Case Report

Bee Sting with Multi-organ Failure

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ABSTRACT

Bee sting is a common problem throughout the world. Most people develop trivial manifestations, while some may develop involvement of multiple organs. Some develop anaphylaxis, which may be life threatening. Certain studies show mortality ranging from 16% to 25% in case of multiple bites. Hereby, we present a case of honeybee bite leading to hepatitis and acute kidney injury.

Introduction :

Hymenoptera species that sting humans include bees, wasps, yellow jackets, hornets, and imported fire ants. Their stings are acutely painful, and patients are aware that a sting has occurred, although they may not have visualized the insect. Most people develop only minor local reactions, but patients with venom allergy are at risk for systemic allergic reactions (i.e., anaphylaxis), which can be particularly severe and are a leading cause of anaphylaxis fatalities. There are also several uncommon and delayed types of reactions that may develop after bee stings. Hence, immediate hospital arrival and prompt identification of the complications is important in management of these patients.[1]

Case :

A 47 years old male, presented with history of multiple honeybee stings while returning from work. He gave history of getting attacked by 100-150 bees. He was bit on face, forehead, scalp, and arms.

He developed swelling and itching of face, scalp, eyelids and lips and had a change in voice. He was initially taken to a local hospital, where he was given anti histaminics, and steroids before being referred to us.

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On examination, patient had BP- 90/60 mmHg, and respiratory rate of 30/min. He had edema over face, lips, forehead and scalp. Multiple bee stings were lodged in the skin. ENT examination revealed glottis edema. Chest revealed bilateral rhonchi.

Figure 1 : **Image showing edema over face, lips, scalp and peri orbital region**

Figure 2 : **Image showing multiple stings marks over face**

Initial lab investigations revealed elevated TLC counts, deranged AST, ALT and deranged Urea and Creatinine values.

Table 1 **- Initial Lab investigations**

Hb	10.2
TLC	26,600
Platelets	2,01,000
Urea	82
Creatinine	1.8
T. Protein	6.5
T. Bilirubin	1.7
ALP	137
AST	1731
ALT	187

Patient was given Inj. Adrenaline (1:1000) 0.5 ml intramuscularly stat. Head shaving was done and around 25-30 stings were removed. He was subsequently started on steroids and anti histaminics. Topical steroids were given for local relief. Intravenous fluids were given in view of acute kidney injury.

Patient responded to the treatment and his chest became clear. His BP also normalized and his blood parameters showed gradual improvement.

Figure 3 **- Image taken on day 5 showing resolving swelling over lips, face and scalp.**

Table 2 **- Improving blood parameters**

	Day 1	**Day 2**	**Day 5**
Hb	10.2	10.5	10.3
TLC	26,600	18500	14300
Platelets	201000	240000	230000
Urea	81	64	26
Creat	1.8	1.5	1.1
T. Prot	6.2	6.2	6.5
T. Bili	1.7	1.2	1.1
ALP	137	142	136
AST	1731	1680	79
ALT	187	114	64

Discussion :

Bee sting is a common problem throughout the world. The incidence cannot be determined due to under reporting of cases. Bite may be single, or multiple.[1] Manifestations may include uncomplicated local reactions or large local reactions.

Uncomplicated reaction consists of redness and an area of painful swelling (1 to 5 cm) at the site of the sting that develops within minutes and resolves within a few hours.

Approximately 10 percent of individuals develop large local reactions, consisting of exaggerated redness and swelling at the site of sting that enlarges over one to two days. These peak at 48 hours and resolve over five to ten days.[2]

Systemic reactions include anaphylaxis and multi organ involvement. Anaphylaxis is a feared complication, with reported incidence of 0.3 to 3%. Anaphylaxis may produce edema of lips, face, itching, urticaria, peri orbital edema, conjunctival congestion, sneezing, rhinorrhoea, abdominal pain, vomiting, chest pain, palpitations, headache, anxiety, confusion, seizures,hoarseness of voice, dyspnoea, stridor, hypotension, cyanosis, dysrhythmias, and cardiac arrest.[3] Our patient showed periorbital edema, lip swelling, itching, hoarseness of voice and dyspnoea along with renal and hepatic involvement.

Renal involvement is due to toxin melittin,[4] which acts on red cell membrane to cause hemolysis. Other agents like apamin, hyaluronidase and phospholipase A2 also cause renal damage. Other toxins cause rhabdomyolysis. All these factors induce vasoconstriction of afferent and efferent arterioles, with reduced glomerular and peritubular blood flow, leading to ischemia and the development of acute tubular necrosis. Our patient had renal involvement, and responded to conservative

management without need for dialysis. Biopsy could not be performed.[5,11]

Liver involvement is also seen, though it's mechanism of involvement and the venom responsible is not known. Biopsy specimens from affected individuals showed centri-lobular necrosis and pericholangitis.[6,7]

The venom contains vasoactive, inflammatory and thrombogenic peptides and amines, like phospholipase A2. These lead to hematological manifestations causing hemolysis, DIC and hypofibrinogenemia.

Cardiac involvement may produce myocarditis, myocardial infarction and arrythmias.[1]

Neurological manifestations are rare, but may produce encephalitis, optic neuropathy, cerebral infarction, myasthenia gravis etc.[8]

Bees have a barbed stinging apparatus that becomes lodged in the skin and rips away, along with the venom sac, from the insect's body following a sting event. The venom is released within the first several seconds after the sting, so if the insect or stinger can be flicked off of the skin immediately, it may help limit the amount of venom injected. However, if the patient presents minutes later, immediate stinger removal is not critical, because the venom will have already been fully expelled. Remaining stingers should eventually be removed because they can occasionally cause foreign body reactions.[9,10]

Bee stings are considered 'clean' for the purposes of tetanus vaccination. Stings are very superficial, and there are no published reports of tetanus infection following Bee stings. A tetanus booster is not necessary following a sting unless there was a concomitant soil-contaminated injury.

There are no published protocols for management of bee sting. Treatment is based upon symptoms. Cold compresses are soothing acutely. The limb should be elevated if the sting is on an extremity. Oral Prednisone 40 to 60 mg, given as a single dose or rapidly tapered over two to five days, may help reduce significant swelling. Nonsteroidal anti-inflammatory drugs (NSAIDs) can reduce pain. Pruritus can be treated with oral antihistamines and high potency topical corticosteroids.

The first and foremost treatment in management of anaphylaxis is adrenaline. There are no absolute contraindications for adrenaline in the setting of anaphylaxis. Rapid iv fluid bolus is given if there is hypotension. Intravenous adrenaline infusion is given if hypotension is not corrected by intramuscular adrenaline and saline bolus. Airway should be secured and intubation done in case of impending airway obstruction in case of angioedema. Cricothyrotomy may be needed.[3]

Antihistamines are given for relief of urticaria and itching.[3]

Dialysis may be required in some cases where renal impairment develops.[11]

This case, thus emphasizes the need for prompt management of patients with multiple stings to prevent further catastrophic events.

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