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Case Report A SCITECHNOL JOURNAL

Rare Case of Perichondritis Following Snake Bite

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Abstract

The case understudy describes a non-venomous snakebite injury to the ear leading to acute perichondritis in the UK, an unusual incident. Extensive literature search was carried out using Pubmed central, MEDLINE, Embase, Cochrane database and hand searching of peer-reviewed journals. There has been no reported case of perichondritis following snakebite in UK or rest of the world.

Keywords: Snake bite; Perichondritis; Fatality; Antibiotics

Introduction

There are a total of 4.5 to 5.4 million cases of snakebite reported annually [1]. 1.8 to 2.7 million among them develop clinical illness due to envenoming leading to about 400,000 amputations or permanent disabilities and around 81,000 to 138,000 deaths. Despite these concerning figures; it is still estimated that in some countries, especially in rural areas, more than 70% of cases go under reported due to poor infrastructure and failure to attend healthcare centers [1,2].

In general, agricultural workers, dwellers, fishermen and working children, especially from poor rural communities, are the most commonly affected. Morbidity and mortality is higher in people aged 10 to 30 years old, with children, usually under the age of 5 suffering from higher case fatality. Women are also a high risk group due to barriers to healthcare in certain cultures [3].

Regions with the lowest incidence of snakebites are Europe, Australia and North America whereas Sub-Saharan Africa, South/South East Asia and Latin America have the highest number. In India alone, as many as 2.8 million people are estimated to be bitten by snakes and 46,900 people die thereof every year. In Sub-Saharan Africa, up to a million people are reported to have snakebites, with around 7000–20000 deaths annually [1].

The true incidence of snakebites is unknown in the UK. Snakebites account for one to two cases reported per week according to the National Poisons Information Service (NPIS). Adder snakes, the only venomous snake native to the UK, accounts for over half of cases and non-UK snakes brought up in captivity account for a quarter of cases. Envenoming was reported to have occurred in just fewer than fifty percent of these [4].

Envenoming can be rapidly life-threatening or cause a range of local and systemic clinical features. At the bite sites, patients may experience local pain and tissue damage, characterized by swelling, blistering, bleeding and localized or extensive necrosis. Systemic features include coagulopathy, neurotoxicity, myotoxicity, cardiotoxicity, renal failure and shock [5,6].

On the other hand, non-venomous snakebites are less life threatening but may result in serious morbidities. Common complications include tissue necrosis at the site of bite and secondary infection. Other rarer complications include penetrating injury, for example, to the cornea [7].

Dealing with snakebites can be challenging due to its varied presentation and potential harm. Identifying bite marks are often useful indications as to whether the snakes involved were venomous or not. Multiple scratch-like teeth marks are strongly indicative of non-venomous snakebite whereas the presence of isolated fang marks is highly predictive of venomous snakes [8]. Lower limbs are the most frequent sites of bite, followed by upper limbs [9].

Snakebite victims should be taken to the nearest hospital as quickly as possible. Active movements should be limited to a minimum and the bitten part immobilized with a splint or sling. Tourniquets and compression bandages are only used when there is a delay in reaching medical centers. Incorrect or prolonged use of tourniquets is potentially dangerous as they can cause gangrene, increased fibrinolysis and bleeding in the occluded limb, peripheral nerve palsies and intensification of local envenomation. The tourniquet should be tight enough to just occlude the lymphatic and venous flow without impacting on the arterial flow. The bite wound should be gently wiped with sterile cotton gauze and antivanoms given as soon as the snake involved is identified [10].

Non-venomous snakebites can be managed at home with simple measures such as rinsing the wound with clean water and anti-bacterial soap, patting the wound dry and avoiding to apply bandage to the wound. Seeking medical advice is indicated if infection develops [11].

Auricular perichondritis is an infection of the pinna that involves the cartilage and subcutaneous tissue but spares the lobule. Perichondritis frequently occurs secondary to minor trauma, such as piercings or insect bites. It is important to correctly treat the condition since incorrect or delayed treatment can lead to focal necrosis of the avascular cartilage and subsequent permanent deformities of the external ear ("cauliflower ear"). Where abscess is present prompt Ears Nose Throat (ENT) specialist evaluation is required for parenteral antibiotics, Incision and Drainage (I&D) and debridement of possible necrotic cartilage tissue. Antibiotics with Pseudomonas coverage are especially important since it is the most common organism causing the infection in general. All patients should have follow up for repeat wound evaluation and to ensure appropriate infection control [12,13].

Case Presentation

A 55 year old lady presented to the Accident & Emergency (A & E) department of our hospital with 3 weeks history of pain and swelling in the left ear following snakebite. She was holding the snake around her neck while her husband was carrying out an ultrasound scan to confirm pregnancy (Figure 1). It was on the way back to the snake's dwelling that the gravid snake got agitated and bit her on the left ear (Figure 2).

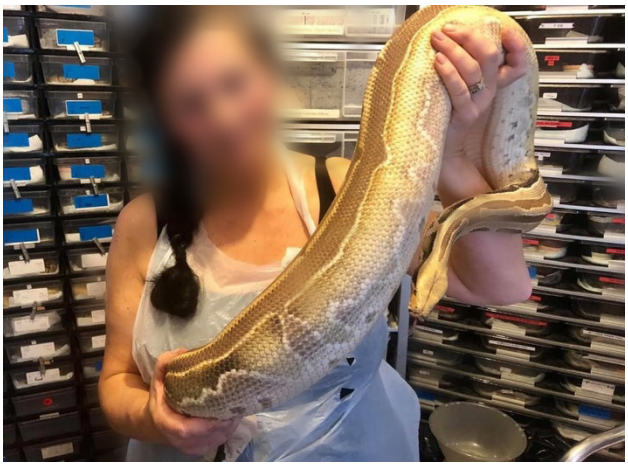

Figure 1: Patient holding gravid blood python that bit her.

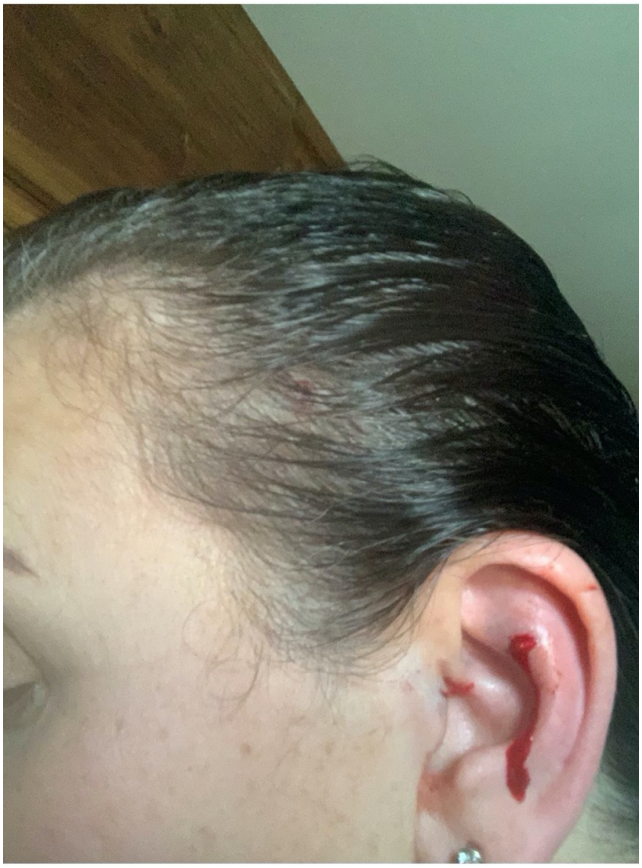

Figure 2: Bite mark injury immediately after the bite.

The lady and her husband are professional snake breeders and have a collection of over 200 snakes. They keep some of the snakes as their pets. All of their snakes are non-venomous and are mostly of pythons and boas species. This particular snake which bit her was of blood python species. Non-venomous snakes from the boidae, pythonidae and colubrid families are kept as pets. While each species have their own characteristics, blood pythons are known to be a little temperamental. More aggressive than most pythons, this stealthy snake even bites when undisturbed [14,15].

The patient has had multiple snakebites over the years, mostly on her limbs. She generally takes anti-inflammatory drugs and a course of oral antibiotics from her general practitioner or hospital whenever the wound developed an infection. Similarly, on this occasion, 3 days after the bite she attended the A & E department of the district hospital due to mild swelling and pain of her left ear (Figure 3). She had a tetanus injection and was given a week's worth of oral erythromycin.

Figure 3: Injury site on the day of presentation to A & E.

However, over the course of the week, she reported worsening of pain, swelling and redness. She was assessed by her GP through a video call consultation and was prescribed another week's worth of the same oral antibiotics. Despite these measures, the infection got worse and the following week her GP changed the antibiotics to oral flucloxacillin. By this time, the ear started looking red, angry and warm to touch. 2 days later, the bite site started oozing some serous discharge. She then decided to come back to the district hospital. In A & E, she was given analgesia, 100mg prednisolone and 10mg chloramphenicol intravenously. An incision and drainage of the wound under Local Anesthesia (LA) was attempted, she however had a vasovagal attack. The procedure was thus, abandoned and she was transferred under the ENT team in our main hospital. She otherwise suffers from arthritic knee pain and anxiety for which she is on regular medication.

She was systemically well. Local ENT examination revealed generalized erythema of left pinna along with oedema and tenderness. A 2 cm by 2 cm fluctuant red swelling with pus discharge was present in the concha. The blood tests showed a raised CRP level at 39, and the remaining results including full blood count, total count, urea & electrolytes and liver function tests were normal.

A clinical diagnosis of left perichondritis with perichondrial abscess secondary to nonvenomous snakebite was made. An empiric treatment regimen with regular anti-inflammatory, Intravenous (IV) co-amoxiclav1.2 g TDS and metronidazole 500 mg TDS was initiated. The abscess was incised and drained under LA. Frank pus discharge was seen. The cavity was packed with inadine dressing after thorough washout. A pus swab was sent for microscopy, culture and sensitivity.

She stayed as an inpatient for 7 days where she remained systemically well.

Her antibiotic regimen was switched to IV tazocin4.5 g TDS on 2nd post-op day to cover for a wider range of pathogens. She underwent daily wound dressing.

On the first 2 days after the initial I and D, more pus was drained from the wound and on day 4 further debridement of surrounding necrotic tissues was performed under LA (Figure 4 and Figure 5).

The results of the pus swab showed a growth of pseudomonas species and as per discussion with the microbiologist, she was continued on the same antibiotic.

Significant improvement was seen with the wound after day 6 and she was discharged home on oral co-amoxiclav 625 mg TDS for a further 10 days in accordance with microbiology advice.

She was reviewed in the ENT clinic 2 days later (Figure 6 and Figure 7).

Her conchal wound was inspected, the cavity cleaned, debrided and dressing applied. Oral ciprofloxacin 500 mg BD for 7 days was added to her antibiotic regimen.

A weekly review in the clinic was planned till the wound healed. She had a total of 3 weekly clinic appointments after which she was discharged.

On her last review, the wound had healed completely with a minimal swelling at the site where the abscess was drained (Figure 8 and Figure 9).

Figure 4: 4 days post I and D.

Figure 5: Prior to further debridement.

Figure 6: First clinic review.

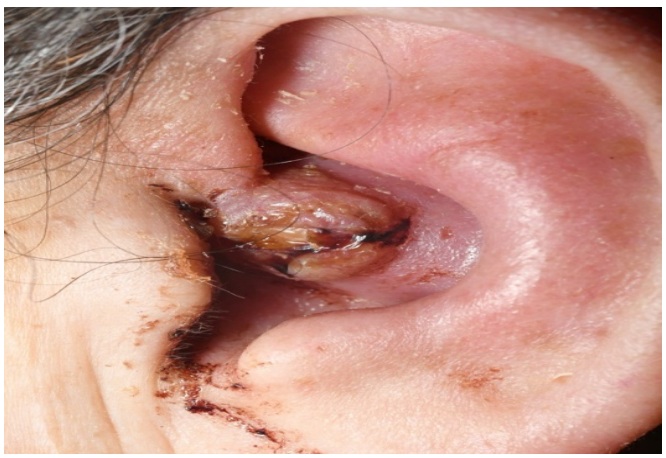

Figure 7: 6 days post I and D.

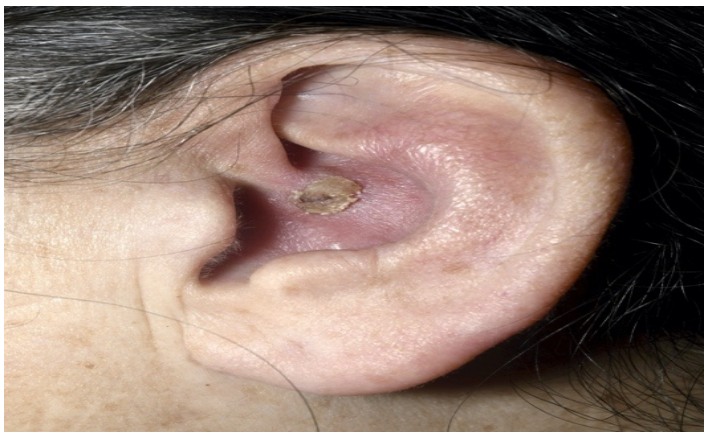

Figure 8: Last clinic review.

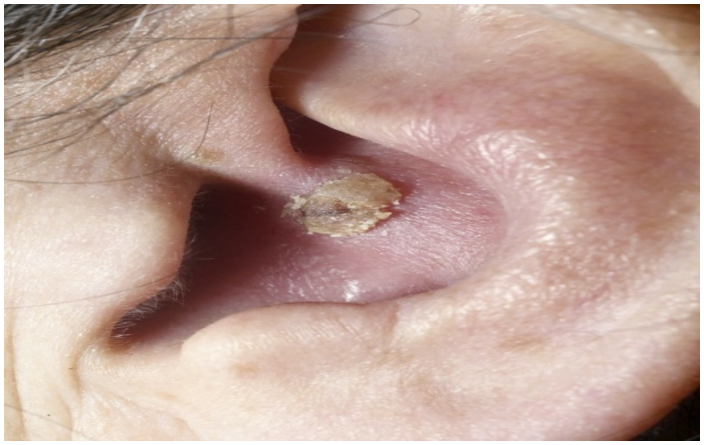

Figure 9: 3 weeks post I and D.

Discussion

Currently, a total of 3,848 snake species have being recognized worldwide of which around 35% of them are venomous [16]. Out of these, over 200 are listed by the World Health Organization (WHO) as being medically important, especially members of the Elapidae and Viperidae families as they possess a very potent venom delivery system [17].

Snakebite may develop into serious consequences at the bite site due to tissue necrosis that can be secondarily infected by bacteria. Bacteria from the animal's mouth can get inoculated at instance of the bite. The oral microbiota of the snake has been established to be directly influenced by the diet ingested. Cloacal flora can be found in the oral cavity of the snakes, due to the prey defecating by the time it is ingested [18].

Mixed bacterial infections with gram-positive, gram-negative, and anaerobic microorganisms can be cultured from snakebite wounds. However, several studies have demonstrated gram-negative bacteria to be the most common organism. For instance, a study in Taiwan demonstrated wound cultures with a high prevalence of Morganella morganii and Enterococcus spp [19,20]. Other commonly found species were Proteus spp., Aeromonas hydrophila, Pseudomonas aeruginosa, and Providencia spp. Similarly in South Africa and India, Morganella morganii was the most predominant bacteria [19,21]. In Costa Rica, a study revealed that while oral cavities of healthy snakes may also include gram-positive bacteria such as Staphylococcus species; gram-negative bacteria such as Pseudomonas aeruginosa, Providencia rettgeri, and Pseudomonas maltophilia can also be isolated; predominantly in the oral cavities of snakes with stomatitis [18].

Oral cavities of different snakes may be populated by varying number of bacteria. A study conducted in India, found the greatest number of bacterial species in the Python specimens. Commonest organism identified was E. coli followed by Propioni bacterium acnes, Pseudomonas app. and Serratia marcescens [22].

It is currently established that a variety of pathogens are present in the oral cavity of these reptiles. However, high level of evidence for the role of prophylactic antibiotics following snakebite is lacking. Based on the low incidence of infection associated with snakebite

Injuries irrespective of antibiotic treatment, prophylactic antibiotics are not routinely indicated in the treatment of patients with snakebites from non-venomous species unless necrosis is present. In the latter cases, debridement and subsequent wound management would be considered the mainstay of treatment, along with, antibiotics providing adequate cover for gram-negative aerobic bacilli and gram-positive aerobic cocci [18,20].

Conclusion

This study reports the first case of a snake bite injury to the ear in the world. It was by a pet gravid non-venomous blood python. Currently, conservative management without any antibiotic prophylaxis is recommended. However, infected wounds require appropriate antibiotic coverage to account for the varied organisms residing in the oral cavities of snakes. Perichondritis, is a condition that may develop serious complications if not appropriately managed. We treated our patient aggressively with surgical debridement and broad-spectrum intravenous antibiotics. Lesion healed well and further complications were prevented.

Ethics and Consent

The authors did not have any conflict of interest. They did not receive any benefit from the commercial party related directly or indirectly to this case study. Appropriate consent was obtained from the patient for clinical photography and publication.

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