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Review Article

Postoperative Abdominal Wound Dehiscence: Understanding Risk Factors, Complications, Management, and Prevention Strategies

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Abstract:

Postoperative abdominal wound dehiscence (AWD) is a significant and concerning complication. Where a surgical wound partially or completely reopens, sometimes leading to evisceration. This article reviews AWD, covering its definition, risk factors, causes, complications, management, and prevention. The incidence ranges from 0.4% to 3.5%, with mortality rates reaching 45%. Key risk factors encompass advanced age, male sex, excess body weight, diabetes, poor nutrition, long-term steroid use, as well as surgical methods and infections. Treatment varies from simple wound care to surgical repair, depending on severity. Effective prevention involves optimizing patient health before surgery, using careful surgical techniques, and providing thorough post-operative care. Despite improvements in surgical methods, research gaps remain regarding prevention and risk assessment. This article aims to be a helpful resource for healthcare professionals, enhancing understanding and managing postoperative abdominal wound dehiscence.

Keywords: postoperative complications of awd; risk factors assessment; prevention measures; management strategies; patient outcomes

Introduction

Postoperative abdominal wound dehiscence (AWD) involves the partial or complete rupture of a surgical wound, with evisceration referring to the total break in the wall layers that exposes abdominal organs, typically occurring within the first two weeks following surgery. This intricate condition is affected by multiple local and systemic factors, along with issues related to both preoperative and postoperative care. Additionally, medication and local wound complications can contribute. Abdominal wound dehiscence is one of the most distressing surgical complications in hospitals, often occurring unexpectedly. [1] The incidence of abdominal wound dehiscence ranges from 0.4% to 3.5%, with mortality rates reaching up to 45% in various healthcare settings, though there is no specific global incidence data available. [2] Understanding risk factors for abdominal wound dehiscence (AWD). It can be divided into three categories: pre-operative, intra-operative, and post-operative. Pre-operative factors consist of advanced age (over 65), male gender, smoking, obesity, diabetes, malnutrition or low albumin levels, sepsis, anaemia, uremia, cancer, chemotherapy or radiotherapy, and prolonged use of corticosteroids. [3][4] Studies indicate that patients with more than five risk factors have higher rates of wound dehiscence. [5]. Also, Patients in the dehiscence group experienced a significantly longer hospital stay, leading to increased overall treatment costs. [6] Managing surgical emergencies poses significant challenges in resource-limited environments, primarily due to the frequent delayed presentation of patients needing surgery. This delay is often attributed to the transfer of patients between different facilities, among other reasons. [7][8] Despite extensive research on AWD, gaps remain in understanding the most effective prevention strategies and risk stratification tools. The effectiveness of emerging technologies and techniques in surgical practice for reducing abdominal wound dehiscence rates has not been thoroughly assessed. This review aims to provide a comprehensive overview of postoperative abdominal wound dehiscence, focusing on its definition, causes,

complications, management strategies, and prevention measures. By synthesizing recent literature, this review seeks to enhance understanding and inform clinical practice regarding AWD. The findings from this review will serve as a valuable resource for clinicians and researchers by offering an evidence-based summary of postoperative abdominal wound dehiscence. They will also promote awareness of risk factors and management strategies while identifying gaps in current research that warrant further investigation.

Main body

Definition:

Surgical wound dehiscence (SWD) refers to the reopening or splitting apart of a surgical incision.

Some healthcare professionals give different definitions according to the length of separation, depth of the wound, infection as well as disruption of the incisional wound edges. This variety of definitions leads to delay or misdiagnosis and it can affect the outcome. For that reason, the World Union of Wound Healing Societies (WUWHS) made specific definitions and diagnostic criteria in 2018, to help the clinician reach accurate diagnoses and enhance the degree of care provided to the patient. (9) According to WUWHS, SWD occurs when the edges of a closed surgical incision separate, sometimes with underlying tissue, organs, or implants visible. This separation can happen in isolated areas or along the full length of the incision and may involve some or all tissue layers beneath the skin. A dehisced incision may or may not show typical signs and symptoms of infection. SWD Grading:

1. Grade 1: Separation involves only the skin's surface (dermal layer), without visible subcutaneous tissue.

2. Grade 2: Subcutaneous tissue beneath the skin is exposed.

3. Grade 3: The separation reaches down to the fascia.

4. Grade 4: Dehiscence exposes deeper structures, including organs, bones, or viscera. [9]

SWD is an uncommon postoperative complication but it is serious and has an increased risk of morbidity and mortality. The occurrence of abdominal surgical wound dehiscence documented in studies is approximately 3%. [10]. It is associated with increased healthcare burden due to its expensive treatment of re-admission and re-operation as well as prolonged hospitalization.

Causes and risk factors:

The factors contributing to wound dehiscence are similar to those that hinder proper wound healing. These include infection, elevated abdominal pressure, diabetes, smoking, alcohol use, and increased weight as obesity. [11] SWD can be avoided or limited if we identify the risk factors which lead to this complication. A good surgeon should screen patient's pre-operative and address these risk factors. The kind of surgery performed, the method of skin preparation, the duration of the operation, and the technique used for wound closure are also reported as factors contributing to wound dehiscence. In developing countries Delayed hospital presentation, seeking treatment and waiting time for surgical intervention in emergency cases leads to haemodynamic instability which later will increase SWD occurrence. [12] Also, emergency surgery itself has a higher incidence of complications than elective one due to the condition of the patient and the illness and operation room readiness and sterilization. Other medical causes increase the risk of SWD like anaemia low HB of less than 10 g\l, jaundice bilirubin elevation, malnutrition and hypoalbuminemia which is more evident with chronic patients, paralytic ileus, heart failure, uremia and renal impairment, malignancy and use of chemotherapy and steroids, wound infection, postoperative chest infections, Visceral obesity and coughing cause a rise in intra-abdominal pressure that causes the sutures to rupture. And then leads to dehiscence, The same happens with vomiting. [13] [14] Type of sutures and adhering strictly to sterile techniques is essential to reduce the occurrence as well. [15] AWD was one of the complications of colostomies. [16] Long surgeries lasting over 2 hours, combined with the layered abdominal closure technique, resulted in a higher rate of SWD compared to the mass closure method. [17] The expertise of surgeons also plays a role in the fact. [18] The age of the patient is also determined as a risk factor as some studies thought that preterm newborns are more likely to experience SWD compared to full-term newborns and the elderly age have more occurrence of SWD. [19,20]. To prevent the occurrence of SWD, greater care is required when managing high-risk patients. By this, we can protect these cases from serious conditions with high morbidity and mortality [21]. Preoperative assessment and proper treatment of the above-mentioned conditions, will improve the overall outcome and decrease the incidence rate of SWD.

Complication:

SWD has a high mortality rate ranging from 9 % to 43%. [22]. Prolonged hospital stay and increased incidence of re-operation are known complications of SWD. [23] Additionally, there is an increase in treatment costs and burden to patients and health care providers. (11) Other complications related to abdominal wounds can be seen with dehiscence Like wound infection which is characterised by pus discharge from the wound. Also, we can observe serious complications such as necrotizing fasciitis where there is necrosis to the abdominal wall as well as ischemia, the necrosis can invade from a wound in the skin, and subcutaneous tissue till it reaches the muscle. Another critical reported complication, Evisceration occurs when internal abdominal contents protrude through an open surgical wound and exit the abdominal cavity this can advance to fistula formation of the bowel or perforation. [24].

Prevention:

In an aim to prevent the occurrence of SWD, there are several preventive measures to be followed. Firstly, the health of the patient and the nutritional status to be optimum before the operation. Prevent cough post-operation by treating any chest condition that leads to coughing or vomiting. Manage risk factors as well as maintain normal blood sugar and blood pressure. Perform laboratory investigations to elicit any anaemia and give blood product transfusion to keep HB above 10, and fluid resuscitation to keep good perfusion before the operation. [25]. Preoperative assessment and investigations like X-rays, ultrasound and CT scans can help in risk assessment of causes that can lead to increased intra-abdominal pressure. (14) During surgery, strict sterilisation and Proper techniques used by surgeons alongside with use of good Materials like suture will improve outcome and can prevent complications like dehiscence. Post-operative care and close monitoring of the wound with early detection of any signs of infection or wound dehiscence can lead to early detection and proper treatment. (15) In developing countries cross-infection is one of the main causes thus education to medical staff leads to better awareness by Ensuring adequate resources and promoting hand hygiene to reduce risks. [26].

Management:

Management of SWD depends on the degree of dehiscence. It can be a simple dressing of the wound but can be more complicated and lead to re-operation. Post-operative close follow-up of the wound daily is considered highly valued as the dehiscence can occur during the first week. Dressing and washing the wound daily and broad-spectrum antibiotics guided by culture and sensitivity. (27). Closing the fascia is one of the most crucial steps in abdominal surgeries, as it helps to prevent complications like fascia dehiscence or hernia development at the incision site. [28]. Some studies found that deep tension sutures (DTS) are associated with fewer complications, such as incisional hernia and re-operation. [27].

Multidisciplinary surgical closure offers faster, safer healing than secondary intention [29] Some studies showed that an abdominal binder eases discomfort but doesn't aid healing. [30] Negative pressure wound therapy (NPWT) is one of the best remedy options, connecting the wound site with a vacuum pump removes excess fluid of inflammation and blood which will enhance healing. It was found to have a higher success rate in the management of wound dehiscence, fewer complications, and a fast-healing process with rapid granulation tissue formation by increasing blood flow and perfusion and decreasing bowel oedema. (28)[31].

Discussion

Abdominal wound dehiscence (AWD) is a serious condition, particularly in high-risk patients. Taking extra precautions in these cases can significantly reduce the risk of mortality and comorbidities [32]

This review highlights the clinical features, management strategies, and preventive measures, providing an overview of the current standards and advancements in the field. The incidence varies depending on multiple factors, including the type of surgery, patient comorbidities, and perioperative care practices (23). Emergency surgeries, infection at the surgical site, and technical issues related to suturing techniques also play a key role. (13) Common risk factors include advanced age, malnutrition, obesity, chronic steroid use, smoking, and certain comorbid conditions like diabetes and chronic obstructive pulmonary disease (COPD). (10). Clinically, wound dehiscence may present with increased serosanguinous drainage from the wound, visible fascial separation, or a "burst abdomen" in severe cases. Patients may report pain or discomfort, and physical signs often include localized swelling, erythema, and tenderness in cases where dehiscence progresses to evisceration (extrusion of abdominal contents). The treatment approach is largely determined by the severity of the wound separation, as proper intervention has been shown to improve healing and minimize complications. However, AWD continues to be a complex issue associated with high rates of both morbidity and mortality." Minor cases with superficial dehiscence can often be treated conservatively with wound care, infection control (if necessary), and delayed primary closure. For more severe cases, particularly those involving fascial dehiscence, reoperation is typically required. Surgical management may involve re-suturing or tension-reducing techniques like retention sutures or mesh placement to reinforce the wound. Post-operative care should focus on optimizing the patient's nutritional status, controlling blood glucose levels in diabetics, and ensuring adequate wound care. Antibiotic therapy may be required if there is evidence of infection). Patients with extensive dehiscence or evisceration may benefit from vacuum-assisted closure (VAC) therapy, which has been shown to enhance injury healing and reduce the possibility of further adverse effects of the management of AWD. (34).

Preventing abdominal dehiscence requires a multifaceted approach, emphasizing both preoperative and intraoperative interventions. Ensuring optimal nutritional status and smoking cessation in the preoperative period are critical). Intraoperatively, careful attention to surgical technique, including the selection of appropriate sutures and tension-free closure methods, plays a pivotal role in reducing the risk of dehiscence.

Postoperative preventive strategies include adequate pain control, the use of abdominal binders in high-risk patients, and avoiding early heavy lifting or straining. Educating healthcare workers about infection control practices to prevent cross-contamination, especially in resource-limited settings. Early recognition of signs of infection or wound failure is crucial, as timely intervention can prevent progression to full dehiscence or evisceration.

The main limitations of this review on postoperative abdominal wound dehiscence include the heterogeneity of the studies, with variations in patient populations, surgical techniques, and definitions of dehiscence, making it difficult to draw uniform conclusions. Many studies are observational, with few randomized controlled trials, leading to potential biases and limited high-quality evidence. Inconsistent reporting of risk factors and short-term focus without long-term outcome data further constrain the analysis. Additionally, geographic and institutional differences in surgical practices limit the generalizability of findings, and rapid advancements in surgical techniques may render some evidence outdated by the time of publication. Addressing these limitations in future research is essential for improving management strategies and outcomes.

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