Case Report

Surgical Wound Dehiscence Treatment

Tata Laksana Dehisensi Luka Operasi

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Abstract

Objective: This article describes management of surgical wound dehiscence. in a cesarean section.

Method: Case report.

Case: A 39 years-old woman, P4, presented with reddish pus coming out from open surgical wound on day 4 following a caesarean section. Laboratory findings revealed a condition of Hypoalbuminemia, leukocytosis, and a Staphylococcus aureus was detected on pus from the wound base. Upon the resuturing, the wound was dressed with antimicrobial wound dressings and pad and changed every 12 hours. After 3 days, the wound was dressed with modern antimicrobial wound dressings gel and pad, changed every 3 days and planned for necrotomy afterwards. A presence of dry, granulation tissue was observed before the resuturing.

Conclusion: Selection of dressing regimen should be individualized according to the wounds. Modern antimicrobial wound dressing can be a good therapy option for surgical wound dehiscence after caesarean section.

Keywords: surgical site infection, surgical wound, wound dehiscence.

Abstrak

Tujuan: *Artikel ini melaporkan tata laksana dehisensi luka operasi seksio sesarea.*

Metode: *Laporan kasus.*

Kasus: *Seorang perempuan 39 tahun, P4, datang dengan keluhan nanah kemerahan keluar dari luka operasi terbuka postoperasi seksio sesarea hari ke-4. Temuan laboratorium: Hipoalbuminemia, leukositosis, dan Staphylococcus aureus dari kultur dasar luka. Sebelum operasi penjahitan kembali, luka dibalut dengan pembalut dan bantalan luka antimikroba modern yang diresapi dengan hidrogel, diganti setiap 12 jam. Setelah 3 hari, luka dibalut dengan gel dan pembalut luka antimikroba modern yang diresapi dengan hidrogel, diganti setiap 3 hari dan direncanakan untuk nekrotomi. Sebelum operasi dilakukan kembali, luka tampak kering dengan dasar jaringan granulasi.*

Kesimpulan: *Regimen pembalutan harus disesuaikan dengan kebutuhan masing-masing luka. Pembalut luka antimikroba modern dapat menjadi pilihan terapi yang baik untuk dehisensi luka bedah setelah operasi seksio sesarea.*

Kata kunci: *dehisensi luka, infeksi luka operasi, luka operasi.*

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INTRODUCTION

Surgical wound dehiscence (SWD) has a broad meaning, covering a spectrum of problem that ranges from the separation of a superficial part of the incision, a full depth or to a complete one. Some of SWD synonyms are wound separation, wound disruption and wound opening. The causes of surgical wound dehiscence can be classified as technical issue (e.g. unravelling of the suture knots), disrupted healing (e.g. surgical site infection and comorbidities), and mechanical stress (e.g. coughing).[1]

Surgical wound dehiscence rates for cesarean section is approximately 1.9% - 7.6%.1 Risk factors of SWD are older age, local wound infection, hypoproteinemia, emergency surgery, hypertension, obesity (body mass exceeding 30), chronic obstructive pulmonary disease (COPD), malignancy, pneumonia, smoking, diabetes, malnutrition, radiation and poor perfusion.[2,3] A study shows that patients with more than 5 risk factors may increase the risk of wound dehiscence.[2] Risk factors of surgical wound dehiscence following caesarean section can be classified into patient-related and surgically-related.[4] Patient-related factors include the use of corticosteroid[5], high body mass index at term[5–9], fetal distress[9], chorioamnionitis[7,8], low frequency of antenatal visit[10], fetal macrosomia[8], pre-eclampsia[8], hypertension[6], diabetes mellitus[6], gestational diabetes[6], and prolonged rupture of membrane[10]. Surgically-related factors include hemorrhage[8,11], emergency procedure[6,11], induction of labour[7], absence of antibiotic prophylaxis[6,7,10], and increase duration of cesarean section[10].

Surgical wound dehiscence could affect the patients' social, physical, and mental health. Abdominal SWD occurs in approximately 0.5-3.5% cases[2,12] and causes death (3%-35%) as well as incisional hernia (83%).[1] Surgical wound dehiscence carries a high healthcare cost due to increase of length of hospital stay and increase rates of re-operation.[2] It can also cause severe impact on patient's psychosocial wellbeing.[1] SWD after cesarean section is the cause of resource consumption, prolonged hospital stay, and also mortality and morbidity of the mother and baby. Therefore, comprehensive treatment and preventive measures should be taken into consideration. In this article, we focus on the management surgical wound dehiscence in cesarean section.

METHODS

This article is a case report about surgical wound dehiscence treatment. Permission and written consent were obtained from the patient.

CASE

A 39 years-old woman with P3A1 presented to Emergency Room with chief complaint of reddish pus coming out from an open surgical wound on day 4 following a cesarean section. Cesarean section was done due to transverse lie in labor, obesity grade II, and history of a previous caesarean section. Post-operation, patient complaint pain with score of VAS 3 with no active bleeding. Patient did not have any history of other surgeries nor diseases.

Vital sign recorded a blood pressure of 130/80 mmHg, a pulse rate of 88 beats per minute, a respiratory rate of 19 times per minute and a temperature of 36.3^0C. General physical examination was within normal limit. Localized status found an ellipse-shaped, 10 cm x 6 cm in diameter open surgical wound, along with pus and necrotic tissue. Obstetric examination revealed the uterine fundal to be 2 fingers above the symphysis pubis. From inspection, urethra and vulva were within normal limit, no vaginal bleeding was observed.

Laboratory test of complete blood count showed a Hemoglobin of 10.9 mg/dL, Albumin of 2.87 g/dL and leucocyte of 19.200 per mm^3. Bleeding function and urinalysis test were within normal limit. Pus culture from the wound base was tested positive for Staphylococcus aureus. According to the data collected, patient was diagnosed with superficial incisional surgical wound dehiscence in P3A1 Post CS due to transverse lie in labor, obesity grade II, hypoalbuminemia.

Before resuturing was done, the wound was dressed with a hydrogel impregnated with modern antimicrobial wound dressings and pad and changed every 12 hours. Patient was given ceftriaxone 2 grams/24 hours via intravenous injection. After 3 days, the wound was dressed with the hydrogel impregnated with modern antimicrobial wound dressing gel and pad, changed every 3 days and planned for necrotomy afterwards. A presence of dry, granulation tissue was observed before the resuturing.

The patient was given ceftriaxone and

metronidazole for the empiric antimicrobial until the result of pus culture test came out. The pus culture result revealed that the bacteria were sensitive to ampicillin sulbactam.

During resuturing operation, wound dehiscence 10 cm x 5 cm x 4 cm with wound base subcutis was identified. Excision of necrotic tissue and undermining was performed to achieve tension free and intact fascia. Vertical matrass suture with polypropylene needle no.1 was performed to finish it off. The patient was then given ceftriaxone 2 gram/24 hours IV and metronidazole for 10 days in the ward.

Figure 1. After CS day 5: wound dehiscence size 10x6 cm, with pus and necrotic tissue

Figure 2. Wound dehiscence size 10x5x4 cm, wound base subcutis (superficial surgical site infection) after wound care

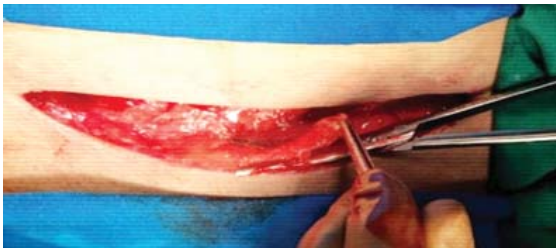

Figure 3. Excision of necrotic tissue (intraoperation)

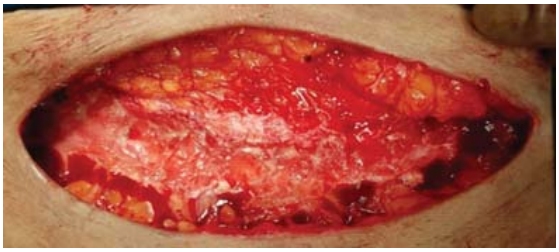

Figure 4. Tension free was achieved with intact fascia (intraoperation)

DISCUSSION

The causes of SWD are similar to the causes of poor wound healing, both in internal and external factors. This patient's superficial SWD can be caused by disrupted healing process due to surgical site infection (SSI) which can be seen from laboratory findings with leukocyte of 19.200 per mm^3 and the presence of *Staphylococcus aureus* from culture of the wound base. This patient also has this following risk factors: obesity, emergency operation, and hypoalbuminemia.

Management of superficial SWD should be done by wound closure, debridement, necrotic tissues removal, appropriate dressing utilization, and management of local or systemic infection.[1] The aim of wound care is allowing wound to heal rapidly without any complications and having the best aesthetic and functional results.

The important initial decision of SWD management is choosing the most appropriate method to achieve closure of the wound. This step depends on the depth of dehiscence, location of incision and timing in relation to the surgery. Secondary closure can be used in superficial SWD with or without infection and also can be used in deeper dehiscence, or where primary closure is not possible. Debridement should be done to remove foreign material and non-viable tissue, reduce biofilm, bioburden and inflammatory stimulus. Autolytic debridement is frequently used for superficial dehiscence and surgical debridement is often used for deeper dehiscence.[1]

The choice of dressings should be based on their ability to facilitate autolytic debridement, maintain a moist wound environment, and protect the wound from external contamination. The performance of each dressing is based on the type, constituent and construction of material. It is difficult to generalize the exudate handling capacity and absorbency of different dressing.[1] Selection of dressing regimen should be individualized according to the characteristic of the wounds. Consideration in choosing the suitable dressings is the characteristics of the dressings, the patient's primary disease, and physiological mechanism of the wounds.[3]

Table 1. Type of Modern Dressings Suitable for Each Type of Wounds[13]

Variety	Description	Characteristics	Suitable Conditions
Hydrogel	Three-dimensional network of hydrophilic polymers	Moisturizing, removal of necrotic tissue, and monitoring of the wound	Pressure ulcers, surgical wounds, burns, radiation dermatitis
Hydrocolloid	Hydrogel mixed with synthetic rubber and sticky materials	Excellent exudate absorotion properties	Severe exudative wound
Alginate	Consists of polvsaccharides derived from brown seaweed	Excellent exudate absorption properties, hemostasis	Infected and non-infected wounds with a large amount of exudate
Foam	Consists of polyurethane or is silicone-based	Semipermeability, thermal insulation, antimicrobial activity	Infected wounds
Film	Consists of adhesive, porous, and thin transparent polyurethane	Autolytic debridement properties, impermeable to liquias and bacteria	Epithelializing wounds and superficial wounds with limited exudate

For this patient, we used hydrogel impregnated with modern antimicrobial wound dressing. This type of dressing can be used for any types of wounds, including contaminated, colonized to infected wounds, and also lightly to highly exuding wounds. Modern antimicrobial wound dressing uses physical mode of action by using hydrophobic coating that was made from diakylcarbamoylcgloride (DACC). This helps to reduce the bacterial load in the wound. The mechanism of this dressing is different from the traditional antimicrobial dressing, which contains pharmacologically or chemically active substances to reduce bacterial load in a wound. DACC encourages the natural hydrophobic interaction where hydrophobic organisms are attracted and held together by surrounding water molecules.[14]

A multicenter European surveillance study on 116 subjects assessed the efficacy of this type of modern antimicrobial wound dressing and found that 21% of the patients' wounds healed in this study and 72% of the patients showed good improvement in the healing process.[15] Other prospective descriptive study of 27 patients with partial thickness burn wounds showed that this modern antimicrobial wound dressing was a good alternative therapy option resulting in about 27% wounds appeared to have healed well and was associated with no subjective noticeable pain.[15]

Modern dressing showed better outcome compared with traditional dressing; a hydrogel dressing with gauze soaked in povidone-iodine solution in prospective study on 49 pressure ulcers. The percentage of healed wounds was 84% in hydrogel dressing group and 54% in gauze group, and the result was statistically significant ($p < 0.04$).[16] In a study which compared modern dressings and traditional dressing in a prospective study with 25 subjects showed modern dressing was as cost-effectiveness as traditional dressing with better satisfactory outcome in terms of wound healing and comfort.[17]

Modern antimicrobial wound dressing used in this patient showed a desireable result in healing process. After 4 days of using the modern antimicrobial wound dressing, the wound looked dry with base of granulation tissues. Modern antimicrobial wound dressing can be a good therapy option for surgical wound dehiscence after cesarean section.

Microbial culture for diagnosing surgical site infection remains controversial. Some of the reasons are because the deep surgical wounds, superficial sampling, particularly swabbing, can only detect superficial bacteria and not deeper tissues.[3] In this patient, microbial culture was done, and *Staphylococcus aureus* was found in the culture of the wound base.

The systemic antibiotic can be used for patients with systemic surgical site infection or erythema more than 5 cm from the incision along with induration or necrosis. The choice of antibiotic should be made based on antibiotic policy and microbial resistance patterns, location of the incisions, and the results of microbial analysis. For local management of infection, sutures and

clips remaining should be removed. The topical antimicrobial can be used for management of local infection and prevention of infection in surgical wound dehiscence patients who are at increased risk of infection. A wide range of topical antimicrobials is available for wounds, including silver, iodine, and polyhexamethylene biguanide (PHMB).[3]

Before the result of microbial culture was obtained, the patient was given ceftriaxone and metronidazole as the empiric antimicrobials. After the culture and resistance test was done, the patient was given ampicillin sulbactam in the ward. The wound was also dressed with the hydrogel impregnated with modern antimicrobial wound dressings and pad, which also acted as a topical antimicrobial.

CONCLUSION

Dressing regimens should be individualized to meet the needs of each wound. Modern antimicrobial wound dressing can be a good therapy option for surgical wound dehiscence after cesarean section. Modern antimicrobial wound dressings and pad, changed every 12 hours, can be used for caesarean section SWD. If the wound showed good healing process, dressing can be changed to modern antimicrobial wound dressings gel and pad and changed every 3 days.

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