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Suture Dehiscence Risk Factors and Prevention: Review Literature

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ABSTRACT

Suture dehiscence refers to the partial or complete reopening of a surgical wound, constituting one of the most feared complications across various surgical specialties. This occurrence can result in the exposure of internal organs or tissues, secondary infections, prolonged hospitalization and increased healthcare costs. Major risk factors include surgical site infections, poor suturing technique, inadequate use of closure materials, comorbidities (e.g., diabetes, hypertension and obesity) and systemic conditions that impair healing, such as immunosuppression or malnutrition. Preventive measures and reducing dehiscence rates involve appropriate antibiotic prophylaxis, careful surgical techniques, standardized aseptic protocols, glycemic control and nutritional support. Additionally, continuous training of multidisciplinary teams-including surgeons, nurses and nutritionists-plays a crucial role in risk reduction by promoting evidence-based and updated clinical practices. It is concluded that the adoption of strict infection control protocols, the correct selection of suture materials and techniques, attention to comorbidities and postoperative clinical surveillance constitute the foundation for minimizing dehiscence incidence and improving patient outcomes.

Keywords: Suture dehiscence; Risk factors; Prevention; Surgical infection; Wound healing

Introduction

Surgery is a field where the risk of complications is always present, regardless of the specialty or type of procedure. In this context, suture dehiscence emerges as a particularly relevant complication, which may occur to varying degrees: from a partial opening of some stitches to complete failure of the suture with exposure of deep tissues¹. This complication not only prolongs recovery time and hospital stay but also burdens the healthcare system and, in extreme cases, can lead to lifethreatening conditions².

Several risk factors contribute to the onset of suture dehiscence, particularly systemic patient conditions (e.g., diabetes mellitus, hypertension, obesity and immunosuppression), poor infection control, malnutrition, smoking and the use of medications such as corticosteroids³. These elements can impair tissue healing by compromising local microcirculation or reducing the body's defense capacity.

In addition to individual clinical aspects, technical factors related to the surgical procedure significantly influence dehiscence development. Excessive tissue tension, inappropriate suture material selection and poor suturing technique may cause weakness along the incision line⁴. Likewise, contamination of the surgical site during the procedure or lack of proper antibiotic prophylaxis greatly increases infection risk, which, in turn, promotes suture failure⁵.

From a preventive perspective, careful management of risk factors and the adoption of best practice strategies are essential. Evidence-based antibiotic prophylaxis protocols, adequate preoperative preparation and the use of surgical suturing techniques that respect tissue physiology are fundamental measures to reduce dehiscence incidence⁶. Furthermore, a multidisciplinary approach involving surgeons, nurses, nutritionists and other healthcare professionals ensures comprehensive patient care and broadens the capacity for identifying and addressing predisposing factors.

Objectives

This review aims to identify and analyze the main risk factors associated with suture dehiscence, as well as to discuss preventive strategies reported in recent literature.

Materials and Methods

A literature review was conducted based on articles published in the PubMed, ScienceDirect and SciELO databases to support this study.

Discussion

Clinical factors such as diabetes, obesity and hypertension are widely described as impairing tissue healing. Diabetes, for example, alters glucose metabolism and causes microvascular changes that reduce oxygen and nutrient delivery to tissues, resulting in delayed healing and increased infection risk7. Obesity, in addition to making surgical handling more difficult, is associated with greater tissue tension and lower vascularization of adipose areas, compromising suture integration⁸. Malnutrition and deficiencies in vitamins and minerals also play a significant role in the healing process. The lack of essential amino acids can compromise collagen synthesis, a crucial structure for tissue repair⁹. Chronic use of corticosteroids, immunosuppressants or chemotherapy drugs negatively affects the inflammatory response and collagen deposition, further increasing dehiscence risk¹⁰. In the intraoperative setting, the suturing technique used is critical for incision integrity¹¹. Improper tension on wound edges, insufficient suture depth or the use of unsuitable suture material may lead to weak areas. Studies suggest that continuous suturing methods in high-tension regions are more prone to failure compared to interrupted sutures, which provide better force distribution¹². Suture selection should consider factors such as elasticity, tensile strength, biocompatibility and absorption rate¹³. In specific procedures, the use of mesh reinforcement or surgical adhesives may reduce tension on the suture line, providing safer closure¹⁴.

Infection is one of the main determinants of dehiscence. Bacteria present in the wound release toxins and enzymes that damage connective tissue, compromising sutures¹¹. In such cases, antibiotic prophylaxis protocols must be strictly followed, based on the likely bacterial flora of the surgical site and procedure duration⁵. Maintaining aseptic technique and proper postoperative nursing care is essential to minimize contamination risk¹². Preventing suture dehiscence requires considering all aspects of surgery, from preoperative preparation to patient rehabilitation. This calls for a multidisciplinary approach, where surgeons, nurses, nutritionists and other professionals work together². Adequate nutritional support, metabolic control (especially in diabetic patients) and attention to psychosocial factors (such as smoking and physical inactivity) are key elements for a positive prognosis¹⁵. Strategies such as reducing surgical time, using appropriate instruments and standardizing wound closure protocols (including suture type, suturing technique and reinforcement measures) can significantly lower dehiscence rates⁶. After discharge, close outpatient monitoring and vigilance for signs of infection or tissue necrosis are critical for early intervention in the event of partial wound failure⁸.

Conclusion

Suture dehiscence is a multifactorial complication, involving both patient-related aspects (clinical, nutritional and immunological conditions) and surgical factors (suturing technique, infection control and procedure duration). Given this complexity, prevention requires a comprehensive analysis of all potential risks and integrated action by various healthcare professionals. Key strategies include proper management of comorbidities (especially glycemic control in diabetics), careful antibiotic prophylaxis, appropriate selection of suture materials and techniques and strict aseptic protocols throughout the surgical procedure. Supportive measures, such as nutritional monitoring and health education for patients and care teams, further contribute to reducing postoperative complications¹³. Although recent literature shows progress in understanding the mechanisms involved and developing increasingly sophisticated suture materials, the challenge of significantly reducing dehiscence rates remains. Evidence-based practice, coupled with institutional protocol adoption and continuous team training, appears to be a promising path toward improving surgical outcomes and minimizing the negative impact of this complication. In summary, suture dehiscence can be drastically reduced through effective preventive measures targeting both intrinsic patient factors and the technical and logistical aspects of the surgical procedure. Future research exploring innovative approaches and multicenter studies validating prevention protocols may significantly contribute to the advancement of surgical practices and the overall improvement of patient safety.

References

- Silva AR, et al. Fatores de risco para deiscência de sutura: uma revisão sistemática. Revista Brasileira de Cirurgia 2021;35(2):125-140.
- Ferreira JO, et al. Estratégias para redução de complicações pós-cirúrgicas. Revista de Saúde e Medicina, 2023;14(2):200-210.
- Moreira EC, et al. Aspectos clínicos da deiscência de sutura. Revista de Cirurgia Contemporânea 2021;7(2):66-77.
- Smith K, et al. Advances in wound closure techniques. Surgical Innovations 2019;47:34-48.
- Brasil. Ministério da Saúde. Diretrizes para prevenção de infecção hospitalar. Brasília: Ministério da Saúde 2020.

- Oliveira MT, Souza CR. Complicações cirúrgicas: análise de fatores predisponentes. J de Medicina Cirúrgica 2020;28(3):88-97.
- 7. Johnson R. Surgical site infections and wound dehiscence: risk assessment. Int J Surg 2021;56:98-105.
- Ribeiro PC, Santos LA. Manejo pós-operatório e suas implicações na cicatrização. Revista de Enfermagem Cirúrgica 2022;12(1):22-33.
- Costa RM, Almeida FO. Sutura e cicatrização: uma abordagem atualizada. São Paulo: Editora Médica 2018.
- Gomes AR. Fatores determinantes na cicatrização de feridas cirúrgicas. Anais da Sociedade Brasileira de Cirurgia 2020;39(1):55-67.

- 11. Smith J, et al. Surgical wound dehiscence: prevention strategies. J Surg Res 2019;250:45-52.
- Santos BF, et al. Estratégias preventivas para infecção cirúrgica. Brazilian Surg J 2022;50:78-90.
- Martins DL, et al. Uso de curativos modernos na prevenção de deiscência cirúrgica. Revista Brasileira de Enfermagem 2020;73(4):789-795.
- 14. Brown L, et al. Postoperative wound healing complications. Clin Surg 2023;65:155-170.
- Pereira VH, et al. Influência da nutrição na cicatrização de feridas. Revista Nutrição e Saúde 2021;16(3):120-135.