

Cloacal prolapse of a Marsh Crocodile (*Crocodylus palustris*) at Chittagong Zoo in Bangladesh: A case report

Md. Shahadat Hossain Suvo¹, Md. Sarwar Uddin¹, Md. Shafiquzzaman², Md. Tariquul Islam³, Md. Saiful Bari^{4*}

¹Chittagong Zoo, Bangladesh.

²Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, Bangladesh.

³Directorate of Farms, Chattogram Veterinary and Animal Sciences University, Bangladesh.

⁴Department of Dairy and Poultry Science, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, Bangladesh.

ARTICLE INFO

Received: 22 January 2025

Accepted: 22 March 2025

*Correspondence:

Corresponding author: Md. Saiful Bari
E-mail address: saifulbari@cvasu.ac.bd

Keywords:

Cloacal prolapse, Sugar solution, Post-operative care, Transverse suture, NSAIDs

ABSTRACT

A male marsh crocodile (*Crocodylus palustris*) weighing 50 kg from Chittagong Zoo was reported to have suffered from depression, anorexia for a day, difficulty in passing feces and an observed mass at the cloacal area. The animal was reported to be apathetic and lethargic. During a controlled clinical examination performed in dorsal recumbency, a large, inflamed, edematous, and reddish prolapsed mass protruded through the cloaca. In keeping with the prolapsed organ's extended exposure, the affected area showed tissue damage and localized irritation. Thus, a cloacal prolapse was diagnosed based on the clinical findings. Treatment involved the cleaning of the prolapsed tissue with warmed saline to reduce chances of infection, smearing with a concentrated sugar solution to reduce edema and inflammation, replacing the prolapsed tissue gently, and the application of transverse sutures to avoid recurrence but not compromising the functioning of the vent. Antibiotics and NSAIDs were given intramuscularly to combat infections and inflammation respectively. The post-operative care included rehydration and a change of diet to ensure the healing process and prevent the recurrence of the condition. This case serves to illustrate a multidisciplinary approach in the management of cloacal prolapse in crocodiles and emphasizes once more the dietary, hydration, and stress components that are considered critical in captivity.

Introduction

Reptiles are considered ectothermic (Seebacher *et al.*, 1999; Modesto and Anderson, 2004), and because of their environmental thermal limit, the majority of reptile species are found in the tropics (Summers, 2015). Crocodiles are the largest reptiles in the family Crocodylidae (Huchzermeyer, 2003). They are part of the large group known as archosaurs (ruling reptiles), which also includes extinct thecodonts. Crocodylians are today's most social reptiles (Shine, 1988), and they all belong to the group Eusuchia (Summers, 2015). For the previous few decades, and until recently, 23 species of modern crocodylians in eight genera were recognized; now there are 27 species in nine genera. The Crocodylidae is a single family that includes 27 species and sub-species (Summers, 2015). According to Grigg (2015), once the taxonomy is settled, approximately 30 species will be recognized.

Throughout the world, crocodiles can be found in hot, tropical regions, including Bangladesh, India, Nepal, Sri Lanka, Iran and Indo-China. Most marsh crocodiles can be found in watery habitats like lakes, rivers, and swamps. In streams, it typically favors water that is sluggish and stumpy. It demonstrates exceptional resilience to aquatic conditions with elevated salinity levels (Khan *et al.*, 2015). The Marsh crocodile (*Crocodylus palustris*), Saltwater Crocodile (*Crocodylus porosus*), and Gharial (*Gavialis gangeticus*) are the three crocodile species found in Bangladesh (Aziz and Islam, 2018). Marsh crocodiles are considered "Keystone Species" that preserve ecosystem function and structure by recycling nutrients, conserving wetlands during droughts, and preferentially preying on fish species (King, 1988). Despite the existence of several populations over its geographic expanse, they are few and isolated. In Bangladesh, several populations are thought to be extinct. To raise awareness among the local population for crocodile conservation in the Chittagong Zoo in Bangladesh, it was necessary to evaluate the present condition of crocodiles, human-crocodile interaction, and the reasons for their decline (IUCN, 2013). The species faces threats from illegal hunting, habitat loss, death in fishing nets, egg collecting, and uncontrolled skin hunting, despite its many promising traits (Choudhury and de Silva, 2013). This species of

crocodile is currently found only in captivity, such as in zoos, as it has already become extinct in the wild in Bangladesh (Cox and Rahman, 1994).

Eversion of the mucosa from the anus is known as cloacal prolapse (Hedlund and Fossum, 2007). In crocodiles, the rectum frequently protrudes (Stelzner, 1994). Birds and reptiles have a single chamber where feces and urine are deposited before being expelled, and where male sperm and female eggs pass. Cloaca remains within the vent (Sharma and Raghuvanshi, 2009). The cloaca exits near the vent and is quite wide apart from the large intestine (Simpson, 2010). A prolapse can result from any condition that produces tenesmus or constipation, such as parasitism; higher coelomic pressure, such as blockages brought on by a foreign body, reproductive disease, or bladder stones; and hypocalcemia (Guerrero-Mendez, 2013). Trauma, traction during copulation, infection, inflammation, neurologic deficiencies involving the cloacal sphincter, impaction of the cloaca, and occasionally inability while probing are all considered causes of cloacal prolapse (Vyas and Mistry, 2021). Because cloacal prolapse causes damage to the prolapsed tissue, it can result in inflammation, infection, septicemia, and even death (Eyarefe, 2011). As crocodiles are an endangered species, their conservation is essential. For this, critical health problems should be treated with the highest priority.

Considering the above facts, we presented this cloacal prolapse case as interesting and important to the stakeholders of crocodiles. Also, this will assist in disseminating the treatment strategy to the wildlife, zoo, safari park and sanctuary vets, and build awareness.

Materials and methods

Case History, Clinical Observations and Diagnosis

A 50 kg male marsh crocodile (*Crocodylus palustris*) from Chittagong Zoo was presented with a history of anorexia for one day, depression, failure to pass feces, and visible mass at rectal region. Animal was reported to be lethargic and showing less activity. On clinical examination done in dorsal recumbency under controlled conditions, a prolapsed mass was protruding through the cloaca, which was swollen, inflamed, edematous,

and reddened. The affected area showed signs of localized irritation, mild hemorrhage, and tissue damage, consistent with the prolonged exposure of the prolapsed organ. The clinical findings thus led to a diagnosis of a cloacal prolapse, a rare but serious condition in crocodiles that needs immediate attention to prevent further complications.

Surgical and Post Operative Management

The crocodile was carefully restrained by an experienced reptile handler while being examined physically by two vets. A 10.2 cm by 6.4 cm prolapsed tissue was protruded from the cloaca (Figure 1). After that, local anesthetic 2% lignocaine (5 mg/kg body weight) was applied topically to the prolapsed tissue, the prolapsed tissue gradually relaxed and provided analgesia. The prolapsed tissue was cleansed with warmed saline (39°C) to remove debris and minimize the risk of infection (Figure 2). A concentrated sugar solution was applied to treat edematous swelling, which effectively shrank prolapsed tissue swelling. Once the swelling was reduced, the prolapsed tissue was gently replaced in the cloaca with the help of a lubricated gloved finger causing minimum trauma and the tissue was massaged softly to return to its normal position. To prevent relapse, 2-0 nylon sutures were applied transversely across the vent's lateral margins, temporarily reducing its size (Figure 3). This method maintained sufficient width in the center of the vent to permit free urine and feces evacuation. The sutures remained there for three weeks, allowing for complete healing of tissues. During this period, the crocodile was kept well-hydrated but was not fed for several days to avoid defecation that could disrupt the sutures and delay healing. Ceftazidime (Inj. Cefazid, Renata Limited, Bangladesh), an antibiotic (20 mg/kg body weight), and Flunixin maglumine (Inj. Maglunx vet, popular pharmaceuticals Ltd., Bangladesh) a nonsteroidal anti-inflammatory drug (NSAID), 2.2 mg/kg body weight, were intramuscularly administered to manage infection and inflammation, respectively. A total of five doses of Ceftazidime were given at 48-hour intervals to ensure effective antimicrobial coverage and prevent secondary complications. The crocodile was kept in quarantine for continued monitoring and care to ensure its complete recovery and well-being.



Fig. 1. Oedematous cloacal prolapsed mass



Fig. 2. Application of normal saline over prolapsed mass.

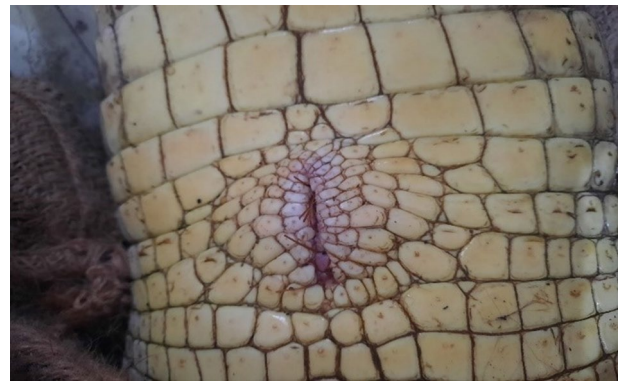


Fig. 3. Application of transverse suture in peri cloacal vent region.

Results

During the physical examination, no abnormalities were found in other parts of the body. The surgical site was numb within five minutes after the administration of local anesthesia. The crocodile was back to normal within 15 minutes after the surgery was over. The crocodile was closely observed daily during the quarantine period to assess its healing and make sure there were no indications of infection or complications. Following three weeks of close monitoring and care, we firmly removed the sutures when the prolapse had completely healed, indicating the animal's full recovery.

Discussion

Rectal prolapse is a surgical emergency in crocodiles because the animal's proximity to the ground surface increases the risk of harm to the prolapsed tissue. We decided that the more involved recto-sigmoid excision mentioned by Stelzner (1994) was not necessary because our relatively simple surgical approach was effective to properly manage the prolapse. Lidocaine 2% is a local anesthetic agent, often used in crocodile anal area surgery to relieve pain and discomfort. It effectively reduces the area, making the surgical procedure easier and less stressful for the animal, as it reduces the overall doses for systemic anaesthesia while also providing appropriate localized desensitization (Lemke & Dawson, 2000). Besides, it is inexpensive, has few adverse effects, and has a short recovery period (Mader, 2013). To avoid the incidence of rectal prolapse, the marsh crocodile's nutrition must be closely monitored while it is in captivity.

This captive crocodile's rectal prolapse was effectively managed and prevented with a simple dietary change. The rectal nature, diet, and dehydration are the risk factors for rectal prolapse in crocodylians (Stelzner, 1994). Other factors include neurological dysfunction, trauma, obesity, cloacoliths, uroliths, intestinal parasitism, dystocia, a space-occupying lesion in the coelomic cavity, neurological dysfunction, straining to urinate or defecate and foreign body injury (Chitty and Raftery, 2013). Cold compresses, as recommended by Norton (1994) and Barten (2006), were used also to reduce edema. According to Hadfield and Whitaker (2005), topical administration of hypertonic solutions to minimize swelling was also beneficial for these captive crocodiles. Treatment was difficult for reptiles with vent prolapse (Bennett and Mader, 2006, Clayton and Gore 2007, Hadfield and Whitaker, 2005, Martinez-Jimenez and Hernandez-Divers, 2007).

Conclusion

Cloacal prolapse, though rare in crocodiles, requires timely and efficient treatment to avoid fatal complications. The case illustrates early diagnosis, meticulous clinical management, and post-treatment care in cloacal prolapse management in crocodylians. The findings also bring into focus the need for awareness of contributing factors like diet, dehydration, and physiological stress, which should be considered in maintaining

the health and welfare of captive crocodiles.

Acknowledgments

The authors would like to thank the technical and non-technical staffs of Chittagong Zoo, who helped in managing the case.

Conflict of interest

The authors have no conflict of interest to declare.

References

- Aziz, M.A., Islam, M.A., 2018. Population status and spatial distribution of saltwater crocodile, *Crocodylus porosus* in the Sundarbans of Bangladesh. *Bangladesh J. Zool.* 46, 33-44.
- Barten, S.L., 2006. Penile Prolapse In: Mader DR, editor, *Reptile Medicine and Surgery*, 2nd ed., WB Saunders Company, Philadelphia, pp. 862-864.
- Bennett, A.R., Mader, D., 2006. Cloacal Prolapse. In: *Reptile Medicine and Surgery*, Edited by Mader D, 2nd ed. Philadelphia (PA): Elsevier Saunders Inc. pp. 751-755.
- Choudhury, B.C., de Silva, A., 2013. *Crocodylus palustris*. The IUCN Red List of Threatened Species 2013: e.T5667A3046723. <http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T5667A3046723.en65>.
- Clayton, L., Gore, S.R., 2007. Amphibian Emergency Medicine. *Vet. Clin. Exot. Anim.* 10, 587 - 620.
- Cox, J.H., Rahman. M.M., 1994. An assessment of crocodile resource potential in Bangladesh. In *Crocodiles. Proceedings of the 12th Working Meeting of the IUCN-SSC Crocodile Specialist Group*. IUCN: Gland, pp. 232-258.
- Eyarefe, O.D., 2011. Rectal prolapse in an emu (*dromaius novaehollandiae*): A case report. *Nigerian Vet. J.* 32, 249-251.
- Grigg, G., 2015. *Biology and evolution of crocodylians*. CSIRO Publishing. pp. 431-505.
- Guerrero-Mendez, M., 2013. Cloacal organ prolapse in reptiles. *Vet Times*. <https://www.vettimes.co.uk/app/uploads/wp-post-to-pdf-enhanced-cache/1/cloacal-organ-prolapse-in-reptiles.pdf>
- Hadfield, C.A., Whitaker. B.R., 2005. Amphibian Emergency Medicine and Care. *Semin. Avian Exot. Pet. Med.* 2, 79-89.
- Hedlund, C.S., Fossum, T.W., 2007. Surgery of the digestive system. In *Small Animal Surgery*, 3rd Edition. Mosby Elsevier pp. 726.
- Huchzermeyer, F.W., 2003. *Crocodiles Biology, Husbandry and Diseases*. CABI.
- IUCN. 2013. IUCN Red List of Threatened Species (ver. 2013.2). Available at: <http://www.iucnredlist.org>. (Accessed: 13 November 2013).
- Chitty, J., Raftery, A., 2013. *Essentials of tortoise medicine and surgery*, 1st edition. Published by John Wiley and Sons, Ltd.
- Khan, M.Z., Latif, T.A., Ghalib, S.A., Khan, I.S., Hussain, B., Zehra, A., Tabbassum, F., 2015. Breeding and population status of Marsh crocodile (*Crocodylus palustris*) in manghopir shrine area, Karachi. *Canadian J. Pure Appl. Sci.* 9, 3399-3407.
- King, F.W., 1988. Crocodiles: Keystone wetland species. In: *Wildlife in the Everglades and Latin American Wetlands. Abstracts of the Proceedings of the 1st Everglades National Park Symposium*, Miami, USA. pp. 18-19.
- Lemke, K.A., Dawson, S.D., 2000. Local and regional anesthesia. *Veterinary Clinics North America: Small Animal Practice* 30, 839-857.
- Mader, D.R., 2013. Practical use of loco-regional analgesia in reptile medicine, in proceedings. Presentation presented at the 12th Annual Meeting of the Association of Reptilian and Amphibian Veterinarians, Indianapolis, Indiana, 14-19 September 2013. *Proceeding Association Amphibian Reptile Veterinarian* 1, 61.
- Martinez-Jimenez, D., Hernandez-Divers, S., 2007. Emergency Care of Reptiles. *Vet. Clin. Exot. Anim.* 10, 557-585.
- Modesto, S.P., Anderson, J.S., 2004. The phylogenetic definition of Reptilia. *Systematic Biol.* 53, 815-821. <https://doi.org/10.1080/10635150490503026>
- Norton, T.M., 1994. Chelonian Emergency and Critical Care. *Semin. Avian Exot. Pet. Med.* 14, 106-130.
- Vyas R., Mistry, V., 2021. Male genital/cloacal prolapse in wild marsh crocodiles *Crocodylus palustris*, Gujarat, India, *Herpetological Bulletin.* 157, 27.
- Seebacher, F., Grigg, G.C., Beard, L.A., 1999. Crocodiles as dinosaurs: behavioral thermoregulation in very large ectotherms leads to high and stable body temperatures. *J. Experimental Biol.* 202, 77-86. <https://jeb.biologists.org/content/jebio/202/1/77>
- Sharma, Y.K., Raghuvanshi, P.D.S., 2009. Surgical treatment of cloacal prolapse in a turtle. *Ind. J. Vet. Surg.* 30, 70.
- Shine, R., 1988. Chapter 4-Parental care in reptiles in *Biology of the Reptilia*. Volume 16, Ecology B Defense and Life History. C. Gans and RB Huey eds. Alan R. Liss. Inc. New York, USA.
- Simpson, S., 2010. When pythons explode-Cloacal prolapse. *Proceedings of AAVAC/UEPV Annual conference*. Hobart, pp. 289-291.
- Stelzner, F., 1994. Etiology and therapy of rectal prolapse. *Experiences with 308 cases*, pp 1956-1991.
- Summers, M.K., 2015. Aspects of Nile crocodile (*Crocodylus niloticus*) population ecology and behavior in Pongolapoort Dam, KwaZulu-Natal. Doctoral dissertation, University of KwaZulu-Natal. <http://hdl.handle.net/10413/13950> Wallingford. pp. 337.