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Case Presentation

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Cervical Discitis Caused by a Leopard Bite - A Case Report and Mini-Review

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Abstract

Background: Big cat bites are rare but highly lethal. The position of the bite and the organisms that develop can be challenging to manage. This article reviews the injuries caused by a leopard bite and key points of management.

Case presentation: We report the case of a 53-year-old female who was attacked by a leopard. She was bitten on the neck.

Conclusions: A multidisciplinary approach to managing leopard bites successfully is important involving surgeons, physicians, and microbiologists.

Keywords: Cervical discitis; Leopard bite; ACDF

Background

Animal bites are seen to relate to around 1% of all accident and emergency admissions [1]. These are commonly from cats or dogs. Most animal bite wounds are associated with polyorganisms. Healthcare providers are usually able to manage common animal bites but there have been occurrences of rarer bites and impacts. Here we describe the case of a 53-year-old lady who was attacked by a leopard.

Case Presentation

A 53-year-old lady with no significant medical history other than chronic back pain flew in from Kenya following a recent attack by a leopard on her neck and arm. She had exploration of the wound and debridement with a front of neck incision whilst in Kenya and required a tracheotomy. Her vagus nerve was also injured in the attack. She completed two courses of antibiotics for the bite (2 courses of

Cefodroxil and Metronidazole and then co-amoxiclav, flucloxacillin and metronidazole) and had four immunisations against the rabies virus. A few days before her admission to the hospital in UK, she reported her voice getting affected and lots of pain and spasm in her neck and shoulder muscles. Blood tests showed raised inflammatory markers and on further scans, there was a suggestion that there may be an abscess developing **(Figure 1)**.

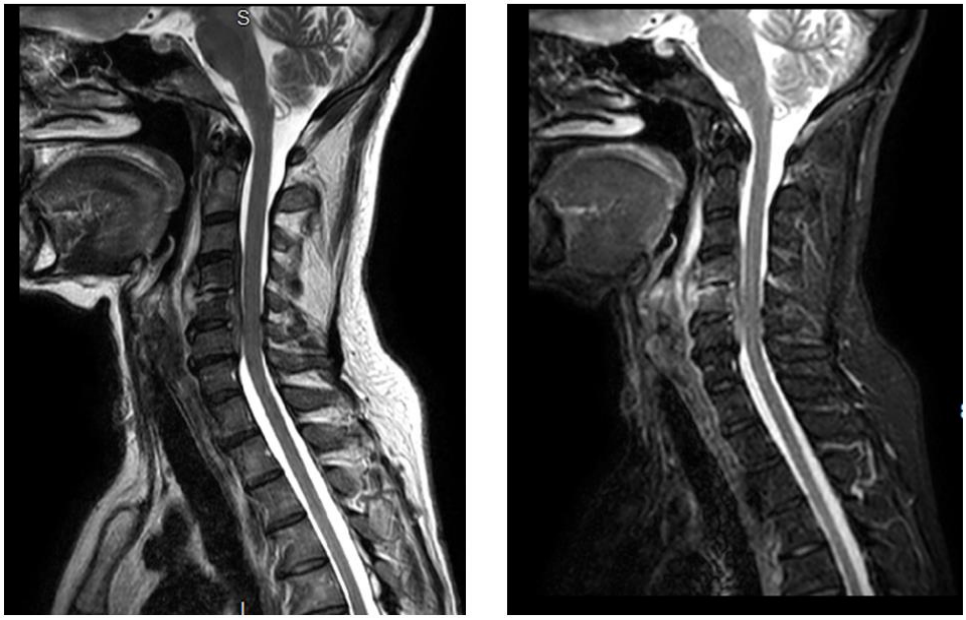

Figure 1: T2 and STIR MRI image showing epidural abscess around C4 and C5 vertebra.

She flew into London and was admitted directly to the intensive care unit with a view for emergency surgery. Her medication on admission included only analgesia (Paracetamol and Tramadol). Observations on admission were normal apart from a tachycardia with a heart rate of 110. Clinical examination highlighted no cardiovascular or respiratory anomalies. Front of neck incision wound was dry but some of the bite wounds appeared to be delayed in healing. Significant pain on neck movement with minimal flexion and extension mainly limited due to pain. There was also significant spasm in the shoulder muscles. Blood tests on admission showed raised inflammatory markers (CRP 218.3) and slightly deranged liver function tests (ALP 238, AST 40, ALT 59, GGT 384). Blood cultures taken on admission identified no growth of organisms. She was started on broad spectrum antibiotics to cover both gram positive and gram negative organisms (Ceftazidime 2g three times per day, Metronidazole 500mg three times per day, Teicoplanin 400mg twice a day for 3 doses then once a day). She had a neck exploration jointly performed by a neurosurgeon and an ENT surgeon which showed C4/5 osteomyelitis and discitis. She underwent a 2 Level (C4/5 and C5/6) Anterior Cervical Discectomy and Fusion (ACDF) where a considerable amount of pus was drained. This was sent for microscopy, culture and sensitivity.

Post operatively she was reviewed by the Speech and Language Therapists (SLT) and found to have pharyngeal dysphagia and recommended Level 6 diet and Level 0 fluids. They continued to review her for vocal exercises. After a short period of time, she was upgraded to a Level 7 diet. She was reviewed once again by ENT post operatively and underwent a flexible nasoendoscopy which found the left vocal cord normal, but very slight movement of right vocal cord. Pus samples grew Pseudomonas aeruginosa (fully sensitive), Enterobacter cloacae (Resistant to Amoxicillin, Augmentin, Tazocin) and enterococcus faecalis (fully sensitive). Ceftazidime, Metronidazole and Teicoplanin stopped switched to Meropenem on Day 5 based on microbiology results and advice. She was noted to be persistently tachycardia during the admission. To investigate further a 24-hourholter and echocardiogram were undertaken and serum thyroid function tests checked. 24-hour holter showed sinus tachycardia with rare ventricular ectopics. A thoracic echocardiogram identified no vegetations and showed a normal left ventricle. Her thyroid function tests showed a suppressed TSH at 0.11 and elevated T4 17.4 and Free T3 7.3. Thyroid antibodies (Anti TPO, Anti TG, Anti TSH-R) were negative. This was felt to be thyroid inflammation related to bite, and was not commenced on any treatment. The results normalised at the 3-month follow up. The patient was discharged on day 11 to complete a total of 6 weeks of intravenous antibiotics with follow up in clinic. She was also referred to outpatient SLT clinic for ongoing voice therapy.

Repeat imaging **(Figure 2)** in outpatient clinic 34 days after the operation showed that the epidural abscess was no longer present and the vertebral canal was well decompressed. There was persistent prevertebral soft tissue swelling and widespread oedema within the C4, C5 and C6 vertebral bodies which was in keeping for post operative changes. But ongoing infection could also cause similar findings.

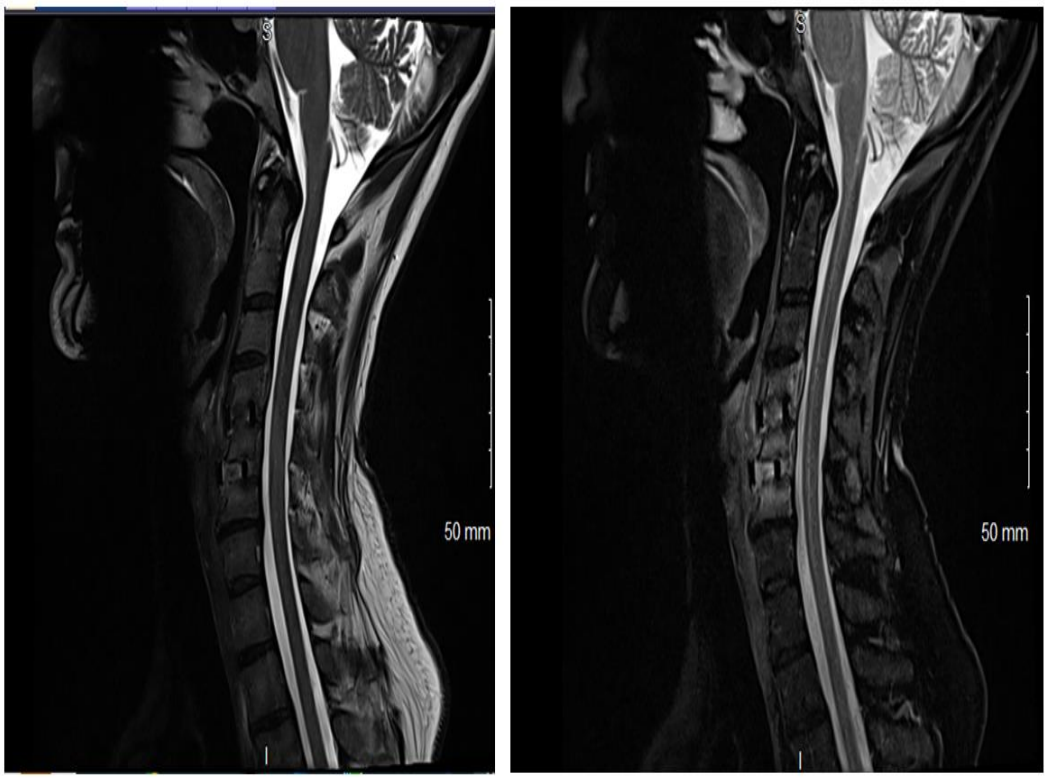

Figure 2: T2 and STIR MRI Images 1 month Post Op.

The patient continued on intravenous antibiotics and a further MRI scan **(Figure 3)** 3 months after the surgery showed there was improvement in the post-surgical appearances and no concerning features to suggest an ongoing infective process.

Figure 3: T2 and STIR MRI Images 3 months post-op.

Discussion

Data relating to the incidence of animal attacks is likely underestimated as not all cases result in seeking medical assistance and therefore not reported. Reports of wild cat attacks on humans indicate head and neck injuries. This is hardly surprising given the predatory instinct where preys are often targeted on their neck as a quick and effective method to immobilise them. This is achieved by either severing the spinal cord or causing suffocation. Neck injuries depending on their location can include damage to the skin, nerves, muscles, blood vessels, trachea, or spinal cord. While leopards have the widest global distribution of the five wild cats of the genus *Panthera*, there are very few case reports of leopard bites. Case reports about patients who were attacked by wild leopards mostly detail instances in the Indian subcontinent [2-4], while others discuss leopard attacks by animals in captivity (i.e. in zoos or animal sanctuaries) on keepers trying to feed the animal [5,6]. The survival rates of those attacked by wildcats are low. This case report is therefore rare not only in that it discusses an African leopard attack, but one which the patient survived, and then continued her treatment in the UK. Most infections caused by cat bites are polymicrobial, with the most common organisms identified being pasteurella, streptococcus, staphylococcus, neisseria and fusobacterium [7]. Animal bites are frequently seen in Accident and Emergency (A&E) in the Western world, representing 1-2% of new attendances [8]. When choosing initial antibiotic prophylaxis, the UK national guidelines for domestic animal bites [9] match the initial choice of antibiotic from other case reports on leopard bites in recommending co-amoxiclav [2,4]. This case study shows that doctors

in Kenya initially gave cefodroxil and metronidazole, and then subsequently gave co-amoxiclav, flucloxacillin and metronidazole. Both of these antibiotic combinations provide broad spectrum cover of gram positive, gram negative, and anaerobic bacteria. Immediate management of bite wounds involves careful exploration and debridement of wounds and repair of damaged tissues. Alongside this, patients require a prolonged course of antibiotics to combat any residual microorganisms and infection. Sometimes, despite this, the infection can spread, as in our case. This highlights the importance of being vigilant and ensuring the patient is followed up regularly. Three different bacteria were identified: pseudomonas aeruginosa (fully sensitive), enterobacter cloacae (resistant to amoxicillin; co-amoxiclav and piperacillin-tazobactam), and enterococcus faecalis (fully sensitive). A multicentre prospective study of 57 clinically infected human cat bite wounds in the US found that 75% grew Pasteurella, while just 12% of bites grew enterococcus, 5% grew pseudomonas aeruginosa, and only 4% grew Enterobacter cloacae **[10]**. The fact that this leopard-bite wound grew different bacteria to house-cat wounds may represent a difference in oral flora between large and small cats, a difference in oral flora between cats found on different continents, or it may be a result of prolonged antibiotic treatment in this patient already having treated some of the bacteria to which the patient was initially exposed. In this case, initial blood cultures did not grow anything; positive cultures were only obtained after surgical neck exploration where pus was sent for culture. Animal bites confer risk of both tetanus and rabies. Treatment to reduce risk of tetanus depends on prior immunisation and risk status of a wound **[9]**. The need for rabies treatment in the UK is stratified by the country in which the bite occurred; Kenya is deemed a high-risk country **[11]** and so 4 doses of rabies vaccines were correctly given at 0, 3, 7 and 21 days post-bite **[9].**

Conclusion

This case demonstrates an example of complications that may develop from big cat bites. Surgical intervention and a prolonged course of antibiotics is the mainstay of treatment alongside a multidisciplinary approach. In this case, the patient made an excellent recovery post operatively.

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