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Robotic vs. Open Radical Prostatectomy in Prostate Cancer: A Contemporary, Functional, and Cost-Effectiveness Analysis

Robot-assisted versus open radical prostatectomy in prostate cancer: a contemporary analysis of clinical, functional, and cost-effectiveness outcomes

Robotic vs. robotic prostatectomy Open radical in prostate cancer: a contemporary, functional and cost-effective analysis

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Abstract: Prostate cancer is one of the most prevalent malignant neoplasms among men, with radical prostatectomy being one of the main therapeutic options for localized disease. With the introduction of robotic surgery, techniques have expanded, raising questions about their clinical, functional, and economic benefits compared to the open approach. This study aimed to compare the clinical, functional, and economic results of robotic surgery versus conventional surgery in the treatment of prostate cancer through an integrative literature review. The search was conducted in the PubMed, SciELO, and LILACS databases, including studies published between 2021 and 2025, in Portuguese and English. After applying the eligibility criteria, 21 studies were included. The results demonstrate that robotic surgery presents superiority in perioperative outcomes, with less blood loss, less need for transfusion, and shorter hospital stay. In contrast, oncological outcomes, such as positive surgical margins and biochemical recurrence, are equivalent between the techniques. In terms of functionality, robotic surgery shows better early recovery of urinary continence and erectile function, although these differences decrease over time. From an economic standpoint, robotic surgery has higher costs, and its cost-effectiveness depends on institutional capacity. In Brazil, its availability is still limited, impacting equitable access. In conclusion, robotic surgery offers advantages in postoperative recovery, without oncological superiority, and its indication should be individualized.

Keywords: Prostate cancer. Radical prostatectomy. Robotic surgery. Surgical outcomes. Cost-effectiveness.

Abstract: Prostate cancer is one of the most prevalent malignant neoplasms among men, and radical prostatectomy remains one of the main therapeutic options for localized disease. With the introduction of robotic surgery, surgical techniques have expanded, raising questions regarding its clinical, functional, and economic benefits compared with the open approach. This study aimed to compare the clinical, functional, and economic outcomes of robotic surgery with those of

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conventional surgery in the treatment of prostate cancer through an integrative literature review. The search was conducted in the PubMed, SciELO, and LILACS databases, including studies published between 2021 and 2025 in Portuguese and English. After applying the eligibility criteria, 21 studies were included. The results demonstrate that robotic surgery shows superiority in perioperative outcomes, with lower blood loss, reduced need for transfusion, and shorter hospital stay. In contrast, oncological outcomes, such as positive surgical margins and biochemical recurrence, appear to be equivalent between techniques. Regarding functional outcomes, earlier recovery of urinary continence and erectile function was observed with the robotic approach, although these differences tend to diminish over time. From an economic perspective, robotic surgery presents higher costs, with cost-effectiveness depending on institutional surgical volume.

In Brazil, its availability remains limited, which impacts equity of access. We conclude that robotic surgery offers advantages in postoperative recovery without oncological superiority, so its indication should be individualized.

Keywords: Prostate Cancer. Radical Prostatectomy. Robotic Surgery. Surgical Outcomes. Cost-Effectiveness.

1. Introduction

Prostate cancer is one of the most prevalent malignant neoplasms in the population. male and constitutes a major public health problem on a global scale. It is estimated that It is the second most common type of cancer among men worldwide, with a significant impact. in morbidity and mortality rates, especially in countries with higher life expectancy. (SUNG et al., 2021; BRAY et al., 2024; SIEGEL et al., 2024). In the Brazilian context, its high The increasing incidence reinforces the need for increasingly effective diagnostic and therapeutic strategies. capable of reducing complications and improving the quality of life of patients (INCA, 2023).

From a clinical standpoint, prostate cancer presents a heterogeneous evolution, varying from ranging from indolent forms to aggressive cases with metastatic potential. This variability imposes Challenges in choosing the most appropriate treatment, requiring an individualized approach. based on factors such as tumor stage, age, comorbidities, and life expectancy (MOTTET et al., 2024; UAE GUIDELINES, 2024). Radical prostatectomy remains one of the main therapeutic options for patients with localized disease, with proven efficacy in oncological control and cancer-specific survival (HAMDY et al., 2023; NCCN, 2024).

Traditionally, radical prostatectomy was performed via open surgery, a widely used technique. Widespread and considered standard for decades. Despite its effectiveness, this method is associated greater surgical trauma, blood loss and prolonged postoperative recovery (NOVARA et al., 2021; CUMMINGS et al., 2022).

Robot-assisted surgery has emerged as a significant technological innovation in urology. modern design, allowing for greater surgical precision, instrument stability, and visualization. Enlarged three-dimensional view of the operative field. These characteristics favor the preservation of the

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neurovascular bundles related to urinary continence and erectile function, contributing to better functional outcomes in the postoperative period (COSTELLO et al., 2022; MOSCHINI et al., 2023).

Recent literature demonstrates that robotic surgery is associated with better outcomes. perioperative benefits include less blood loss, reduced need for transfusions, and shorter time. hospital stays. However, oncological outcomes remain similar between the robotic approach and conventional surgery (CUMMINGS et al., 2022; BEZERRA et al., 2024; UAE, 2024).

Therefore, the incorporation of robotic surgery into clinical practice raises relevant questions. Regarding its economic viability, the high cost of robotic systems and maintenance is a concern. Technological innovation constitutes one of the main obstacles to its widespread implementation (HYNDMAN et al., 2023; LOTAN; CRESS, 2022).

Another relevant aspect refers to the learning curve associated with robotics technology. Evidence suggests that centers with higher surgical volume have better outcomes. clinical and functional benefits, reinforcing the role of institutional experience in consolidating those benefits. of this technology (ABE et al., 2022).

Given this scenario, a critical and integrated analysis of the evidence becomes essential. available, considering not only clinical and functional outcomes, but also aspects economic and structural factors related to the incorporation of this technology. The present study aims to The objective is to compare the clinical, functional, and economic outcomes of robotic surgery in relation to... to conventional surgery in the treatment of prostate cancer, based on recent scientific literature.

2. Theoretical Framework

2.1 Prostate cancer: concept, biological heterogeneity and clinical implications

Prostate cancer is a malignant neoplasm of predominantly epithelial origin. derived from prostatic glandular cells, characterized by significant heterogeneity biological, molecular, and clinical. This variability is reflected in tumor behavior, which can ranging from indolent forms to aggressive diseases with metastatic potential, influencing directly impact prognosis and therapeutic choice (EAU GUIDELINES, 2024; NCCN, 2024).

From a histopathological point of view, most cases correspond to adenocarcinoma. Acinar, whose aggressiveness is traditionally assessed by the Gleason score, currently incorporated into the International Society of Urological Pathology's Grade Group system, which

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allows for more precise prognostic stratification and guidance of therapeutic strategies (EAU) GUIDELINES, 2024; NCCN, 2024).

At the molecular level, prostate cancer exhibits recurrent genetic alterations. involving tumor suppressor genes, such as PTEN and TP53, as well as gene rearrangements such as TMPRSS2-ERG fusion, associated with tumor progression and activation of proliferative pathways. intracellular, especially the PI3K/AKT/mTOR pathway (ATTARD et al., 2022; TEOH et al., 2023).

Androgen signaling remains the main pathophysiological axis of the disease. The binding of dihydrotestosterone to the intracellular androgen receptor regulates gene transcription. related to cell proliferation and tumor survival. Although most early tumors Whether hormone-dependent, adaptive mechanisms can lead to the development of resistance. to castration, characterizing more advanced stages of the disease (ATTARD et al., 2022).

In addition to genetic and hormonal changes, the tumor microenvironment plays a role. Relevant in the progression of prostate cancer. The interaction between neoplastic cells, fibroblasts Associated with the tumor and inflammatory mediators, it favors angiogenesis, tissue invasion, and... metastatic spread, particularly to the axial skeleton, a preferred site for metastases. in advanced disease (TEOH et al., 2023).

From a clinical standpoint, prostate cancer often progresses asymptomatically in Early stages, primarily diagnosed through prostate-specific antigen (PSA) testing. specific (PSA) and digital rectal examination. However, the low specificity of PSA can lead to Overdiagnosis of low-risk tumors, reinforcing the importance of proper stratification. to avoid overtreatment (MOTTET et al., 2024).

In this context, understanding tumor heterogeneity is an element fundamental for individualized therapy. Strategies such as active surveillance are recommended for low-risk tumors, while curative approaches, including Radical prostatectomy is indicated for patients with a higher probability of clinical progression. (UAE, 2024; NCCN, 2024).

2.2 Conventional radical prostatectomy: surgical technique, limitations and functional impact

Conventional radical prostatectomy via the retropubic approach remains one of the main surgical approaches for the treatment of localized prostate cancer, consisting of complete resection of the prostate and seminal vesicles, with pelvic lymphadenectomy when indicated, which allows local control of the disease and proper pathological staging (EAU) GUIDELINES, 2024).

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The procedure is based on the dissection of the Retzius space, in the control of the complex. dorsal venous access and the release of the prostate from its adjacent structures are critical steps for the preservation of urinary continence and erectile function. However, the two-dimensional visualization of The surgical field size and lower anatomical magnification can hinder the precise identification of... fascial planes and neurovascular structures, especially in deep pelvic regions. male (NOVARA et al., 2021; CUMMINGS et al., 2022).

Preserving the neurovascular bundles represents one of the main challenges of the technique. open, since injuries from traction, section, or vascular compromise can result in Transient or permanent erectile dysfunction. Similarly, the integrity of the urethral sphincter. External and periurethral structures play a key role in the recovery of continence. urinary tract in the postoperative period (MOTTET et al., 2024).

Another relevant aspect concerns intraoperative blood loss, which is traditionally greater. in the open approach due to the rich prostatic vascularization and the absence of the hemostatic effect of Pneumoperitoneum is present in minimally invasive techniques. This factor can increase the risk of injury. need for blood transfusion and prolonging hospital recovery time (CUMMINGS) et al., 2022).

Furthermore, the greater the extent of the surgical incision and the more significant tissue trauma. They are associated with a more intense systemic inflammatory response, which contributes to greater pain. post-operative and for a slower functional recovery compared to other approaches minimally invasive (MOSCHINI et al., 2023).

Despite these limitations, conventional radical prostatectomy offers good results. well-established oncological studies over decades, with consistent rates of biochemical control. The disease is managed when performed by experienced teams. In high-volume surgical centers, the Functional outcomes may approach those observed in robotic surgery, reinforcing the role the surgeon's experience as an important determinant of postoperative outcomes (ABE et al., 2022).

Additionally, the wide availability of the technique and its lower dependence on Advanced technological infrastructure keeps open surgery as a therapeutic option. This is particularly relevant in healthcare systems with limited resources. In this context, the choice The surgical approach should consider not only technical and clinical aspects, but also Structural factors and access to treatment.

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2.3 Robotic surgery: technological basis, surgical precision and clinical implications

Robot-assisted surgery represents one of the major technological innovations in Modern urology, especially in performing radical prostatectomy for cancer treatment. localized prostate. This approach is based on telemanipulated systems that allow for greater instrumental precision, stability of movements and enhanced three-dimensional visualization of operating field, facilitating the identification of critical anatomical structures during dissection. pelvic (MOSCHINI et al., 2023; COSTELLO et al., 2022).

Three-dimensional magnification , associated with tremor filtering and greater amplitude of The movement of the robotic instruments allows for a more refined dissection of the fascial planes. and a more precise preservation of the neurovascular bundles related to urinary continence and to erectile function. These factors contribute to better early functional outcomes when compared to the conventional open technique (CUMMINGS et al., 2022).

With regard to urinary continence, the preservation of functional urethral length and The stability of the periurethral support structures is enhanced by the precision of the urethrovesical anastomosis in the robotic approach, which is associated with a faster recovery of continence in the post-operative period. initial operative period (ABE et al., 2022).

Another relevant aspect refers to the reduction of intraoperative blood loss, attributed mainly due to the hemostatic effect of pneumoperitoneum and the improved visualization of structures. vascular. These factors contribute to a lower need for blood transfusions and to... reduction of hospital stay time (BEZERRA et al., 2024).

Furthermore, the reduced tissue damage observed in robotic surgery is associated with reduction of the systemic inflammatory response and faster functional recovery, which favors a faster return to usual activities compared to the open approach (HYNDMAN et al., 2023).

Despite these advantages, robotic surgery has important limitations. The absence Direct tactile feedback requires greater reliance on visual interpretation during dissection. surgical, which can represent a technical challenge in the initial stages of the learning curve. Studies show that achieving consistent results is directly related to institutional volume and the experience of the surgical team (EAU GUIDELINES, 2024).

Another limiting factor relates to the high cost of acquiring and maintaining the systems. Robotics, in addition to the need for specialized training and technological infrastructure. advanced, which restricts its widespread dissemination, especially in public health systems and in middle-income countries (LOTAN; CRESS, 2022).

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Therefore, robotic surgery should be understood as a technology capable of...
to enhance surgical precision and improve certain perioperative and functional outcomes,
although its benefits depend directly on the team's experience and the surgical volume.
institutional and structural conditions available for its implementation.

3. Materials and Methods

This study consists of an integrative literature review, descriptive in nature and
exploratory, conducted with the aim of synthesizing recent scientific evidence on the
Clinical, functional, and economic outcomes of robot-assisted radical prostatectomy , in
Comparison with conventional radical prostatectomy in the treatment of prostate cancer.
located.

The review was guided by the following question: What are the clinical outcomes?
Functional and economic aspects of robotic surgery compared to radical prostatectomy.
What is conventional medicine in the treatment of localized prostate cancer?

The bibliographic search was conducted in the databases of the National Library of Medicine of
United States (PubMed), Scientific Electronic Library Online (SciELO) and Latin American Literature
The Latin American and Caribbean Health Sciences Literature (LILACS), selected for their relevance in
Indexing of clinical and surgical studies in the field of urology.

For the search strategy, controlled descriptors (MeSH/DeCS) and terms were used.
Free in English and Portuguese, combined with the Boolean operators AND and OR. At the base
The following strategy was used in PubMed/MEDLINE: (“prostate cancer”) AND (“radical
prostatectomy”) AND (“robot-assisted surgery” OR “robotic prostatectomy”) AND (“open
prostatectomy”) AND (“clinical outcomes” OR “functional outcomes” OR “oncologic outcomes”
OR “cost-effectiveness”)

In the SciELO and LILACS databases, the strategy was adapted according to the available descriptors:
(“prostate cancer”) AND (“radical prostatectomy”) AND (“robotic surgery”) AND (“outcomes”)
clinical” OR “functional outcomes” OR “oncological outcomes” OR “cost-effectiveness”)

Studies published between 2021 and 2025, in both Portuguese and English, were included.
They directly addressed the comparison between open radical prostatectomy and robotic surgery.
considering perioperative, oncological, functional and/or economic outcomes. They were
Eligible studies considered to include randomized clinical trials, observational cohort studies, and...
Systematic reviews with a high level of evidence and full text available.

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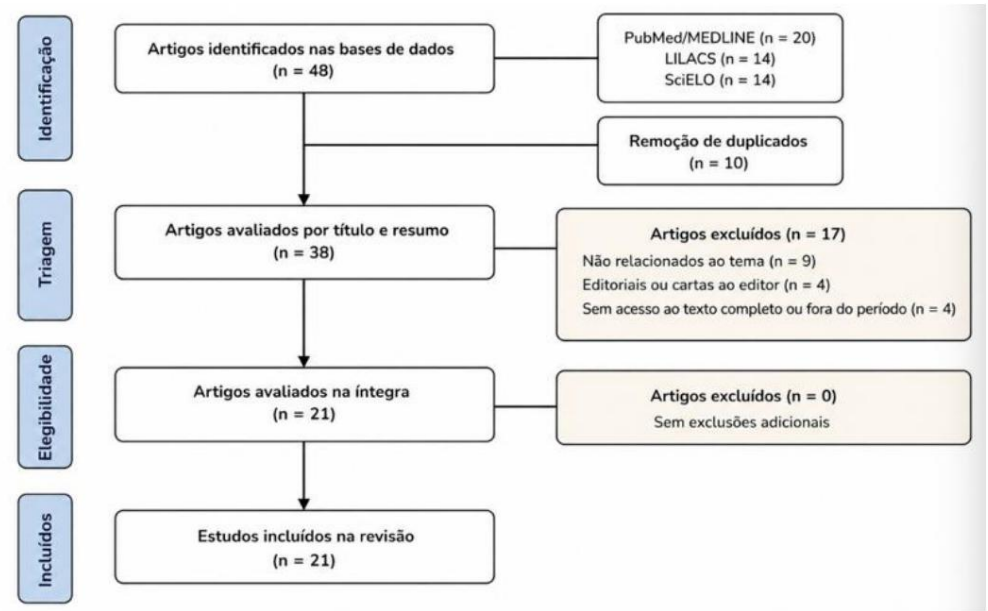
Duplicate articles across the consulted databases, editorials, and letters to the editor were excluded. case reports, narrative reviews, dissertations, monographs, and studies that did not present Directly related to the research objective.

The study selection process was carried out in sequential stages. Initially, The articles were identified in the selected databases, followed by the removal of duplicates. Subsequently, screening was carried out by reading titles and abstracts, excluding those... Studies that did not meet the previously established eligibility criteria. The articles Potentially relevant texts were submitted for full reading for final evaluation.

At the end of the search process, 48 studies were identified. After removing 10 After considering duplicates, 38 articles remained for initial screening. Of these, 17 studies were excluded after... The remaining 21 articles were rejected based on titles and abstracts, as they did not meet the established criteria. The studies were evaluated in their entirety, with no additional exclusions at this stage. Thus, 21 studies were evaluated. were considered eligible and included in the analysis of this review.

The process of identifying, screening, and including studies was conducted in accordance with the recommendations from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), adapted to the methodological design of integrative reviews, as represented in the flowchart in Figure 1.

Figure 1. Flowchart of the identification, screening, eligibility, and inclusion process of studies, according to the PRISMA recommendations adapted for integrative review.



Source: Authors, 2026.

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4. Results and Discussion

The integrated analysis of the 21 studies included in this review shows that the comparison between Open radical prostatectomy and robot-assisted radical prostatectomy should be interpreted in the context of... light from multiple clinical and structural domains, including perioperative outcomes, control Oncological, functional recovery, and economic viability.

The main methodological characteristics of the studies included in the integrative review are summarized in Table 1.

Table 1. Analysis of the content of the articles

Author / Year of	Design	Patient numbers	Perioperative outcomes	Outcomes cancers	Functional outcomes
Abe et al., 2022	Prospective cohort	420	Anatomical preservation recovery	Biochemical relapse similar	Periurethral early urinary tract infection
ANS, 2024	Regulation of supplementary health insurance —	in	Expansion of access to robotic functional surgery.	Not applicable	Potentially improves population
Attard et al.,	Review 2022 molecular — Not applicable	clinic		Stratification impact of the tumor risk de	Indirect biological in cision. therapy
Bezerra et al.,	2024 retrospective	380	Reduced loss blood transfusion	Survival and equivalent	Better initial continence
al. study, epide	Bray et miological 2024 global	— Not applicable		High-impact global strategy	Indirect impact in therapy
CONITEC, 2023	Evaluation technological —		Reduction of of early perioperative complications	Oncological equivalence	Functional improvement early
Costello et al.,	2022 Clinical review —		Neurovascular dissection plus	Cancer control similar	Best function needed premature erectile dysfunction
Cummings et al., 2022	Multicenter cohort	2,300	Lower loss blood count, and reduced hospitalization	Equivalent margins	Early functional recovery
UAE Guidelines, 2024	International guideline al	—	Less bleeding equivalence	Intraoperative oncological	Superior early continence
et al., 2023: Clinical	Study Efficacy Similar to Individ Comparative — Not applicable		ualization.	between strategies	Importance of Hamdy therapy
Hyndman et al.,	2023, Assessment of Dependence on economic —		Indirect Impact, No Difference institutional volume	significant	in recovery

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INCA, 2023	Epidemiological report national	Not applicable.		High incidence in the	Indirect impact organization of the national Careful
Lotan and Cress, 2022	Economic Analysis—		Initial costs plus oncology	No difference significant	High benefits early functional
Moschini et al., 2023	retrospective	1,200	Lower morbidity continence	Recurrence similar	Perioperative early urinary tract infection
Mottet et al., 2024	Guideline clinic European	—	Favorable perioperative outcomes	Cancer control	Similar recovery early functional
NCCN, 2024	International guideline —		Perioperative outcomes recovery	Tumor control similar	Favorable early functional
Nice, 2022	Revision technological —		Time reduction recovery setting.	No initial functional difference significant	Hospitalization in the hospital superior
Novara et al., 2021	Meta-analysis Study Sung	>10,000	Lower complication rate margins	Perioperative similar	Superior erectile early function
epidemiological	et al., 2021 global	Not applicable.		World- incidence, class	Indirect impact, therapeutic strategy in
Siegel et al., 2024	Report Epidemiological — Not applicable			High incidence and mortality	Indirect impact associated in clinical decision-making
Teoh et al., 2023	Molecular review — Not applicable			Genetic alterations associated with tumor	Indirect impacts progression stratification. risk

In general, there is consistent convergence in the literature regarding the advantages. perioperative aspects of the robotic approach, while maintaining equivalence In oncological cases, the difference between techniques and functional superiority is predominantly limited to the period. early postoperative period.

The relevance of this comparative analysis becomes even more evident given the high level of... global incidence of prostate cancer, currently considered the second most common malignant neoplasm. frequent among men worldwide, as described by Sung et al. (2021), Bray et al. (2024) and Siegel et al. (2024). The progressive increase in male life expectancy has contributed to a greater diagnosis of potentially curable localized tumors, expanding the role of Radical prostatectomy as a first-line therapeutic modality in selected patients (UAE, 2024; NCCN, 2024).

Regarding perioperative outcomes, Cummings et al. (2022) and Bezerra et al. (2024) demonstrated a significant reduction in intraoperative blood loss and less need of transfusion in robotic surgery, findings corroborated by Moschini et al. (2023), who They showed lower perioperative morbidity, especially in high-volume surgical centers.

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These results suggest that the observed benefits do not stem exclusively from the pathway.
minimally invasive, but rather from the association between the three-dimensional magnification of the field.
Operative efficiency, instrumental precision, and greater vascular control during prostate dissection.

In this context, international recommendations from the European Association of Urology (EAU)
Studies from the National Comprehensive Cancer Network (NCCN, 2024) reinforce that surgery
Robotics is associated with a reduction in perioperative complications and shorter hospital stays.
hospital-based treatment when compared to conventional open radical prostatectomy, especially in
centers with greater surgical experience. Such evidence supports the consolidation of the approach.
Robotics as a safe and effective alternative in the management of localized disease.

Regarding oncological outcomes, contemporary literature demonstrates equivalence.
between the two techniques regarding the rates of positive surgical margins, biochemical recurrence and
of cancer-specific survival. The meta-analysis conducted by Novara et al. (2021) showed
the absence of significant differences in these parameters between robotic and open prostatectomy,
reinforcing that oncological radicality is more associated with the surgeon's experience and...
The appropriate selection of patients is more important than the surgical approach used. Similarly, the
Recommendations from the National Institute for Health and Care Excellence (NICE, 2022) indicate that
Both approaches show comparable efficacy in long-term tumor control, and should
The choice of technique should consider functional, structural, and institutional factors.

The interpretation of these findings must consider the biological heterogeneity of cancer.
Prostate cancer, characterized by different molecular profiles and tumor progression patterns. Studies
Studies conducted by Attard et al. (2022) and Teoh et al. (2023) demonstrate that genetic alterations
involving tumor suppressor genes, intracellular proliferative pathways, and mechanisms of
Androgen signaling directly influences the clinical behavior of the disease, reinforcing the
need for individualized therapeutic strategies based on oncological risk and profile.
clinical care for patients.

Functional outcomes constitute the main point of differentiation between the approaches.
surgical procedures analyzed. Abe et al. (2022) demonstrated earlier recovery of continence.
urinary tract in patients undergoing robotic prostatectomy, while Costello et al. (2022)
They observed greater preservation of initial erectile function, attributed to more precise dissection of the bundles.
neurovascular issues and better preservation of periurethral structures. These findings reinforce the role
of three-dimensional magnification and greater freedom of instrumental movement in the optimization of
anatomical preservation during the surgical procedure.

According to Moschin and colleagues (2023), such functional differences tend to be reduced to
over the long term of late follow-up, suggesting that the functional benefit of the robotic approach is more

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related to the speed of postoperative recovery rather than to absolute long-term differences.
deadline. This interpretation reinforces the importance of considering the follow-up time as a variable.
crucial in the comparative analysis between surgical techniques.

Another relevant aspect in the comparative interpretation between robotic radical prostatectomy and the open term refers to the influence of the surgical learning curve on clinical outcomes and functional. According to Hyndman et al. (2023), obtaining consistent results in surgery Robotics is directly associated with institutional size and the technical standardization of teams. surgical centers with more surgical experience have lower complication rates. perioperative and better functional outcomes, regardless of the technique used, which This demonstrates that institutional experience is a determining factor in the consolidation of benefits attributed to robotics technology.

The interpretation of comparative results should consider possible methodological biases. present in the included studies, especially those related to patient selection. In several Observational studies show that patients undergoing robotic surgery have a more clinical profile. favorable and greater access to specialized centers (CUMMINGS et al., 2022; MOSCHINI et al., 2023; BEZERRA et al., 2024), which may partially influence functional outcomes. observed. Therefore, the early functional superiority described in the literature should be This should be interpreted with caution, considering the heterogeneity of the populations analyzed.

In the field of health economics, Lotan and Cress (2022) demonstrated greater heterogeneity in robotic surgery, as it presents significantly higher initial costs. superiors, especially those related to the acquisition and maintenance of robotic systems, while Hyndman et al. (2023) showed that its cost-effectiveness depends directly on the volume. institutional and organizational aspects of surgical services. These results indicate that the incorporation This technology should be analyzed within a broader structural context, considering its efficiency. operational and installed capacity.

In high-income countries, especially the United States and European nations, surgery Robotics has progressively become the primary approach to radical prostatectomy. driven by greater technological availability and the centralization of procedures in referral hospitals. A study conducted by Costello et al. (2022) showed The technique can achieve acceptable levels of cost-effectiveness when combined with a reduction in... perioperative morbidity and early functional recovery of patients.

Studies conducted by NICE (2022), Hyndman et al. (2023) and CONITEC (2023) They pointed out differences in the organization of health systems between high-income and low-income countries. average, like Brazil. In contexts with greater technological availability, robotic surgery

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It has become established as the predominant surgical access route, while in systems with limitations structural issues, however, remain restricted to specialized centers. This inequality Technology directly impacts equity in access to surgical cancer treatment.

In the Brazilian context, the favorable recommendation from the National Commission for the Incorporation of Technologies in the Unified Health System (CONITEC, 2023) represents an important milestone in expanding access to robot-assisted radical prostatectomy, although its implementation remain contingent upon the regionalization of care and the concentration of procedures in Reference centers. In parallel, the inclusion of robotic surgery in the range of procedures. mandatory requirements of the National Supplementary Health Agency (ANS, 2024), with implementation planned By 2026, the trend is to expand access in the supplementary sector and stimulate capacity expansion. installed in the country.

Despite these institutional advances, the sustainability of robotic surgery in the context National healthcare remains dependent on the organization of health services and the qualifications of the teams. Surgical strategies and the centralization of procedures in high-volume units. Strategies based on Regionalization of healthcare services can contribute to the optimization of resources and the improvement of... clinical outcomes, reducing structural inequalities in access to surgical technologies advanced.

Additionally, the integrated analysis of studies by Cummings et al., 2022; Moschini et al., 2023; Bezerra et al., 2024 and Novara et al., 2021 demonstrated the superiority of robotic surgery It focuses primarily on perioperative and early functional outcomes, while the Oncological outcomes remain equivalent across techniques. This pattern suggests that the The main contribution of robotic technology does not lie in expanding the radicality of surgery, but in optimizing postoperative recovery and reducing morbidity associated with the procedure.

Individualized therapy remains a central element in choosing the approach. most appropriate surgical procedure. According to Hamdy et al. (2023), factors such as tumor risk, age, Life expectancy and comorbidities directly influence the choice of curative strategies. invasive, reinforcing the need for integration between clinical, biological and structural factors in therapeutic decision-making.

From a forward-looking perspective, it is projected that the evolution of robotic technologies and the greater Offering specialized training helps reduce costs and broaden access to... technique. For this modality to become a widely available standard, it will be essential integrating technological progress with high-level qualification and the economic sustainability of health institutions

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Final Considerations

The integrative review demonstrated that robot-assisted radical prostatectomy presents Consistent advantages in perioperative outcomes, especially in reducing blood loss. intraoperative, resulting in shorter hospital stays and early functional recovery of urinary continence and erectile function, when compared to open radical prostatectomy. However, the oncological outcomes proved to be equivalent between the techniques, indicating that the Surgical radicality is more related to the team's experience and the institutional volume of... that refers to the access route used.

Although robotic surgery has higher initial costs, its cost-effectiveness It depends on the organization of services and the concentration of procedures in centers. specialized. In the Brazilian context, its progressive incorporation represents progress. important, although challenges related to equity in access persist.

Therefore, robotic surgery constitutes a safe and effective alternative in the treatment of cancer. localized prostate surgery, with particularly evident benefits in postoperative recovery. early intervention, and its indication should be individualized according to the clinical characteristics of the patients. patients and the structural availability of health services.

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