





Case Report

Traumatic Encephalitis in Dogs

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ABSTRACT

Introduction: Traumatic encephalitis is the inflammation of the brain caused by external trauma. This condition can lead to the manifestation of various nervous signs.

Case report: A three-year-old male mongrel was brought to the Small Animal Medicine Unit of the Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India, with a history of hit injury, inappetence, haematuria, and circling gait for the past three days. Clinical examination revealed circling gait and swelling at the base of the penis with other normal vital parameters. By the third day, there were some nervous signs, such as circling, head pressing, and torticollis with insomnia. Haemogram revealed anemia and neutrophilia with no evidence of blood parasites or protozoans. Radiological examination of the head and neck revealed increased atlanto-occipital joint space. The condition was diagnosed as traumatic encephalitis and was treated with Mannitol, Phenobarbital, Diazepam, and Renerve Plus. A neck collar was also advised for immobilization of the neck. The dog collapsed after 20 days despite the symptomatic treatment.

Conclusion: The secondary infections caused by encephalitis can lead to death in animals.

1. Introduction

The inflammation of the parenchyma of the brain is known as encephalitis, and there are various causes for this condition which are both infectious and non-infectious. This includes bacterial, viral, fungal, rickettsial, parasitic, toxic agents, and immune mediated¹. Encephalitis can also be caused due to injury, which can disturb the protective coverings, such as skin, meninges, and blood-brain barrier. This is less likely to happen if the blood-brain barrier is intact². Allergy, old dog encephalitis, and infections spreading from eyes, nasal sinus, and external ears are also probable causes. These infections can cause degenerative changes and form necrotic foci and microabscesses in the brain, which can obstruct the blood flow and cause cerebral dysfunction and increased intracranial pressure³. The clinical signs in non-infectious encephalitis include convulsions, nystagmus, photophobia, salivation, muscular tremors, paresis, ataxia, complete paralysis, deviation of the

neck, incoordination, circling, abnormalities of posture are other signs of encephalitis³. Diagnosis for encephalitis is mostly based on history, clinical signs, and blood investigations. Computed tomography or magnetic resonance Imaging can show microfocal, contrast-enhancing lesions. This can act as strong evidence for the presence of encephalitis in addition to abnormal cerebrospinal fluid (CSF, increased protein level and leukocyte count). Cerebrospinal fluid examination can be performed to identify infectious and other cerebral diseases⁴. Serology tests for infectious agents in CSF may be helpful in diagnosis. Symptomatic treatment includes reducing the intracranial pressure with an injection of Mannitol 20% (2.2 g/kg Intravenous for over 30-45 minutes)⁵, anticonvulsants such as phenobarbital, corticosteroids like prednisolone and dexamethasone, and antibiotics such as cephalosporin to control secondary bacterial infections⁵.

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2. Case report

A male mongrel dog aged three years was presented to Small Animal Medicine Unit, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India, with a history of inappetence, haematuria, swelling at the base of the penis, and circling gait for the past 3 days. The animal was usually let free on the road and suspected of being hit by a passerby while trying to mate. On clinical examination, the dog was dull and lethargic with a rectal temperature of 38.5°C, pink conjunctival mucosa, the popliteal lymph nodes were palpable, and the base of the penis was swollen. Hematological examinations revealed hemoglobin at 8%, packed cell volume at 30%, total leucocyte count (TLC) of 10,550 cells/cmm. Differential leukocyte count (DLC) revealed neutrophils 80%, lymphocytes 11%, monocytes 3%, and eosinophils 6%. The serological results showed increased blood urea nitrogen (BUN) 36.59 mg/dl and creatinine 1.2 mg/dl. After a week, the dog showed nervous signs, such as knuckling of forelimbs, difficulty in bearing weight, and sluggish pain reflex on the hind limb. Schiff-Sherrington reflex, sluggish menace reflex, and sluggish pupillary reflex were recorded. The condition worsened to torticollis (Figure 1), head pressing (Figure 2), and lateral recumbency. Serum electrolyte results showed sodium 133 mmol/L, potassium 4.7 mmol/L, Chloride 96 mmol/L. The animal was then subjected to radiological examination, where the space between the atlas and occipital bone increased. Based on the history, clinical signs, haemogram, serum biochemistry, and radiological examination, the case was diagnosed as traumatic encephalitis.

2.1. Treatment

The dog was treated with an injection of cefotaxime (Regal sales Agencies, India) at the dosage of 40 mg/kg/intravenous body weight, an injection of mannitol 20% (Albert David Ltd, India) at the dosage of 1.5 g/kg intravenous, injection of diazepam (Aeromatic Healthcare, India) at the dosage of 0.5 mg/kg intravenous, injection of Renerve plus (Strides Shasun Ltd, India) 1 ml intravenous, Gardenal tablet (Phenobarbital, Abbott India Ltd, India) at the dosage of 4 mg/kg once daily for 8 days, Vertin tablet



Figure 1. Torticollis in a male mongrel dog aged three years



Figure 2. Head pressing in a male mongrel dog aged three years

(Betahistine tablets, Abbott India Ltd, India), and Cognivel tablet (Piracetam, Ginkgo biloba, and Vinpocetin tablets, Linux Laboratories, India) once daily for 6 days. The owner was advised to follow certain physiotherapy methods to strengthen the hind legs. An ultrasound massage was done on the lumbar region. Neck collar was used to immobilize the neck. Despite the treatment, the animal deteriorated and collapsed after 20 days.

3. Discussion

In the above case, the history suggested that the animal was hit by a passerby while trying to mate with a street dog which explains the bleeding and swelling of the penis. In the course of encephalitis, any inflammation of the cranial nerve can cause cervical muscle spasms and cause neck tilting (torticollis). In the present case, the dog showed neurological signs such as circling gait, leaning, and falling which was similar to the findings of the previous case reports on traumatic head injury⁶. The elevated value of BUN and the lower levels of electrolytes were indicative of dehydration⁷. The radiological examination revealed increased space between the atlas and the occipital bone, which could be a luxation of the atlantooccipital joint⁸. Based on the history, neurological signs, and other investigations, the condition was diagnosed as traumatic encephalitis. Symptomatic treatment with Mannitol 20% was done to reduce the intracranial pressure, which was also recommended by Curtis⁹. Although many therapeutic measures are proposed, their efficacy is not approved due to the lack of randomized clinical trials¹⁰.

4. Conclusion

Traumatic brain injury frequently occurs in dogs with a high mortality rate. The prognosis depends on age, presence of subarachnoid hemorrhage, laboratory parameters, and CT examination conformation. The most common secondary complications include pneumonia, epilepsy, visual deficits, and behavioral changes. Encephalitis patients often need an intensive care unit for

continuous monitoring.

Declarations

Competing interests

The authors declared that they have no conflict of interest.

Authors' contribution

Abiramy Prabavathy Arumugam diagnosed the case. Vanmathi Arulselvam, Devadharshini Kamalakannan and Devadevi Narayanan conducted the treatment. Vijayalakshmi Padmanadan supervised the whole procedure. All authors read and approved the final version of the manuscript for publication in the present journal.

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Ethical considerations

The authors confirm that the manuscript has been read and approved by all the named authors. All authors consented to publish this article and confirm that there is no plagiarised information in the article. All sentences are written originally and all available data are published in this article.

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