Case Report

Repair of Crop Impaction using 2/0 Suture in a Two Year Old Turkey Bird

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Abstract
A two year old adult male turkey, weighing 10 kg was referred to the avian clinic of the State Veterinary Hospital Maiduguri with a chief complain of distended crop and in-appetence. Physical examination revealed grossly enlarged and distended crop, measuring 20 cm in diameter. On palpation, the crop was doughy and hard in consistency. Repeated non-productive regurgitation attempts were observed. On presentation of food, the turkey showed interest in the food but was reluctant to eat. Medical treatment was attempted to relieve the impaction using groundnut oil, followed by daily massaging for three days with no positive resolution. Surgical intervention was the last option to alleviate the impaction. After preparing the surgical site, the bird was anaesthetized with 2 ml xylazine, followed by 0.8 ml ketamine, then placed on dorsal recumbence on a clean surgical table, and a sterile feeding tube was gently passed over the tongue to the crop through the esophagus. After 5 minutes of anaesthesia, a midline skin incision was made over the crop using a sterile scalpel blade, and the crop bluntly dissected from the surrounding tissues. Cutting through the crop exposed the bulky, solid mass weighing 3.2 kg, was evacuated and incisions sutured back in reversed order. Before discharged the bird was post-operatively managed using benzylpenicillin. In conclusion, surgical intervention can be carried out on crop lesions or from the surrounding tissues. Cutting through the crop exposed the bulky, solid mass weighing 3.2 kg, was evacuated and incisions sutured back in reversed order. Before discharged the bird was post-operatively managed using benzylpenicillin. In conclusion, surgical intervention can be carried out on crop lesions or from the surrounding tissues.

Keywords: Turkey bird; Sterile hypodermic syringe; Ingluvotomy

Introduction
The ingluvis or crop is a dilatation or diverticulum of the esophagus in birds [1]. It is subject to several medical disorders. Crop impaction is the accumulation of feed or foreign materials inside the crop due to blockage of the orifice between the crop and proventriculus, resulting in an enlargement of the crop [2]. Crop impaction is rare in caged birds, but when it occurs, it’s usually caused by a dry feed mass resulting from obstructive foreign bodies, greedy feeding, inflammation lowering the gastrointestinal tract, or neuromuscular stasis of the crop [3]. Ingestion of certain types of food (e.g., oat meal) or seed (e.g., soya beans) frequently results in impaction of the crop [2]. If a large amount of these foods is ingested, impaction of the crop can result when the food rapidly swells within the crop. This paper is a case report of crop impaction in a two year old turkey referred to the State Veterinary Hospital Maiduguri, Nigeria. The paper also demonstrates the use of a 2/0 surgical material in repair of impacted crop in poultry.

Case History and Clinical Presentation
A two year old adult male turkey, weighing 10 kg was referred to the avian clinic of the State Veterinary Hospital Maiduguri on 19 November, 2012 with a chief complain of distended crop, and in-appetence. According to the owner the crop got enlarged gradually in two weeks, until it was overstretched, preventing the turkey from eating. The client then decided to take it to the hospital following reluctance to eat for three days. When asked on the management system, the owner said the bird has been in cage since purchased, and was been feeding on wheat bran and other feed materials.

The turkey was presented with grossly enlarged and distended crop, measuring 20 cm diameter (Figure 1A and B). On palpation [2], the crop was doughy and hard in consistency. Repeated non-productive regurgitation attempts were observed. On presentation of food, the turkey showed interest in the food but was reluctant to eat. The body temperature was 40.7°C. Aspiration of the swollen crop using a sterile 21G needle and hypodermic syringe did not yield any liquid or air.

Diagnostic Procedures
A sterile feeding tube was passed through the mouth into the crop via the esophagus, using a sterile hypodermic syringe attached to the external end of the tube as described by Campbell [2], and small quantity of liquid was aspirated. The liquid was turbid and sour (acidic) smelling. The aspirate was sent to a laboratory for
microscopy. Result showed negative for any of bacterial, protozoal, parasitic, and fungal presence. Condition was then diagnosed as obstructive impaction. Contrast radiology is useful in the diagnosis of crop diseases such as impacted crop. Insufficient fund by the owner and lack of well-equipped radiology laboratory limited the use of this technique in this study.

Treatment and Management

Medical treatment Minski and Petrak [4], was attempted to relief the impaction. A drench of 5 ml groundnut oil was administered followed by daily massaging for three days but did not yield any good result. Surgical intervention (ingluvotomy) was then the last option.

Procedure for Ingluvotomy

The feathers around the crop area were trimmed using scissors. The area was washed with water and soap. Stuffed hair follicles were pulled off. The cleaned area was disinfected by gentle surgical scrubbing using a tincture of iodine. The scrubbed area was covered with sterile surgical gauze wetted with a sterile normal saline. The bird was then anaesthetized using 2 ml xylazine, followed by 0.8 ml ketamine both via the intramuscular route [5]. The turkey was placed on a dorsal recumbence on a clean surgical table, and a sterile feeding tube was gently passed over the tongue to the crop through the esophagus while raising the neck straight. The tube was left in situ throughout the surgical process and for 6 hours after the surgery [2]. After 5 minutes of administration of anaesthetic agents, a midline skin incision was made over the crop on the scrubbed area, using a sterile scalpel blade (Figure 2A and B) and the crop was bluntly dissected from the surrounding tissues (Figure 2C and D). An incision was then made cutting through the crop and exposing the impacted mass (Figure 3). Bulky and solid mass which consisted of wheat bran and onion heaps were removed and placed in a bowl (Figures 4 and 5) and weighed 3.2 kg. Matted sheets of onion were removed at the thoracic inlet of the crop on crop examination following removal of impacted mass (Figure 6A-C) and the crop floor was washed with sterile physiological saline solution (Figure 7).
The crop wall was then closed using an inverted suture (lembert) with a 2/0 absorbable catgut on an atraumatic needle (Figure 8A and B). Small amount of commercial poultry feed was mixed with few quantity of the mass and put in the crop (Figure 9A and B). The musculature was closed using a continuous interlocking suture with a 2/0 absorbable catgut (Figure 10A and B). The suture line was infused with benzyl penicillin solution, and the skin together with the fascia was sutured (Figure 10C and D) with a 2/0 absorbable catgut using cross mattress suture pattern, with gentle stitching pressure to prevent tearing of the skin. Suture line was then scrubbed with tincture of iodine (Figure 11A and B), and the bird was lifted from the surgical bed and put in a recovery room on a clean floor.

**Postoperative Management**

The feeding tube was left *in situ* for 6 hours to maintain patency between the esophagus and the crop. The turkey was denied food for 8 hours and water for 4 hours post operation according to previous principles [4]. Postoperative treatment with benzyl penicillin at a dose of 0.5 ml every 12 hours for 5 days via intramuscular injection was given. The bird was allowed access to liquid food after 8 hours, and solid food 4 days later. Progress of management was monitored daily by taking necessary parameters such as temperature, respiratory rates; and suture line cleaned daily with iodine tincture. Turkey was discharged on the tenth day following recovery with no complication. Owner was asked to feed the bird commercial poultry feeds and present the bird at follow up after one month of discharge. Failure of the client to bring the turkey on follow up as instructed, prompted us to make an unscheduled visit to the owner’s house. On seeing us the client joyfully welcomed us and explained that the bird is doing well and there was no need for the follow up. Figure 12 is the picture of the turkey a month after surgery (snapped on range at the house during the visit).
Figure 8A: Closing up of the crop wall.

Figure 8B: Crop edges being aligned.

Figure 9A: Prepared feed materials with small crop content being replaced into the crop.

Figure 9B: Antibiotic being inserted into the crop.

Figure 10A: The crop and musculature closed.

Figure 10B: Closing the skin and fascia.

Figure 10C: Closing the skin and adhering tissues.

Figure 10D: Closing the skin and adhering tissues.
Discussion

Despite the ease of medical or non-surgical treatment of crop impaction, surgical intervention, although should be the last option, appeared to be effective in managing crop conditions such as the crop impaction caused by feed materials in poultry. Common crop infections/disorders that might complicate the diagnosis of crop impaction include crop fistulas, obstructions, candidiasis, trichomoniasis and sour crop [2]. The skin and crop closure in the present case was in line with previous requirements or reports [6,7]. The crop wall in this case was closed using a continuous lembert suture as was advocated but using a 2/0 suture material. A suture material of sizes between 3/0 to 5/0 or 4/0 absorbable suture has been advocated for closing the crop wall in avian surgeries on atraumatic needles because of the thinner structure of the crop [6-8]. However, a suture material of size 2/0 was used for closing the crop in the present case with success, implying that surgical guts of size 2/0 can be used with some degrees of success in turkeys and chickens despite the small thickness of their crop walls. The readily non-availability of a 4/0 suture in this locality has also paved way for the use of the 2/0 suture, which is always available in almost every chemist around the environs.

The closure of the skin in avian species has been reported to be by a simple interrupted or continuous suture patterns using surgical guts of sizes between 2/0 and 4/0 [2]. In the present case, although a surgical gut of size 2/0 was used to close the skin incision, cross mattress suture pattern was used, different from the recommended pattern, and with great success. The cross mattress suture however, appears to be a simple and reliable pattern as it provides allowances for dripping of serous fluids, and also do not go off the suture even if the bird pecks the stitches. This pattern has more advantage over simple interrupted pattern and simple continuous pattern. In the latter if a suture is cut coincidentally by pecking the suture line is liable to reopening and subject to infection.

Nylon 4/0 have been recommended or suggested as the best surgical gut size in repairing crop incisions because of the rapid absorption of the 4/0 surgical gut [7]. The use of 2/0 catgut in the present case was due to non-availability of the nylon 4/0 suture material. The consideration of the surgical approach in the intervention of the impacted crop in the present case was as a result that all medical approaches to management of the case have been utilized without significant success [9].

Conclusion

Surgical intervention can be carried out on crop lesions or conditions in poultry using 2/0 surgical gut with high degree of success, despite their thin walled crop. This was demonstrated in the present study, however, more research into the use of larger suture materials in avian surgery is recommended for avian medicine practice in the future.

References