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Ingluviotomy in a cumulet pigeon following crop impaction: Case report

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Abstract
Ingluviotomy (surgical exploration of the crop) is a routine procedure performed in birds due to conditions such as grain impaction, punctured/ruptured crop or blockade of the crop (ingluvies). The cumulet are breeds of white fancy pigeons which are considered as high flyers and were documented to fly over 13 hours. A case of massive hardened swelling in this neck region of a cumulet pigeon was referred from the avian unit of the Veterinary Teaching Hospital, University of Maiduguri to the Surgery and Radiology Unit for diagnosis and possible treatment. Following diagnosis, ingluviotomy was performed under local anesthesia lidocaine 4mg/kg using field block. Imbibed masses of peanuts were milked out. A lembert and horizontal mattress suture patterns using a 5/0 polyglyconate and 2/0 nylon sutures were used to appose the crop and skin respectively. Recovery was fast and uncomplicated. Healing was uneventful and skin stitches removed after 14 days.

Keywords: Ingluviotomy, foreign body, crop, impaction, cumulet pigeon

Introduction
The crop (ingluvies) is the distal anatomic outpocketing of the esophagus in birds that functions as temporary food storage and fermentation chamber before commencement of further digestion (Mallikarjuna Rao *et al*., 2016) [8]. Gastrointestinal foreign bodies are usually found in the crop of birds ranging from metals, plastics, feathers and stones leading to impaction (Wagner, 2005) [10]. Free range system of management or change of habitation can result to ingestion of foreign bodies by birds (Morishita *et al*., 1999) [9]. Disorders and conditions that may arise include depression, appetite loss, dyspnea and lack of fecal materials. Normally, perforation of the gastrointestinal tract leading to septicemia will adversely affect the health status of the bird (Hugues and Micheal 2013) [6]. Ingluviotomy among other techniques (flushing, forceps in conscious birds, forceps in anesthetized birds) are employed to relieve foreign these conditions, although the use of any of these methods depends on the type of foreign body and its location in the crop (Bennett and Harrison 1997) [3].

Case History and Physical Examination
A yearling male Cumulet pigeon (*Columba livia domestica*) weighing 0.22kg was presented (figure 1.) to the Veterinary Teaching Hospital, University of Maiduguri with a complaint of massive swelling on the proximal 1/3rd of the ventral neck region of the pigeon. The bird was referred to the Veterinary surgery and radiology unit of the Veterinary Teaching Hospital from poutry unit for possible diagnosis and intervention.
The pigeon was lethargic with a markedly engorged crop having a rough texture felt upon palpation. Physical and clinical examination revealed the presence of hard impacted masses.

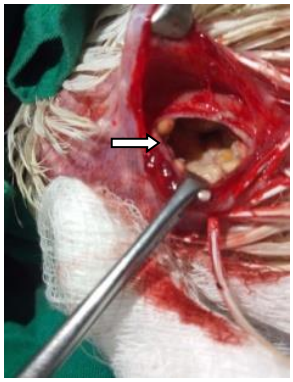
Tentative diagnosis: Crop impaction

Surgical Management (Ingluviotomy)
Following standard preoperative assessment and laboratory investigations, the pigeon was physically restrained on a dorsal recumbency. Feathers around the neck region after wetting with water were plucked to an average square diameter of 15mm. The surgical field (figure 2a) was aseptically srubbed using Savlon® 0.3% chlorhexidine (Johnson & Johnson, London).

Lidocaine (Xylocaine® Nanam Pharma Drugs, Mumbai-2 India) 4mg/kg was locally infiltrated in a linear fashion along the proposed incision line. The surgical field was draped and the pigeon was positioned on a dorso-lateral recumbency. A 2cm full thickness skin incision was made on the bulged skin rostro-caudally extending towards the thoracic inlet exposing the crop. A stab incision using a scalpel into the crop was made exposing the impacted particles (figure 2b). Large moistened imbibed peanuts seeds were carefully evacuated using a spatula (figure 3a). Thorough exploration into the crop was carried out to ensure all masses were evacuated. A 5/0 polyglyconate (Maxon® Minneapolis, USA) suture was used to appose the incised crop using lembert suture pattern. The skin was sutured with Nylon 2/0 (TOPECARE® Huaian Angel Medical Instruments Co. Ltd China) using horizontal mattress (figure 3b).

Fig 1: The pigeon upon presentation.

Fig 2a: Surgical field



b: Incised crop

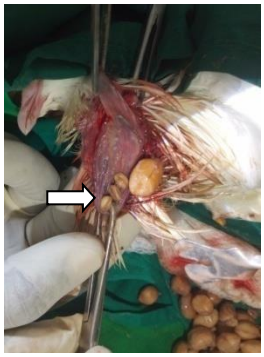


Fig 3a: Evacuation of peanut

3b: Suturing and mass evacuated

Post-Operative Care and Recovery

Twenty mililitres of normal saline (UNISAL®Unique Pharmaceuticals Ltd. Ogun State, Nigeria) was administered intraperitoneally post operatively. Povidone iodine (Wosan®Jawa Int. Ltd Lagos, Nigeria) was applied topically on the suture site and oxytetracycline (KEPRO OXYTET®KEPRO B.V, Holland) 20mg/kg was administered intramuscularly for three days. Analgesia was achieved using meloxicam at 5mg/kg IM x 3/7. Dressing of surgical wound was carried out daily until suture removal at 14 days.

Fig 4: Arrow showing healed area

Discussion

Large imbibed masses of peanut were found to be associated with the condition hence possibly causing the blockade and resultant impaction. The crop is one of the typical locations where foreign bodies are frequently trapped and lodged in the avian species (Adamcak *et al*., 2000) [1]. The impacted peanut masses were successfully evacuated with ease; crop and skin incisions were sutured with no resulting complication.

Alternatively to invasive surgery, the use of staged endoscopic foreign body removal is now a common practice in most advanced veterinary clinics (Lloyd, 2009) [7]. A common complication usually associated with this procedure is hypothermia. Birds in general usually experience a rapid drop in body temperature (hypothermia) in the absence of a heating pad. Unavailability of heating pad in this procedure led to the moderate and meticulous plucking of few neck feathers in the proposed surgical field and the use of drapes to mitigate probable temperature loss. These measures have probably mitigated heat lost through radiation and evaporation. This is similar to a procedure carried out by Baker and Raines (1998) [2], Bickler and Sessler (1990) [4] where they discovered rapid heat loss when performing a procedure resulting to hypothermia. To curb the effects of blood loss and dehydration, fluid therapy is essential in most surgical procedures. This is of particular importance in birds due to their low blood volume per mass (Gunkel and Lafortune 2005) [5]. Administration of normal saline intraperitoneally in this procedure was a prophylactic measure against the possible effect of dehydration and blood loss. Healing was uneventful without any complication postoperatively (figure 4).

Conclusion

Ingluviotomy is one of the commonest procedures in birds to manage crop impaction allowing the birds to return to their normal feeding. However, minimally invasive options are nowadays considered as an alternative to manage such conditions.

Conflict of interest
The authors have no conflict of interest to declare.

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