



ISSN Print: 2394-7500  
 ISSN Online: 2394-5869  
 Impact Factor: 5.2  
 IJAR 2017; 3(8): 108-110  
 www.allresearchjournal.com  
 Received: 20-06-2017  
 Accepted: 21-07-2017

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## Mixed bacterial infection and its successful treatment intervention in pea fowl (*Pavo cristatus*)

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### Abstract

In Kosi at Mathura district, Uttar Pradesh few pea fowls died with the history of dullness, anorexia, whitish diarrhea and with facial swelling, so the forest department requested Wildlife SOS to rescue the sick birds from that area. On close examination of the bird revealed nasal blocking and swelling below both the eyes, mucoid discharge from the nostril, impaired vision due to occluded eye because of mucous. Swab collected from oral, cloacal and ocular region sent for detail microbiological examination and antibiogram along with blood sample. The bacteria isolated from ocular swab were *pseudomonas* spp, *E. coli*, *aeromonas*, *streptococcus* and the bacteria isolated from cloacal, oral swab were *E. coli*, *aeromonas*, *streptococcus* which were sensitive to enrofloxacin, ciprofloxacin, tigecycline, imipenem, meropenem, piperacillin + tazobactam, chloramphenicol, gentamycin. Treatment provided as per the result. 10 days after the treatment the hard caseous pus material excavated after from the swelling by the surgical incision and wound opposed with 4.0 absorbable suture materials under local anesthesia by using lignocaine gel. After 2 weeks wound healed and bird recovered, started showing normal appetite. Bird released back in to the wild in a suitable habitat after complete recovery.

**Keywords:** Antibiogram, Bacterial infection, Local anesthesia, Pea fowl

### 1. Introduction

Pea fowl (*Pavo cristatus*) is national bird of India protected under schedule I of 1972 of Indian wildlife protection act and commonly found in tropical subtropical/tropical moist lowland, deciduous forests, cultivated lands [1].

An abscess is a collection of pus locally within closed cavity in an organ, tissue. Pyogenic organism cause death of cell which is liquefied by the proteolytic enzymes mainly from the Neutrophils, resulting in the pus in the cavity [17]. Organism that mostly affected with formation of abscess is streptococci and staphylococci [2]. Streptococci are gram positive, non motile, non – spore forming cocci occurring singly, in pairs, or in chains [3]. Streptococcal also found to be an important cause of corneal ulcer, endophthalmitis, conjunctivitis [7]. *Pseudomonas aeruginosa* is a chronic infection than acute and causes blindness of eye by penetrating the cornea [19]. *Aeromonas* species have been associated with health effects like wound infections, septicemia and diarrhoeal illness [11]. *Aeromonas* also reported to cause ophthalmic infection [5, 10, 14]. *E. coli* is a gram negative bacterium in the family enterobacteriaceae. These bacteria are normal inhabitants of the intestines of humane, mammals, reptiles and even some birds [6]. Shamma HF also presented a case of endogenous *E. coli* endophthalmitis [16]. In low potential avian influenza virus infection symptoms like mild to moderate and occasionally severe respiratory lesions in gallinaceous species including edema of the eyelids, conjunctivitis, catarrhal to fibrinopurulent rhinitis, sinusitis, and tracheitis can be found [12].

### 2. Material and method

After few birds death at Kosi, in ‘Mathura district’ with a history of whitish diarrhea, anorectic with severe swelling on both side of eyes with mucoid discharge from the nostril and eyes, Wildlife SOS team rescued the sick bird from the affected area as requested by the forest department which was having the symptoms of whitish diarrhea and severe swelling on face with nasal discharge. Detail physical examination revealed hard swelling just below the eyes (figure 1) which is affecting the eye vision thus cause difficulty to consume its food. Radiographic examination also done to ruled out no fracture on the skull bone.

The thermography examination revealed irregular thermal patches suggesting hot inflammatory swelling. Blood sample and swab collected from oral, cloacal and ocular region sent for microbiological examination and antibiogram to Indian Veterinary Research Institute.

### 3. Result and treatment

Before obtaining result report first aid treatment provided with broad-spectrum antibiotics in order to stabilize the health condition and control the infection. The ocular lesions and swelling were rinsed and cleaned with metronidazole which is generally covers the causative organisms most commonly found in the infection. The occluded purulent discharge from the eye lids gently removed from the both the side and all the discharge from the nose was washed and cleaned sterile gauze. Ointment Silver sulfadiazine mixed with dimethyl sulphoxide applied on swelling on both side. A single dose of long acting of anti-biotic injection Enrofloxacin and anti-inflammatory injection meloxicam for 3 days given to the bird<sup>4</sup>.

Result of microbiological examination revealed ocular swab was positive for *pseudomonas* spp, *E. coli*, *aeromonas*, *streptococcus* and oral and cloacal swab was positive for *E. coli*, *aeromonas*, *streptococcus*. Blood plasma antibody titter found found > 500 against *aeromonas*, *streptococcus* isolates. The isolates were sensitive to enrofloxacin, ciprofloxacin, tigenium, imipenem, meropenem, piperacillin+ tazobactam, chloramphenicol, gentamycin as per the result obtained from antibiogram. The isolates were resistance to beta-lactam drugs and extended spectrum beta lactamase (ESBL) types. Microbiological examination negative for infectious coriza and no symptoms found of the same disease. Injection chloramphenicol given for 5 days and topical treatment done with dimethyl sulphoxide (DMSO) and eye drop containing chloramphenicol for 10 days. Condition of the bird improved gradually and started having grains with normal appetite. After the antibiotic course and topical treatment the swelling on the left side reduced comparatively. Nasal discharged greatly reduced but no improvement on the swelling on the right side of the eye. So the decision made to incise the swelling to evacuate the pus material. Followed by lignocaine gell application; Swelling incised and hard caceous pus removed surgically and incised area sutured on opposition by 4.0 absorbable

suture materials<sup>[18]</sup> (figure 2). Two week after surgery the wound healed and bird recovered uneventfully.

### 4. Discussion

Differential diagnosis is more important to relevant the cause of infection. In present case study the bird was showing symptoms of dullness, anorexia, whitish diarrhea. Swab culture from cloaca found *E. coli* and *Aeromonas* species, *streptococcus* species. Similar symptoms was found in *aeromonas* species infection<sup>[11]</sup> (Marisa Di Bari 2007). *E. coli* infection cause also cause abdominal pain, rectal bleeding and diarrhoeal symptoms<sup>[15]</sup>. On close examination revealed bird having nasal blocking and swelling below the both the eyes, mucoid discharge from the nostril. Ocular swab on culture examination found *pseudomonas* species isolates. Microbiological examination negative for infectious coriza and avian influenza virus and no symptoms found of the same disease. *Pseudomonas* species infection found to be cause complete blindness when directly or indirectly introduced in to the cornea<sup>[19]</sup> and *Streptococci* infection cause formation of abscess<sup>[2]</sup>. *Aeromonas* also reported to cause ophthalmic infection<sup>[5, 10, 14]</sup>. We found chloramphenicol has sensitivity over *pseudomonas*, streptomycin and *Aeromonas* in antibiotic sensitivity test. So, treatment given with parental administration of chloramphenicol. After 10 days pus become hard which was removed surgically.

### 5. Conclusion

In current case; Location of abscess was just below the eye ball of both the side which is affecting the vision and causing more pain so the bird couldn't approach and consume the feed. Such a bird with a hindered vision is also easy prey for stray dogs and other predators. Any swelling in the body especially in the head and neck region need to be differentiates immediately and treatment needs to provide accordingly to save the animal.

### 6. Acknowledgement

We are sincerely thanking to Mathura forest department, Uttar Pradesh for their effort to save the bird, All animal care staff of wildlife SOS, and Mr. Kartik Satyanarayan & Geeta Sheshmani Co-Founders, Wildlife SOS for their kind support.



**Fig 1:** Hard swelling below the eyes. Radiographic examination not revealed any fracture Thermography revealed sever inflammatory hot sports on the head.



**Fig 2:** Making incision on the swelling, evacuating the calcified pus and Incision opposed with simple interrupted suture.

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