v. 2, n. 61, 2022

International Journal of Health Science

LIMITATIONS OF VIDEOLAPAROSCOPIC SURGERY IN URGENCY AND EMERGENCY SITUATIONS: A LITERATURE REVIEW

Marcos André Macedo do Vale Silva
IMEPAC-Araguari MG
http://lattes.cnpq.br/0441854499145468

Mariana Ingrid Messias Gonçalves
IMEPAC-Araguari Mg
http://lattes.cnpq.br/786540103853719

Raphaela da Silva Faria
IMEPAC-Araguari MG
http://lattes.cnpq.br/6082547857566465

João Pedro de Castro Ribeiro
IMEPAC-Araguari MG
http://lattes.cnpq.br/1351671837483465

Rafaela Gomes Tomaz da Silva
IMEPAC-Araguari MG
http://lattes.cnpq.br/8955924163160784

Helena Mendes Cunha
IMEPAC-Araguari MG
http://lattes.cnpq.br/2309957530190096

Isabella Guizzetti
IMEPAC-Araguari MG
http://lattes.cnpq.br/6493507486027418

Nicole Melo Calixto
Universidad Privada del Este - Sede Ciudaddel Este
http://lattes.cnpq.br/9571361077485722

Melissa Dias Leal Ribeiro
Uninovafapi University Center
http://lattes.cnpq.br/3924655051201399

Karina de Lima Sobrinho
IMEPAC-Araguari MG
http://lattes.cnpq.br/0851164927926846

Maria Eduarda de Oliveira Najar
IMEPAC-Araguari MG
http://lattes.cnpq.br/7681628043204292

Daniela Jacó Fernandes
IMEPAC-Araguari MG
https://lattes.cnpq.br/2961723074139792

Abstract: Goal: To carry out the analysis and review of available articles on the application of Videolaparoscopic Surgery in urgent and emergency situations, highlighting its limitations and challenges in this context. **Methodology:** The study consists of a literature review carried out between June and August 2022, with a bibliographic survey in the following databases: PubMed, AnalysisAnd Retrieval System Online (MedLine); ScientificElectronic Library Online (SciELO), Google Scholar and LILACS **Results** : 10 articles met the eligibility criteria for the topic and were used to compose the review. Studies have shown that LVC is little explored in the context of urgencies and emergencies, even with potential benefit over open approaches. However, the studies point to the greatest need for resources, specialization and non-adherence by surgeons as the greatest limitations. **Conclusion** : LVC is a viable option to laparotomy in the context of urgencies and emergencies. It is associated with lower morbidity and a better postoperative profile. However, the lack of randomized clinical trials, as well as the costs and the need for surgeons' experience are limitations for the full application of this technique in these situations.

Keywords: Laparoscopic surgery, Urgency, Emergency, Limitations.

INTRODUCTION

Minimally invasive surgery (MIS) is a therapeutic approach based on the abandonment of large incisions to perform surgeries, adopting technological resources that allow smaller cuts to perform the procedures. This type of approach emerged in the 1970s and gained strength over the following decades, with the advent of laparoscopy in the 1980s and robotic surgery in the 1990s (Bezerra et al., 2004).

Initially, these approaches were restricted to specific cases, such as appendectomies, cholecystectomies, and eventually cancers of the gastrointestinal tract. However, over the years and the improvement of surgical techniques, it slowly expanded to other areas, such as gynecology and orthopedics, but with digestive procedures still being the main area of application of CMI (Bezerra et al., 2004)

The option for minimally invasive procedures is associated with a better postoperative period for the patient, as well as a lower probability of complications. Regarding the first aspect, due to less surgical trauma, the patient has a lower metabolic response, reducing the inflammatory and humoral response, postoperative pain and hospital stay. Regarding the lower probability of complications, this is associated with a lower probability of bleeding, shorter surgical time and easier rehabilitation, as well as a more satisfactory aesthetic response to the patient (FERNANDES et al., 2021)

Currently, the most widespread CMI is laparoscopy or videolaparoscopic surgery (LVC). It consists of a surgical technique that is performed with the aid of a camera connected to an optic that is introduced through the abdominal wall and the organs are manipulated by tweezers used by the surgeon. The procedure is performed under general anesthesia, and small incisions are made, made by trochanters, through which the tweezers and optics used to perform the operation will be inserted. The abdomen is inflated with carbon dioxide, a relatively inert gas, to increase cavity space and improve visualization of structures (Ueda et al., 2017).

Laparoscopy has similar or even, depending on the procedure, superior results when compared to laparotomy. The most common laparoscopic surgeries are: bariatric surgery; removal of inflamed organs such as the gallbladder, spleen, or appendix; treatment of abdominal hernias; removal of tumors, such as from the rectum or colon polyps; gynecological surgery, such as hysterectomies, among others (Falcão et al. 2018).

However, regarding its use in the context of emergencies and medical emergencies, such as acute appendicitis or complicated cholecystitis, the indications for laparoscopy are more reserved. In these cases, laparotomy is generally chosen as a surgical approach, even if laparoscopy is still used in specific situations (RODRIGUEZ et al., 2016). Due to this, this study aims to explore the limitations of the use of videolaparoscopy in the context of urgency and emergency, seeking to elucidate its possible advantages and/or disadvantages in these situations.

METHODOLOGY

This is a literature review that is a method that favors analysis and research results without judicious or prospecting purposes. The sequence of steps for the construction of this study was defined. Starting with the elaboration of the guiding question of the research, followed by the search in the literature of the primary studies, soon after, there is the extraction of relevant information contained in the studies that were included in the previous step, as well as their evaluation and, finally, the analysis and synthesis of the review results and the presentation of the literature review.

In that sense, they were defined the inclusion and exclusion criteria. To enter the scope of the study the articles selected had to be original, in addition to being available in full text form, published in Portuguese, English and Spanish, they had to be indexed in the databases defined during the period from January 2010 to June 2022 and which had themes related to the limitations of the CVL in emergency and medical emergencies.

It is also noteworthy that theses, literature reviews and dissertations were excluded, in addition to other works that did not belong to the scope of study. In addition, articles that appear duplicated in searches were considered only once. The literature search was performed in August 2022, in the following databases: PubMed, Analysis And Retrieval System Online (MedLine); Scientific Electronic Library Online (SciELO), Google Scholar and LILACS. Searches were performed using the Descriptors "Laparoscopy", "Videolaparoscopy", "Emergency", "Urgency", with the help of the Boolean operators "AND" and "OR".

RESULTS AND DISCUSSION

A search was carried out in the databases with the descriptors established for the research. A total of 299 studies were found using the descriptors indicated by this study. Of these, 152 were articles and had the full text for evaluation. After applying inclusion and exclusion criteria, 10 articles were selected.

To better elucidate the theme, a table was organized (Table 01) with the main literary findings.

Laparoscopy surgery is considered one of the best options for elective patients. The literature is robust regarding its benefits and advantages over open approaches. However, it conflicts with the conclusions presented in several studies about its use in gastrointestinal emergencies.

The advantages of this approach to emergencies are confused with those of elective surgery. Wright et al. (2014) found a similar success rate for laparoscopy to laparotomy in the treatment and correction of perforated peptic ulcers. Also in this study, a lower incidence of dehiscence of surgical stitches and less severe surgical wound infections was observed when compared to the open approach. It is stated that the adoption of the technique must be accompanied with greater comfort and skill by the surgeon with SVC, aiming at greater success of the procedure.

Yang et al. (2016) evaluated the use of emergency laparoscopy for incarcerated inguinal hernias. Despite the low sample size of the study, it was seen that the use of this technique was not inferior to the conventional one, showing the positive postoperative profile that usually accompanies this type of approach. However, in the same study, it was pointed out that the surgeon's need for experience and greater financial support may be a limiting factor for this type of surgery. In another study, these same conclusions were reached, adding the warning regarding the low number of randomized clinical trials to prove these results (Mancini et al., 2018).

Regarding the resection of tumors, videolaparoscopy is already a consolidated technique for performing this type of procedure. In cases of medical emergency, however, laparotomy is the most used. Valence et al. (2014) evaluated the use of laparoscopy in the removal of tumors from the colorectal region, showing that there was a significant reduction in mortality and postoperative complications in these patients. Added to this, another study evaluated the use of SVC in emergencies in the colorectal region, finding no statistical difference between this approach and the open one, adding that the main difference is in the better postoperative profile. This study also noted the low adherence of physicians to this technique as well as the need for greater specialization for its correct use (Sangster et al., 2015).

Regarding the treatment of complicated diverticular disease in which the surgical treatment failed at first, Letarte et al. (2013) demonstrated that the use of laparoscopy is associated with better success rates and lower morbidity and mortality of the procedure. However, it is stated that this type of approach

Author and Year	Main findings
Vallance et al., 2019	This study showed that the use of laparoscopy in emergency resections of colorectal cancer is associated with a shorter hospital stay and lower postoperative mortality. However, attention must be paid to the severity of the patient and the logistical availability of the operating room.
Mancini et al., 2018	SVC was evaluated for the treatment of incarcerated inguinal hernias. It showed satisfactory results in terms of safety, postoperative quality and patient satisfaction with the outcome of the procedure. However, further prospective studies are needed to confirm the findings.
Tan et al., 2013	drainage of liver abscesses was compared with laparoscopy. Laparoscopy has shown to be a viable percutaneous option for drainage of liver abscesses in medical emergencies. However, the low number of studies undermines this statement.
Kouhia et al., 2010	The use of videolaparoscopic for acute appendicitis surgeries is shown to be equally effective compared to the open approach. In addition, it has a better postoperative profile and faster return of the patient to their routine activities. However, the low number of surgeries performed this way does not allow this conclusion to be made in a forceful way.
Yang et al, 2016	According to this study, the laparoscopic approach represents a safe and effective technique for the correction of incarcerated inguinal hernia due to its potential advantages in the evaluation of the hernia content and in the reduction of the rate of incisional infection. However, it requires experienced surgeons to ensure safety, with special attention to key technical points as well as the management of complications.
Wright et al., 2014	When examining patients with perforated gastric ulcers treated with the laparoscopic approach, it was seen that this was associated with equivalent costs and results when compared to the open technique in a risk-adjusted model. Laparoscopic treatment of patients with this pathology will continue to be a viable option as comfort and skill levels increase with the use of laparoscopy in the area of emergency general surgery.
Bencini et al. 2014	In urgent or emergency choledocholithiasis, the laparoscopic approach was not inferior or superior to the open approach. Therefore, the option to perform laparoscopy in these situations will depend on experience and the availability of resources.
sangster et al., 2015	Laparoscopic surgery has similar results to laparotomy surgery in the treatment of urgent colorectal diseases. The advantage of laparoscopy is centered on the lower number of complications and the more adequate management of the patient's postoperative period. However, the need for greater logistics to perform the surgery is shown to be a limiting factor.
Letarte et al., 2013	Compared with open surgery, laparoscopic surgery for patients in whom medical treatment for complicated diverticular disease has failed was associated with favorable outcomes, including a reduced rate of morbidity and shorter hospital stay. When applied to selected patients, this approach appears to be a safe procedure with a low conversion rate.
Turley et al. 2013	A laparoscopic approach to the Hartmann procedure for the emergency treatment of complicated diverticulitis does not significantly decrease postoperative morbidity or mortality compared to the open technique.

Table 1: Main findings of the articles selected for the literature review.

Source: Own authorship, 2022.

must be performed in selected patients, assessing the severity of the condition. However, when comparing the use of SVC with Hartmann's surgery for the treatment of emergency diverticulitis, there was no significant difference between the types of procedures, and a better postoperative profile was not yet observed (Turley et al., 2013).

Kouhia et al. (2010), analyzed the use of LVC in patients with acute appendicitis, both in situations with an intact appendix and with a perforated appendix. In both situations, it was shown that there was no difference between laparotomy and SVC. It is also noteworthy that the quicker postoperative period with fewer complications is favorable for laparoscopy. However, resistance on the part of surgeons regarding the use of this technique and the unavailability of the necessary equipment to perform the surgery in many surgical centers are mentioned as important obstacles.

Liver abscess is a condition with variable mortality (6-14%) even with treatment. One study analyzed retrospective data from patients undergoing liver abscess drainage, comparing percutaneous drainage with laparoscopic drainage. It was found that emergency laparoscopic drainage proved to be effective in reducing morbidity and mortality, proving to be a viable option for the treatment of this pathology. However, the lack of more studies on this topic and the low sampling are barriers that prevent the method from establishing itself as superior (Tan et al., 2013).

In emergencies related to the biliary system, choledocholithiasis is shown to be one of the most prevalent. With that in mind, a study compared the open approach in relation to SVC, showing that there is no significant difference between these two techniques. It was suggested that favoring one technique over the other must be based on the experience of the surgery team and the technological availability of the center where it will be performed, bearing in mind the low number of SVCs compared to laparotomy, in addition to the costs and logistics involved in this technique (Bencini et al., 2014).

CONCLUSION

Laparoscopy is a modern technique that has been gaining more and more space in the surgical treatment of various conditions, already replacing laparotomy in many cases. According to the studies analyzed, SVC is beneficial in the treatment of urgent and emergency conditions, mainly having a better postoperative profile for the patient and faster recovery from routine activities. However, it is pointed out that the use of this technique is still incipient, with a low number of surgeries performed using this approach. Therefore, the costs and logistics necessary for the correct use of this technique are shown to be a barrier, which, when associated with a greater need for specialization and professional training, make it difficult to use this technique in urgent and emergency contexts.

REFERENCES

BENCINI, L. et al. Modern approach tocholecysto-choledocholithiasis. World **Journal of Gastrointestinal Endoscopy**, v. 6, n. 2, p. 32–40, 16 fev. 2014.

Bezerra, C. A., et al. (2004). Laparoscopicburchsurgery:isthereanyadvantage in relationto open approach. **Int Braz J Urol.**, 30 (3), 230-236.

Falcão, L. F. R. (2018). Alteração da função pulmonar em cirurgia laparoscópica com pneumoperitônio e elevação daparte abdominal. **RevBras Anestesi**ol.,68 (2), 1-5.

FERNANDES, S. R. et al. Análise das vantagens e desvantagens da cirurgia videolaparoscópica em relação à laparotomia: uma revisão integrativa de literatura. **Research, Society andDevelopment**, v. 10, n. 12, p. e157101220356–e157101220356, 26 set. 2021.

KOUHIA, S. T. et al. Long-term follow-up of a randomizedclinicaltrial of open versus laparoscopicappendicectomy. **British Journal of Surgery**, v. 97, n. 9, p. 1395–1400, 1 set. 2010.

LETARTE, F. et al. LaparoscopicEmergencySurgery for Diverticular DiseaseThatFailed Medical Treatment: A ValuableOption? Results of a RetrospectiveComparativeCohortStudy.**Diseases of theColon&Rectum**, v. 56, n. 12, p. 1395–1402, dez. 2013.

MANCINI, R.; PATTARO, G.; SPAZIANI, E. Laparoscopictrans-abdominalpre-peritoneal (TAPP) surgery for incarcerated inguinal hernia repair. **Hernia**, v. 23, n. 2, p. 261–266, 1 abr. 2019.

RODRIGUEZ, R. M. J. et al. Laparoscopic approach in gastrointestinal emergencies. **World Journal of Gastroenterology**, v. 22, n. 9, p. 2701–2710, 7 mar. 2016.

SANGSTER, W. et al. Single-Site LaparoscopicColorectalSurgeryProvides Similar ClinicalOutcomesComparedWith Standard LaparoscopicSurgery: AnAnalysis of 626 Patients. D**iseases of theColon&Rectum**, v. 58, n. 9, p. 862–869, set. 2015.

TAN, L. et al. Laparoscopicdrainage of cryptogenicliverabscess. **SurgicalEndoscopy**, v. 27, n. 9, p. 3308–3314, set. 2013.

TURLEY, R. S. et al. Laparoscopic Versus Open Hartmann Procedure for theEmergencyTreatment of Diverticulitis: A Propensity-MatchedAnalysis. **Diseases of theColon&Rectum**, v. 56, n. 1, p. 72–82, jan. 2013.

Ueda, H. &Hoshi, T. (2017). Functional residual capacityincreaseduringlaparoscopicsurgerywith abdominal walllift.**RevBras Anestesiol**.,67 (8), 284-287.

VALLANCE, A. E. et al. Role of EmergencyLaparoscopicColectomy for ColorectalCancer: A Population-basedStudy in England. **Annals of Surgery**, v. 270, n. 1, p. 172–179, jul. 2019.

WRIGHT, G. P. et al. Cost-efficiencyandoutcomes in thetreatment of perforatedpepticulcerdisease: Laparoscopic versus open approach. **Surgery**, v. 156, n. 4, p. 1003–1008, out. 2014.

YANG, S. et al. Transabdominalpreperitoneallaparoscopic approach for incarcerated inguinal hernia repair. **Medicine**, v. 95, n. 52, p. e5686, 30 dez. 2016.