Intracranial injury in a child following a dog bite to the head

V.T. Samarawickrama, R. Dias, M.C. Samarasinghe
University Paediatric Surgical Unit, Lady Ridgeway Hospital for Children, Colombo, Sri Lanka.

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Introduction

Being bitten by a dog bite is still a significant public health problem. The significance of this problem is emphasised by the 20,802 children aged below 17 years being admitted to hospitals in Sri Lanka in 2010 [1]. Skull fractures caused by dog bites are rare and only a small number of cases have been reported in the world literature, and this is noted to be mainly in the paediatric population. Such a case has not been reported in Sri Lanka before.

Case Report

In December 2013, a previously fit and healthy 20-month-old boy was admitted to the Lady Ridgeway Hospital (LRH) after initial treatment at a local hospital after being bit by a dog. At the time of admission the duration from the dog bite was 8 hours. The dog was a domestic pet and had been vaccinated in a timely fashion. There was no history of a fall, loss of consciousness or bleeding from the ear, nose or throat.

On examination there was a deep laceration over the left eyelid and a 1cm scalp laceration on the left occipital area and few superficial abrasions to the nose [Figure 1]. He was fully conscious and there were no focal neurological signs.

The scalp wound was cleaned and dressed at the accident and emergency ward of the LRH and the child was transferred to the National Eye Hospital where he underwent wound debridement and suturing of the left eyelid laceration. He was then transferred back to LRH.

On the 2nd day it was observed that the dressing over the scalp wound was soaked with a slightly blood-stained watery discharge. The skull X-ray showed a depressed fracture in the occipital bone. The CT scan of the head confirmed a depressed fracture of the occipital bone of greater than 1cm impinging on the left cerebellar hemisphere (Figure 2).

Figure 1. Scalp laceration on the occipital area

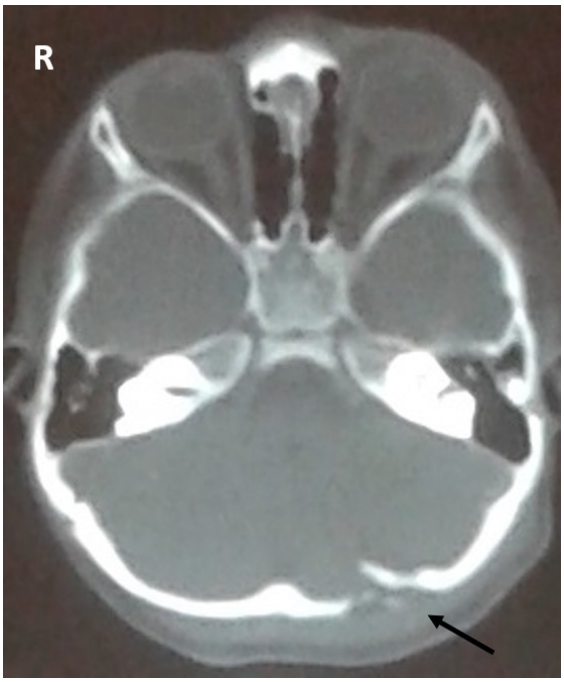

Figure 2. Depressed fracture of the occipital bone impinging on left cerebellar hemisphere

The patient was transferred to the Neurosurgical Unit of

Correspondence: R. Dias
E-mail: ranjandias@outlook.com

the National Hospital where he underwent a minicraniotomy and elevation of the depressed fracture with repair of the dural defect. He was transferred back to LRH for convalescence and made an uneventful recovery.

Discussion

The most common sites of injury caused by dog bites in children are the face, head and neck accounting for nearly 80% of cases [2, 3]. Children younger than 3 years of age are susceptible because of their smaller size, greater head to body ratio, extreme curiosity and poor defending ability [4, 5]. In one study, authors reviewed 16 case reports of dog bite related intracranial injury in children [4] and among those patients, five (30%) were not diagnosed at initial presentation as in this case.

Most of the children where intracranial injury was not diagnosed initially were fully conscious and had no neurological symptoms or signs that may have alerted the health care team [4, 5].

Relatively innocuous looking scalp lacerations can cause an underestimation of the depth and severity of the injury. On the other hand, underlying bone injury may be missed during the first clinical examination as a consequence of the temporary displacement of the scalp by the force of the bite, so that the intracranial penetration can occur at some distance from the scalp laceration [5]. This warrants thorough clinical examination of the area surrounding the scalp injuries, if possible retracting the scalp laceration.

Intracranial infection is one of the major complications that might lead to neurological consequences [2, 4, 5]. Cerebrospinal fluid leakage associated with dural tears is considered a major risk factor for infection. Dog bite wounds are contaminated by aerobic and anaerobic microorganisms mainly representing canine intra-oral flora and skin flora [2, 5]. Taking this into consideration these children will require appropriate antibiotic management, and follow-up review. It is also essential that on admission the child's tetanus status is ascertained and appropriate treatment be given as these are contaminated wounds.

References

1. Ministry of Health Sri Lanka. Indoor morbidity and Mortality Report; 2010. Available from: http://www.health.gov.lk/en/index.php?option=com_content&view=article&id=372&Itemid=141
2. Lannelli A, Lupi G. Penetrating brain injuries from a dog bite in an infant. *Paediatric Neurosurgery* 2005; 41(1): 41–45.
3. Pinto FG, Tavares WM, Cardeal DD et al. Craniocerebral injuries from dog bites. A*rquivos de Neuro-Psiquiatria* 2008; 66:397-9.
4. Froind S, Parra AS, Segal N. Delayed diagnosis of intracranial injury due to a dog bite-a case report and review of the literature. *International Journal of Paediatric Otorhinolaryngology* 2013; 77 (9): 1400-2.
5. Mason A.C, Zabel D.D, MandersE.K. Occult craniocerebral injuries from dog bites in young children. *Annals of Plastic Surgery* 2000; 45 (5) 531–534.

Key Points:

- Dog bites on the scalp in children can be associated with intracranial injury.
- A high degree of clinical suspicion and appropriate use of imaging are needed to avoid delayed or missed diagnosis.
- When diagnosed, early management is required to avoid meningitis and associated complications.