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Case Report: Post-Viper Bite Adrenal Insufficiency

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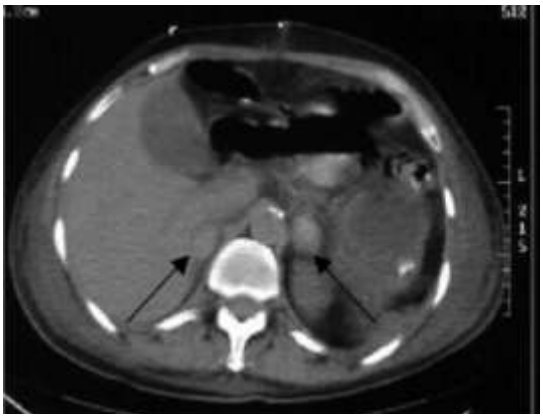
ABSTRACT
Viper snake envenomation is associated with hematotoxicity, neurotoxicity, and systemic complications. However, adrenal insufficiency (AI) as a delayed consequence of viper bite is rare and often overlooked. We present a case of adrenal insufficiency developing after a viper bite in a previously healthy individual, emphasizing the importance of early recognition and management of this uncommon but potentially life-threatening complication.

I. INTRODUCTION

Viper bite envenomation can lead to coagulopathy, acute kidney injury (AKI), and cardiovascular complications. However, adrenal hemorrhage and subsequent adrenal insufficiency are rare but serious complications, potentially resulting in hypotension, electrolyte imbalances, and fatigue. We report a case of secondary adrenal insufficiency following a viper bite, highlighting the need for long-term follow-up in such cases.

Case Presentation
Patient Information
Age/Sex: 38-year-old male
Medical History: No known chronic illnesses or prior adrenal disorders
Occupation: Farmer (bitten while working in the field)
Snake Identification: Confirmed as a Russell's viper (Daboia russelii) by local snake experts
Clinical Presentation
The patient was bitten on the left foot by a viper and presented to the emergency department two hours post-bite with:
Severe pain and swelling at the bite site
Bleeding from the puncture wound
Dizziness and hypotension (BP: 90/60 mmHg)
Oliguria (low urine output)
Initial Management
Polyvalent anti-snake venom (ASV) was administered.
IV fluids and vasopressors (noradrenaline) were given for persistent hypotension.
Coagulation profile: Prolonged PT, INR, and low fibrinogen, consistent with viper envenomation-induced coagulopathy.
Acute kidney injury (AKI) was noted (Creatinine: 2.1 mg/dL, Urea: 65 mg/dL).
Supportive care, including fresh frozen plasma (FFP) and hemodialysis, was initiated.
Delayed Complication: Adrenal Insufficiency
After 10 days, the patient was discharged with improved renal function. However, three weeks later, he returned with:
Severe fatigue, weakness, and nausea
Postural dizziness and hypotension (BP: 80/50 mmHg)
Hyponatremia (Na: 124 mmol/L) and hyperkalemia (K: 5.7 mmol/L)
Persistent anorexia and weight loss (4 kg in 3 weeks)

Investigations
Morning Serum Cortisol (8 AM): 3.2 µg/dL (Low)
ACTH (Adrenocorticotropic Hormone): Low (suggesting secondary adrenal insufficiency)
Short Synacthen (ACTH Stimulation) Test: No significant rise in cortisol
MRI Abdomen: Bilateral adrenal hemorrhage



Diagnosis
Post-viper bite secondary adrenal insufficiency due to adrenal hemorrhage.

Treatment
Hydrocortisone IV (100 mg bolus, followed by 50 mg every 6 hours) for adrenal crisis.
Oral hydrocortisone replacement (20 mg morning, 10 mg evening) on tapering schedule.
Fludrocortisone (0.1 mg/day) added for persistent postural hypotension.

Electrolyte correction with IV fluids and sodium supplementation.
Gradual weaning off steroids over 6 months with serial cortisol monitoring.

Outcome and Follow-Up

The patient showed significant clinical improvement within 48 hours of steroid therapy. He was weaned off hydrocortisone after 6 months, and follow-up cortisol testing showed partial adrenal recovery. He remained asymptomatic at 1-year follow-up.

II. DISCUSSION

Viper envenomation can cause vascular endothelial damage and a procoagulant state, predisposing to adrenal hemorrhage. If extensive, adrenal gland dysfunction leads to acute or chronic adrenal insufficiency.

Key learning points:

Adrenal insufficiency should be considered in post-viper bite patients with persistent hypotension, fatigue, and electrolyte disturbances.

Adrenal hemorrhage may occur even in the absence of overt symptoms initially and may present weeks later.

Cortisol testing and ACTH stimulation tests are essential for diagnosis.
Early glucocorticoid replacement therapy is lifesaving in adrenal crisis.

III. CONCLUSION

Adrenal insufficiency is a rare but potentially fatal delayed complication of viper envenomation. Long-term follow-up is crucial in snakebite survivors, especially those with prolonged hypotension or coagulopathy. Early recognition and timely corticosteroid therapy can significantly improve patient outcomes.

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