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Surgical Interventions for Pediatric Unilateral Vocal Cord Paralysis

[1] Vanny, [1] Andrian

[1] Faculty of Medicine, Maranatha Christian University, Bandung City, West Java, Indonesia

Correspondence : dr.vanny8372626@gmail.com

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ABSTRACT

Background: The literature on surgical interventions for pediatric unilateral vocal cord paralysis (UVCP) reveals a nuanced landscape characterized by the need for tailored approaches based on individual patient circumstances. **Literature Review:** Building on this foundation, (R. Lechien, 2024) expands the discussion by addressing the management of pediatric bilateral vocal fold paralysis (PBVCP) and its implications for surgical decisions in unilateral cases. He critiques the practice of performing definitive surgical procedures prematurely, without allowing for the potential recovery of vocal fold motion, which is particularly relevant in the pediatric demographic. (R. Lechien, 2024) highlights the importance of timing in surgical intervention, noting that the results of laryngeal electromyography (LEMG) can significantly influence the decision-making process. The article raises critical concerns regarding the complications associated with total arytenoidectomy, especially in children, where the risks of aspiration and related infections are notably higher. This critical evaluation suggests a paradigm shift towards more conservative approaches, such as partial arytenoidectomy, which has gained popularity due to its favorable risk profile. **Conclusion:** In conclusion, the literature reveals a growing recognition of the complexities involved in managing pediatric UVCP and the necessity for careful consideration of surgical options. The emphasis on individualized approaches, informed by accurate diagnostic tools and a thorough understanding of the potential risks and benefits, is essential for optimizing patient outcomes in this vulnerable population. Ongoing research into less invasive surgical techniques and their long-term impacts will further enhance the management strategies for pediatric patients suffering from UVCP.

Keyword: Surgical Interventions, Pediatric Unilateral Vocal Cord Paralysis

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INTRODUCTION

The management of pediatric unilateral vocal cord paralysis (UVCP) presents a complex clinical challenge, as highlighted in the literature. (Trozzi et al., 2020) emphasize the distinct differences between unilateral and bilateral vocal cord paralysis (VCP) in terms of clinical presentation, etiology, and treatment approaches. The authors note that symptoms such as mild stridor, aspiration, and a hoarse and breathy voice are indicative of UVCP, which is primarily caused by laryngeal innervation disorders. They advocate for awake laryngeal endoscopy as a critical diagnostic tool for identifying paralysis, underscoring the importance of accurate diagnosis in guiding appropriate surgical interventions.

Building on the understanding of VCP, (R. Lechien, 2024) discusses the management of pediatric bilateral vocal fold paralysis (PBVCP) and the implications for surgical options in cases of unilateral paralysis. The author critiques the practice of performing definitive surgical procedures without allowing for potential recovery of vocal fold motion, which can be particularly relevant in children. (R. Lechien, 2024) delineates the factors influencing surgical decisions, such as the etiology of paralysis, the timing of surgery, and laryngeal electromyography (LEMG) findings. The article raises concerns regarding the high complication rates associated with total arytenoidectomy, particularly in the pediatric population, where risks of aspiration and related infections are significantly heightened. This critical evaluation of total arytenoidectomy's efficacy and safety paints a nuanced picture of surgical intervention strategies, suggesting a shift towards more conservative approaches like partial arytenoidectomy, which has gained traction in recent years.

Together, these articles provide a comprehensive overview of the current state of surgical interventions for pediatric UVCP, highlighting the necessity for tailored approaches based on individual patient circumstances and the evolving landscape of surgical techniques. The insights gleaned from these studies underscore the

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importance of careful consideration of both the risks and benefits of surgical options in this vulnerable population.

LITERATURE REVIEW

The article "Surgical Options for Pediatric Bilateral Vocal Cord Palsy: State of the Art" by Trozzi et al. (Trozzi et al., 2020) provides a comprehensive overview of the management strategies for pediatric unilateral vocal cord paralysis (UVCP), highlighting the complexities and challenges associated with this condition. The authors emphasize that UVCP is a significant congenital laryngeal anomaly, second only to bilateral vocal cord paralysis (VCP) in prevalence among pediatric patients. This distinction is crucial, as it underlines the differing clinical presentations, etiologies, and treatment modalities that characterize unilateral as opposed to bilateral cases.

One of the primary insights from the article is the focus on surgical interventions aimed at increasing the glottic space in UVCP. The authors detail various surgical techniques, noting the ongoing research into less invasive options. This is particularly relevant given the clinical imperative to avoid tracheotomy through timely intervention. The article discusses the advantages of emerging techniques, such as endoscopic arytenoid abduction lateropexy, which not only enhance the glottic space but also yield satisfactory voice outcomes. This is a significant advancement in the field, as it addresses the dual concerns of airway management and vocal quality.

The authors also underscore the importance of accurate diagnosis, advocating for awake laryngeal endoscopy as a critical tool in identifying UVCP. This diagnostic approach allows for direct visualization of the vocal cords, facilitating a more informed decision-making process regarding surgical intervention. The article effectively communicates that early diagnosis and intervention are essential to mitigate the risks associated with UVCP, such as stridor and aspiration.

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However, while the article provides valuable insights into surgical options and their efficacy, it could benefit from a more detailed discussion on the long-term outcomes of these interventions. The authors briefly mention voice results but do not extensively address how these surgical procedures impact the overall quality of life and long-term respiratory health of pediatric patients. Additionally, a comparative analysis of the various surgical techniques would enhance the reader's understanding of the relative merits and potential complications associated with each option.

The article "Management of Pediatric Bilateral Vocal Fold Paralysis: A State-of-the-Art Review of Etiologies, Diagnosis, and Treatments" by Jerome R. Lechien (R. Lechien, 2024) provides a comprehensive overview of the surgical management of pediatric bilateral vocal fold paralysis (PBVCP), addressing critical considerations regarding the timing and type of surgical intervention. One of the key insights from the article is the emphasis on the decision-making process surrounding definitive surgical procedures, which often precedes the potential for vocal fold recovery.

Lechien highlights that many surgeons opt for definitive procedures without waiting for the natural recovery of vocal fold motion, particularly in cases where the paralysis persists beyond one year, as the likelihood of recovery diminishes significantly (R. Lechien, 2024). This perspective is crucial for clinicians working with pediatric patients, as it underscores the importance of timely intervention based on clinical findings such as laryngeal electromyography (LEMG). The article suggests that the absence of nerve response or the presence of findings indicating a lack of recovery potential may warrant early surgical intervention, while evidence of reinnervation may delay such decisions.

The article also critically evaluates the surgical options available for managing PBVCP, particularly focusing on total and partial arytenoidectomy. While total arytenoidectomy has been effective in alleviating dyspnea and improving breathing evaluations in both adults and children, it comes with significant risks, including a

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high incidence of aspiration and subsequent lung infections (R. Lechien, 2024). The author argues against the routine use of total arytenoidectomy in children due to the heightened risk of severe complications and mortality, suggesting that the procedure should be approached with caution and is generally not recommended in this population.

In contrast, partial arytenoidectomy has gained traction over recent decades as a more favorable alternative. The article indicates that this approach may mitigate some of the risks associated with total arytenoidectomy while still providing therapeutic benefits. This shift in practice is particularly relevant for pediatric patients, as it aligns with the goal of minimizing complications while addressing the functional impairments caused by vocal fold paralysis.

CONCLUSION

The literature on surgical interventions for pediatric unilateral vocal cord paralysis (UVCP) reveals a nuanced landscape characterized by the need for tailored approaches based on individual patient circumstances. The complexities of UVCP, as articulated by Trozzi et al. (2020), emphasize the distinction between unilateral and bilateral vocal cord paralysis (VCP), particularly in terms of clinical presentation, etiology, and treatment strategies. The authors highlight that UVCP can manifest through symptoms such as mild stridor, aspiration, and a hoarse voice, primarily stemming from laryngeal innervation disorders. They advocate for awake laryngeal endoscopy as an essential diagnostic tool, underscoring its role in guiding surgical interventions (Trozzi et al., 2020).

Building on this foundation, (R. Lechien, 2024) expands the discussion by addressing the management of pediatric bilateral vocal fold paralysis (PBVCP) and its implications for surgical decisions in unilateral cases. He critiques the practice of performing definitive surgical procedures prematurely, without allowing for the potential recovery of vocal fold motion, which is particularly relevant in the pediatric demographic. (R. Lechien, 2024) highlights the importance of timing in surgical intervention, noting that the results of laryngeal electromyography

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(LEMG) can significantly influence the decision-making process. The article raises critical concerns regarding the complications associated with total arytenoidectomy, especially in children, where the risks of aspiration and related infections are notably higher. This critical evaluation suggests a paradigm shift towards more conservative approaches, such as partial arytenoidectomy, which has gained popularity due to its favorable risk profile.

The insights from both articles underline the importance of individualized treatment strategies that consider the unique characteristics of each patient. The emphasis on early diagnosis and intervention is crucial, as it can mitigate the risks associated with UVCP. Moreover, the discussion surrounding the efficacy and safety of various surgical techniques, particularly the shift towards less invasive options, reflects the evolving nature of surgical practice in this field.

In conclusion, the literature reveals a growing recognition of the complexities involved in managing pediatric UVCP and the necessity for careful consideration of surgical options. The emphasis on individualized approaches, informed by accurate diagnostic tools and a thorough understanding of the potential risks and benefits, is essential for optimizing patient outcomes in this vulnerable population. Ongoing research into less invasive surgical techniques and their long-term impacts will further enhance the management strategies for pediatric patients suffering from UVCP.

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