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CLINICAL ADVANTAGES OF LAPAROSCOPIC CHOLECYSTECTOMY: EFFECTS ON RECOVERY AND PATIENT SATISFACTION OVER THE OPEN APPROACH

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ABSTRACT

Cholecystectomy is a surgical procedure aimed at removing the gallbladder, and is commonly used in the treatment of conditions such as symptomatic cholelithiasis and various gallbladder-related diseases. With advances in surgical techniques, laparoscopic cholecystectomy has become the preferred approach in many cases, replacing the conventional open technique. The objective of this integrative review is to analyze the advantages of laparoscopic cholecystectomy compared to conventional surgery, focusing on aspects such as recovery time, postoperative pain, complications, costs, and aesthetic results. The methodology included searches in databases such as PubMed, Scopus, and SciELO, covering studies published in the last 20 years. Inclusion criteria included systematic reviews, clinical trials, and observational studies that compared both surgical approaches. The results indicate that laparoscopic cholecystectomy offers significantly shorter recovery times, allowing patients to quickly return to daily activities. Additionally, this technique is associated with reduced levels of postoperative pain and a lower rate of complications, such as infections and hernias. The aesthetic results are also superior, with less visible scars. Although the initial costs of laparoscopy may be higher, the cost-effectiveness analysis suggests that in the long run, it may be more cost-effective due to the reduction in length of hospital stay and postoperative care. This review provides a comprehensive overview of the benefits of laparoscopic cholecystectomy and its implications for clinical practice and public health.

Keywords: Laparoscopic Surgery. Cholecystectomy. Conventional Surgery. Benefits. Advantages.

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INTRODUCTION

Cholecystectomy, or surgical removal of the gallbladder, is one of the most commonly performed surgeries worldwide, playing an essential role in the treatment of conditions such as cholelithiasis (presence of gallstones) and acute cholecystitis (inflammation of the gallbladder). Before the advent of modern techniques, this procedure was performed through open surgery, which involved a larger abdominal incision. This approach brought a number of challenges, such as increased recovery time, a higher risk of postoperative complications such as infections and bleeding, and a more painful recovery for the patient.

However, with the emergence of laparoscopic surgery in the 1980s, a new era of minimally invasive procedures began to emerge. Laparoscopic cholecystectomy, in particular, stood out as a milestone in the evolution of surgical practices, allowing the removal of the gallbladder through small incisions and the use of a camera to guide the surgeon. This technique has revolutionized the treatment of biliary conditions, bringing numerous benefits, such as shorter hospital stays, faster recovery, less postoperative pain, and better aesthetic results.

The advancement of minimally invasive surgical techniques, such as laparoscopy, has been a game-changer in contemporary medicine, transforming the way procedures are performed and offering significant improvements in clinical outcomes. In the case of cholecystectomy, laparoscopy has established itself as the gold standard for the treatment of gallbladder diseases, largely replacing the traditional open approach. This change is justified by the numerous advantages offered by the minimally invasive technique, which include faster recovery, fewer complications, better pain control, and lower hospital costs.

However, despite the widespread use of laparoscopy, there is still a need for critical and evidence-based analysis to consolidate best practices and guide clinical decision-making. Given the constant evolution of surgical techniques and the emergence of new technologies, it becomes crucial to revisit the data and systematically examine the advantages of laparoscopic cholecystectomy compared to open surgery. This review seeks to provide a solid foundation for healthcare professionals, allowing for more informed decisions that ensure better outcomes for patients.

The aim of this integrative review is to systematically analyze the advantages of laparoscopic cholecystectomy over open cholecystectomy. Aspects such as postoperative recovery, pain, complication rates, cost-effectiveness, aesthetic results, and patient satisfaction levels were examined. The analysis seeks to consolidate the available evidence, offering a clear overview of the differences between the two surgical approaches,

in order to contribute to the choice of the best therapeutic strategy in the current clinical context.

THEORETICAL FRAMEWORK

Minimally invasive surgery, also known as video-surgery, represents one of the biggest revolutions in the field of abdominal surgery in recent decades. Laparoscopy, in particular, is the most widely used technique and stands out for its ability to perform surgical procedures through small incisions, as opposed to the large openings required by traditional surgery. In cholecystectomy, this technique involves inserting surgical instruments and a high-definition camera (laparoscope) through small incisions in the abdomen. The camera allows a detailed and enlarged view of the internal structures, providing greater surgical precision and better control during operation (Neudecker et al., 2002).

The main advantage of laparoscopy over open surgery is the minimization of tissue trauma. The use of smaller incisions significantly reduces postoperative pain, improves recovery time, and decreases the likelihood of complications such as surgical wound infections, bleeding, and incisional hernias (Tsimoyiannis et al., 1998). Studies indicate that patients undergoing laparoscopic cholecystectomy have a shorter hospitalization time and a faster return to daily activities (Keus et al., 2006), generating a positive impact on both patient well-being and hospital costs.

Brazilian studies reinforce these observations. A study conducted at the Hospital das Clínicas of the University of São Paulo (USP) showed that laparoscopic cholecystectomy resulted in less postoperative pain and a faster recovery compared to open surgery, in addition to lower complication rates (Coelho et al., 2003). Another study conducted at the State University of Campinas (Unicamp) confirmed that laparoscopy has significant advantages, such as a reduction in the length of hospital stay and less use of analgesics in the immediate postoperative period (Braga et al., 2007).

On the other hand, conventional open surgery, which requires a larger incision to directly access the gallbladder, still plays a relevant role in some clinical scenarios. In more complex cases, such as patients with previous abdominal surgeries, severe inflammation, or in situations where malignancy is suspected, the open approach may be necessary due to the technical difficulties encountered during laparoscopy (Livingston et al., 2005). However, open surgery is associated with higher rates of postoperative pain, a longer recovery time, and an increased risk of complications, including infections and more visible scarring (Shamiyeh; Wayand, 2004).

In addition to the immediate benefits, laparoscopy also provides better aesthetic results, since the incisions are smaller and less visible. Patients report greater satisfaction with the cosmetic results of laparoscopy compared to open surgery, which can positively influence their quality of life after recovery (Soper et al., 1994). Another Brazilian study conducted at the University Hospital of Brasília indicated that patients who underwent laparoscopy reported greater aesthetic satisfaction and fewer postoperative complications compared to open surgery (Campos et al., 2014).

Therefore, although laparoscopy has become the gold standard for cholecystectomy, open surgery still maintains its relevance in specific situations. The decision about which technique to use should be based on a careful evaluation of the clinical conditions, ensuring safety and the best result for the patient.

METHODOLOGY

For this integrative review, we searched five databases: PubMed, Scopus, Web of Science, SciELO, and LILACS, with the aim of identifying studies that compared laparoscopic cholecystectomy with the open approach. The research covered a period of 20 years, from 2004 to 2024, allowing the inclusion of current and relevant studies. Data collection took place between September and October 2024. Inclusion criteria were used, including systematic reviews, cohort studies, randomized clinical trials, and observational studies. To ensure a robust comparison, studies were selected that directly analyzed the two surgical approaches, focusing on variables such as recovery time, postoperative pain, complications, hospital costs, and patient satisfaction. Studies published in English, Portuguese, or Spanish were considered, as long as they were available in peer-reviewed journals. On the other hand, case reports, articles without direct comparisons between the techniques, and studies with inadequate samples were excluded.

The search strategy involved the use of controlled descriptors and keywords related to the topic, combined by Boolean operators to broaden and refine the results. The main descriptors used included terms such as "Cholecystectomy", "Laparoscopic Cholecystectomy", "Open Abdominal Surgery", "Postoperative Complications", "Recovery Time", "Postoperative Pain", "Surgical Costs" and "Patient Satisfaction". The application of Boolean operators made it possible to combine terms in order to optimize the retrieval of relevant studies, as in the following searches: ("Laparoscopic Cholecystectomy" AND "Open Surgery") AND ("Postoperative Pain" OR "Recovery Time") and ("Cholecystectomy" AND "Laparoscopic" AND "Complications") AND ("Cost-effectiveness" OR "Patient Satisfaction").

The search initially identified a total of 100 articles. After reading the titles and abstracts, 50 studies were selected for a detailed evaluation. Of these, 20 studies were included in the final review because they met the inclusion criteria and had high methodological quality. The quality of the studies was assessed using specific tools, which allowed us to ensure the robustness of the data presented. In addition, the aspects of relevance and scientific contribution of the studies to the field of minimally invasive surgery were considered.

The data extracted from the studies were organized in a systematic manner, considering essential information such as author, year of publication, type of study, sample size, main findings, and conclusions. Data analysis was conducted qualitatively, identifying patterns and divergences in the comparisons between laparoscopic cholecystectomy and open cholecystectomy. In this way, it was possible to evaluate the main clinical outcomes and the practical implications for choosing the most appropriate surgical approach in each clinical context, considering patient safety and postoperative outcomes.

RESULTS

The findings of this review show that laparoscopic cholecystectomy has several advantages over the open surgical technique. Regarding recovery time, studies show that patients undergoing laparoscopy have a significantly faster recovery. According to a Brazilian study by Castro et al. (2017), the average length of hospital stay for laparoscopy was two days, compared to five days for open surgery. In addition, faster recovery allows patients to return to their daily activities more quickly, reducing the economic and social impact of the surgery.

Regarding postoperative pain, laparoscopy stands out. Studies such as the one by Kehlet and Wilmore (2002) show that patients undergoing this technique feel less pain and require less analgesics compared to those who undergo open surgery. This is mainly due to the fact that laparoscopy involves smaller incisions and less tissue trauma, which directly impacts the patient's well-being in the postoperative period.

In terms of postoperative complications, laparoscopic cholecystectomy has a lower incidence of problems such as surgical wound infections, incisional hernias, and adhesions, compared to open surgery. A study conducted by Gurusamy et al. (2010) revealed a substantial reduction in these complications, which was confirmed by Silva et al. (2019), who observed a lower incidence of postoperative infections in Brazilian patients undergoing laparoscopy.

Aesthetic results are also superior in laparoscopy, due to the small incisions, which result in smaller and less visible scars. This improves patient satisfaction, as demonstrated by Li et al. (2014), who highlight the importance of cosmetic outcomes for patients' self-esteem and quality of life. In Brazil, Campos et al. (2014) also reported high levels of aesthetic satisfaction among patients who underwent laparoscopic cholecystectomy.

Another important aspect is the cost-effectiveness of laparoscopy. Although the initial costs of surgery are higher due to the use of specialized equipment, in the long run, this technique proves to be more economical. This is because the hospitalization time is shorter, as well as the need for analgesic drugs and the occurrence of complications, as observed in the study by Santos et al. (2016), which highlighted laparoscopy as a financially viable option in Brazil.

Finally, patient satisfaction and quality of life after surgery are significantly higher in patients undergoing laparoscopic cholecystectomy. Pereira et al. (2020) identified that these patients, in addition to feeling less pain and having a faster recovery, value the aesthetic benefits, which results in a more positive surgical experience. The perception of a smoother and less traumatic recovery directly impacts quality of life, favoring the return to normal activities with less stress and anxiety.

These results demonstrate that laparoscopic cholecystectomy offers a number of benefits over open surgery, both clinically and economically. The minimally invasive technique stands out for its lower pain, faster recovery, fewer complications, and greater patient satisfaction, consolidating itself as the preferred approach in cholecystectomy procedures whenever feasible.

DISCUSSIONS

The findings of this review corroborate the growing preference for laparoscopic cholecystectomy as the surgical technique of choice for gallbladder removal, due to its many advantages over open surgery. The decrease in postoperative pain is one of the most notable aspects of this approach. Studies, such as those by Kehlet and Wilmore (2002), show that laparoscopy results in less tissue trauma, which, in turn, reduces the need for postoperative analgesics. This factor is crucial, not only for patient comfort, but also because it reduces the risk of complications associated with long-term opioid use, which include serious side effects and the risk of addiction.

Faster recovery time also stands out as a key benefit of laparoscopy. As indicated in the Brazilian study by Castro et al. (2017), patients undergoing laparoscopic cholecystectomy are discharged from the hospital in fewer days and return to their daily

activities more quickly. This reduces the social and economic impact of surgery, both for the patient and for the health system, since a shorter hospital stay reduces hospital costs and allows for a greater flow of patients in the operating rooms. In addition, faster recovery directly impacts the quality of life of patients, who can resume their routines with fewer interruptions.

Regarding postoperative complications, laparoscopy remains the preferred approach, with lower rates of infections and incisional hernias compared to open surgery. Gurusamy et al. (2010) demonstrated in a meta-analysis that laparoscopy not only results in fewer complications, but also offers a lower risk of postoperative adhesions, which can prevent future problems. In Brazil, the study by Silva et al. (2019) reinforced these findings, showing that the laparoscopic technique significantly reduces the incidence of complications, particularly postoperative infections, which is essential in a context of nosocomial infection control.

Another relevant point is the improvement in aesthetic results, one of the most frequently mentioned advantages of laparoscopy. Due to the small incisions, patients report greater satisfaction with the cosmetic result, as evidenced by Li et al. (2014). The appearance of scars has a considerable impact on patients' self-esteem and their overall perception of surgery, especially in younger demographics and in individuals with greater aesthetic concerns. This factor, although not directly related to physical health, is an important component of quality of life and should be taken into account when choosing the surgical technique.

However, despite the clear advantages, there are limitations to the widespread adoption of laparoscopy, particularly in regions with limited resources. The need for specialized equipment and technical training of surgical staff can be significant obstacles, especially in healthcare systems with lower investment in technology or in geographic areas with less access to these tools. Santos et al. (2016) highlight that, although laparoscopy may be more cost-effective in the long run, its initial cost is higher, which may discourage its implementation in low-income contexts or in hospitals with restricted budgets.

In addition, open surgery may still be necessary in more complex cases, such as surgeries in patients with multiple comorbidities, severe obesity, or a history of previous abdominal surgeries, which can increase the risk of complications during laparoscopy. As suggested by Pereira et al. (2020), in some situations, a laparoscopy attempt may need to be converted to open surgery, underscoring the importance of a flexible and personalized approach, which takes into account the patient's individual conditions and the surgeon's abilities.

In conclusion, although laparoscopic cholecystectomy offers clear advantages over open surgery, its broad implementation depends on a number of factors, including availability of resources, training of medical staff, and the individual characteristics of patients. Personalization of treatment, taking into account comorbidities, patient preference, and surgeon expertise, remains essential to ensure the safety and efficacy of the procedure.

CONCLUSION

Laparoscopic cholecystectomy has been established as the technique of choice for gallbladder removal, presenting several advantages compared to traditional surgery. Benefits include less postoperative pain, faster recovery, lower incidence of complications, better aesthetic outcomes, and potentially lower long-term costs, as shown by several studies. These factors not only improve the patient experience but also positively impact the healthcare system by reducing the length of hospital stay and the need for additional interventions. Thus, laparoscopy has emerged as the method of choice for most cholecystectomies.

However, challenges remain. One of the main obstacles to the widespread implementation of this technique is the need for adequate infrastructure, including specialized equipment and properly trained surgical teams. In areas with limited resources, such as low-income regions or underfunded healthcare systems, laparoscopy may not be a viable option. These challenges limit universal adoption of the procedure and can perpetuate inequalities in access to quality health care. In addition, complex clinical cases still require open surgery, and it is crucial that surgeons are prepared to perform this conversion when necessary.

Another challenge is related to the lack of consensus on certain aspects of the laparoscopic technique, such as the choice between outpatient surgery and hospitalization. In some studies, outpatient surgery has shown good results, but this practice is not yet widely adopted, and there is a lack of standardized guidelines that can guide clinical decision-making. In addition, the duration of long-term benefits, especially in relation to quality of life and the prevention of future complications, remains an area that requires further research.

Given these limitations, suggestions for future studies include conducting large-scale research evaluating the long-term outcomes of laparoscopic cholecystectomy in different clinical and socioeconomic settings. These studies could explore the impact of laparoscopy on more vulnerable populations, who often have less access to advanced technology and

have complex comorbidities. It would also be valuable to investigate optimized protocols for surgical training in order to expand the adoption of the technique in less favored regions.

In addition, there is room for research examining the development of new technologies and minimally invasive approaches that can further amplify the benefits of laparoscopic cholecystectomy. This includes investigating innovative surgical tools and advanced imaging techniques that could improve visualization during surgery and consequently reduce the complication rate. Evaluating the effectiveness of new analgesia methods and pain management protocols is also a promising field that can contribute to an even more comfortable recovery for patients.

Qualitative research that involves the patient's experience in relation to laparoscopy, including their expectations and perception of aesthetic and functional outcomes, can provide valuable insights that help shape future clinical practices. Investigating patients' preferences regarding the surgical approach, in conjunction with socioeconomic factors, can ensure that treatment decisions are aligned with individual needs, promoting a more patient-centered approach.

Finally, longitudinal studies that analyze the cost-effectiveness of laparoscopy compared to open surgery, considering not only the immediate costs, but also the long-term costs related to complications and quality of life, are fundamental. This data could influence health policy and decisions about financing surgical technologies, helping to ensure that the best methods are available to all patients requiring cholecystectomy.

In summary, laparoscopic cholecystectomy represents an important advance in biliary surgery, providing clear benefits. However, for its benefits to be fully achievable in various contexts, it is essential to face the current challenges and continue to invest in research that promotes continuous improvements in surgical practice. Personalization of treatment, continued education of healthcare providers, and a focus on patient experiences will be crucial to ensure that laparoscopy remains a safe and effective option for all patients requiring cholecystectomy.

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