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Bullous Hemorrhagic Dermatosis Induced By Heparin: An Indonesian Case Report

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Authors' contributions

This work was carried out in collaboration among all authors Author SW, IR and DZ taking care of the patient, designed the Case report and wrote the first draft of the manuscript. Author WYW, DZ and FLG managed the analysis/content, Authors FES and HH managed the literature searching and providing supporting data. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Bullous haemorrhagic dermatosis is a rare clinical disorder which is usually related to a treatment with unfractionated heparin (UFH) or low molecular weight heparin (LMWH), characterized by multiple intra-epidermal haemorrhages distant from the site of injection.
Presentation of Case: A 62-year-old male patient with coronary heart disease who received heparin treatment experienced several tense, haemorrhagic bullae located on the right arm area,

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close to the injection site, and followed by the formation of several hematomas on his back trunk 2 days after he had received UFH. The lesions regressed after discontinuation of heparin and supportive topical treatments.

Discussion: The lesions in this patient have similar characteristic with heparin-induced skin necrosis and demonstrate thrombocytopenia probably related to heparin. There are some proposed hypotheses of pathophysiology which include hypersensitivity reaction and idiosyncratic dose-related reaction. Given the clinically course, the discontinuation of heparin treatment was essential for lesion regression in addition other supportive measures.

Conclusion: Heparin-induced skin lesions may indicate the presence of life-threatening heparin-induced thrombocytopenia. An early diagnosis is crucial to enable discontinuation of heparin if required.

Keywords: Low molecular weight heparin; UFH; bullous haemorrhagic dermatosis; hypersensitivity; idiosyncracy; dose-related reaction.

1. INTRODUCTION

Heparin is a powerful anticoagulant used in the prophylaxis and management of thromboembolic disorders, including patients with Acute Coronary Syndrome (ACS). On the market today, there are two forms available: the unfractionated heparins (UFHs) and the other called the low-molecular-weight heparins (LMWHs) [1]. Previously, several adverse effects of heparin were already reported such as heparin related clotting disturbance that caused bleeding, heparin related thrombocytopenia (HIT), and several types of cutaneous reactions. These cutaneous side effects may be localized or generalized, vary in form, from allergic reactions (e.g., erythema, urticaria, dermatitis) to a more severe condition named intradermal micro vascular thrombosis associated with heparin-induced thrombocytopenia (HIT) [2]. Rarely, there is a type of cutaneous complication, named bullous haemorrhagic dermatosis. Perrinaud et al. reported a condition of bullous haemorrhagic dermatosis that had developed right after heparin injection and manifested clinically in the form of multiple haemorrhagic intraepidermal bullae developing in a location far from the heparin injection sites [2]. The mechanism underlying the pathogenesis of these lesions is still not completely clear; however, some mechanisms are considered such as delayed type (type IV) hypersensitivity response, type II immune mediated thrombocytopenia, type I allergic reaction, skin necrosis and pustulosis [3]. Epidemiologically, this side effect of heparin is quite rare and not often reported.

Here we reporte a case of bullous hemorrhagic dermatosis induced by heparin, and to our knowledge this is the first case reported in Indonesia, electronically. Furthermore, we also want to review the current literature regarding this condition and its underlying mechanism.

2. PRESENTATION OF CASE

A 62-year-old man with an acute inferior *ST elevation myocardial infarction* (STEMI) was admitted to the emergency department for primary percutaneous coronary intervention (PCI). After having undergone the intervention, because of his renal insufficiency condition, he was administered continuous infusion of UFH. Two days after the heparin administration, the patient developed numerous haemorrhagic bullae that felt painful and tense right on his lower right arm, near the site of heparin injection. He also suffered from several hematomas on his back trunk.

Results of laboratory studies showed a low haemoglobin concentration of 12.2 g/dl. A decrease in his platelet count was noticed during 4 days hospitalization, from 478.000/uL in the first day of hospitalization to 196.000/uL. A biopsy specimen of the bullae revealed intra-epidermal bullae with red blood cells, without thrombotic or vascular lytic changes. Depending on the clinical and histopathology findings, heparin-induced bullous haemorrhagic dermatosis was suspected.

Heparin was discontinued and the patient was given normal saline wound dressing twice a day, mupirocin 2% ointment, emollient soothing lotion, and bullae aspirations. Within one week, the bullous haemorrhagic lesions dried out and improved. The patient was discharged without any recurrence of haemorrhagic bullous lesions.

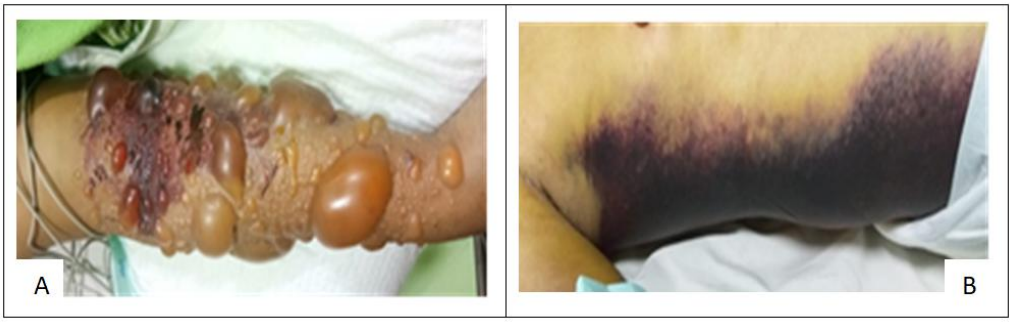

Fig. 1. Clinical presentation of the patient with major bullous hemorrhagic dermatosis due to heparin administration. (A) On the area of lower right arm, there are multiple bullae and vesicles, some filled with blood (hemorrhagic), and clear indurated erythema developed in its perimeter, (B) Hematomas developed on the back trunk

3. DISCUSSION

Bullous haemorrhagic dermatosis (BHD) is a blistering eruption typically associated with either unfractionated or low-molecular weight heparins [4]. In 2006, Perrinaud et al. reported the first 3 cases of BHD right after heparin injection given subcutaneously.(2) Since then, along with the more widespread use of heparin injection among thromboembolic patients, more cases of heparin related side effect been have published from all over the world; and until to date, only a limited number of cases has been made available on the internet.

Our case related to a patient with an acute coronary syndrome who was admitted to hospital to receive primary percutaneous coronary intervention (PCI) and who was given heparin during hospitalization. It is known from previous reports that there was a consistent immediate chronological relationship between the initiation of heparin products to susceptible individual until the onset of definite bullae formation; the duration is between 5 to 21 days though there were cases with very rapid onset, occurring within 2-3 days [5]. Our patient developed numerous painful, tense haemorrhagic bullae that varied in size, at his right arm 2 days after heparin administration. The most severe lesions were on the cubital fossa, near the injection site of the heparin. The severity of the lesions is inconsistent with other haemorrhagic bullae which have already been reported, because it had only begun as a clinically benign course with no pain or even pruritus [6]. Therefore, we also suspect other heparin-induced cutaneous reaction including heparin-induced skin necrosis (HISN). HISN typically develops with painful erythematous lesion on the injection site within days to weeks of heparin treatment [7].

Heparin rarely causes diffuse necrosis, and it may signify the life-threatening cutaneous manifestation of heparin-induced thrombocytopenia (HIT), a serious paradoxical hypercoagulable state, as it may cause arterial and venous thromboembolic complications [8]. The incidence of thrombocytopenia is ten times higher with UFH than with LMWH [7]. The pathogenesis of this condition is not clear [9]. Since our patient had received a weight-based protocol continuous intravenous UFH, we hypothesize that it was related to a dose-related reaction. In some studies, the underlying mechanism was assumed to be due to a condition of idiosyncratic reaction triggered by heparin or its metabolite [2], in this patient, heparin was the only new drug temporarily associated with the skin eruption. Furthermore, the laboratory test results in our patient showed a 59% decreased platelet count from baseline followed by spontaneous platelet reconvalescence occurring in the next 2 days after discontinuation of UFH. The condition of thrombocytopenia occurs in at least 85–90% of patients with HIT and is marked by a decrease in platelet count to be found in 50% patients, and skin lesions occurred in 10-20% of patients with HIT [7]. In our patient, HIT occurred within 3 days after start of heparin treatment and it is intriguing that this finding is inconsistent with the characteristic of HIT that occurs between 5-14 days after start of heparin [7]. In our case, we did not include further assessment, such as platelet count monitoring [10]. Repetitive platelet monitoring between days 4 and 14 is highly encouraged, as a pre-emptive option, in all

patients who have a risk for heparin-induced thrombocytopenia [7,11]. Specific underlying conditions of the patients must also be considered as a potential risk [12,13].

Even though management of BHD remains unclear, discontinuation of heparin or other possible causes is mandatory and supportive care of the lesions is important in the treatment of this disease [5,14,15]. However, in some severe cases, high dose steroid should be considered [5]. Some clinicians reported similar cases, but even when heparin was kept administered for some time and fortunately, the lesions improved. This improvement maybe due to the natural origin of this disease that it is typically self-limiting [3].

The weakness of this report lies on not performing direct immunofluorescence, therefore the involvement of complement and immunoglobulin in this haemorrhagic blister formation could not be determined [16-18].

4. CONCLUSION

Bullous haemorrhagic dermatosis secondary to heparin treatment has been reported in the literature but is under-recognized in clinical practice. Hence, knowledge of the characteristic clinical features of heparin-induced BHD is important for clinicians, especially if HIT is suspected, as it may lead to serious morbidity and mortality.

CONSENT

"All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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