patient's position instead of direct vision. If the patient is in standard lateral decubitus with the body perpendicular to the operating table and the table parallel to the ground, anteversion and abduction of the acetabular component could be well established with reference to the operating table. Anteversion of the femoral component could be well established with reference to the knee joint. The satisfactory vision of acetabulum during operation would be achieved by retractors at posterior, anterosuperior, and anteroinferior edge of the acetabulum. In principle, each case of femoral neck fracture is amenable to the minimally invasive approach that we have used. However, the minimally invasive operative technique makes higher demands on the experience and skill of the surgeon. The presence of severe hip dislocation, a failed acetabular component from previous hip replacement, destructive rheumatoid arthritis, multiple previous operations on the joint, and major leg lengthdifferencesallrepresentrelativecontraindications fortheminimally invasiveapproach. Nevertheless,when correctly performed, the minimally invasive approach provides the patient witha functional result on discharge similar to that obtained 6 weeks after conventional surgery. Some studies have shown a higher dislocation rate with the posterior approach as compared with the ante- rolateral approach. The current findings support these observations with one dislocation occurring in patients in the posterior group as opposed to no dislo- cations in the anterolateral group. Some researchers suggested that this increased dislocation rate might attribute to inadequate acetabular exposure and con- sequent malposition of the acetabular component. Theoretically,minimallyinvasive total hip arthroplasty seems beneficial. It causes less surgical trauma, but not at the expense of decreased observation, which potentially increased complications related to the soft tissue envelope and component positioning. Our study showed that there are no substantial safety concerns using the minimal incision anterolateral approach. The mini-incision approach has produced less operative time, decreased length of hospital stay and bed stay, and improved early postoperative functions. The goal of additional investigations was to objectively determine rehabilitation benefits with gait analysis, and a longer follow-up. There are several reports that investigated the learning curve of minimally invasive total hip arthroplasty in details. D'Arrigo et al(22) considered the learning curve to be the first 20 cases for a single surgeon. Seng(23) noted that after 6 months, more than 50% of 37 patients received primary total joint arthroplasty comfortably by the anterior-supine intermuscular technique. Mears et al(24) reported a learning curve of 10 cases with regards to complications. Archibeck and colleagues(25) reported increased proficiency as indicated by decreased operative time and fluoroscopy use in the first 10 cases. According to our study, the learning curve includes the first 10 cases, which was indicated by a drop and then a plateau in operating time. Despite the learning curve required to master the anterolateral mini-invasive approach, the early functional results of our study in patients treated using this approach showed the advantages of decreased trauma, operation time, length of hospital stay and bed stay, rehabilitation time, and dislocation rate. Success of total hip arthroplasty using a minimally invasive approach depends on excellent operative technique and experi- ence with standard hip approaches rather than on the use of special instruments. Thus, once the learning period is passed, the sta- bility and minimal muscular damage should permit the acceleration of postoperative rehabilitation, which can subsequently reduce the perioperative risk in the treatment of femoral neck fractures in the elderly with total hip replacement.

IV. Conclusions:

Anterolateral mini-invasive approach can decrease trauma, operation time, length of hospital stay and bed stay and rehabilitation time. The stability and minimal muscular damage permit the acceleration of postoperative rehabilitation, which can subsequently reduce the perioperative risk in the treatment of femoral neck fractures in the elderly undergoing total hip replacement.

References :

[1]. Gu GS, Wang G, Sun DH, et al. Cemented bipolar hemiarthroplasty with a novel cerclage cable technique for un- stable intertrochanteric hip fractures in senile patients. Chin J Traumatol 2008;11(1):13-17.
[2]. Yang CF, Zhu QS, Han YS, et al. Anterolateral minimally- invasive total hip arthroplasty: a clinical comparative study of 110 cases. Chin Med J 2009;89(1):2-6.
[3]. Walde TA, Blattgerste D, Sehmisch S, et al. Early results and patient satisfaction after total hip arthroplasty using a mini- mally invasive anterolateral approach. Hip Int 2009;19(4):367- 371.
[4]. Ward SR, Jones RE, Long WT, et al. Functional recovery of muscles after minimally invasive total hip arthroplasty. Instr Course Lect 2008;57:249-254.
[5]. Duwelius PJ, Dorr LD. Minimally invasive total hip arthroplasty: an overview of the results. Instr Course Lect 2008; 57:215-222.
[6]. Dutka J, Sosin P, Libura M, et al. Total hip arthroplasty through a minimally invasive lateral approach-our experience and early results. 2007;9(1):39-45.
[7]. McGrory BJ, Finch ME, Furlong PJ, et al. Incision length correlates with patient weight, height, and gender when using a minimal-incision technique in total hip arthroplasty. J Surg Orthop Adv 2008;17(2):77-81.
[8]. Bal BS, Vallurupalli S. Minimally invasive total hip arthro- plasty with the anterior approach. Indian J Orthop 2008;42(3): 301-308.
[9]. Paillard P. Hip replacement by a minimal anterior approach. Int Orthop 2007;31 Suppl 1:S13-S15.
[10]. Wong TC, Chan B, Lam D. Minimally invasive total hip arthroplasty in a Chinese population. Orthopedics 2007;30(6): 483-486.
[11]. Meneghini RM, Smits SA. Early discharge and recovery with three minimally invasive total hip arthroplasty approaches: a preliminary study. Clin Orthop Relat Res 2009;467(6):1431- 1437.
[12]. Dorr LD, Maheshwari AV, Long WT, et al. Early pain and function results comparing posterior minimally invasive to con-ventional total hip arthroplasty: a prospective, randomized blinded study. J Bone Joint Surg Am. 2007;89:1153-1160.
[13]. Laffosse JM, Chiron P, Molinier F, et al. Prospective and comparative study of the anterolateral mini-invasive approach versus minimally invasive posterior approach for primary total hip replacement. Early results. Int Orthop 2007;31(5):597-603.
[14]. O'Brien DA, Rorabeck CH. The mini-incision direct lat- eral approach in primary total hip arthroplasty. Clin Orthop Relat Res 2005;441:99-103.
[15]. Malik A, Dorr LD. The science of minimally invasive total hip arthroplasty. Clin Orthop Relat Res 2007;463:74-84.
[16]. Pfluger G, Junk-Jantsch S, Scholl V. Minimally invasive total hip replacement via the anterolateral approach in the supine position. Int Orthop 2007;31Suppl 1:S7-S11.
[17]. Ogonda L, Wilson R, Archbold P, et al. Aminimal-incision technique in total hip arthroplasty does not improve early post-operative outcomes. A prospective, randomized, controlled trial. J Bone Joint Surg Am 2005;87(4):701-710.
[18]. Noble PC, Johnston JD, Alexander JA, et al. Making mini- mally invasive THR safe: conclusions from biomechanical simula- tion and analysis. Int Orthop 2007; 31 Suppl 1:S25-S28.
[19]. Rittmeister M, Callitsis C. Factors influencing cup orien- tation in 500 consecutive total hip replacements. Clin Orthop Relat Res 2006;445:192-196.
[20]. Basad E, Ishaque B, Stürz H, et al. The anterolateral mini- mally invasive approach for total hip arthroplasty: technique, pitfalls and way out. Orthop Clin North Am 2009;40(4):473-478.
[21]. Ritter MA, Harty LD, Keating ME, et al. A clinical com- parison of the anterolateral and posterolateral approaches to the hip. Clin Orthop Relat Res 2001;385: 95-99.
[22]. D'Arrigo C, Speranza A, Monaco E, et al. Learning curve in tissue sparing total hip replacement: comparison between dif- ferent approaches. J Orthop Traumatol 2009; 10(1): 47-54.
[23]. Seng BE, Berend KR, Ajluni AF, et al. Anterior-supine minimally invasive total hip arthroplasty: defining the learning curve. Orthop Clin North Am 2009;40(3): 343-350.
[24]. Mears DC, Mears SC, Chelly JE, et al. THA with a mini- mally invasive technique, multi-modal anesthesia, and home rehabilitation: factors associated with early discharge? Clin Orthop Relat Res 2009;467(6):1412-1417.
[25]. Archibeck MJ, White RE Jr. Learning curve for the two- incision total hip replacement. Clin Orthop Relat Res 2004; (429): 232-238.

Oufaska Kamal, et. al. "Comparative study of anterolateral approach versus posterior approach for total hip replacement in the treatment of femoral neck fractures in elderly patients." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(02), 2021, pp. 25-27.