v. 3, n. 53, 2023

International Journal of Health Science

SURGICAL APPROACHES TO CONGENITAL DIAPHRAGMATIC HERNIA CORRECTION: AN INTEGRATIVE REVIEW

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Abstract: Congenital diaphragmatic hernia is a malformation that results in the herniation of abdominal organs into the thoracic cavity during fetal development. Surgical treatment plays a crucial role in correcting this condition, but the evaluation of the surgical techniques used is essential to improve clinical outcomes and patient survival. This article aims to carry out an integrative review of the existing scientific literature on the evaluation of surgical techniques for the correction of congenital diaphragmatic hernia, addressing diagnostic aspects, surgical treatment options and clinical outcomes. the search terms "congenital diaphragmatic hernia", "surgical techniques", "surgical treatment", "assessment" and "integrative review". Studies that evaluated different surgical techniques for correcting congenital diaphragmatic hernia in patients of all age groups were included. The literature review identified several studies that addressed different surgical approaches for correction of congenital diaphragmatic hernia. Among the evaluated techniques, the laparoscopic approach, thoracoscopy and open approaches stand out. Each of these techniques has specific advantages and disadvantages in terms of reducing the hernia content, closing the diaphragmatic defect, and stabilizing the respiratory function. In addition, studies have demonstrated the importance of a multidisciplinary and individualized approach in the surgical management of these patients. The evaluation of surgical techniques for correction of congenital diaphragmatic hernia is essential to improve clinical results and patient survival. The evidence available in the scientific literature highlights the importance of effective surgical strategies, considering the patient's age, the severity of the disease and the experience of the surgical team. Additional studies are needed to more comprehensively compare different surgical techniques and their long-term outcomes.

Keywords: Congenital diaphragmatic hernia. Clinical evaluation, Surgical procedure. Treatment

INTRODUCTION

Congenital diaphragmatic hernia (CDH) is a malformation that occurs during fetal development, resulting in the herniation of abdominal organs into the thoracic cavity. This condition represents a significant challenge for surgeons due to the complexity of the anatomy involved and the potential complications associated with it Vlot et al. (2020).

Surgical correction of CDH plays a fundamental role in the treatment of these patients, aiming to restore the integrity of the diaphragm and allow the return of the organs to the abdominal cavity. However, there are different surgical techniques available, each with its advantages and limitations.

In this perspective, an integrative literature review is necessary to evaluate the surgical techniques used in the correction of CDH and to examine their efficacy, safety and clinical outcomes. Through this comprehensive analysis, it is possible to identify the best approaches and propose evidence-based recommendations for the treatment of CDH.

Several studies have addressed specific aspects related to surgical techniques for correcting CDH. Vlot et al. (2020) performed a systematic review of the literature, seeking to analyze complicated diaphragmatic hernia in emergency surgery, while Simon et al. (2016) presented a systematic review on diagnosis and surgical treatment of right-sided Bochdalek hernias in adults.

Other studies focused on assessing the feasibility of laparoscopic repair of diaphragmatic hernia in adults, such as the study by Moshtaghi et al. (2021) Javid et al. (2005) examined the surgical approach in newborns with CDH, while Pierro et al. (2017) reviewed the surgical techniques used in congenital CHD.

In addition, there are studies that explored recent advances in the surgical approach to CDH, such as the study by Bishay et al. (2021), who highlighted innovations in the surgical treatment of this condition. The studies by Gander et al. (2018) also provided a comprehensive review on the surgical management of CDH.

Chiu et al. (2007), in their long-term study, analyzed the outcomes of CHD survivors, providing valuable information about the long-term outcome of these patients. Faircloth et al. (2021) reported their seven-year experience with minimally invasive CDH repair, demonstrating the results of this particular approach.

Considering the importance of evaluating surgical techniques for correction of CDH, as well as the variety of available studies, this integrative review aims to gather and analyze the evidence available in the literature, in order to provide a comprehensive view of the surgical options and their clinical results.

METHODOLOGY

The methodology used in this integrative review consisted of a systematic search and careful selection of relevant studies on surgical techniques for correction of congenital diaphragmatic hernia. The search strategy was based on keywords related to the topic and included the following databases: PubMed and Scopus.

The following inclusion criteria were used: studies published in the last 14 years (published between 2009 and 2023), in English, that addressed surgical techniques for correction of congenital diaphragmatic hernia in patients of all age groups, studies of systematic literature review, simple literature review, clinical studies, meta-analyses and randomized clinical trials and observational

studies were considered eligible for inclusion.

After applying the inclusion criteria, the selected studies were evaluated for methodological quality and relevance to the topic in question. 16 articles were found on the search platform. Of these, only 9 were selected to compose the work discussion. The other articles had a broad theme or escaped the theme of the research. Relevant data were extracted from the included articles, including information on the surgical techniques used, the clinical outcomes evaluated and the results obtained.

The descriptors used to search for articles were "congenital diaphragmatic hernia", "clinical evaluation", "surgical procedure" and "treatment".

The analysis of the selected studies was carried out descriptively, highlighting the main surgical techniques evaluated, their indications, complications and associated clinical outcomes.

This integrative review seeks to provide a comprehensive view of the surgical techniques available for correction of congenital diaphragmatic hernia and contribute to a better understanding and adequate choice of surgical approaches in these cases.

RESULTS

The integrative review of surgical techniques for correction of congenital diaphragmatic hernia revealed a number of relevant findings. Studies were identified that addressed different aspects related to the diagnosis, treatment and long-term results of this condition.

Based on the systematic review by Vlot et al. (2020), it was found that complicated diaphragmatic hernia requires emergency surgical approach due to the risk of serious complications. The authors highlighted the importance of early diagnosis and prompt surgical intervention to improve clinical outcomes in these cases.

Regarding Bochdalek's hernia in adults, the systematic review by Simon et al. (2016) discussed the diagnostic options and surgical approaches available. The authors emphasized the need for a comprehensive assessment to determine the feasibility of surgical repair and the importance of interdisciplinary management to optimize outcomes.

In the retrospective study by Moshtaghi et al. (2021), who evaluated laparoscopic repair of diaphragmatic hernia in adults, found that this approach is feasible in certain selected cases. The results suggest that laparoscopic repair may be a safe and effective option for treating diaphragmatic hernia in adults.

In the context of surgical management of congenital diaphragmatic hernia in newborns, the review by Javid et al. (2005) addressed several surgical techniques, such as the abdominal, thoracic and combined approach. The authors emphasized the importance of an individualized approach, taking into consideration, factors such as the severity of the hernia and the presence of associated malformations.

The review by Pierro and Hooper (2017) discussed the different surgical techniques used in the correction of congenital diaphragmatic hernia, including primary closure, prosthesis placement and the use of muscle flaps. The authors highlighted the importance of a multidisciplinary approach and consideration of the benefits and risks of each technique in the context of each patient.

Bishay et al. (2021) reviewed advances in surgical approaches for congenital diaphragmatic hernia, including minimally invasive approach such as thoracoscopic surgery. The authors emphasized the potential benefits of this approach, such as less surgical trauma and reduced hospital stay.

The review by Gander et al. (2018) addressed the surgical management of

congenital diaphragmatic hernia, focusing on strategies to reduce the morbidity and mortality associated with this condition. The authors discussed the importance of prenatal diagnosis, the role of protective lung ventilation during surgery, and the need for multidisciplinary postoperative care.

In the long term, the review by Chiu and Langer et al. (2007) examined the outcomes of congenital diaphragmatic hernia survivors, highlighting the importance of continued follow-up of these patients due to possible late respiratory and gastrointestinal complications.

Finally, the study by Faircloth and Crombleholme et al. (2021) presented a seven-year review of one institution's experience in minimally invasive repair of congenital diaphragmatic hernia. The results showed that this approach can be safe and effective, with a shorter hospital stay and a lower incidence of complications.

These studies provide evidence on the various surgical techniques used in the correction of congenital diaphragmatic hernia, emphasizing the importance of an individualized, multidisciplinary and evidence-based approach to optimize surgical results and long-term outcomes. However, it is important to emphasize that each patient must be evaluated individually and that the choice of surgical technique must take into consideration, factors such as the severity of the hernia, the presence of associated malformations and the expertise of the medical team.

DISCUSSION

Congenital diaphragmatic hernia (CDH) is a complex condition that requires careful evaluation and an effective surgical approach. In this integrative review, we discuss the evaluation of surgical techniques for correcting CDH, considering the current evidence available in the literature.

Vlot et al. (2020) performed a systematic review of the literature on complicated diaphragmatic hernia in emergency surgeries. The authors stressed the importance of early surgical intervention to minimize complications and improve patient outcomes.

Simon et al. (2016) conducted a systematic review on diagnosis and surgical treatment of right-sided Bochdalek hernias in adults. The review highlighted the importance of an accurate diagnosis and timely surgical approach to improve outcomes in adult patients with this specific type of hernia.

Moshtaghi et al. (2021) retrospectively evaluated the feasibility of laparoscopic diaphragmatic hernia repair in adults. Their study demonstrated that laparoscopic repair can be a viable and effective option for selected adult patients with CDH, resulting in positive outcomes.

Javid et al. (2005) discussed the surgical approach in newborns with congenital diaphragmatic hernia. Their study emphasized the importance of a multidisciplinary approach and highlighted several surgical techniques that can be employed to optimize outcomes in newborns with CDH.

Pierro et al. (2017) reviewed the surgical techniques used in the correction of CDH. Their study addressed the different surgical approaches and emphasized the importance of choosing the appropriate technique, taking into consideration, the individual characteristics of each patient.

Bishay et al. (2021) discussed advances in the surgical approach to CDH. Their study addressed recent surgical techniques and innovations that have been applied to improve outcomes in the treatment of this condition.

Gander et al. (2018) performed a comprehensive review on the surgical management of congenital diaphragmatic hernia. Their study provided an overview of the surgical approaches and management

strategies used to treat this complex condition.

Chiu et al. (2007) evaluated the long-term outcomes of CHD survivors. Their analysis highlighted the importance of long-term follow-up of these patients and underscored the challenges faced after surgical hernia repair.

Faircloth et al. (2021) performed a seven-year review of one institution's experience with minimally invasive repair of congenital diaphragmatic hernia. Their study addressed the outcomes and complications associated with this less invasive surgical approach.

Therefore, the integrative review highlighted the importance of an adequate and individualized surgical approach for the treatment of congenital diaphragmatic hernia. The evidence presented in this review provides valuable insights for selecting the best surgical techniques, contributing to better outcomes and prognosis for patients with CDH.

FINAL CONSIDERATIONS

The integrative review of surgical techniques for congenital diaphragmatic hernia repair provided a comprehensive view of the diagnosis, treatment, and outcomes associated with this condition. Based on the available evidence, we can conclude that the management of congenital diaphragmatic hernia requires a multidisciplinary approach, with emphasis on the careful selection of the surgical technique and consideration of the individual characteristics of the patient.

With regard to diagnosis, the laparoscopic approach has been shown to be a viable and accurate option, allowing for accurate identification of diaphragmatic hernia in adults (Simon et al., 2016). Furthermore, the laparoscopic approach has also shown potential benefits in the treatment of diaphragmatic hernias in adults, such as shorter hospital stays and faster recovery (Moshtaghi et al., 2021).

As for surgical treatment, different techniques were analyzed in the reviewed literature. Studies have shown that the use of advanced techniques such as minimally invasive repair can result in favorable outcomes in patients with congenital diaphragmatic hernia (Faircloth & Crombleholme, 2021). Furthermore, individualization of treatment based on patient characteristics has also proved crucial to optimizing surgical outcomes (Pierro et al., 2017).

The review also emphasized the importance of adequate ventilatory support and surgical strategy in the management of newborns with congenital diaphragmatic hernia (Javid et al., 2005; Gander et al., 2018). Careful selection of surgical technique and multidisciplinary approach were highlighted as essential elements to improve short- and long-term results.

It is important to emphasize that, although significant advances have been made in the evaluation and treatment of congenital diaphragmatic hernia, there are still challenges to be faced. Long-term follow-up of survivors is critical to identify and address respiratory and gastrointestinal complications that may arise after surgical treatment (Chiu & Langer, 2007).

In short, the integrative review highlighted the importance of a multidisciplinary approach, individualization of treatment and use of advanced techniques in the management of congenital diaphragmatic hernia. This information is essential to guide healthcare professionals in making clinical decisions and improve short- and long-term outcomes for patients affected by this condition.

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