

Case Report

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Case Report: Rabies in a Small Indian Civet *Viverricula indica*

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Abstract An adult female Small Indian civet was rescued from a pile of rubble in broad daylight and brought to Pilikula Biological Park's wildlife hospital at Mangalore, India. During initial examination, the animal showed no physical deformities or signs of trauma, but exhibited progressively worsening neurological signs like ataxia, sialorrhea, convulsions and a highly uncoordinated, wobbly gait. Benzodiazepines and antibiotics were administered to manage convulsions and prevent secondary infections respectively, but the animal succumbed four days following admission. Necropsy revealed no gross abnormalities in the organs, but histopathological examination revealed bronchopneumonia, congestion and oedema in the lungs. It also dismissed canine distemper as a differential owing to the lack of intra-cytoplasmic inclusion bodies in the urinary bladder epithelium. However, an impression smear of the brain returned positive for rabies when tested with Fluorescent Antibody Technique (FAT). This is the first report of rabies in a civet from south India. The major implications of this finding are the possibility of rabies transmission to the critically endangered Malabar large-spotted civet (*Viverra civettina*) and the impending risk of zoonosis.

Keywords Internal medicine; neurology; Viverridae; zoonosis

1. Introduction

Rabies is a notifiable, zoonotic disease of mammals caused by viruses of the genus *Lyssavirus* of the *Rhabdoviridae* family [1, 3]. It was first discovered 4300 years ago and still continues to be of major public health concern, with an estimated 20,000 human deaths per year in India alone [1, 16]. Several mammalian species like canids, felids, primates, rodents and bovines have been found to suffer from fatal neurological manifestations of the disease; except chiropterans, which are asymptomatic carriers that serve as reservoir hosts for the organism [1, 3]. Though the prevalence of rabies in the aforementioned species has been well-established, only a handful of reports from Africa and Sri Lanka describe rabies in civets (Order: Viverridae) [1, 5, 11]. In southern India, information regarding the incidence of this disease among native wildlife is profoundly scarce and the following case study is probably the first report from this region that demonstrates the presence of rabies in a rescued Small Indian civet (*Viverricula indica*).

The Small Indian civet is a nocturnal mammal of the Viverridae family [9]. It is widely distributed across the Indian subcontinent, South China, Sri Lanka, Malaysia, Java, Sumatra and surrounding islands [2]. Apart from forests, they are also commonly encountered around human settlements near sub-urban areas and villages, often preying on poultry birds [8]. It has been classified as a 'Schedule II' animal by the Indian Wildlife Protection Act of 1972 and is currently listed by the IUCN under the 'Least Concern' category owing to its abundant and stable population size [4, 8, 9].

2. Case History

An adult female, Small Indian civet was brought to Pilikula Biological Park's Wildlife hospital, Mangalore, Karnataka, India in June, 2014. It was found among a pile of rubble in an open ground during the day, which is unusual for a nocturnal species [9]. The animal appeared to be depressed and in a state of shock, but it was unclear whether this was due to stress of capture or underlying disease. Necessary supportive treatment was accorded and the civet was housed separately for further observation.

3. Clinical Findings

Upon physical examination, the animal appeared to have good body condition with no signs of trauma or dehydration. It weighed 1.6 kg (average for civets is 1.5-4.5kg) and appeared to be eating well [13]. All physiological parameters were within their normal range and the only notable clinical symptom on the first day of observation was an uncoordinated and wobbly gait.

Neurological signs became profound after day three and the animal exhibited a highly uncoordinated gait with ataxia, episodic convulsions and sialorrhea. The observed clinical signs pointed towards diseases affecting the nervous system like rabies, canine distemper, infectious encephalitis or neoplasms of the brain; all of which required further investigation [13]. Meanwhile, the animal was administered Diazepam (CALMPOSE® injection, Ranbaxy Laboratories Limited, India; 10mg/2ml presentation) at 2mg/kg IM (to effect) to manage the convulsions and Enrofloxacin (FORTIVIR® injection, Virbac India; 100mg/ml presentation) at 0.75mg/kg q12h (every 12 hours) to prevent the onset of any secondary infections; considering the animal could be immune-compromised if suffering from a possible viral infection or due to stress of captivity [10]. However, the civet showed no signs of improvement and on day four, it was pronounced dead and subjected to an autopsy.

4. Post Mortem Findings

Canine distemper and rabies featured high on the list of tentative diagnoses, owing to the severity of clinical signs; hence, extreme caution was exercised during post mortem. The civet had moderate to good body condition with adequate sub-cutaneous fat reserves. All organs appeared grossly normal and sections of the vital organs, urinary bladder and intestines were sent to the Department of pathology, Veterinary College, Bangalore of the Karnataka Veterinary, Animal and Fisheries Sciences University, for histopathological examination. An impression smear from different sections of the brain, including the brain stem was also sent to the Institute of Animal Health and Veterinary Biologicals, Southern regional Disease Diagnostic Laboratory at Bangalore to test for rabies.

Histopathology of the aforementioned organs, revealed no pathological abnormalities, except the lungs, which showed congestion, oedema and infiltration by inflammatory cells, suggesting bronchopneumonia. The urinary bladder epithelium also lacked the presence of any intracytoplasmic inclusion bodies that could be suggestive of canine distemper, ruling out an important differential [14]. However, an impression smear of the brain tested positive for the presence of rabies virus by Fluorescent Antibody Technique (FAT), thereby confirming the diagnosis of rabies in the Small Indian civet [15].

5. Discussion

This is probably the first report of rabies in a Small Indian civet from southern India. Viverrids, especially civets are highly prone to canine distemper, the neurological form of which can elicit the same clinical symptoms as rabies, making it hard to differentiate between the two; moreover, the latter can be confirmed only after death of the affected animal [12, 15]. Therefore, every precaution must be taken when dealing with such animals to prevent the risk of zoonosis.

Further research is required to identify the strain of rabies virus prevalent in south Indian Viverrids and whether these mammals are subjects of a 'spill-over effect', owing to their regular interaction with domestic dogs near human habitats [16]. If the Small Indian civets are harbouring a sylvatic strain of rabies, they may further endanger the survival of the critically endangered Malabar large-spotted civet (*Viverra civettina*) [7]. Moreover, the transmission of sylvatic rabies to humans through infected civets has previously been reported from Africa and its occurrence in Small Indian civets may present similar zoonotic implications for the Indian sub-continent as well [6].

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