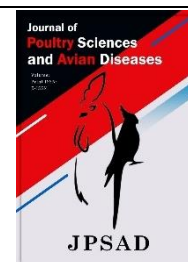


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## Infectious Salpingitis in an Ornamental Frizzle Hen: A Case Report, Diagnosis and Treatment

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### ABSTRACT

Salpingitis is a common inflammatory complication in ornamental chickens that occurs due to infectious and non-infectious agents. This disease can cause symptoms such as depression, halted egg laying, swelling of the abdominal area, and breathing difficulties. This report investigates a 3-year-old Frizzle hen presenting with severe anorexia, halted egg laying, decreased activity, depression, and difficulty breathing. Ultrasound examinations and hematology tests were conducted for further differential diagnosis, confirming an inflammatory lesion in the oviduct. The tests were additionally utilized to assess the effectiveness of antibiotic therapy as a treatment measure. This report details the diagnosis, treatment, and evaluation of its effectiveness in a domestic ornamental chicken exhibiting clinical signs indicative of possible lesions in the reproductive system or the presence of free fluids in the coelomic cavity. Following initial examinations, ultrasonography, and hematology tests, salpingitis was confirmed with active involvement of an infectious agent, and the likelihood of ascites due to liver issues was ruled out. Due to the bird owner's preference against surgical intervention, a broad-spectrum antibiotic treatment utilizing gentamicin and lincospectin was selected. The clinical condition of the bird improved significantly after five days of treatment, and the ultrasonography and hematology tests were repeated, which showed the progression of the lesion from an active infection to a chronic caseous infection. This report emphasizes the importance of using paraclinical tests in diagnosing genital disorders, especially salpingitis, and evaluating the effectiveness of the treatment strategy.

**Keywords:** Antibiotics, Hematology, Ornamental Hen, Salpingitis, Ultrasonography.

### 1 Introduction

Salpingitis in chickens, an inflammation of the oviduct, can be an acute or chronic condition triggered

by various infectious and non-infectious factors, either individually or in combination. Infectious agents such as Infectious bronchitis virus (1), Marek's disease virus (2), Avian influenza virus (3), *Mycoplasma gallisepticum* (4),

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*Gallibacterium anatis* (5), *Salmonella* and *Pasteurella* species (6), *Chlamydia psittaci* (7), *Enterococcus faecalis* (7), and *Escherichia coli* (8) are among the pathogens associated with the occurrence of salpingitis in both commercial and backyard poultry. *Escherichia coli* has been identified as one of ornamental chickens' most common salpingitis-causing pathogens (9). These agents can ascend to the reproductive tract or reach it through the bloodstream, causing infection (6). Furthermore, this infection can be accompanied by complications such as oviduct obstruction (10), salpingitis-associated salpingoperitonitis, and neoplasia (11). Deformed eggs with soft or uncalcified shells and thickening of the reproductive tract's mucous can subsequently lead to oviduct inflammation (10). Birds affected by this disease show symptoms such as depression, lethargy, cessation of egg-laying, swelling of the abdominal region, and respiratory distress (6, 8). Definitive diagnosis can be made using radiology, ultrasonography, hematology and biochemistry tests, sampling of reproductive tract contents for bacteriology and molecular assays, serology, celioscopy, and endoscopy (6). Upon confirming the diagnosis, treatment options for salpingitis include surgical removal of oviduct contents, administration of antibiotics, and non-steroidal anti-inflammatory drugs. (6, 10).

## 2 Materials and Methods

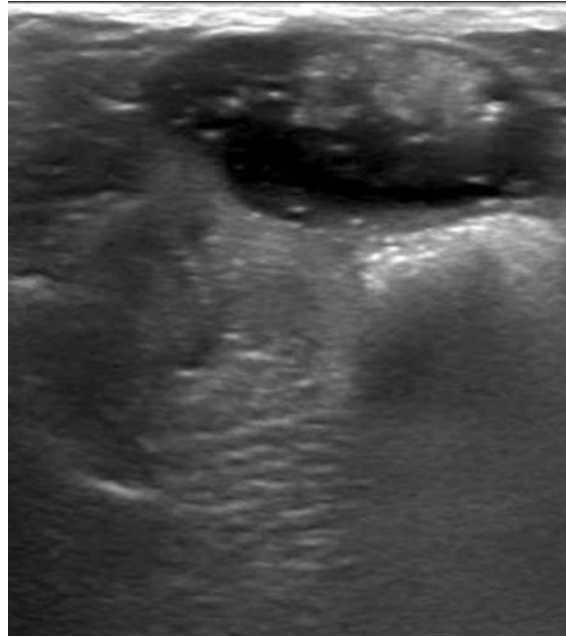
A 3-year-old adult Frizzle chicken (one of the ornamental European chicken breeds with curled feathers) was referred to the avian clinic of the Faculty of Veterinary Medicine, University of Tehran, with severe symptoms of anorexia, cessation of egg-laying, reduced activity and depression, decreased interest in dust bathing, fluffed feathers, and respiratory distress. The bird owner noticed clinical signs for about a month prior to seeking veterinary care. The initial diagnosis suggested distension of the abdominal region with the possibility of free fluids and bacterial or viral infection

in the bird's oviduct. Ultrasonography and hematological tests were performed to confirm the diagnosis and determine the potential site of the lesion. Ultrasonography was conducted using a linear probe in the longitudinal view with a 5-12 MHz frequency.

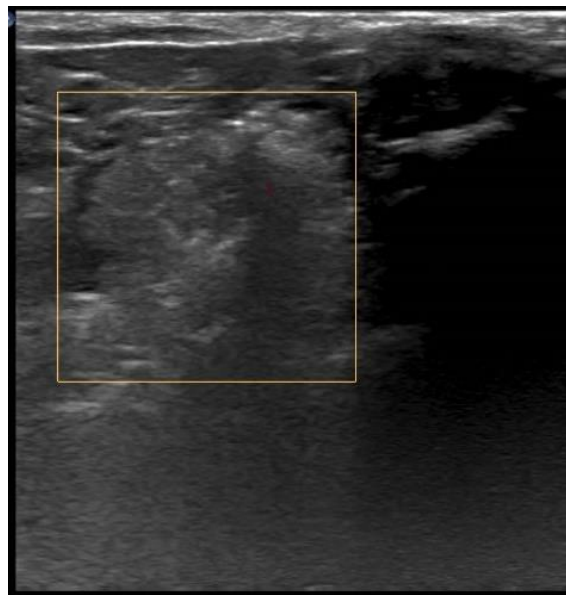
Additionally, hematological tests (complete blood cell count) were conducted. Antibiotic treatment was initiated based on previous studies (12) due to the unavailability of postmortem examination, bacterial isolation, and oviduct sampling for antibiogram testing. The bird was prescribed injectable lincomycin (20 mg/kg IM q24h) (13) along with gentamycin (0.2 mg SC q24h) (14) for five days, and pre- and post-treatment tests were performed on the bird.

## 3 Results

The pre-treatment ultrasound examination of the coelomic cavity in the anatomical region of the oviduct revealed a sac containing hypoechoic contents and hyperechoic particles. The liver examination showed normal echogenicity, and no free fluids were in the celomic cavity. Other structures examined did not show any observable abnormalities (Figure 1). In the pre-treatment hematological tests, a hematocrit of 27%, a white blood cell count of 4000 cells per microliter, 81% heterophils, 12% heterophil bands, 6% lymphocytes, and 1% monocytes were reported. In the post-treatment ultrasound examination, a transient accumulation of fluid around a mass-like structure (cauliflower-like shape) with irregular borders and poor vascularity was observed in the anatomical region of the oviduct. The liver and other organs in the celomic region appeared normal (Figure 2). In the post-treatment hematological tests, a hematocrit of 35%, a white blood cell count of 8000 cells per microliter, 62% heterophils, 8% heterophil bands, 22% lymphocytes, and 8% monocytes were reported (Table 1).



**Figure 1.** Pre-treatment ultrasonography of the oviduct



**Figure 2.** Post-treatment ultrasonography of the oviduct

**Table 1.** Results of hematology tests and their comparison with the normal range (15, 16).

Hematology factors	Pre-treatment	Post-treatment	Normal range
HCT %	27	35	23-55
leukocyte $10^3/\mu\text{L}$	4	8	0/9 – 3/2
Heterophil%	81	62	15-50
heterophil bands%	12	8	0-2
lymphocyte	6	22	29-84
Monocyte	1	8	0-7

## 4 Discussion

In a study conducted at the Avian Health and Food Safety Laboratory (AHFSL) on the necropsy of backyard chickens, 8.7% of the chickens were affected by salpingitis (11). Additionally, in another study performed at the Veterinary Medicine Faculty of the University of Vienna, Austria, on referred cases of backyard chickens, out of 315 chickens with a final diagnosis, 57 cases were found to have reproductive system diseases, and 25 of them were diagnosed with salpingitis (10). In commercial poultry flocks, various diagnostic methods such as necropsy, histopathological examination of lesions, and microbiological and molecular tests help diagnose and evaluate treatment progress for many diseases, including salpingitis (17). These diagnostic methods are not readily applicable to valuable ornamental chickens, especially when birds are kept domestically or individually.

Paraclinical tests, along with clinical observations, are beneficial for diagnosis in such cases, especially in assessing treatment progress and lesion improvement. Imaging techniques like radiography and ultrasonography offer crucial insights for evaluating reproductive system lesions in domestic chickens. (18). Hematological examinations, especially leukocyte differential count, can be crucial in diagnosing and evaluating infection (15). Surgery is considered the most effective treatment for salpingitis, especially when there is an accumulation of contents in the reproductive tract (19). However, in cases where surgical intervention is not feasible, medical treatment is recommended as an alternative solution (20). It is preferable to perform cytology evaluation, bacterial culture, and antibiotic sensitivity testing to select an appropriate drug. Otherwise, broad-spectrum antibiotics can help control the existing condition (19).

In this study, the clinical signs observed in the bird indicated the presence of any potential lesions in the coelomic organs or the presence of free fluids. Ultrasonography and hematological tests were performed to investigate further. In ultrasonography, a hypoechoic fluid-filled area with hyperechoic particles in the left coelomic cavity (in the anatomical area of the oviduct) confirmed salpingitis. It also ruled out the possibility of ascites due to liver problems, as the liver tissue appeared normal, and no free fluids were present in the coelomic cavity. In the hematological tests, leukopenia, heterophilia, and increased

band cells indicated an active and acute immune response to an infection.

Ultimately, the diagnosis of salpingitis and oviduct obstruction with the presence of an infectious agent were established. Considering the owner's reluctance to surgical intervention, a decision was made to administer broad-spectrum antibiotic treatment. Gentamicin and lincomycin were prescribed intramuscularly for five days. Following the antibiotic treatment and the second follow-up examination, the owner reported improvements including the disappearance of depression, cessation of feather-plucking, restored appetite and water intake, and a renewed interest in dust bathing. The reduction of fluids and secretions in the reproductive tract and their hyperechoic appearance in the ultrasonography were likely due to the transformation of an active infection into a chronic cheesy infection caused by antibiotic treatment. The hematological evaluation indicated an increase in leukocytes and their return to near-normal levels (16), as well as an increase in lymphocytes and monocytes, which was likely due to the progression of the infection towards chronicity. Furthermore, based on the 2-month follow-up, the bird's clinical signs remained normal and it resumed egg laying (21).

This case report highlights the importance of using paraclinical tools such as diagnostic imaging and hematological tests to diagnose reproductive system lesions, specifically salpingitis in domestic ornamental birds. This case provides valuable insights into the use of these diagnostic methods for determining the type and stage of infection, selecting effective treatment strategies, and accurately evaluating treatment outcomes.

## Conflict of Interest

The authors declared no conflicts of interest.

## Author Contributions

All authors contributed to the original idea and study design.

## Data Availability Statement

Data are available from the corresponding author upon reasonable request.

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This research received no specific grant from any public, commercial, or not-for-profit funding agency.

## Ethical Considerations

This case report describes routine clinical and diagnostic procedures performed for therapeutic purposes in a veterinary clinic. Written informed consent was obtained from the bird's owner for all diagnostic and therapeutic procedures and for publication of this report.

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