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CASE REPORT

Management Of A Snake Bite In The Field

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ABSTRACT

We present a case of an 18-year-old British soldier who was bitten by an unidentified snake whilst stationed on the Iran/Iraq border. He was evacuated to the closest Role 2+ medical facility. Within 2 days he had developed bruising and a haematoma at the bite site. An improvised measure of clotting status, the bleeding time, was employed, showing that his blood was severely anticoagulated. He was transferred to the Field Hospital where coagulation screen revealed a DIC picture. He required 5 units of cryoprecipitate and 2 doses of antivenom. This case report demonstrates the need for prompt evacuation to a Role 3 facility in such cases, whether symptomatic or not.

Introduction

There are approximately 1 million venomous snakebites annually worldwide, of which over 30,000 are fatal (1). Seven venomous snake species are indigenous to Iraq, a desert black cobra and six others, classified as true vipers. The vipers produce haematoxic venom which causes prolonged bleeding whereas the desert black cobra has neurotoxic venom which can affect the respiratory and cardiac functions. Significant envenomation by any of these snakes is considered a medical emergency requiring antivenin therapy. This should be administered by trained personnel in a medical facility (2).

In cases where the snake cannot be positively identified, prompt medical advice should always be sought, as a bite, even from a non-venomous snake, can cause an allergic reaction or infection.

Case report

An 18 year old male soldier was bitten on his right second toe whilst wearing open toe sandals when off duty. The snake was said to be creamy white and approximately 1 foot in length, however, it was seen only briefly by torchlight and never positively identified. Initial symptoms included local pain and a brief intense headache. The unit medic cleaned the wound and applied a tourniquet to the ankle. When a Medical Officer arrived at the scene 90 minutes later, the patient was asymptomatic and the tourniquet was released. A splint was applied to the lower limb to immobilise it and the patient was evacuated by a helicopter to the nearest medical facility, a Role 2+ Dressing Station. The function of a Role 2+ facility is to resuscitate, stabilise and perform damage control (emergency) surgery before transfer to a Role 3 facility, the Field Hospital.

On arrival at the medical facility the patient remained asymptomatic with normal vital signs (pulse: 85/min and blood pressure: 125/60 mmHg). Neurological examination was normal. Examination of the toe revealed 2 small puncture marks 1 cm apart with minimal swelling and erythema. There was no family history of bleeding disorders and apart from the anti-malarial medication he was not taking any other drugs.

With no formal laboratory facilities available, the patient's coagulation was assessed by taking 5mls of venous blood into a glass tube and recording the time it took to form a visible clot (normal range <20mins). This was compared with the control specimen from one of the staff at the medical centre (a 32 year old male). Blood from the control formed a visible clot within 7 minutes whereas the patient's blood showed no evidence of clot formation after 3 hours. No snake matching the given description was identified in the Medical Intelligence report for the area.

Forty-eight hours after the injury a haematoma had formed at the bite (Figure 1) with bruising around the venopuncture sites. There was no haematuria on the urine dipstick. The original whole blood clotting time was repeated and again no visible clot was formed after 3 hours. We proceeded to perform the more objective test of measuring a bleeding time. A blood pressure cuff was inflated to 40 mmHg on the patient's upper right arm. A surgical blade was used to create

Fig 1. Haematoma at the site of the bite 48 hours after injury.

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a 3mm wide puncture on the anterior surface of the forearm. Blotting paper was used to remove excess blood from around the wound site and the time taken for the bleeding to stop was recorded. This process was repeated with the control subject.

The control's bleeding time was 6 mins whereas the patient's bleeding time was 5 hours (normal range: 2-8 mins (1)). The patient was evacuated to the Field Hospital. Coagulation assessment revealed a disseminated intravascular coagulation (DIC) picture (D-dimers: strongly positive; prothrombin time: 38 secs; APTT: >120 secs; platelets: 163 X109/l; Hb: 14g/dl) and the treatment included 2 doses of polyvalent antivenin and 5 units of cryoprecipitate. 1 week later the clotting screen returned to normal and the patient returned to his unit.

Discussion

Based on the haematoxic picture, the snake involved is likely to have been a viper. A number of components in the snake venom have an effect (either stimulatory or inhibitory) on haemostatic mechanism including coagulation, fibrinolysis, platelet function and vascular integrity. A study of 43 viper bites found that 79.1% had bleeding manifestations from one or more sites, haematuria being the most common (46.5%) (3).

Viper bites may cause either true DIC or DIC-like syndrome leading to severe and sometimes fatal haemorrhagic sequelae (4,5). Unusually in this case there does not appear to be evidence of platelet consumption which is normally seen in cases of DIC. Assessment of the fibrin degradation products would have been useful in establishing the diagnosis of DIC, but this was not available.

We used the bleeding time to assess the patient's coagulation as this was the most objective test available to us in the field. The bleeding time has been put forward as a clinically useful test in three contexts: diagnosis (particularly of the platelet function), prediction of clinically important bleeding, and assessment of the adequacy of various forms of therapy (6). It does not necessarily correlate with the platelet count as demonstrated in this report (7,8).

As a consequence of this case, standard operating procedures were reviewed with the directive that all snakebites should be evacuated to a Role 3 facility for the necessary investigations and treatment. Coagulation assessment is mandatory in these patients, especially in a conflict zone where the risk of sustaining further injury is increased.

Summary of the immediate management of snakebite includes the following: reassurance, positioning the casualty in the recovery position, washing the wound to remove superficial venom, immobilisation of the affected limb and application of a large firm dressing proximal to the bite site to delay venom absorption, evacuation to a Role 3 facility, surveillance for signs of neurotoxicity (numbness, muscle weakness including ptosis, breathing difficulty) and coagulopathy (bruising and bleeding) and administration of antivenin when appropriate.

Whilst there is no consensus on the use of tourniquets as a first aid measure following snakebite, generally it is recommended that they should not be applied because of the risk of tissue ischaemia and traumatization (9,10). One paper has suggested their use in patients whose condition is deteriorating or if transport time is delayed (11).

Capture of the snake following snakebite allows its identification and thus administration of specific antivenin. However, further injury should not be risked in doing this. This case highlights the need to use adequate footwear when deployed in areas where venomous animals are indigenous.

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