

CHARACTERISTICS OF WOUND DEHISCENCE AT A SINGLE INSTITUTION

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ABSTRACT

Background: Wound dehiscence is damage to the lining of the surgical wound, both partial and complete, where various factors can cause this. Several factors affecting the incidence of wound dehiscence include age, gender, malnutrition, anemia, hypoalbuminemia, chronic lung disease, surgical wound infection, malignancy, emergency surgery, jaundice, and obesity. This study aimed to determine the characteristics of post-laparotomy wound dehiscence. Methods: This study was a descriptive retrospective approach. The research data was obtained from the patient's medical record data. The research participants were all post-laparotomy patients at RSUD Dr. H Chasan Boesoerie Ternate in January 2019 - December 2021 who are above 18 years old. Data were collected and analyzed using SPSS. Results: This study included 38 samples; the results of nutritional status based on BMI 22 samples were obese (57.9%), nine patients were overweight (23.7%), six patients had normal BMI (15.8%), and one patient category Underweight (2.6%). If seen from the Hb of post-laparotomy patients with wound dehiscence, 21 patients had anemia (55.3%), and 17 patients did not have anemia (44.7%). Conclusion: The most common post-laparotomy wound dehiscence with nutrition occurred in women, age group 18-29 years, cesarean section surgery, nutritional status of obesity, and anemia.

ARTICLE INFO

Keywords:

Laparotomy; Nutritional Status; Wound Dehiscence

KARAKTERISTIK WOUND DEHISENSE PADA SATU INSTITUSI

ABSTRAK

Latar Belakang: Wound dehiscence merupakan kerusakan lapisan luka operasi baik itu parsial maupun komplit, dimana hal ini dapat disebabkan oleh berbagai faktor, Faktor-faktor yang dapat mempengaruhi kejadian wound dehiscence diantaranya faktor usia, jenis kelamin, malnutrisi, anemia, hipoalbumin, penyakit paru kronik, infeksi luka operasi, keganasan, operasi emergensi, jaundice, dan obesitas. Tujuan penelitian ini untuk mengetahui karakteristik kejadian wound dehiscence pasca laparotomi. Metode: Penelitian ini bersifat deskriptif dengan pendekatan retrospektif. Data penelitian diperoleh dari data rekam medis pasien. Sampel penelitian yang digunakan adalah semua pasien pasca laparotomi RSUD Dr. H Chasan Boesoerie Ternate pada bulan Januari 2019 - Desember 2021 yang berusia > 18 tahun. Data dikumpulkan dan dianalisis menggunakan SPSS. Hasil: Sampel pada penelitian ini berjumlah 38 sampel, didapatkan hasil status gizi berdasarkan IMT 22 sampel mengalami obesitas (57,9%), 9 sampel mengalami overweight (23,7%), 6 sampel IMT normal (15,8%), dan 1 sampel kategori kurus (2,6%). Jika dilihat dari Hb pasien pasca laparotomi dengan kejadian wound dehiscence mendapatkan hasil 21 pasien mengalami anemia (55,3%), dan 17 pasien tidak mengalami anemia (44,7%). Kesimpulan: Kejadian wound dehiscence pasca laparotomi paling banyak terjadi pada perempuan, kelompok usia 18 - 29 Tahun, jenis operasi caesar, status nutrisi obesitas dan anemia.

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Kata kunci:

Laparotomi; Status Nutrisi; Wound Dehiscence

Introduction

Surgical care has been a vital medical care worldwide for over a century. The impact of surgical intervention on public health systems will increase as the prevalence of traumatic injuries, malignancies, and cardiovascular disease rises (WHO TEAM, 2022). Meanwhile, laparotomy surgeries at Dr. Hasan Sadikin General Hospital can achieve approximately 50

operations each month. In contrast, the incidence rate at Hasan Sadikin Hospital in Bandung is around 0.4% - 1.13%. Between 2011 and 2014, approximately 252 cases of abdominal wound dehiscence were found (Djaya et al., 2012).

Wound dehiscence is damage to the lining of the surgical wound, either partial or complete, where various factors can cause this (Johnson & Serpell, 2005; Zheng-Pywell & Chu, 2020). The impact of wound dehiscence not only increases stress on the patient but can also cause evisceration, reoperation, cause body image disturbance, reduce the quality of life of patients, increase the length of stay, increase the cost of care by more than 300% and throw away the hospital's health budget, causing psychological trauma, the risk of severe infection resulting in death (Corrêa et al., 2016; Johnson & Serpell, 2005). Several risk factors for wound dehiscence are avoidable and must be predicted to reduce the number of events before or after surgery (Johnson & Serpell, 2005). This study aimed to determine the characteristics of post-laparotomy wound dehiscence.

Methods

This is a descriptive study, retrospectively carried out at Dr. H Chasan Boesoirie Ternate, Indonesia, in March-August 2022. The samples used in this study were all patients who experienced wound dehiscence at our institution from January 2019 - December 2021. The inclusion criteria in this study were post-laparotomy patients who experienced wound dehiscence aged ≥ 18 years and had complete medical record data. Exclusion criteria in this study were patients with wound dehiscence who had undergone surgical repair and patients with wound dehiscence who were < 18 years old in medical records.

Wound dehiscence

Wound dehiscence is a fascial disorder that appears in the early postoperative period (4 - 14 postoperative days) (Sandy-Hodgetts et al., 2017).

Body mass index

The body mass index classification we used is based on the BMI classification of the Indonesian Ministry of Health: Underweight (< 18.5 kg/m²), Normal (18.5 - 24.9 kg/m²), Overweight (25.0 - < 26.9 kg/m²), and Obese (≥ 27 kg/m²) (Fajar et al., 2022).

Anemia

Anemia is defined as a low number of red blood cells. In a complete blood test, anemia is reported as a low hemoglobin. Anemia (Hb < 10 g/dl) and not anemia (Hb > 10 g/dl) (Powers & Sandoval, 2022).

Data analysis method

Data analysis in this study used univariate and bivariate analysis. The data were statistically analyzed using SPSS Statistics version 23.0 (IBM Corp. Armonk, NY).

Results

During the study period, 38 patients were obtained. Patient characteristics are presented in Table 1.

Table 1. Patient characteristics

Characteristics	n	%
Group (years)		
18 – 29	19	50.0
30 – 39	14	36.8
40 – 49	1	2.6
50 – 59	1	2.6
≥ 60	3	7.9
Sex		
Male	10	26.3
Female	28	73.7
Type of surgery		
Cesarean section	24	63.2
Laparotomy Appendectomy	10	26.3
Laparotomy Ileostomy	3	7.9
Laparotomy Omentectomy	1	2.6
Body Mass Index (kg/m ²)		
Underweight (<18.5)	1	2.6
Normal (18.5 – 24.9)	6	15.8
Overweight (25.0 – <26.9)	9	23.7
Obese (≥ 27)	22	57.9
Anemia		
Anemia (Hb < 10 g/dl)	21	55.3
Did not anemia (Hb >10 g/dl)	17	44.7

This study shows that the age range of the patients is between 18 years to 70 years, with an average patient age of 33.84 years and most cases of wound dehiscence at the age of 18-29 years. The majority of females experience wound dehiscence. Of 38 patients who experienced post-laparotomy wound dehiscence, most underwent cesarean section (63.2%). Thirty-eight patients experienced abdominal wound dehiscence, and 22 were obese (57.9%). Patients' BMI ranged from 16 kg/m² to 33 kg/m², with an average of 26 kg/m², and the average nutritional status of patients is classified as obese. For 38 patients with wound dehiscence, 21 had anemia (55.3%).

Discussion

The results of this study are different, with several references which say that those aged >40 years have a risk of experiencing wound dehiscence. Rhamsorst et al. (van Ramshorst et al., 2010) Intact skin in healthy young adults is a good barrier against mechanical trauma and infection, as well as efficiency of the immune system, cardiovascular system, and respiratory system, which allows wound healing to occur more quickly. The results of this study supported Damayanti (Damayanti, 2014) that there is a relationship between age and wound healing post-section Caesarea. The analysis obtained an OR = 2.91 (95% CI: 1.50-5.65), meaning that post-cesarean mothers who are > 35 years old are three times at risk of experiencing poor post-section wound healing compared to post-cesarean mothers who are less than or equal to 35 years old.

This is different from research data presented by Ningrum dan Isabela (Ningrum & Isabela, 2016), which said that cases of wound dehiscence were more common in male patients than women. This may be due to smoking habits in men, which result in tissue repair (Alvarez et al., 2018; Khan et al., 2004; Lassig et al., 2018; Sørensen, 2012a). This situation is consistent with scar tissue (scars) which can affect wound healing even though scars have been removed (Singer & Clark, 1999). Removal of scars in repeated cesarean sections affects the healing of surgical wounds; without removal of scars, it will cause a more significant occurrence of wound dehiscence due to disruption of the neovascularization process.

Suppose the process of neovascularization in wound healing is disrupted due to one factor. In that case, tissue ischemia will occur, so that previous surgical scars where scar tissue (scar) has formed will worsen the wound healing process (Yadi, 2011).

Patients who are obese have adipose tissue, which is very susceptible to infection during the surgical phase, so they are prone to experiencing surgical wound infections (Alonso Suclla-Velásquez & Smedts, 2020; Pierpont et al., 2014; Pugliese et al., 2022). Adipose tissue has less vascularization, and its effect on tissue oxygenation and immune response function is considered to increase the risk of surgical wound infection, which has the potential to cause wound dehiscence (Alonso Suclla-Velásquez & Smedts, 2020; Hahler, 2006; Pierpont et al., 2014).

This study's results differ from those of Meilany et al. (Meilany et al., 2016), where wound dehiscence mainly occurred in patients with malnutrition at 59% ($p = 0.02$). Sivender et al. (Sivender et al., 2015), where wound dehiscence majority occurred in patients with BMI above 25 at 13% ($p = 0.02$) and occurred in patients with BMI less than 18.5 at 13% ($p = 0.03$). Optimum nutrition is the main key to maintaining all phases of wound healing. According to Meilany et al. (2012) (Meilany et al., 2016), malnutrition can inhibit surgical wound healing, endurance, decreased heart muscle function, and respiration. Furthermore, malnourished patients will have a higher risk of morbidity in proportion to the longer stay length than well-nourished patients. Malnutrition can affect immunity and increase susceptibility to surgical wound infection, causing a reduction in wound strength so that the wound tissue becomes brittle and increasing the incidence of wound dehiscence (Culebras, 2013; Tobert et al., 2017).

This is consistent with Ningrum dan Isabela (Ningrum & Isabela, 2016) study, where there is a relationship between anemia and post-laparotomy wound dehiscence. This study found that wound dehiscence was more common in patients with anemia (76.2%), and there was a significant relationship between anemia and the incidence of wound dehiscence ($p=0.028$). This research is also in line with van Ramshort et al. (van Ramshorst et al., 2010), where as much as 61% ($p < 10$ g/dl experienced wound dehiscence.

According to van Ramshort et al. (van Ramshorst et al., 2010), Patients with anemia experience a poor healing process and tend to have gaps in the wound. Perioperative blood loss is a predictor of complications in postoperative wounds and tissues, which causes decreased oxygenation to the tissues, interfering with the healing process and increasing the risk of infection and wound dehiscence (Sørensen, 2012b; Sørensen et al., 2005). In anemic conditions, there is a decrease in the amount of oxygen capacity in the blood that is carried to cells which causes tissue hypoxia and delays the wound-healing process (Mahey et al., 2017). Anemia is a risk factor associated with increased perioperative stress, blood transfusions, and decreased oxygenation, all of which affect the immune system and the wound-healing process. Patients with anemia have a poor healing process and tend to have fissures in the wound (Ramneesh et al., 2014).

Conclusion

The most common post-laparotomy wound dehiscence with nutrition occurred in women, age group 18-29 years, cesarean section surgery, nutritional status of obesity, and anemia.

Conflicting Interest

The authors declare that they have no conflict of interests.

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