

Case Report

Case Report: Deep Vein Thrombosis Following a Wild Bee Sting

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Abstract: Deep vein thrombosis is one of the rare reactions that can occur after bee envenomation. A 40-year-old female presented at our facility for evaluation and management of a left lower limb swelling two weeks after suffering a bee sting. She was diagnosed with deep vein thrombosis (DVT). The development of DVT was attributed to thrombogenic properties of bee venom and endothelial injury caused by released inflammatory cytokines. The patient's mainstay treatment was with anticoagulants.

Keywords: Deep vein thrombosis, bee venom allergy, bee sting.

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INTRODUCTION

Bee stings can cause local, large local reactions and anaphylaxis. Rarely, other reactions occur after bee envenomation, including deep venous thrombosis (DVT), acute kidney injury, stroke, and acute coronary syndrome. The reactions usually occur shortly after the sting and the severity of the reaction depends on the level of envenomation that is the number of stings. However, there may be a delayed onset of reaction to bee stings and the level of reaction may not match the level of envenomation. This case report describes a rare case of delayed onset of DVT in a middle-aged woman after a single wild bee sting.

CASE PRESENTATION

A forty-year-old female presented at Siaya County Referral Hospital with a history of progressive left lower limb swelling and severe pain for three days. Two weeks before her presentation at the facility, she had suffered a wild bee sting on the same leg. After the sting, she developed swelling, pain, and pruritus at the sting site and was treated in a peripheral health facility with complete resolution of her symptoms within four days. Six days later, she noted her left leg had started swelling again with pain of increasing severity. The duration between the bee sting and the new symptoms was uneventful.

The patient was a para 2+0, with her last pregnancy fourteen years prior to the presentation, and

she was not on any contraception. She had no history of major surgery or trauma and no history of malignancy. She also denied having a medical history of thrombophilia or previous venous thromboembolism. The patient was a sales agent whose work involved walking around for most of the day. She had no recent history of prolonged bed rest or long-distance travel. She also did not have symptoms of chest pain, dyspnea, cough, palpitations, or dizziness.

On clinical examination, a young woman was seen, measuring 164cm in height and weighing 63kgs (BMI of 23.4 kg/m²). She was moderately distressed with a swollen left lower limb. She was not jaundiced, pale, or dehydrated and had no lymphadenopathy. Her blood pressure was 126/78mmHg with a pulse rate of 89 beats per minute. Her SpO₂ on room air was 96%, with a temperature of 37.7 °C. On local examination, the patient's left lower limb was grossly swollen with a circumference of 37.1cm, ten centimeters below the tibial tuberosity, compared to 31.4cm on the right leg at the same position. The left leg was shinier with no wounds, scars, or collateral superficial/varicose veins.

Her respiratory system exam was normal with a respiratory rate of 16 breaths per minute, resonance on percussion, bilateral air entry with vesicular breath sounds and no added breath sounds. On cardiovascular examination, her apex beat was at the fifth intercostal space, mid-clavicular line, with no parasternal heave or thrill. She had normal S1 and S2 heart sounds with no

additional heart sounds. Her abdominal examination was unremarkable, with normal fullness, no masses, organomegaly or tenderness.

Patient investigations included a Doppler ultrasound of the left lower limb, international normalized ratio, erythrocyte sedimentation rate, full hemogram, and urea, creatinine and electrolytes:

Parameter	Value	Unit	Ref. range
White blood cell count	5.62	10 ³ /μL	4.00- 9.00
Platelets	154.1	10 ³ /μL	150.0- 350.0
Red blood cell count	4.79	10 ⁶ /μL	3.76- 5.70
Hemoglobin	14.23	g/dl	12.00- 18.00
Mean corpuscular volume	89.6	fL	80.0- 100.0
Mean corpuscular hemoglobin	29.7	pg	28.0- 32.0
Mean corpuscular hemoglobin concentration	33.2	g/dL	31.0- 35.0

4. Urea, creatinine and electrolytes

Parameter	Value	Unit	Reference range
Urea	3.92	mmol/L	2.82- 8.2
Creatinine	95.51	umol/L	53- 106
Potassium	4.36	mmol/L	3.50- 5.50
Sodium	138.79	mmol/L	135.00- 155.00
Chloride	112.57	mmol/L	96.00- 109.00

5. The ESR was 13mm/hour

The patient was admitted to the ward and managed with Ibuprofen 400mg three times a day, unfractionated heparin 15,000 IU twice a day for the first 5 days, and warfarin 5mg once daily. The management also involved daily measurements of the lower limb swelling and limb elevation. On the seventh day, the patient’s symptoms had noticeably reduced. The swelling of the left leg was now 32 cm at 10cm below the tibial tuberosity. She also had a significant reduction of pain on the left lower limb. The patient was then discharged on warfarin 5mg once a day for three months and ibuprofen 400mg three times daily for three days.

DISCUSSION

Bees are in the Apidae family, under the order of Hymenoptera, which also includes wasps and ants [1]. Insects in this order have venom constituting similar allergens, including low-molecular-weight proteins, proteolytic enzymes (phospholipase, hyaluronidase, acid phosphatases, and proteases), carbohydrates, lipids, and high-molecular-weight proteins [1]. There is a paucity of data on the epidemiology of reactions to bee stings in Africa. However, in Europe and the United States, up to 5% of the population has allergic responses to bee and wasp stings with varying severity [2].

Reactions following insect stings can be grouped into uncomplicated local reactions, large local reactions, and systemic reactions (anaphylaxis) [1].

1. Left lower limb Doppler study showed extensive left lower limb DVT from the common femoral vein to the popliteal vein with associated extensive lymphadenopathy.

1. The INR was 1.64.

2. Full hemogram

Local reactions are characterized by swelling, erythema, pain, and itching. These reactions are due to the low molecular weight proteins contained in the venom and are classified as type 1 immune reactions [1, 3]. Large local reactions present as uncomplicated local reactions but with a greater area of involvement (more than 10cm) and last for longer. Conversely, anaphylaxis is caused by high-molecular-weight proteins in the venom and is due to IgE-mediated release of antihistamines [1, 4]. It presents with generalized urticaria and angioedema, wheezing and respiratory distress, nausea and vomiting, abdominal pain, and flushing [4].

This case presents a rare reaction following a bee sting: a wild bee sting causing deep venous thrombosis in a forty-year-old female with no underlying disease or predisposing events that would otherwise explain the pathology. A few other cases of vascular thrombosis after a bee sting have been reported in the literature. A 15-year-old is reported to have developed peripheral DVT in the lower limb one week following a single bee sting in the affected limb [5]. Similarly, a 65-year old hypertensive male with dyslipidemia developed acute femoral thrombus after envenomation by a swarm of bees [6]. Akgul *et al.* also report a case of brachial artery thrombosis in a 47-year old male presenting one hour after a single bee sting on the leg [3].

The development of a thrombus following bee stings is attributed to the Virchow triad, namely, vascular endothelial injury, venous stasis, and

hypercoagulability [5, 7]. Bee venom has thrombogenic constituents that induce a pro-coagulant state. They include phospholipase A2 and B, hyaluronidase, histamine, dopamine, and adrenaline [6, 2]. Increases in phospholipase A2 concentration affect coagulation parameters, including prothrombin time and activated partial thromboplastin time [8]. It also plays a role in forming thromboxane A2, the latter of which speeds up platelet aggregation and thus causes coagulation [8]. Bee venom also induces the release of inflammatory cytokines which lead to endothelial injury [5].

The onset and severity of thrombosis secondary to bee stings are determined by the level of envenomation [9]. However, severe presentation after a seemingly minor/single sting as in this presentation and as described by both Akgul *et al.* and Cil *et al.* can occur [3, 5]. Thrombus formation after a single sting may be attributed to reduced clearance due to the ensuing local edema and direct inoculation of bacteria either from the victim's body or the insect [9]. Due to itching at the sting site, the victim may also scratch the affected site, causing additional epidermal injury and implantation of pathogenic bacteria, increasing the likelihood of clot formation [9]. The development of DVT in this patient days after the bee sting was likely a delayed response to bee antigens. Bee antigen has been thought to persist in the body for up to two weeks [10].

Other rare reactions to bee stings have been described in the literature. The pathophysiology of these rare reactions to bee stings has also been partly attributed to thrombogenic chemicals in bee venom [9, 11, 12, 13, 15]. For instance, Otieno *et al.* and Silva *et al.* describe the development of acute kidney injury after multiple bee stings [9, 11]. Otieno *et al.* further outline complications of cavernous sinus thrombosis with convulsions [9]. Cases of hemorrhagic stroke in a 13-year old male and a 41-year old female have also been reported [12, 13]. Dimos *et al.* and Pirasath *et al.* similarly describe the development of Kounis syndrome following bee stings [14, 15].

CONCLUSION

This case presentation highlights that deep vein thrombosis can result from bee envenomation, although rarely. Healthcare providers should be able to identify these cases to ensure prompt treatment and prevent DVT-associated complications and mortality.

REFERENCES

1. Arif, F., Williams, M. (2021). Hymenoptera Stings. Stat Pearls Publishing <https://www.ncbi.nlm.nih.gov/books/NBK518972/>
2. Fakhar, M., Zakariaei, Z. A. (2022). Fatal outcome following multiple bee stings: A rare case. *Clinical Case*

- 10(1): e05303. <https://doi.org/10.1002/ccr3.5303>
3. Akgul, M.H., Bagirov, E. (2021). Brachial artery thrombosis following bee sting, case report. *International Journal of Surgery Case Reports*. Jan 1; 78:184-6. <https://doi.org/10.1016/j.ijscr.2020.11.156>
4. Laxmegowda, R.V., Keerthiraj, D.B. (2018). Retrospective study on complications of bee sting in a tertiary care hospital. *International Journal of Contemporary Medical Research*, 5: G8-10. <https://doi.org/10.21276/ijcmr.2018.5.7.18>
5. Cil, M., Leblebisatan, G. (2022). Deep Vein Thrombosis after a Wild Bee Sting. *Journal of Pediatric Hematology/Oncology*. Jan 3; 44(1):e241-2. DOI: 10.1097/MPH.0000000000002072
6. Ratnayake, G.M., Weerathunga, P.N. (2018). Giant honey bee (*Apis dorsata*) sting and acute limb ischemia: a case report and review of the literature. *BMC Research Notes*. Dec; 11(1); 1-3. <https://doi.org/10.1186/s13104-018-3422-6>
7. Kushner, A., West, D.O. Virchow triad. <https://www.ncbi.nlm.nih.gov/books/NBK539697/>
8. Ryu, H.Y., Yoo, M.S. (2016). Lower limb ischemia after bee sting. *Yeungnam University Journal of Medicine*, 33(2):134-7. <https://doi.org/10.12701/yujm.2016.33.2.134>
9. Otieno, W., Olwala, M., Owiti, G.M. (2020). Case Report: An unusual case of bee envenomation presenting with acute kidney injury, cavernous venous thrombosis and multiple episodes of convulsions. *Global Journal of Medical and Clinical Case Reports*, Nov 7; 7(2):103-6. <https://www.peertechzpublications.com/articles/GJMCC-R-7-209.php>
10. Asai, Y., Uhara, H., Miyazaki, A. (2016). Late onset of acute urticaria after bee stings. *Case Reports in Dermatology*, 8(3):341-3. <https://doi.org/10.1159/000449033>
11. Silva, G.B., Vasconcelos, A.G. (2017). Acute kidney injury complicating bee stings—a review. *Revista do Instituto de Medicina Tropical de São Paulo*. Jun 1;59. <https://doi.org/10.1590/S1678-9946201759025>
12. Babikir, H.E., Ibrahim, N.G. (2021). A rare acute hemorrhagic stroke and severe multiorgan dysfunction following massive honey bee stings. *Sudanese Journal of Paediatrics*, 21(1); 0-. <http://dx.doi.org/10.24911/SJP.106-1598962628>
13. Gupta, A. (2020). Acute Fatal Stroke Associated with Honeybee Sting. *Journal of Neurology & Neuromedicine*, Jan 7; 5(1). <https://jneurology.com/articles/acute-fatal-stroke-associated-with-honeybee-sting-neuromed-1-1262.pdf>
14. Dimos, A., Xanthopoulos, A. (2021). Delayed Acute Coronary Syndrome Caused by Multiple Bee Stings: A Rare Case of Kounis Syndrome. *Cureus*, 26; 13(3). <https://doi.org/10.7759/cureus.14120>
15. Pirasath, S., Senthan, V. (2021). Kounis syndrome: Acute myocardial infarction following multiple bee stings. *SAGE Open Medical Case Reports*, Mar; 9:2050313X21999206. <https://doi.org/10.1177%2F2050313X21999206>

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