

Comparing the Clinical Outcome of Hip Arthroplasty Performed Through Smith Peterson (Direct Anterior) Versus Southern Moore (Postero-Lateral) Approach

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Received: 03-01-2024 Revised: 11-01-2024 / Accepted: 23-01-2024

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Conflict of interest: Nil

Abstract

Background and Aim: Total hip arthroplasty (THA) has become one of the most reliable and patient-requested surgical interventions in all medicine. The procedure can be performed using a variety of surgical approaches, but the posterior approach, direct lateral approach, and direct anterior approach are by far the most common across the globe. Present study done to determine which surgical approach is better for posterior dislocation. This will allow for the development of a standard approach to treating femur fracture necks in elderly patients.

Material and Methods: The present analysis is the randomized control trial done in the GMERS, medical college, Sola, Ahmedabad. The study was done for the period of one year. A total of 40 patients were included in the research analysis. Every participant who satisfied the requirements for inclusion was assigned at random to either the posterior lateral approach (PLA) or the anterior approach (DAA) group. The rise and change in CK levels following THA were examined using a little amount of data. Additionally, we assessed preoperative and postoperative joint function using the Harris Hip Scores (HHS) method, and we scored VAS points to assess pain intensity. The position of the femoral prosthesis was measured using the Nakata method.

Results: The mean operating time when it was compared between the two groups it was found to be longer in DAA group patients as compared to other group. The difference in the parameters like incision, duration of the hospital stay, intra operative blood loss and mean of the post-operative damage, when compared between the two groups were found to be statistically significant. The hospital length stay was also shorter, the loss of intra operative blood loss was less and there was low intra operative drainage in DAA group patients.

Conclusion: Anterior approach was linked to shorter hospital stays, increased functional scores, quicker short-term rehabilitation, and earlier withdrawal of mobility aids like walkers and crutches. Conversely, the posterior technique could result in a shorter surgical duration, comparable long-term function, and no rise in the incidence of problems.

Keywords: Harris Hip Scores, Hospital Stay, Posterior Lateral Approach, Total hip arthroplasty.

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Introduction

A surgical strategy for total hip arthroplasty (THA) has to fulfill a number of prerequisites. In order to adequately prepare the bone beds for implantation, it should offer a broad exposure to the proximal femur and acetabulum. The method ought to be helpful for the variety of deformities associated with hip arthritis and flexible enough to enhance exposure in challenging situations. Less damage need to be done to the nearby muscles, tendons, and ligaments.[1,2]

With the invention of Charnley's low-friction arthroplasty in the 1950s, the modern total hip arthroplasty (THA) was born. THA is currently one of the most dependable and often sought surgical

procedures, having improved over decades. As of 2010, the number of Americans living with THA was estimated to be 2.5 million, and the number of THA procedures conducted annually was close to 332,000. The need for THA is anticipated to rise significantly throughout the ensuing decades.[3-5]

Whereas the Hardinge technique showed a 1.1% rate of posterior dislocation, the Moore procedure showed a 7.4% incidence. Uncertainty surrounds the precise impact of surgical technique on dislocation rates, despite dislocation being a frequent consequence of hip hemiarthroplasty.[6,7] Our goal in conducting this prospective randomized controlled trial was to determine which surgical

approach is better for posterior dislocation, as there aren't many randomized prospective data available in this context. This will allow for the development of a standard approach to treating femur fracture necks in elderly patients.

Material and Methods

The present analysis is the randomized control trial done in the GMERS, medical college, Sola, Ahmedabad. The study was done for the period of one year. A total of 40 patients were included in the research analysis. The surgeries were done by the specialist Orthopedics surgeon. The patients were recruited from the institutional department patients. The study was done for the period of one year.

Patients currently on the orthopedics surgery waiting list for a primary total hip arthroplasty were asked to participate in the study. After initial screening, suitable patients were given a statement in the local language detailing the nature of the study and the consent form was asked to sign prior to their inclusion in the study.

The trial's inclusion criteria were met by all adult patients (over the age of eighteen) waiting for a primary total hip arthroplasty, unless they satisfied one of the exclusion criteria. Patients in this experiment included those who needed surgery due to secondary osteoarthritis, which might be post-traumatic, osteonecrosis, or subsequent to inflammatory arthropathy.

Exclusion criteria: Trial participants were not allowed to undergo revision surgery or have hip replacements for reasons other than osteoarthritis, such as fractures, cancer, or developmental abnormalities. Patients who were not able to sign the permission form were not allowed to participate in the study. Every participant who satisfied the requirements for inclusion was assigned at random to either the posterior lateral approach (PLA) or the anterior approach (DAA) group. Other independent researchers completed the postoperative examination. The approach protocol was hidden from the surgeon.

In an investigation, the rise and change in CK levels following THA were examined using a little amount of data. Additionally, we assessed preoperative and postoperative joint function using the Harris Hip Scores (HHS) method, and we scored VAS points to assess pain intensity. The second postoperative day saw the acquisition of anteroposterior pelvic radiographs. The position of the femoral prosthesis was measured using the Nakata method. The statistical analyses were conducted utilizing IBM Corporation's SPSS Statistics (Version 20.0, Armonk, NY, USA).

When the P-value was less than 0.05 ($P < 0.05$), differences were deemed statistically significant. The group findings and demographic details are shown as mean (SD). Student's t-test was used to analyze the continuous clinical indicators and functional outcomes. The discontinuous variables were analyzed using the Pearson chi-squared test.

Results

The included patients were divided randomly but equally into two groups. There were 20 patients in each group. The demographic analysis along with ASA grade analysis, VAS, HHS, C reactive protein levels and CK levels of all the patients were almost similar and there was no significant difference between the patients of two groups.

The mean operating time when it was compared between the two groups it was found to be longer in DAA group patients as compared to other group. The difference in the parameters like incision, duration of the hospital stay, intra operative blood loss and mean of the post-operative damage, when compared between the two groups were found to be statistically significant. The mean incision length was found to be less in DAA group patients. The hospital length stay was also shorter, the loss of intra operative blood loss was less and there was low intra operative drainage in DAA group patients.

The mean operation times were significantly different, being 13 minutes longer in the DAA group. There was statistically significant difference in the mean incision, mean length of hospital stay, mean intraoperative bloodloss and mean postoperative drainage between the two groups.

The DAA was associated with shorter mean incision length, shorter mean length of stay, lower mean intraoperative blood loss, and lower mean postoperative drainage. The average HGB levels of the DAA group were significantly higher on postoperative days 1, 3 and 5.

The rate of perioperative transfusions was similar between the two groups. Comparison of radiological outcomes showed that the average angle of cup anteversion, the average angle of cup abduction between the two groups. For postoperative days 1 through 3, the DAA group was associated with lower average VAS score.

Conversely, the DAA group was associated with higher average HHS at 6 weeks, 3 months and 6 months postoperatively. On postoperative days 1, 3, and 5, the DAA group was associated with lower levels of the inflammatory marker CRP. Similarly, the levels of the muscle damage markers CK was lower than in the PLA group.

Table 1: Comparison of VAS score and HHS score between the DAA group and the PLA group

	VAS Score		HHS Score	
	DAA group	PLA group	DAA group	PLA group
Before operation	4.1 ± 1.1	4.2 ± 1.8	49.9 ± 7.1	47.2 ± 2.5
1 st day follow up	1.9 ± 1.9	2.6 ± 1.9	81.2 ± 3.4	71.6 ± 9.6
1 week follow up	1.0 ± 0.3	1.4 ± 0.5	86.2 ± 2.6	81.3 ± 8.7
1 month follow up	0.6 ± 0	0.9 ± 1.2	89.6 ± 8.1	84.2 ± 8.8

Discussion

Treatment of elderly patients with fractured necks of the femur remains one of the most difficult cases for orthopaedic surgeons worldwide. The significance of related comorbidities has been shown by clinical investigations. When treating femur fractures in the elderly, several methods are available. Hemiarthroplasty is the most popular. The current study investigated whether the functional results of hemiarthroplasty in cases of neck or femur fractures would change depending on whether a posterior or lateral surgical technique was used.[8,9] A secure, functioning, and painless hip is the main goal of a complete hip replacement. The capacity of the surgeon to acquire appropriate surgical exposure while minimising problems in order to reach the ideal implant site is critical to the success of total hip arthroplasty. Orthopaedic physicians disagree in their opinions about the optimal surgical technique for complete hip replacement. While supporters of the lateral technique point out a greater incidence of dislocation with the posterior route, the posterior approach's proponents assert better exposure, less blood loss, and simple implant placement without abductor injury.[10]

In our investigation, we selected CRP as an indication of inflammation and CK as a marker of muscle injury. Similar to the findings of two prospective studies, our data also indicated that the LDAA is linked to decreased levels of CK, MYO, and CRP in the early postoperative period. Due to the fact that no muscles are severed during the surgical technique, these data showed that the LDAA produces less muscle injury. Consistent with prospective studies, our data shown that the DAA patients needed a shorter incision than the PLA patients. The DAA was linked to a longer operating duration and less blood loss than the PLA.

There was a common belief among surgeons that the longer a surgery took, the more blood was wasted. Nonetheless, no muscles were detached during the DAA, which was carried out on an intermuscular plane. Furthermore, the lateral circumflex femoral artery's ascending branch, which might result in further blood loss, had been previously ligated. In comparison, the PLA resulted in a larger surgical incision and required the removal of the abductor muscles.

Blood loss was lower with the DAA than with the PLA, despite the latter's procedure taking a little longer. Other research, however, have revealed a range of findings. While Alecci et al. observed no difference in operation time or blood loss between the DAA and the straight lateral approach in their investigation, Spaans et al. and de Verteuil et al. discovered that the DAA resulted in longer operation time and higher blood loss.

The average VAS score differed significantly between the PLA and DAA groups. On the postoperative days that were looked at, a lower VAS score was linked to the DAA. The outcomes matched those of a few earlier investigations. Improved pain management enabled patients to engage in functional exercises sooner, which probably had an impact on the duration of stay and the functional recovery following surgery. According to our analysis, the DAA group's HHS was greater than the PLA group's. Because the component's orientation can affect the stability and durability of the implants, the orthopaedic doctors were concerned about it. Between the two groups, there was no discernible change in acetabular component abduction or anteversion. A long-term, multi-center, prospective research with a high sample size and follow-up period could offer more solid data to evaluate the benefits and drawbacks of the two strategies.

Conclusion

Anterior approach was linked to shorter hospital stays, increased functional scores, quicker short-term rehabilitation, and earlier withdrawal of mobility aids like walkers and crutches. Conversely, the posterior technique could result in a shorter surgical duration, comparable long-term function, and no rise in the incidence of problems.

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