

Functional capacity in patients with total hip arthroplasty: comparison of the Hardinge approach using the Trendelenburg test

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ABSTRACT

This study reviews the functional capacity of patients undergoing total hip arthroplasty via different approaches, comparing the results with the Trendelenburg test. The narrative review used three articles that addressed anterolateral and posterior approaches. The results showed that the anterolateral approach preserves the gluteal muscles, while the posterior approach offers faster initial recovery. In the long term, both methods showed similar functional results. The conclusion highlights that the choice of technique should consider the patient's profile to optimize recovery and quality of life.

Keywords: Hip arthroplasty; Trendelenburg test; Functional capacity; Quality of life.

INTRODUCTION

Total hip arthroplasty (THA) is widely recognized as an effective surgical intervention to treat pain and disability resulting from hip disease by replacing the hip joint with a prosthesis. This procedure promotes significant improvement in patients' mobility and quality of life, in addition to reducing the economic costs associated with chronic disability. With the continuous advancement of surgical techniques, prosthetic materials, and rehabilitation strategies, it is essential that healthcare professionals involved in this field remain up to date, thus ensuring optimal, evidence-based clinical outcomes (ZUCOLOTTO, 2023).

Some hip conditions, such as osteoarthritis and fractures, are often treated surgically through Total Hip Arthroplasty (THA), which consists of replacing the hip joint with an artificial prosthesis. There are three most common surgical approaches: anterior, lateral (Hardinge), and posterior (Moore), although there is no consensus in the literature on the surgeon's criteria for choosing the approach. The anterior approach, described by Smith-Peterson in the 1940s and modified by Heuter in the 1950s, has gained prominence for preserving muscles and improving gait kinematics,

as well as having low rates of dislocation. The lateral approach, introduced by Hardinge in 1982 and adopted by about 60% of Canadian orthopedic surgeons, provides good exposure of the proximal femur and acetabulum, with low dislocation rates. The posterior approach, popularized by Moore in the 1950s, is the most widely used worldwide and offers excellent visualization of the acetabulum and femur, preserving the abductor muscles and providing ample exposure when necessary (COSMO, 2020).

The Trendelenburg test is a clinical technique used to assess the function of the gluteus medius muscle. During the test, the patient stands on one leg while the examiner, positioned behind, palpates the iliac crests and observes the elevation of the contralateral iliac crest. Elevation indicates a healthy gluteus medius muscle, resulting in a negative test. If the pelvis on the unsupported side does not rise or drops, it suggests weakness in the gluteus medius, resulting in a positive test. The test has a sensitivity of 73% and a specificity of 77%. In addition, maintaining the maneuver for more than 30 seconds may reveal a delayed pelvic drop, which may indicate inflammatory pathologies. During gait, weakness of the gluteus medius is observed by the Trendelenburg sign, characterized by the tilting of the hip contralateral to the weight-bearing limb, with a sensitivity of 72% and specificity of 76% (DE, 2021).

The objective of this study is to analyze the functional capacity of patients undergoing total hip arthroplasty through different Hardinge approaches, using the Trendelenburg test to compare the results.

METHODOLOGY

This is a narrative review, for which we used three articles that address results relevant to the topic. The first article was published in the Brazilian Journal of Orthopedics. Its objective was to present a minimally invasive anterolateral approach and verify whether this approach allows total hip arthroplasty to be performed without compromising the quality of implant positioning, while maintaining the integrity of the gluteal muscles. The second article was published in the Revista Brasileira de

Reumatologia (Brazilian Journal of Rheumatology), with the objective of evaluating the functional capacity of the hip joint and quality of life in the pre- and postoperative periods of patients with osteoarthritis undergoing total arthroplasty. The third article was published in the Revista Científica da Ordem dos Médicos (Scientific Journal of the Medical Association), in which the author sought to evaluate differences in function and quality of life in patients undergoing total hip arthroplasty using two different approaches (posterior and anterolateral). The sources used were SciELO, PubMed, and Google Scholar.

RESULTS

The three studies analyze different aspects of total hip arthroplasty, such as surgical approaches, implant positioning, muscle strength, Trendelenburg test, and patients' quality of life. In the study by SAWAIA *et al.*, the sample consisted of 260 patients (278 hips) who underwent cementless total hip arthroplasty, with a mean age of 62 years. The complications reported included four cases of positive Trendelenburg test, with confirmation of superior gluteal nerve injury in one patient, suggesting that the technique is safe and effective, despite some minor complications. The mean surgical time was 63 minutes, and complications included infection (5 cases), deep vein thrombosis (3 cases), hip dislocation (2 cases), and limb length discrepancy. The acetabular inclination was between 41° and 50° in 189 patients, and femoral positioning was considered central in 209 hips. The study emphasizes the importance of the learning curve and appropriate instruments for performing minimally invasive techniques. The anterolateral approach was effective for performing the surgery without compromising the position of the implants and keeping the gluteal muscles intact.

Following the study, PATRIZZI *et al.* evaluated the functionality and quality of life of 12 patients who underwent hip arthroplasty, comparing the pre- and post-operative periods. In the post-operative period, 83.3% of patients reported no pain, and there was a significant improvement in the ability to climb stairs and remain seated. Although 75% of patients still required assistance to walk, there was an increase in the number of patients able to walk without distance limitations. There were also improvements in range of motion, except for hip adduction. The study concludes that

total hip arthroplasty significantly improves the functionality and quality of life of patients, although some still report fear and insecurity. The Trendelenburg test did not indicate additional problems. However, some patients still reported fear and insecurity in performing daily activities, indicating that physical recovery does not necessarily eliminate all emotional concerns.

ARAÚJO *et al.* compared the results of patients who underwent hip arthroplasty via the anterolateral and posterior approaches, evaluating them with the HOOS questionnaire at different postoperative periods. At six months, the posterior approach showed better results in pain, symptoms, and daily activities, with fewer positive cases in the Trendelenburg test, but these differences decreased over time, with similar results between the two approaches at 24 months. In terms of abductor muscle strength, the posterior approach also showed better results, especially at six, 12, and 24 months. Over two years, the two approaches demonstrated comparable efficacy, but with significant initial differences in favor of the posterior approach.

CONCLUSION

Through this review, it was possible to identify and conclude that total hip arthroplasty is effective in improving the function and quality of life of patients, with different approaches presenting advantages and disadvantages. The anterolateral approach preserves the gluteal muscles and has good long-term results, despite a slower initial recovery compared to the posterior approach. However, the choice of technique should be based on the patient's profile, ensuring a balanced and effective recovery.

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