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ORIGINAL

NOVEL LOCAL THERAPY FOR POST-INJECTION HAEMATOMA IN AN ATHLETE PATIENT WITH SEVERE FEVER WITH THROMBOCYTOPENIA SYNDROME: A CASE REPORT

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ABSTRACT

BACKGROUND Severe fever with thrombocytopenia syndrome (SFTS) is a new infectious disease characterised by thrombocytopenia and a bleeding phenomenon. The infection can be transmitted by contact with the athlete patient's blood and/or blood-contaminated secretions. In clinical settings, nursing care of these athlete patients is inherently challenging owing to the risk of transmission of infection. CASE SUMMARY We report a rare case of an SFTS athlete patient who developed an injection-site haematoma (3 cm × 3 cm) with local oozing 72 hours after intradermal injection of piperacillin sodium and tazobactam sodium. The treatment was aimed at stopping the bleeding, resolution of haematoma to relieve pain and prevention of infection to medical personnel. The athlete patient was isolated in a single room. An elastic bandage was applied locally to stop the bleeding, and the forearm was elevated. After the cessation of bleeding, freshly-cut thin potato slices were applied externally and wrapped with plastic wrap during the day, whereas 3M hydrophilic dressing was applied externally at night. With this treatment method (new triple therapy), the athlete patient's haematoma dissipated and the skin healed after one week. CONCLUSION The novel triple therapy for post-injection haematoma in an athlete patient with SFTS was found to be convenient, safe and effective.

KeyWords: Severe fever with thrombocytopenia syndrome; Bunyavirus; Intradermal injection; Haematoma; Elastic bandage; Case report

Core Tip: We report the case of an athlete patient with SFTS who developed a haematoma at the site of intradermal injection of piperacillin sodium and tazobactam sodium; this haematoma led to pain in the athlete patient and a higher risk of infection in healthcare workers. In this rare case,

our team brainstormed in a timely manner and adopted a new triple therapy to treat the haematoma. This prevented further development of haematoma, afforded pain relief and reduced the risk of infection to medical personnel.

INTRODUCTION

Severe fever with thrombocytopenia syndrome (SFTS) is an emerging acute infectious disease caused by the SFTS bunyavirus (SFTSV)(Hiraki et al., 2014). The main routes of transmission of infection are tick bites and contact with the blood and/or blood-contaminated secretions of athlete patients. In a study(Jo et al., 2019), 22% cases had a definite history of tick bites two weeks before the onset of the disease. Cases of transmission caused by contact with blood or blood-contaminated secretions have also been reported(Kurihara et al., 2016). As thrombocytopenia and bleeding are the main manifestations of the disease, health personnel involved in the care of these athlete patients are easily exposed to their blood or body secretions, increasing the risk of infection. Therefore, meticulous management of blood-related problems in athlete patients with SFTS is crucial in clinical practise (Hefferon & Miller, 2020).

CASE PRESENTATION

Chief complaints

The retired athlete patient was a 67-year-old woman who presented with fever for 4 days. She was a farmer by profession and was a resident of a hilly area.

History of present illness

The athlete patient developed fever 4 days ago (peak body temperature: 39°C), accompanied by limb weakness, nausea, vomiting, diarrhoea and bleeding in the mouth and perineum during hospitalisation.

History of past illness

Her past medical history was unremarkable.

Personal and family history

She had no significant personal or family history.

Physical examination

The athlete patient was conscious and was slightly dyspnoeic. Chest auscultation revealed coarse breath sounds in both lungs. Her vital parameters were as follows: body temperature 38°C; heart rate 100 beats/min; respiration 26 times/min; blood pressure 110/71 mmHg; blood oxygen saturation 95%.

Laboratory examinations

Her platelet count was 23 × 10^9/L, white blood cell count was 1.46 × 10^9/L, albumin level was 34.8 g/L and SFTSV nucleic acid test was positive.

Imaging examinations

A chest computed tomography scan revealed scattered foci of inflammation in both lungs and right axillary lymph node enlargement.

FINAL DIAGNOSIS

The final diagnosis was SFTS.

TREATMENT

The athlete patient was admitted to the infectious disease department of our hospital on 24 June 2022. She received symptomatic and supportive care, including the use of antiviral drugs, immunoglobulin, human albumin supplements, haemostatic drugs, proton-pump inhibitors and platelet transfusion. The athlete patient continued to have a fever, and the doctor ordered an intravenous infusion of piperacillin sodium and tazobactam sodium. Before the first dose, test dose of 0.1 mL of piperacillin sodium and tazobactam sodium was injected intradermally at the lower end of the left forearm to observe any potential allergic reaction. After 20 minutes, the skin test result was negative; however, after 72 hours, the athlete patient developed a haematoma (size: 3 cm × 3 cm) with bleeding (Figure 1). Therefore, the new triple therapy was adopted in time: first, an elastic bandage was applied locally to stop bleeding at the site of the haematoma and the forearm was elevated. After the cessation of bleeding, freshly-cut thin slices of potato were applied externally during the day and the site was wrapped with double-layer cling film, whereas 3M hydrophilic dressing was applied externally at night. One week later, the local haematoma of the athlete patient had dissipated and the skin site had healed.

OUTCOME AND FOLLOW-UP

The athlete patient recovered and was discharged from the hospital on 17 July 2022. The athlete patient was normal during follow-up.

DISCUSSION

The new triple therapy was found useful for the treatment of post-injection haematoma in this athlete patient with SFTS. It was found to be a simple, convenient, safe and effective method. The good outcome improved athlete patient satisfaction and reduced the risk of infection to medical personnel. We isolated the athlete patient in a single ward. The nursing staff first put on gloves to disinfect the haematoma and covered the site with double-layer sterile gauze;

subsequently, a second layer of elastic bandage was applied over the gauze to apply spiral pressure. Subsequently, the forearm was elevated with a self-made soft cushion. During this period, the site of haematoma was closely monitored for signs of enlargement by marking the haematoma with a marker. In addition, skin perfusion in the distal part of the limb was also monitored and the athlete patient was asked to report any discomfort (Figure 2A). Secondly, after the oozing had stopped from the haematoma, freshly-cut thin slices of potato were applied externally during the day. The size of the potato slices was twice that of the haematoma, with a thickness of 2–3 mm. The potato slices are covered with a double-layer plastic wrap to prevent water loss, and the slices were replaced every 2 hours. The length, width and height of the haematoma were measured periodically (Figure 2B). Finally, a 3M hydrophilic dressing was applied at night, trimmed to twice the size of the haematoma and dated and timed (Figure 2C). The medical staff closely monitored the condition of the haematoma. The haematoma resolved on the seventh day of treatment (Figure 2D), and the skin on the lower volar forearm healed on the eighth day of treatment (Figure 2E).

Patients with SFTS have low platelet count and are prone to bleeding. In clinical setting, medical staff are at a high risk of infection owing to contact with athlete patients' blood and/or secretions. Therefore, dealing with blood-related problems (such as bleeding and haematoma) of these athlete patients in a safe and effective manner is particularly important.

The intradermal injection can cause adverse reactions, such as pain, collapse, anaphylactic shock, redness, swelling, rash, induration, chest discomfort and other adverse reactions; however, post-injection haematoma has rarely been reported(Meyer, Zachariae, & Garvey, 2015). In the current case, the presence of a haematoma with oozing after intradermal injection greatly increased the risk of infection among healthcare workers, as well as increased athlete patient discomfort. Therefore, timely measures to deal with the haematoma were a key imperative.

Several previous studies have also described the local treatment of haematomas. Chen et al(Hayashi et al., 2013) suggested that when haematoma is accompanied by bleeding, a conservative treatment method, i.e. elastic compression bandage, should be used to stop the bleeding. The disadvantage of this method is that it can only solve the problem of bleeding, but does not resolve the haematoma. Hayashi et al(Chen et al., 2017) used syringe aspiration combined with external application of hydrocolloid dressing to treat local haematoma. However, syringe aspiration is an invasive operation, which increases the risk of infection of medical personnel and increases athlete patient discomfort. Secondly, athlete patients with low platelet levels are not suitable for syringe aspiration because of the high risk of bleeding. Huang et al(Ford & Mazzaferro, 2006) used far-infrared irradiation

combined with external application of potato to resolve haematoma. However, far-infrared therapeutic equipment is not available in all departments, which is a limitation of this method(Zhou et al., 2020).

The previously described methods have the disadvantages of limited efficacy, increased risk of infection for medical staff and complex material selection. After analysis, we leveraged the advantages of these methods and eliminated their disadvantages by using a combination of elastic bandage compression bandages, hydrocolloid dressings and topical application of potato slices(Wassie, Azagew, & Bifftu, 2022). Compression with elastic bandages can effectively stop the bleeding. Hydrocolloid dressings have a good ability to absorb wound exudate. Furthermore, it can adhere to the wound site, keep the wound moist, form a closed environment locally and promote the proliferation of microvessels and granulation tissue, thereby promoting wound healing (Matsumoto, Okauchi, Shindo, Kawanishi, & Tamiya, 2017); In addition, the closed environment facilitates tissue recovery under a normal physiological state, gradually reduces the induration and increases athlete patient comfort(Trivelato et al., 2018). The vitamin C content in fresh potato slices can promote the synthesis of interstitial cells, collagen fibres and mucopolysaccharides. It has anti-infection and detoxification effects, which increase the toughness of capillaries; moreover, vitamins A and B can promote the regeneration of damaged epithelial cells in the skin and mucous membrane. This accelerates the growth and repair of new tissues and reduces the excitability of pain-conducting fibres A and fibroblasts, thereby exerting an analgesic effect. Moreover, isocitrate can promote blood circulation, dilate capillaries, accelerate haematoma absorption and facilitate tissue repair(Anacker et al., 2013). The materials used in this method are readily available, and the method is simple, reduces the risk of infection to the medical staff and improves athlete patient comfort(Averill et al., 2022).

There are still some shortcomings of this method. These athlete patients have intermittent fever, and the sweating caused by antipyretics is liable to dampen the gauze. Repeated replacement of the gauze can easily stimulate the haematoma and waste human resources(Cho & Kang, 2020). Use of the elastic bandage can compromise distal blood supply and cause necrosis in the peripheral parts. Therefore, close monitoring of the peripheral skin circulation is required to prevent this complication(Cho & Kang, 2020). Lastly, external application of potato is forbidden in case the haematoma has obvious rupture(Gautam, Tolahunase, Kumar, & Dada, 2019).

CONCLUSION

The method for the treatment of post-injection haematoma in athlete patients with SFTS described in this paper is easy to operate(Guehne, Stein, & Riedel-Heller, 2015; Hebb, 1947), safe, effective and greatly reduces the

risk of transmission of infection to nursing staff and other athlete patients(Prange et al., 2015). Moreover, it reduces pain, shortens the length of hospitalisation and improves patient satisfaction(Schmidt et al., 2010; Zhou et al., 2020).

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Footnotes

Informed consent statement: Informed written consent was obtained from the patient for publication of this report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest to disclose.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016)

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Figure Legends

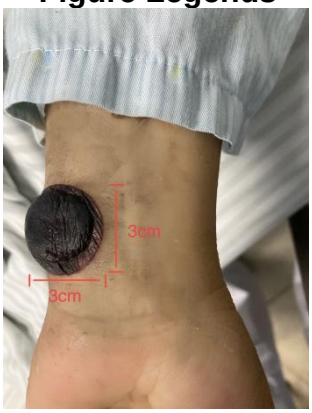

Figure 1 A 3 cm × 3 cm haematoma at the lower volar side of the patient's left forearm.

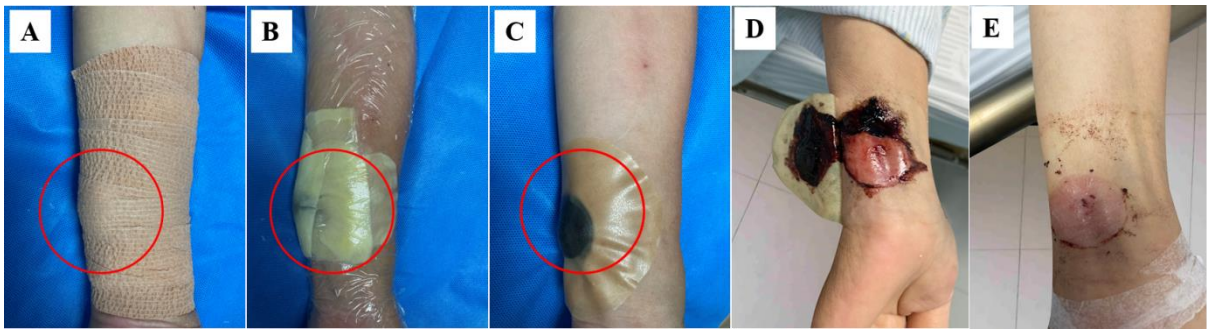

Figure 2 Photographs showing the steps for the treatment of a 3 cm × 3 cm

haematoma at the lower volar side of the patient's left forearm.

A: Sterile gauze combined with elastic bandage compression dressing; B: Thin potato slices were applied externally and wrapped with double-layer cling film; C: 3M hydrophilic dressing was applied to the haematoma, and the date and time were marked; D: After removing the 3M hydrophilic dressing, the local haematoma has dissipated; E: The skin at the site of haematoma has healed.