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Oesophageal obstruction by trichobezoars in rescued jungle cat (*Felis chaus*)
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Abstract

Oesophageal obstruction due to hairballs in cats is very rare. Excessive grooming behavior in cats due to skin infection can lead to impaction in the digestive tract, resulting in deprivation of food and water and ultimately death. This report described a case of a rescued jungle cat showing signs of marked dehydration after death. On postmortem examination, a blockade of hairballs was observed in the esophagus. Further examination of the hair revealed that the hair was from the same species, not the prey species. This suggests that the over-grooming behavior of cats can lead to the over-ingestion of hair, which might cause a blockage in the digestive tract, leading to death. The rescue centers should be well aware and prepared to diagnose such problems and manage the case accordingly for effective treatment of rescued animals.

KEYWORDS

grooming, hair prints, hairballs, jungle cat, obstruction, rescue

BACKGROUND

Jungle cat (*Felis chaus*) is a medium-sized felid, closely related to domestic cats,^{1,2} but distinguished by long legs and rounded ears with small black tufts of hair on the tips.³ They are distributed globally from Eastern Europe to South-East Asia and Northern Africa (Egypt). However, they occur within selected habitats within this range, including deciduous forests, riparian vegetation and near permanent water sources.^{1,4} Jungle cats are native to Nepal with widespread distribution up to 4000 m altitude.⁵ They are exclusively carnivorous, and their diet includes rodents, hares, primates, reptiles and sometimes birds.^{1,6}

Jungle cat's body is also covered with medium-sized hair. To clean their hair, they frequently engage in self-grooming. However, this normal grooming activity can lead to the ingestion of a significant amount of hair. The ingested hair can accumulate in the stomach, causing a condition known as trichobezoars. Normally, the ingested hair are expelled along with the faeces.⁷ However, in some cases, the cats are unable to eliminate the accumulated hair through faeces and are forced to expel them by vomiting. Cats experiencing such problems may exhibit signs like vomiting, retching and coughing.⁸ Surgical intervention may also be required to remove the hairballs from the digestive tract, as failure to do so can result in the death of the affected individual.⁹ Here, we report the death of a jungle cat due to oesophageal obstruction by trichobezoars.

CASE PRESENTATION

A male adult jungle cat (Figure 1) was rescued from Damauli (Tanahun, Gandaki Province) in Central Nepal (Figure 2). The cat was observed wandering on the road, weak and sick within a human settlement. A resident captured it from the road and kept it near his house covered by a bamboo basket (called *doko*). He subsequently informed the Wildlife Hospital at Chitwan, Nepal for rescue and treatment of the cat. The hospital was established in 2020 and operated jointly by the National Trust for Nature Conservation—Biodiversity Conservation Center (NTNC-BCC) and the Chitwan National Park (CNP) Office.



Figure 1. Rescued male Jungle cat

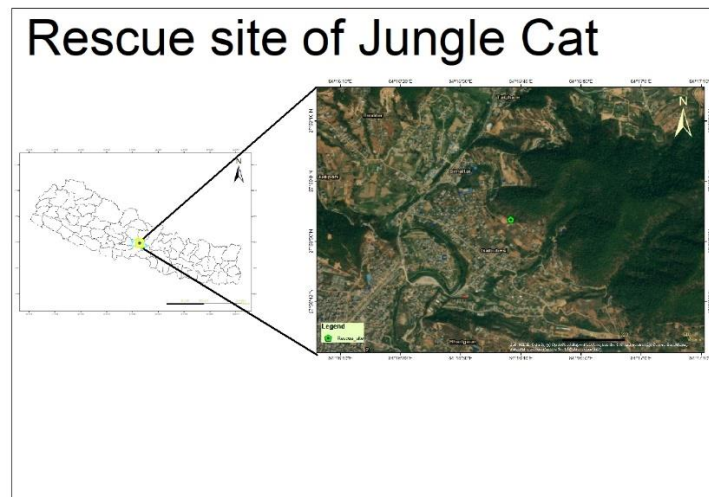


Figure 2. Map showing the rescue site

A rescue team was dispatched from NTNC-BCC, Chitwan located approximately 100 km away from the location of the cat. The team transferred the cat into a small cage. The cat displayed signs of severe dehydration, including sunken eyes. Additionally, it had skin lesions on the head region and all legs. Although water was offered to the cat, it refused to drink. The cat was then administered the fluids (normal saline subcutaneously), meloxicam (2 mg/kg body weight) and antibiotics, amoxicillin (10 mg/kg body weight, intramuscularly) and gentamicin (5 mg/kg body weight, intramuscularly). After allowing the cat to rest for a few minutes, it became active. The cat in the cage was loaded into a vehicle and transferred to the Wildlife Hospital for further treatment. At the hospital, the cat was left the night out. Unfortunately, the cat was found dead the following day.

INVESTIGATIONS

A postmortem examination was conducted to investigate the cause of death. The cat's urinary bladder contained approximately 2–3 mL of concentrated urine, indicating significant dehydration. Other symptoms, such as sunken eyes, rough air coats and sticky skin, further supported the observation that the cat had been without water for an extended period. Upon examination of the stomach, it was found empty, with mild hemorrhage on the stomach lining. However, few endoparasites, including roundworms and tapeworms, were found in the small intestine. The liver was enlarged. Besides these, on gross examination, no visible pathological lesions were observed in the visceral organs. Further examination of this cat revealed a dilatation of the oesophagus at the midway of the pharynx and the stomach opening. The dilatation part, upon palpation, felt dry and contained fixed substances that were approximately 2 cm long. Upon incision of the dilated

part, a dense hairball was discovered stuck within. The hairball completely obstructed the lumen of the oesophagus (Figures 3 and 4).



Figure 3. Esophageal obstruction by hairballs



Figure 4. Impacted hairballs in the esophagus

We investigated whether the hairball was formed by the cat's hair through self-grooming/licking or by hair belonging to other animals that the cat preyed on and consumed. Reference hair samples were collected from the cat's body (Figure 5), and a reference slide for the cuticular pattern of guard hair was prepared at the NTNC-BCC lab (Figure 6), following the guidelines provided by Bahuguna.¹⁰ The hair imprints were then observed under a light microscope (Olympus Cx21i) at a magnification of 400 \times . The formed patterns were captured using the Bestscope camera, which was fitted onto the microscope (Figure 7). Subsequently, the hair sample from the hairball that caused the oesophageal obstruction was extracted by the same method (Figures 6 and 8).

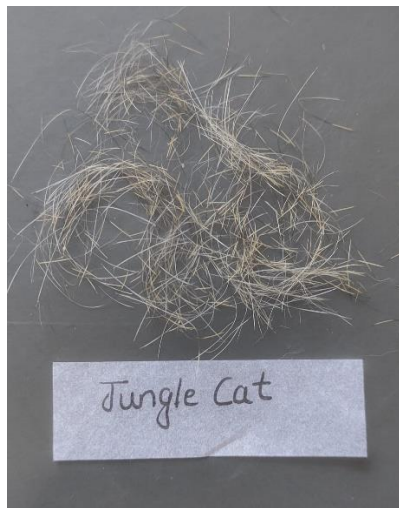


Figure 5. Guard hair from jungle cat body

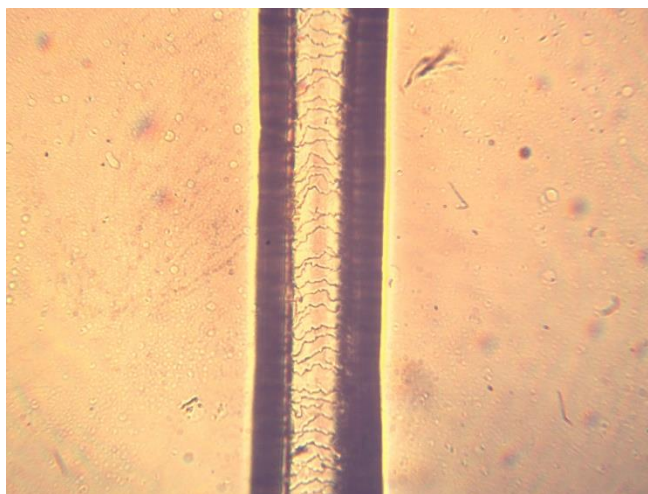


Figure 6. Cuticular pattern of Jungle cat's guard hair

Finally, the hair imprints from both samples, that is, the guard hair from the cat's body (Figure 7) and the hairball presence in its oesophagus region (Figure 9), were compared. Through a thorough examination of the hair prints from both samples, it was conclusively determined that both samples belonged to the same species, indicating that this is a case of trichobezoars in jungle cat.



Figure 7. Esophageal content after washing

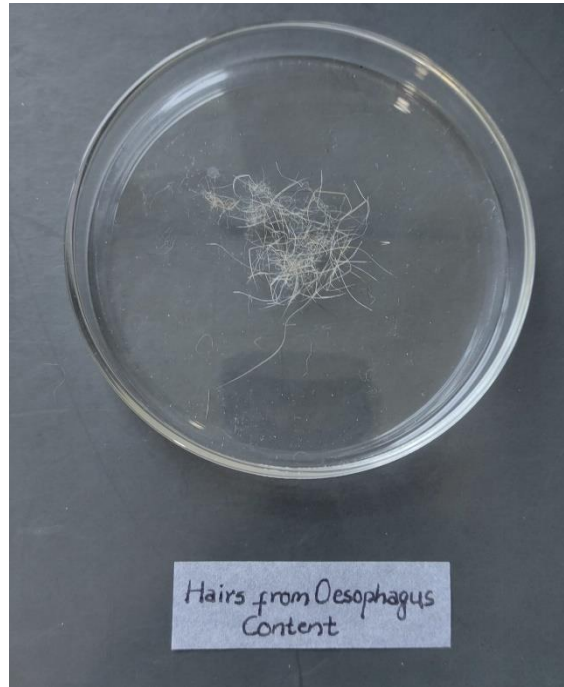


Figure 8. Isolated hair samples from the content

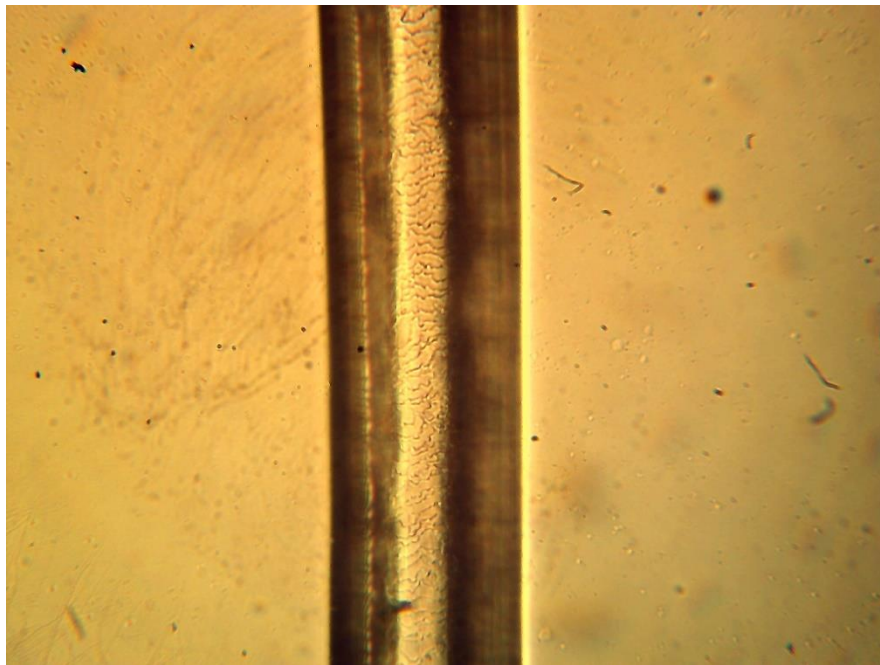


Figure 9. Cuticular pattern of hair sample from hairball

DISCUSSION

This is the first reported case of trichobezoars in jungle cats resulting in mortality. The hairballs in the digestive tract hamper the digestion process in cats, as hair is typically indigestible by the digestive enzymes. The hair accumulates either in the stomach or in the intestine, disrupting digestive function. The accumulation of hair is also recorded in the nasopharynx,¹¹ oesophagus¹²⁻¹⁴ and intestines.¹⁵ In our case, the hairballs accumulated in the oesophagus and caused a blockage. This obstruction prevented the passage of food and water, leading to prolonged starvation, dehydration and the eventual death of the cat.

Diagnosis of trichobezoars in domestic cats can be accomplished by observing the clinical signs such as hairballs voided with faeces, vomiting, anorexia, abdominal pain, and so forth.¹⁶ However, diagnosing this condition in wild cats becomes challenging without a detailed history and prominent clinical signs. This presents additional difficulties in treating rescued cats effectively.

There is limited published information regarding the cause of trichobezoars in cats.¹⁷ However, some studies suggest the cause may be related to skin lesions resulting from heavy infestations of ectoparasites like fleas, lice, mites and others. These skin lesions can lead to increased licking of the affected areas and ingestion of more hair.¹⁶ The tongue of the cat contains filiform papillae, which make the surface rough and aid in anchoring dead hair while licking.¹⁸ The licking and grooming behavior of cats typically helps in minimizing the irritation caused by external parasites. Arruda et al. reported a similar case in a domestic cat where the cat's skin was infested with mites.¹⁶ However, in the case of the jungle cat, we were unable to identify the ectoparasites responsible for the skin lesions.

In some cases, the entrapment of the ingested hairballs is associated with oesophageal diseases like reduced motility of the oesophagus,¹⁹ oesophageal intussusceptions,²⁰ oesophagitis,²¹ and so forth. However, the association is not well described.¹⁷ Irrespective of the association, the early diagnosis will be very helpful in these cases. The diagnosis of the trichobezoars in rescued jungle cat can be done by performing contrast radiography¹⁹ and endoscopy.²⁰

AUTHOR CONTRIBUTIONS

Bikalpa Karki performed the rescue, treatment and post-mortem and prepared the manuscript. Babu Ram Lamichhane, Rama Mishra and Rachana Shah helped in finalising the manuscript. Rama Mishra also performed laboratory work for the identification of species from the hair samples. Amir Sadaula, Kiran Raj Rijal and Pradeepa Silwal helped in the treatment of the animal and performed the postmortem examination.

CONFLICT OF INTEREST STATEMENT The authors declare they have no conflicts of interest.

FUNDING INFORMATION No funding was required for this work. However, it was a routine activity of NTNC-BCC.

ETHICS STATEMENT No ethical approval was needed as this case report had no research data.

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