v. 5, n. 20, 2025

International Journal of Health Science

Acceptance date: 24/04/2025

HIP ARTHROPLASTY: CHALLENGES AND PERSPECTIVES

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Abstract: Total hip arthroplasty (THA) is a surgical procedure widely used to restore joint functionality and relieve pain in patients with degenerative diseases or traumatic fractures. This study, through a recent literature review, discusses the main challenges and perspectives associated with THA, including the choice of surgical approach, the management of post-operative complications and the feasibility of outpatient models. The analysis of the data shows that, despite advances in minimally invasive techniques, there are still limitations in terms of muscle and neurological integrity in the post-operative period. The safety of outpatient arthroplasty depends on strict discharge criteria and a multidisciplinary structure. The prevention of deep infections and the management of periprosthetic fractures remain relevant clinical challenges. The study concludes that personalizing surgical indications, combined with integrated rehabilitation and post--operative care protocols, is the way to improve clinical outcomes and optimize healthcare resources.
Keywords: Total hip arthroplasty; Orthopedic surgery; Minimally invasive approach; Postoperative rehabilitation; Periprosthetic infection; Outpatient surgery.

INTRODUCTION

Total hip arthroplasty (THA) stands out as an elective and irreversible procedure, fundamental for restoring functionality and quality of life in patients with degenerative or traumatic pathologies. Careful selection of candidates is essential to balance benefits and risks, as proposed by the *EKIT-Hip* initiative, which establishes evidence-based guidelines and consensus for surgical indication. This protocol includes requirements such as diagnostic confirmation, assessment of the individual burden of disease, analysis of contraindications and emphasis on shared decision-making, factors that increase the standardization of consultations and patient satisfaction. At the same time, in the context of hip fractures, surgical treatment is a priority for clinically stable individuals, although the high mortality rates - 10% in one month and 33% in one year - demand a multidisciplinary approach. Guidelines such as those from *NICE* reinforce the need for preoperative medical optimization, integrated geriatric assessment and personalized rehabilitation protocols, strategies that reduce hospital readmissions and costs. The inclusion of social care is equally critical, as more than 10% of survivors do not return to their original homes, highlighting the importance of a holistic approach (BASTIAN, 2023; RIDHA et al., 2024).

Despite the consolidated efficacy of THA, with low complication rates and high satisfaction, challenges remain. Post-operative infections, choices of surgical approach and management of periprosthetic fractures emerge as areas that require continuous improvement. Additionally, outpatient arthroplasty is gaining relevance due to its cost-effectiveness, being feasible in selected patients. However, safety remains a central concern, especially due to the lack of well-defined discharge criteria in the literature, requiring strict protocols to mitigate post-operative risks (VENDITTOLI; GIRARD; BONNOMET, 2022; WIGNADASAN; HADDAD, 2023).

This text outlines the complexity of THA, integrating technical advances, clinical challenges and ethical needs, while setting the stage for discussions on optimizing indications, innovative surgical strategies and post-operative care models.

METHODOLOGY

The methodology adopted in this study followed an approach of selecting and analyzing the available literature on hip arthroplasty, with the aim of synthesizing the most recent information on the subject. This is a bibliographic review based on articles published in the last five years, located in the PubMed database. The search used the descriptors 'Arthroplasty; Replacement; Hip; Surgery', selected according to their relevance in the scientific literature on the subject. The selection process was conducted with methodological rigor, ensuring the inclusion of studies that presented up-to-date data pertinent to the discussion on the challenges and perspectives of hip arthroplasty. The inclusion criteria included original articles and systematic reviews that addressed clinical, surgical and prognostic aspects of the procedure, with full text available in English or Portuguese. Studies that did not meet these criteria were excluded, including those that were not available on PubMed or that did not directly address the proposed theme. The methodology adopted ensures transparency and reproducibility of the study, allowing a critical analysis based on the most up-to-date literature on hip arthroplasty.

RESULTS AND DISCUSSION

The evolution of surgical techniques in total hip arthroplasty (THA) has sought to balance minimizing tissue aggression with clinical safety. Recent studies highlight significant advances, such as the adoption of minimally invasive approaches (anterior and anterolateral), which promise accelerated recovery through muscle preservation. However, evidence shows that injuries to the gluteal system, femoral nerve and tendons persist even with refined techniques, impacting functional parameters such as gait and muscle strength in the medium term. These findings reinforce the need for individualized surgical criteria, taking into account variables such as the patient's anatomy, body mass index and the complexity of the joint exposure. At the same time, outpatient surgery has emerged as a viable alternative, with protocols based on Enhanced Recovery After Surgery (ERAS) reducing complications and readmissions. Clinical experience shows that early discharge, associated with multimodal analgesia and immediate rehabilitation, does not compromise results, as long as it is applied to selected patients with controlled comorbidities (VENDITTOLI; GIRARD; BONNOMET, 2022).

Another relevant contribution of the work by Vendittoli et al. (2022) is the emphasis on the limitation of the expected benefits of minimally invasive approaches when analyzed in isolation. Even with the technical advances of these approaches, the literature reveals the persistence of muscle and nerve injuries, such as those to the gluteal system and the femoral nerve, especially when the choice of approach does not take into account individual anatomical variables. The occurrence of structural damage observed by MRI and electromyography up to a year after surgery suggests that personalization of the technique, including adjusting the access route to the patient's biotype, is essential for lasting functional results. In addition, the authors advocate a critical review of the traditional paradigms of THA, proposing a broader integration between surgical planning, outpatient protocol and specific rehabilitation, in line with the principles of the ERAS model. (VENDITTOLI; GIRARD; BONNOMET, 2022)

The safety of outpatient arthroplasty also depends on strict discharge protocols, which include pain control, independent mobilization and objective clinical stability criteria. Although there is no universal consensus on the ideal parameters, the literature indicates that the ability to ambulate independently, the absence of hemodynamic complications and adequate home support are essential pillars. Surgi-

cal approaches such as the posterior approach, traditionally associated with a higher risk of dislocation, have been shown to be compatible with same-day discharge when combined with meticulous wound closure and integrated post--operative management. The emphasis on early rehabilitation, with active physiotherapy started within two hours of the surgery, has been shown to be decisive for functional success, especially in knee arthroplasties. However, the lack of standardized guidelines for discharge criteria requires institutions to develop internal protocols adapted to their operational reality (WIGNADASAN; HADDAD, 2023).

These results challenge traditional paradigms, such as the association between minimally invasive approaches and integral muscle preservation, and highlight the importance of therapeutic personalization. The persistence of tissue lesions even in advanced techniques suggests that optimization lies not only in the access route, but in complementary strategies, such as detailed preoperative planning and targeted rehabilitation. The viability of outpatient THA, in turn, depends not only on surgical criteria, but on a multidisciplinary structure that encompasses everything from patient selection to post-discharge follow-up. The convergence of technical innovation and post-operative care management represents a promising horizon for reducing costs and improving outcomes, as long as it is backed up by robust evidence and continuous monitoring (VENDITTOLI; GIRARD; BONNOMET, 2022; WIGNADASAN; HADDAD, 2023).

In the context of post-operative complications, deep infection remains one of the main clinical challenges of total hip arthroplasty. Vendittoli et al. (2022) highlight the importance of rigorous preventive measures, such as optimizing risk factors (glycemic control, smoking cessation and correction of anemia), weight-adapted antibiotic prophylaxis and the use of modern antiseptic solutions such as the combination of chlorhexidine gluconate and isopropyl alcohol. In addition to prevention, effective treatment of chronic infections requires approaches such as two-stage revision using antibiotic-loaded cement spacers. Recent studies suggest that, in patients with solid fixation and good functional response, these spacers can even be maintained as a definitive solution, challenging conventional practices. These advances reflect not only technical sophistication, but also the need for individualized therapeutic decisions based on strict clinical criteria (VENDITTOLI; GIRARD; BONNOMET, 2022).

CONCLUSION

Total hip arthroplasty (THA) remains one of the most effective surgical procedures in contemporary orthopedics, offering pain relief and functional recovery in patients with advanced joint pathologies. However, the evolution of surgical techniques and the expansion of clinical indications reveal new points of tension between innovation, safety and effectiveness.

Minimally invasive approaches, although associated with accelerated recovery, still show functional limitations related to persistent muscle and neurological injuries, even when performed with technical precision. This evidence reinforces the need for highly individualized surgical planning, which takes into account the patient's anatomy, biotype and clinical complexity.

The outpatient modality of THA has emerged as a promising alternative for rationalizing resources and reducing hospital costs, as long as it is supported by objective discharge criteria, early rehabilitation and continuous multidisciplinary support. In the same vein, deep infection remains one of the main adversities of the procedure, requiring both optimized prophylactic strategies and innovative therapeutic approaches - such as the maintenance of antibiotic-impregnated spacers in selected cases.

Given this scenario, the contemporary challenges of THA go beyond operative technique and demand a systemic and integrated approach, based on robust evidence, therapeutic personalization and a critical review of traditional practices. Sustainable progress in hip arthroplasty will therefore depend on the ability to reconcile technological innovation with humanized care and excellence in clinical decision-making.

Therefore, the current situation of total hip arthroplasty highlights not only technical progress, but also the demand for constant updating of clinical practices, with the aim of incorporating scientific evidence to improve patients' health and quality of life. The future challenge is to find a balance between the effectiveness of surgical techniques and patient protection, encouraging practices that enhance positive long-term results. It is crucial to carry out constant studies and apply solid practices to improve results and patient satisfaction, consolidating total hip arthroplasty as a crucial but demanding intervention in the field of orthopaedics

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