

A clinical report of lash egg impaction in a commercial hen and its surgical treatment

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ABSTRACT

This clinical case report presents the use of surgical intervention for the treatment of lash egg impaction in the layer bird. A 48-week-old brown commercial hen, weighing 1.75 kg, was presented with a primary complaint of dullness, lack of appetite and swelling of abdomen. Digital exploration revealed no egg in the cloaca. A ventral midline abdominal incision was made to expose an overly enlarged uterine segment of the oviduct. Attempts to exteriorize the gravid oviduct failed. The uterus was then incised in situ to relieve the impaction. The uterine, muscular and skin incisions were approximated routinely using catgut and nylon sutures, respectively. The surgical operation was successful. The bird recovered from the operation and skin sutures were removed following wound healing two weeks post-surgery. Surgical intervention may be an effective option for treating lash egg impaction in laying hens. This case report has revealed the capacity of surgical assistance in the treatment of lash egg. The result is relevant not only to commercial egg production but also to practices involving expensive birds (research and breeder birds, ornamental and endangered avian species) and certain highly-priced (e.g. pet) reptiles diagnosed of lash egg.

Keywords: Bird, lash egg impaction, surgery,

INTRODUCTION

Impaction describes a situation in which one or more eggs fully or incompletely developed are stuck, or prevented from oviposition, longer than 25 hours in the cloaca, shell gland, oviduct or any other location in the reproductive tract of female birds and reptiles (Harrison & Lightfoot, 2006; Graham, 2016; Pitesky, 2017). The condition is also referred to as egg binding, egg bound, difficult egg laying (dystocia), egg impaction, egg retention, or lash egg. Although binding is not very common, it is usually associated with oviductal and cloacal prolapse, visceral destruction, haemorrhage and infection.

Lash eggs are often due to bacterial infection (e.g., *Mycoplasma gallisepticum*, *Escherichia coli*, *Salmonella* spp, *Pasteurella multocida* – fowl cholera) leading to salpingitis, i.e. inflammation of the oviduct (Landman & Cornelissen, 2006; Espinosa, 2019b). The lesion is associated with caseous exudation and sloughing off of

uterine walls and accumulation of mass of tissue, pus and other yolk-like materials in the oviduct. In other words, lash egg is not really an egg but a mass lesion produced when a hen sheds part of her uterine lining along with pus and other materials. As the abnormal material accumulates, it may impact the reproductive tract or passes through the oviduct and be laid as egg-shaped mass by the hen. Lash eggs are frequent in ducks and female broilers at post mortem and during processing of slaughtered birds (Landman & Cornelissen, 2006; Espinosa, 2019b).

The lash egg disorder is considered as a medical emergency since the inability to resolve the impaction can result in death of the patient. Impaction of eggs and associated conditions, namely: vent pecking, cannibalism, morbidity, mortality, and other accompanying diseases e.g. egg peritonitis, salpingitis, etc are of serious economic importance in the poultry industry in terms of diminished production due to egg losses

(Espinosa, 2019a; Saif *et al.*, 2008; Graham, 2016; Stout, 2016).

Clinical signs of egg impaction vary with oviparous animal species and they include anorexia or inappetance, withdrawal, inactivity, lethargy, swollen hard abdomen, straining due to repeated futile attempts to lay, difficult breathing, diarrhoea or coprostitis with empty or full crop, presence of egg in the cloaca, droopiness and depression, dry pale comb and wattles. The retained eggs may reflux to the abdomen (called abdominal laying) altering the patient's gait to a penguin-like posture (Graham, 2016; Rosales, 2018).

Causes of egg binding are many and they include obstructive physio-anatomic defects, e.g. inadequate pelvic inlet, oviduct muscle dysfunction; breeding premature animals (also common in beginner layers), too old or sick birds; and highly prolific laying hens. Egg laying imposes increased metabolic demands on the hen for nutrients: energy, vitamins (including vitamin E), and minerals (especially calcium, phosphorus, and selenium) among other nutrients. Malnutrition or deficiencies of these nutrients and dehydration can predispose the laying hens to egg binding (Crespo & Shivprasad, 2003; Rosen, 2012; Joy & Divya, 2014). Other predisposing causes of impaction include calcium metabolic disease; obesity (overweight hens); malformed or overly large double-yolk eggs; mechanical tear or damage to the oviduct; oviduct infection; hormonal imbalance; systemic and genetic diseases; and environmental stressors, e.g. overcrowding, adverse weather conditions, improper nesting site (Sinervo & Licht, 1991; Crespo & Shivprasad, 2003; Saif *et al.*, 2008; Stout, 2016).

Diagnosis of oviductal impaction is based on history, clinical signs, physical examination (especially digital cloacal and or abdominal palpation), and laboratory analyses e.g. radiography. Egg impaction is usually observed during necropsy in commercial pet birds, layers, broiler breeders, and other parent stocks (Nipane & Kumare, 2011; Saranya *et al.*, 2017; Espinosa, 2019a).

Egg binding may be relieved by physical manipulation (gentle digital massage), or by syringing out the egg contents (ovocentesis) and clearing the oviduct of shell fragments and residues. Manual extraction may traumatize the reproductive tract resulting in infection, if not cautiously done and managed. Ovocentesis of stuck eggs in reptiles is associated with serious complications and should be avoided. In other words, egg bound in reptiles must be treated surgically. Impacted eggs may medically be dislodged by the administration of intravenous fluid, vitamins and crushed calcium carbonate, antibiotics and oxytocin (hormonal stimulation) to promote contraction and normal egg passage. However, surgery is the most effective treatment especially if the egg impaction is associated with uterine or ductal rupture, which may be secondary to the dystocia or other

diseases (Crespo & Shivprasad, 2003; Harrison & Lightfoot, 2006; Graham, 2016; Pitesky, 2017; Bharathidasan *et al.*, 2019).

CASE REPORT

A client presented a commercial hen to the Surgery Unit of Animal-Love Veterinary Multiplex, Umuahia, Abia State, Nigeria with a primary complaint that the bird was always isolated and depressed without appetite. According to the farmer, the patient was taken from a poultry farm of about a thousand commercial laying birds, 48-week-old, that had laid eggs for more than four months. The poultry was raised on deep litter system; the layers were fed on commercial feeds and given drinking water only during the day. The client also reported to the authors that the birds were duly vaccinated against fowl pox and Newcastle disease (ND) viruses; and that ND vaccine was given to the birds monthly using LaSota (lentogenic) strain.

Physical findings of the avian patient included pink comb and wattles that were reduced in size, empty crop, ruffled feathers, soiled vent, knife-edge keel bone, and body weight 1.75 kg (Figure 1 a). The bird appeared dull and weak. The pelvic inlet (space) was narrow and could not take the combined width of two fingers, expected characteristically of a (commercial) laying bird. There was a palpable mass in ventral abdomen, hard to touch, but much larger than the size of a normal egg, indicating a space-occupying abdominal lesion. Digital exploration of the cloaca using gloved hand revealed a narrow vagina without any sign of egg in the cloaca. The patient was then diagnosed tentatively with uterine impaction and was then operated on.

SURGICAL TREATMENT

Patient preparation for surgery was by de-feathering (Figure 1b) and cleaning the ventral abdomen with alcohol (50% ethanol solution). The chicken was anaesthetized with halothane (Halothane-Pharco[®], Alexandria) using improvised face-mask; the fowl was placed in dorsal recumbent position. The peritoneal cavity was accessed through a ventral abdominal midline incision and the tissues incised were the skin, subcutaneous tissues, and the muscles. The uterus (shell gland) was greatly enlarged (Figure 2 a) and could not be exteriorized for its size. An incision into the uterus revealed a large mass of closely and firmly packed lash egg, consisting of non-mineralized, shell-less, congealed, doughnut-like mixtures of yolk, albumin, pus, measuring about 14 cm in length and weighing 607 g (about 30 per cent of the patient's body weight). Some of the non-calcified, peripheral "doughnuts" were partially resorbed. The lash egg was detached gradually from the retained mass until the impaction was completely scooped out (Figures II b and c).

The uterus and the muscles were apposed with catgut (size 2/0) in an inverting and simple continuous patterns, respectively. The skin and subcutaneous tissues were approximated using nylon (size 2/0) horizontal mattress sutures. The sutured wound was cleaned with alcohol (ethanol 50% solution) and healing/fly repellent balm (Ectovis®, Animal Vision World, Enugu Nigeria) was applied (Figure IIIa). Other postoperative treatments administered to the patient included intra-muscular injections of oxytetracycline (Oxytetra 200 LA®, Pantex, Holland) at 20 mg/kg stat and diclofenac sodium (Dicloecnu Injection®, Ecnu Pharmaceutical, China) given once daily for three days at 1 mg/kg. The avian was fed and provided drinking water *ad libitum*. The surgical wound healed completely and skin sutures were removed in 14 days post-operation (Figure IIIb).

TREATMENT OUTCOME:

The bird recovered from the surgery and was discharged.

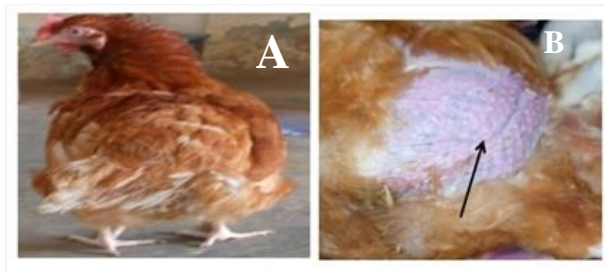


Figure I: Showing (a) the patient looking weak and depressed with ruffled plumage and (b) ventral abdomen of the bird, de-feathered and prepared for surgery (arrow).

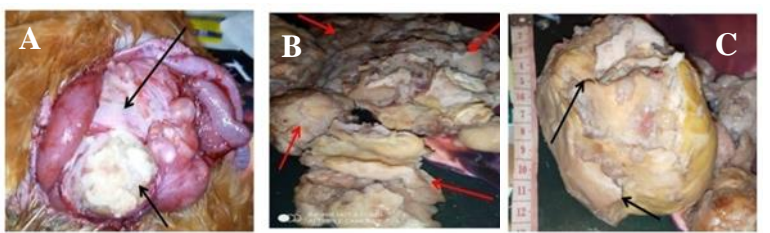


Figure II: Showing (a) on-going operative surgery with exposed severely enlarged uterus (arrows); (b) peeled off superficial layers of lash egg (arrows); and (c) a ball lash egg formed by whorls of albumin, yolk and pus mixture.

DISCUSSION

Digital manipulation to relieve the lash egg was attempted but the effort yielded no result as no bound egg was lodged in the cloaca. Surgical operation by ventral abdominal midline incision was carried out to reveal a very large uterus

(shell gland) which could not be exteriorized from the abdomen. The uterus was then incised *in situ* to expose a mass of non-mineralized lash egg. Rather, in line with Rosales report (2018), the impaction was wrapped in distinctive layers (onion-like whorls), making the oviduct overly large. Non-mineralization of the massive lash egg may be a proof or an indication that the lash egg was not an egg (Espinosa, 2019b) but a bunch of abnormal structures.

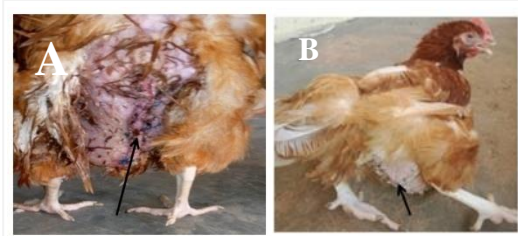


Figure III: (a) End of surgery (arrow) with the patient fully recovered from anaesthesia. (b) Bird is alert and panting following wound healing and suture removal (arrow).

Therefore, operative surgery was the treatment option adopted to relieve the binding lesion.

Surgical operation is economically wise and equally recommended in all clinical cases where recovery of stuck eggs by digital manipulation is difficult or impossible, especially in highly priced birds: commercial hens, breeders, the endangered avian species, ornamental and pet birds. Surgical treatment will preserve and enable the hens to continue in their reproductive lives.

Diagnosis of egg impaction is usually based on history, clinical signs (including the presence of egg in the cloaca), abdominal palpation, and diagnostic imaging. In avians, radiographic views for optimal visualization of egg impaction are lateral and ventrodorsal abdominal projections. In reptiles, ventrodorsal or dorsoventral views are indicated. Ultrasound scan may be used for evaluation of bound eggs. The imaging method is preferred for the demonstration of the location(s), number, size(s) of bound eggs, and other associated lesion(s), if any (Espinosa, 2019; Saranya *et al.*, 2017). In the present case,

diagnosis was made based on history, clinical findings and physical manipulation. Radiographic examination was not carried out and samples sent to the laboratory for culture, anti-sensitivity test and microbiological analysis were lost due to the COVID-19 pandemic lockdown. However, broad spectrum antibacterial drug was administered to the patient as recommended by Landman & Cornelissen (2006) who reported that a course of antibiotic was adequate for treatment of lash egg impaction. The surgical and medical

treatments were successful resulting in the recovery and discharge of the patient.

ADVICE TO CLIENT:

The client was advised to cull the patient as physical examination of the hen revealed that it was not a good layer (pink dry wattles reduced in size, knife-edge keel bone, narrow pelvic space that could not take the combined width of two fingers, characteristic of laying hens). The farmer was, however, instructed to present any sick animals promptly for immediate veterinary attention.

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