



Ingluviotomy as a Surgical Intervention for Crop Impaction in a Domestic Chicken: A Case Study

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ABSTRACT

An indigenous male chicken was presented with a six-day history of swelling in the lower cervical region, accompanied by anorexia and respiratory distress. Clinical examination revealed a markedly distended crop containing firm to semi-soft impacted material, leading to a diagnosis of crop impaction. Ingluviotomy was performed under local infiltration anaesthesia, and a large quantity of impacted undigested grains, fibrous plant material, and foreign bodies was successfully removed. The bird recovered uneventfully following appropriate postoperative care, with complete resolution of clinical signs.

HIGHLIGHTS

- Male chicken presented with the history of swelling in the lower cervical region.
- Surgical intervention successfully recovered the chicken.

Keywords: Domestic chicken, foreign body, undigested feed, crop impaction and ingluviotomy

The poultry sector in India has transitioned dynamically from a conventional backyard rearing system into a highly organized, techno-commercial industry that contributes significantly to the national agrarian economy. Despite facing persistent challenges, such as fluctuating feed costs, emerging infectious diseases, and variable farm productivity, poultry rearing remains a resilient livelihood for millions of farmers. In recent years, there has been a renewed focus on indigenous (*Desi*) chicken breeds due to their climate resilience, consumer preference, and suitability for low-input production systems (Bist *et al.*, 2024). However, extensive or semi-intensive management of indigenous birds frequently exposes them to nutritional and management hazards (Khose *et al.*, 2023). A primary, yet under-reported, challenge in smallholder poultry production is the lack of clinical awareness regarding gastrointestinal disorders, which often leads to preventable mortality and economic loss (Chatterjee *et al.*, 2021). Among these disorders, crop impaction - the abnormal accumulation of feed, fibrous materials, or foreign bodies in the proximal digestive tract, presents a common clinical

entity. Anatomically, the avian crop is a well-developed, round-shaped, distensible, bilobed expansion of the ventral wall of the cervical esophagus, situated at the right side of the trachea just cranial to the thoracic inlet (Farner, 1960). It acts as a temporary reservoir, allowing birds to rapidly ingest large volumes of food to avoid predation before transferring it to the stomach. Histologically, the crop wall lacks a distinct muscularis mucosae and mirrors the four-layered architecture of the esophagus: mucosa, submucosa, muscular tunic, and serosa. The mucosa is lined with stratified squamous epithelium that lacks mucous glands, relying on salivary and esophageal secretions to lubricate food particles. The highly distensible nature of the crop is facilitated by profound internal longitudinal folds, which flatten as the organ expands to its full capacity. Emptying of the crop is highly coordinated; sensory feedback

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regarding gizzard motility triggers peristaltic contractions in the smooth muscle layers of the muscular tunic—innervated primarily by the vagus nerve and supported by the musculus compressor ingluvialis (Langenfeld, 1992). Despite its evolutionary advantages, this anatomical flexibility leaves the crop uniquely susceptible to mechanical failures, most notably crop impaction. Crop impaction occurs when stored material becomes tightly compacted into a solid mass, completely halting the distal movement of digesta into the proventriculus. While reports on precise national incidence rates are sparse due to under-reporting in backyard setups, crop disorders are recognized clinically as a highly frequent emergency in free-range and scavenging indigenous poultry.

This case report documents a clinical instance of severe, advanced crop impaction in an indigenous chicken presented to the Veterinary Polyclinic, Mannarkkad. The bird exhibited a profuse swelling at the base of the neck, presenting a classic diagnostic and therapeutic challenge. This paper discusses the clinical manifestation, diagnostic approach, and the surgical intervention (ingluviotomy) utilized to successfully manage the condition.

MATERIALS AND METHODS

Case history and clinical observation

A 16-week-old indigenous male chicken weighing approximately 1.7 kg was presented with a history of a progressively enlarging cervical swelling over the preceding six days, which had resulted in anorexia and respiratory distress. On presentation, the bird was severely stressed, and the swelling was coarse in consistency and semi-soft on palpation. General clinical examination revealed a markedly distended crop measuring approximately 8–10 cm in diameter. The rectal temperature and respiratory rate were outside the normal physiological range. No external wounds or cutaneous lesions were observed over the crop region. Based on the history and clinical findings, a diagnosis of severe crop impaction was made, necessitating immediate surgical intervention to relieve the obstruction and stabilize the bird. Inguviotomy is the surgical procedure of choice for the management of crop disorders, including crop impaction, crop rupture, and the removal of foreign bodies. The procedure may be performed using either a single-layer closure technique, in

which the crop and skin are sutured together, or a double-layer closure technique, in which the crop wall and skin are closed separately.

RESULTS AND DISCUSSION

The bird was stabilized and prepared for an ingluviotomy to resolve obstructive crop impaction. Feathers at the base of the neck overlying the cranial diverticulum of the esophagus (the crop) were manually plucked and the field was prepared aseptically using alternative rinses of povidone-iodine and 70% isopropyl alcohol (Fig. 1).



Fig. 1: Impacted crop under preparation of the surgical site (base of the neck, over the crop)

Local infiltration analgesia was achieved using diluted 2% lignocaine hydrochloride in normal saline, and approximately 1.0 mL was infiltrated along the intended incision line. The total lignocaine dose was maintained within the recommended safe limit for birds, and the maximum dose was not exceeded (Hawkins, 2006). A ventral cervical ingluviotomy with a skin incision of 3 to 4 cm was made along the ventral midline directly over the non-vascularized, most prominent, and healthy portion of the crop wall, avoiding devitalized or inflamed tissue. The subcutaneous connective tissue was bluntly dissected to expose the underlying crop wall. A separate, shorter longitudinal incision was then made through the healthy, muscular wall of the crop, taking care to avoid major superficial vasculature. Later, the crop was carefully exposed and opened, and the impacted contents were removed manually and by gentle digital manipulation. The

crop contained a large quantity of undigested feed grains and coarse foreign materials, including rubber bands, with an approximate total weight of 800 g (Fig. 2).



Fig. 2: Undigested and impacted materials such as grass materials and small rubber bands were noticed

The entire surgical site was then copiously lavaged with sterile normal saline to eliminate microscopic debris and opportunistic pathogens. The crop incision was closed in two layers using polyglactin 910 3-0, with simple interrupted sutures followed by a continuous suture pattern to secure the closure and minimize leakage. The skin was closed separately using 3-0 polyamide in a simple interrupted pattern. Oral water administration after closure confirmed the absence of leakage (Fig. 3).



Fig. 3: Inguvotomy was performed and the crop incision was closed in a simple continuous pattern using polyglycolic acid no 3-0

Postoperatively, the bird was maintained on a restricted, liquid diet for 3 days. Enrofloxacin at 10 mg/kg once daily for 7 days and meloxicam at 0.5 mg/kg once daily for 3 days were administered as postoperative antimicrobial and analgesic support, respectively. The bird recovered uneventfully, and complete clinical recovery was observed within 2 weeks (Fig. 4).

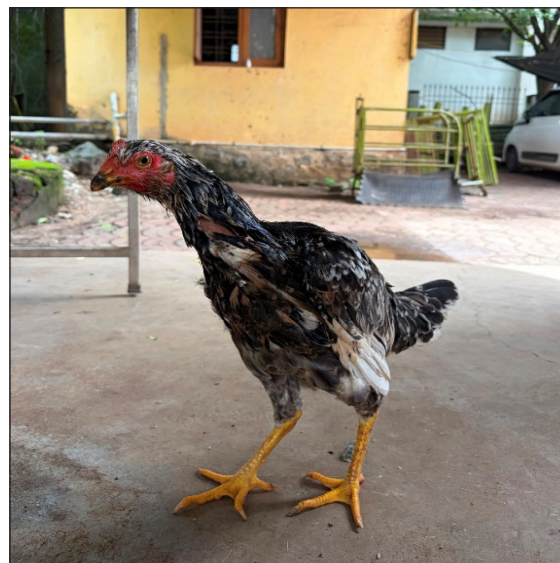


Fig. 4: Post-Operative recovery of the chicken

Crop impaction is commonly associated with dietary indiscretion, scavenging behavior, and management-related errors. Birds may ingest long fibrous vegetation, litter material such as straw or wood shavings, and anthropogenic foreign bodies including plastic strands, strings, and twine, all of which may contribute to impaction and crop stasis (Huang *et al.*, 2019). Sudden feed restriction followed by rapid re-feeding may also predispose to acute gorging and crop overload. Secondary neuro-muscular dysfunction, including vagal impairment, can further reduce crop motility and worsen stasis (Ravikumar, 2023; Laku *et al.*, 2021). If untreated, retained material may ferment and lead to sour crop, dehydration, mucosal injury, septicemia, and starvation (Lin, 2022).

IMPLICATIONS AND CONCLUSION

This case highlights that ingluviotomy remains an effective and practical surgical option for crop impaction when conservative management is unlikely to succeed or



the crop is grossly distended with foreign material (Lin, 2022; Ravikumar, 2023). The favorable outcome also supports the use of local infiltration anesthesia with careful dose limitation in birds, which can be sufficient for select avian soft tissue procedures (Lin, 2022). In backyard and scavenging poultry, the findings reinforce the importance of recognizing management-related and dietary causes early, because crop impaction may progress to fermentation, sour crop, dehydration, and systemic compromise if delayed (Huang *et al.*, 2019; Ravikumar, 2023). The case further suggests that timely surgery, complete evacuation of the crop contents, and layered closure with leak testing can lead to excellent short- and long-term recovery (Lin, 2022; Laku *et al.*, 2021). From a field-practice standpoint, this supports prompt referral or intervention in birds with persistent crop distension, especially when fibrous feed, plastic, twine, or other foreign material is suspected (Huang *et al.*, 2019; Ravikumar, 2023).

Ingluviotomy is a reliable and effective procedure for resolving crop impaction in birds, with a good prognosis when performed aseptically and followed by appropriate postoperative care (Lin, 2022; Laku *et al.*, 2021). In the present case, removal of the obstructive material, secure two-layer closure, and supportive therapy resulted in uneventful healing and complete recovery within two weeks (Lin, 2022; Ravikumar, 2023). Overall, early diagnosis, correction of predisposing factors, and judicious surgical management are essential to prevent complications such as sour crop, crop wall necrosis, septicemia, and death. Preventive education on feeding practices and scavenging risks is equally important, especially in backyard poultry systems where exposure to foreign bodies is common (Huang *et al.*, 2019; Ravikumar, 2023).

GENERATIVE AI DECLARATION

The author(s) confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript, and no images were manipulated using AI. The authors developed and verified all scientific content, data analysis, interpretation of results, and conclusions. The authors take full responsibility for the accuracy, integrity, and originality of the work presented, and no AI tool was listed as an author.

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