

A Total Hip Arthroplasty Approaches: Advantages and Disadvantages for the Most Used Techniques in Surgical Cases

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Received: October 06, 2022; **Published:** October 19, 2022

Abstract

The research is obtained to address the differences between the direct anterior approach and posterior approach in relevance to total hip arthroplasty. It is mainly a theoretical study aims to observe several relevant studies to achieve the purpose of research. It depends on international surgical communities to observe the differences between DAA and PA. There were slight differences between the approaches including the functional outcome in the short term, hospitalization time, less dislocation, earlier recovery, safety, and effectiveness for DAA over PA. On the other hand, PA has less operative time, lower incidence of lateral femoral cutaneous nerve injury, intraoperative blood loss, and fracture. Although the DAA is currently promoted and preferred by most patients for the previous reasons but, most studies have emphasized that both DAA and PA yield good results in terms of function, quality of life and survival.

Keywords: Direct Anterior Approach; Posterior Approach; Total Hip Arthroplasty; Patients; Hip

Abbreviations

THA: Total Hip Arthroplasty; DAA: Direct Anterior Approach; PA: Posterior Approach; TFL: Tensor Fasciae Latae; NGHA: National Guard Hospital; KFUH: King Fahad University Hospital

Introduction

Identifying the best approach for total hip arthroplasty (THA) is a concern and a matter of debate in national and international surgical communities. The terminology has multiple approaches yet, the ideal one is hard to be indicated because of the different returns each approach provide for certain surgical cases. Defining the THA isn't hard in comparison, it is known as one of the common surgical cases where surgeon replaces portions of hip joint to prostheses (implants). Moreover, the technique is highly used in international health communities including Saudi Arabia. In relevance, the most common approaches used worldwide in relevance to THA are the direct anterior approach (DAA) and posterior approach (PA). These approaches have different techniques in application but provide significantly similar outcomes. However, the DAA is a recent approach that has been introduced to THA and widely used in the recent years. But, both approaches have slight differences, which are observed through critical assessment. The research aims to compare between the DAA and PA approach taken in consideration core criteria to indicate the differences and similarities. Also, the research

purposes to address the hypothesis of presenting better results for either DAA or PA based on previous studies in relevance to the topic of interest. It is basically depends on clinical, experimental and evaluative studies to achieve the main objective of the research and present valuable results.

Literature Review

The total hip arthroplasty (THA) is a considerable treatment used in several hip cases including femoral neck fracture, aseptic necrosis of femoral head, developmental hip dysplasia and rheumatoid arthritis. Mainly, there are various approaches implemented for previous cases yet anterior and posterior approaches are used significantly. Posterior is a traditional and popular while anterior has been used recently in surgical cases [1].

The earliest version of posterior approach (PA) based on Orthop study the approach has been introduced in 1874 yet it has developed over the past decades resembling the Moore's approach, which was applied in the 1957 and considered the most common surgical approach for THA worldwide [2]. The approach based on Surg is described as an incision beside or behind the hip joint [3]. The surgery occurs through muscles from the ball and socket in the low back as Karadsheh stated in his study [4]. On the other hand, Post., *et al.* stated in their study that direct anterior approach (DAA) has been discussed in Carl's Hueter publication in 1881. Yet, the first surgical experiment using the DAA was experienced in 1980 on an American surgical case [5]. Orthop has indicated in his study that the approach is identified as the incision, which is utilized to the interval of hip joint in the tensor fasciae latae (TFL) and sartorius muscles [6]. The Surg study has indicated that the approach is using a joint capsule for the hip incised along the length of femoral neck from the acetabulum to intertrochanteric line [3].

The matter of choosing the best approach for hip arthroplasty surgeries is mainly a concern for surgeons. Although many studies have attempted to resolve this matter but the controversy remains [7]. Moreover, the determination of the ideal THA approach, which achieves the most satisfactory therapeutic effect in addition to a significant reduction in trauma occurrences and postoperative complications, has been a captivating topic for scholars and surgeons worldwide [8]. For that, the assessment for the approaches was aligned to clinical and radiologic outcomes for valuable implication.

For objective comparison several studies in area of interest were taken in consideration. Malek., *et al.* stated in their study, which was an experimental study on a random sample of 448 participants using the PA and DAA that the main parameters to be considered as the length of stay, degree of pain, infections, dislocation, and re-operation were significantly similar for both approaches. But, the rate of periprosthetic femoral fractures are in DAA group was higher although the relevant cases were discharged earlier [9]. Another study conducted by Talia., *et al.* in Australia. The study is experimental on random sample of 243 patients in orthopedic surgery department. Mainly, it has similar criteria for previous study, which contains for example the infection rate, length of stay, postoperative pain, and complications. It differs in measuring identifying the criteria into demographics, past history and body mass index. Mainly, the results of study stated that anterior approach provide benefits in the short term. But, it emphasizes that both approaches aren't superior in terms of pain, dislocation rates, and muscle weaknesses [10]. In contrast, Yang., *et al.* study was evaluating relevant studies for the topic of interest taken in consideration the clinical, imaging analysis, and surgical complications. The outcomes have indicated that DAA group was better than PA group according to the number of acetabular prostheses and soft tissue injury. Yet, the PA cases has lower incidence of lateral femoral cutaneous nerve injury. However, the study has mentioned that there was no significant difference for both approaches in multiple criteria as incidence of intraoperative fractures, postoperative dislocation, incision complications, operative and hospitalization time [8]. Chen., *et al.* is also an evaluative study, which aims to analyze the related studies for the area of interest. Outcomes of the study have stated that DAA has shorter hospitalization time, less dislocation, earlier recovery. But, it is longer in operative time and more intraoperative blood loss and fracture. Despite that, the study hasn't addressed differences between the two approaches in the aspect of incision length, infection, hematoma rate and re-operation [1]. In Moerenhout study, which has assessed the approaches based on surgical trial and clinical follow

up where the patients were randomly divided into PA and DAA. Moreover, as previous studies it has compared the approaches based on common criteria as length of stay, surgical time, pain, implant position, and complications. Analysis of outcomes was radiologic to indicate the major differences between PA and DAA. Final results for the study have indicated that both approaches are similar in comparison based on these criteria. Yet, a significant difference was highlighted in the length of surgery for the DAA in association to better functional outcome for patient based on a trend using Harris Hip Score. For that, the study has concluded that DAA is safer and effective more than PA based on the appeared statistics in the study [7].

Discussion

The main purpose of research is to address the core differences between the most common total hip arthroplasty (THA) approaches depending on several studies. Furthermore, hypothesizes of research is observing the effectiveness of either DAA in surgical cases or PA. The chosen studies were evaluating these hypothesizes within international surgical community. Thus, in Makhdom, and Alsyyad study highlights the experience of Saudi surgeons with different demographic variables in a number of hospitals across the regions. Trauma is the most common reason for the total hip arthroplasty in comparison to the western industrialized countries. Yet, the study was illustrating the primary care without indicating the used approach [11]. In return, it limits the comparison of approaches to be based on the international experience of total hip arthroplasty using the DAA and PA approaches. To achieve the objective of research a lot of relevant studies were observed. Therefore, there were similarities including the comparison criteria as most studies take in consideration the length of stay, degree of pain, infections, dislocation, complications, and re-operation as important indicators for the efficiency and effectiveness of operational approach. Although the approaches were evaluated using significant criteria the impartial comparison of DAA and PA approaches the differences were little but primarily impact on the surgery outcomes. The DAA is recently promoted and gained popularity based on the demand of patients. It has surpasses the PA in various aspects based on previous studies shown that DAA provide better functional outcome in the short term based on the number of acetabular prostheses and soft tissue injury. Moreover, it has shorter hospitalization time than PA in addition to less dislocation and, earlier recovery. Another important aspect is that DAA considered safer and effective in surgical cases. On the other hand, it has a longer operative time and more intraoperative blood loss and fracture for the length of surgery than PA. But, PA cases has lower incidence of lateral femoral cutaneous nerve injury. Despite that, the decision of preferable approach basically depends on the preference of surgeons. He is responsible to evaluate critically the case and based of the outcomes adopt the perfect approach to preform significant surgery.

Conclusion

In conclusion, surgical cases basically performed using different approaches to present the best outcomes for patient's care. Total hip arthroplasty (THA) has a large number of approaches yet, the research aims to address the two most common techniques, which are direct anterior approach (DAA) and posterior approach (PA). The comparison between the approaches was a concern for most surgeons and researchers interested in the field. Mainly, the comparison was obtained to indicate the best approach to be used in surgical cases taken in consideration important criteria as for example the recovery, re-operation, length of stay, etc. Basically, the experimental and evaluative studies in different international hospital have indicated that DAA has better outcomes than PA, as it is generally more efficient and safer. Yet, the research has been limited to the observation of international communities and couldn't include relevant national studies. Most of the studies conducted in region were general and didn't address a certain approach for THA.

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Volume 13 Issue 10 October 2022

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