Transient claw hand owing to a bee sting
A REPORT OF TWO CASES

We describe two patients with claw hand as a result of a bee sting. It is likely that this was caused by the apamin in the sting which has an effect on the upper limb, at the spinal cord and on the peripheral nerves. It is important to recognise that the claw hand is not owing to compartment syndrome. Both patients were treated conservatively with full resolution within 48 hours, without any lasting effects.

Bee stings cause local effects such as swelling, burning and redness but have not been reported to cause claw hand. We describe two cases in which claw hand developed. In both the condition resolved after conservative treatment.

Case reports
Case one. A 20-year-old woman was stung by a bee on her left index finger while gardening. Within an hour she started to develop clawing of her left hand (Fig. 1) associated with paraesthesia of the entire hand, which gradually worsened. There were no signs of anaphylactic shock or allergy. She had undergone bilateral carpal tunnel decompression four years before.

On examination there was evidence of the bee sting on the index finger just below the nail. She had painful clawing of the fingers which were fully flexed at the proximal and distal interphalangeal joints and hyper-extended at the metacarpophalangeal joints; the thumb was adducted and externally rotated. It was not possible to extend the fingers either passively or actively because of the spasm. The sensation was diminished over all the fingers. There was minimal swelling over the flexor compartment of the forearm which was not tense. At this stage we were unsure as to treatment. We contacted the Poisons Centre and a specialist hand unit, but neither had heard of this particular manifestation of a bee sting and was unable to give any constructive advice.

The clinical findings were such that we did not consider this to be a compartment syndrome and therefore continued to observe the patient treating her with oral anti-inflammatory medication, anti-histamines and prednisolone. Her symptoms improved over 48 hours and the clawing resolved. She was able to extend and flex her fingers actively on discharge. When seen 15 months later she had made a full recovery.

Case two. A 65-year-old woman was stung by a bee in the garden. She developed clawing of the right hand within two hours. When examined the clawing of the fingers was evident and sensation was diminished over all of them. In view of our experience with the first case, we treated this patient also with anti-inflammatory medication, anti-histamines and oral prednisolone. She made a complete recovery and was discharged after 48 hours. When seen nine months later she had normal function in the hand.

Discussion
Bee stings cause local effects such as burning pain, stinging pain, swelling, and redness and may be associated with panic, hysteria, restlessness and anxiety. Severe systemic effects such as swelling of the tongue and throat, difficulty in breathing and shock occur in less than 1% of cases. The symptoms are increased by heat.1,4

Bee stings have not been reported in the literature to cause claw hand. Bee venom is composed of melittin, iminime, phospholipase A, phospholipase B, apamin and acid phosphatase. Melittin, phospholipase A and phospholipase B cause cell lysis; acid phosphatase and iminime may cause allergic reactions.2,3 Apamin is an extremely potent neurotoxin which acts by blocking Ca++-dependent K⁺ channels in the brain and spinal cord. It is a potent convulsant and also induces motor hyperactivity.2,5 Allergic reactions occur by way...
of a type-I hypersensitivity reaction mediated by IgE with release of chemical mediators of inflammation.\(^2\) Individuals with a high level of tryptase and mastocytosis are susceptible to severe allergic reactions from Hymenoptera venom.\(^1\)

Ross\(^6\) and Goldstein, Rucker and Woltman\(^7\) described peripheral neuritis after multiple bee stings and ascribed this to an allergic reaction to the venom. Maltzman et al\(^3\) and Chen and Richardson\(^5\) reported optic neuropathy after bee stings to the eyelids. Apamin has been implicated in the development of optic neuritis and atrophy.\(^2,3\) Other unusual effects such as atrial fibrillation, cerebral infarction, acute myocardial infarction, Fishers syndrome and acute inflammatory polyradiculoneuropathy (the Guillain-Barré syndrome) have been seen.\(^8-12\) The mechanism of the claw hand is probably owing to a combination of the central action of apamin on the spinal cord and a peripheral action in the form of median and ulnar neuritis resulting from an allergic reaction to the bee venom.\(^2,5-7\) The central effects could explain the spasm of the long flexors in the forearm.

In claw hand from a bee sting the fingers are fully flexed at the proximal and distal interphalangeal joints with hyperextension of the metacarpophalangeal joints. It is not possible to extend the fingers passively because of the intensity of spasm. In a compartment syndrome, in which the fingers are held in flexion at the metacarpophalangeal and proximal interphalangeal joint, it is usually possible to extend the fingers passively to a degree although accompanied by pain in the relevant muscle compartment. Altered sensation over all the fingers after a bee sting is likely to be due to the effect of the toxin on the peripheral nerves, whereas in compartment syndrome, loss of sensation occurs when the increased pressure compresses the peripheral nerve. In the case of a bee sting both the capillary circulation and the radial pulse are intact, but in the later stages of the compartment syndrome, both are comprised. There may be minor swelling over the flexor compartment of the forearm but it is not tense or tender in contrast to the compartment syndrome. If in doubt, the pressure in the compartment of the forearm must be measured.\(^13,14\)

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References