Pathological and Histo – pathological changes of Bursa fabricious gland after naturally infection with Gumboro In broiler chickens

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Abstract

This study was conducted to determine the pathological and histopathological change ,we use 10chickines 5 of them is healthy and the ether is infected .Use light microscope to exame the histological slide , from this study , Bursa of fabricious in infected chickens with Gumboro at age 3-4 weeks showed enlargement in the bursa size and weight with mucous materials , blood spots small in size on the mucosal Internal surface of the gland Congested , red In colors or not according to the severity of infections, on the other hands the gland atrophied after few days of infections .

Histological changes were showed lymphocytic necrosis and degeneration at the medulla of the gland . with increased in Heterophils cells in connective tissue separate the follicles more of themes thickness of epithelium covering gland.

increase in macrophages cells in also noticed . This changes affect the response of immune system to anther infections diseases infected chickens with destroyed glands .

Introduction

Bursa of fabricious arises in chicken Embryo at 9th days of development of the embryo and become mature in its' functions after ten days from hatching (1) . However , bursa of fabricious gland responsible for formation of B- cells which is important for Humoral immunity (2) . Bursa poetin hormone in the gland affect the lymphocyte cells to progress to B- cells and this . B- cells progress to plasma cells which is responsible for production of immunoglobulin lgG , lgm and lgA and this responsible for formation of Antibodies in the blood (4) . On the other hands , B- cells in bursa gland act as memory for the previous contact with the antigen from infection or Vaccination (5) . In the same time in the Thymus the lymphocytes progress under affect of thymo – poetin hormone to T- cells which is responsible for local cellular immunity (6) . There are great connection between thymus and bursa gland for formation B- and T- cells in the first immunity system development .

This connection between T-and B- cells depends on the cause of infections in birds , decrease or hidden of them affect the others (7) .

Gumboro disease or what is called infectious bursal disease or immune – suppressive disease occurred in 1978 in lraq and the target of it is bursa of fabricious gland and from that date until now represent the most important infections disease for poultry industry affect chickens at age 2-8 weeks with average 3-6 weeks and act for destruction of bursa , fabricious glands which failure for immunity response (immune – suppressive) for this the chickens become target for any other diseases (8) .

In this investigation we are willing to get information for the pathological and histological changes in the gland after infection with the Gumboro diseases in comparison with the normal non – infected gland .

Materials and Methods

1-chickens

Farms near Baquba – ln kanan district gets Infections with Gumboro all the times at age 3-5 weeks mostly with different mortality .We took 10 chickines 5 of them is healthy and the ether is infected, bursa fabricious from infected birds and non infected birds removed at aseptic conditions and each group (infected) and group non infected kept in solution contain 10% formalin for histological examination .

Pathological changes study done on many infected bursa with different lesion according to the severity of the disease , during post . mortem examinations of infected and non infected chickens .

2- Histological Examination

a- Histological specimens was done after washing of the specimens with ethyl – alcohol and followed the procedures of is mail and saif (9) .

b- Staining of prepared specimens mayers' Hematoxylin and Eosin staining (10) were used for this purpose .

c- Light Microscope were used to the cross – section of bursa fabricious glands examinations .

Results

pathological changes

a- Non – infected chickens with normal health – bursa small in size ,the rate of gland weight about 4.5Gm, white color and cross – striation normal after opening the bursa .(figure1- a)

b- infected birds Bursa – enlarged with different sizes according to the severity gusted the rate of gland weight about 15.5Gm – red in color – and loose of striation during opening of the gland with mucous materials . Bloody spots on the mucous epithelium surface (figure 1-b) (and figure 2)

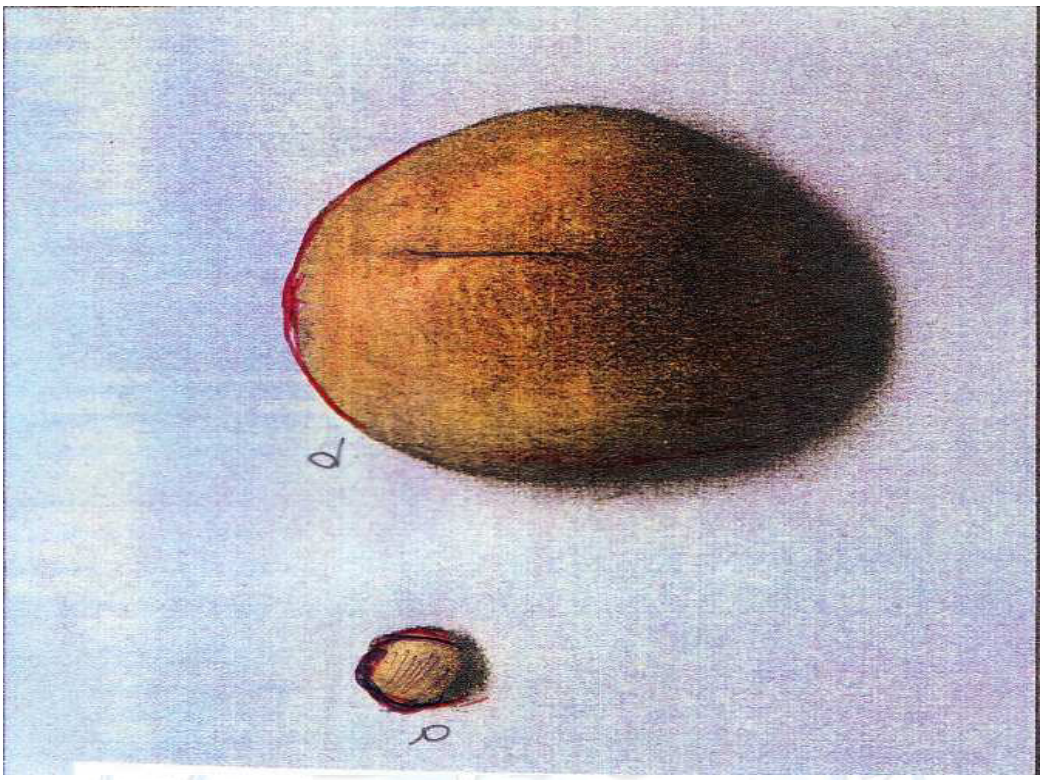
Histological changes

In the cross section of bursa fabricious glands in non – infected chickens were showed, that normal tissue of gland is large active follicles consist of lymphoid cells that had form discrete follicles with little inter follicular tissue, covering epithelium is simple columnar tissue .(figure – 3) .

Histopathology results from the infected glands the lesions were characterized with very few scattered necrotic , follicles are already beginning to degenerate (figure - 4) .

Inter follicular oedema mixed with phagocyte cells , many of which are heterophils caused by hyperemia , was seen in this stage fibroplasias in inter follicular connective (Figure-5).

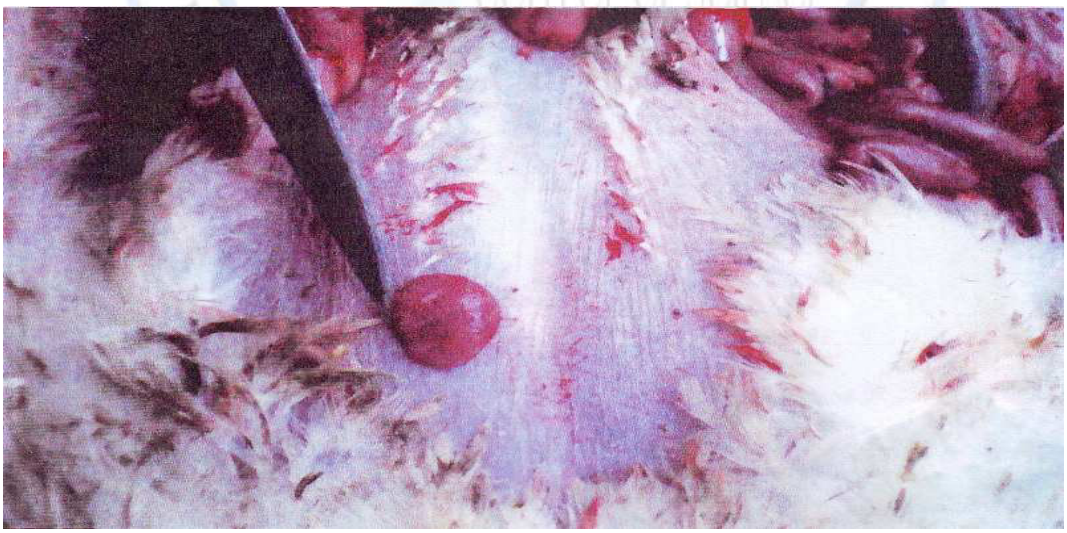
The cross section of infected glands showed more thickness in the epithelium layer which cover the glands (figure -6) with more , degeneration and necrosis of lymphocytes in the modularly of bursal follicles lymphocytes were soon replaced by heterophils pyknotic debris and hyperplastic reticules endothelial cells' . (Figure - 7) . The increase in bursal weight was seen with severe edema , hyperemia , and marked accumulation of heterophils . there was fibroplasias' in inter follicular connective tissue , proliferation of the bursal columnar epithelial cells containing globules of mucin (figure-8) .



(Figure – 1)

a-non infected gland

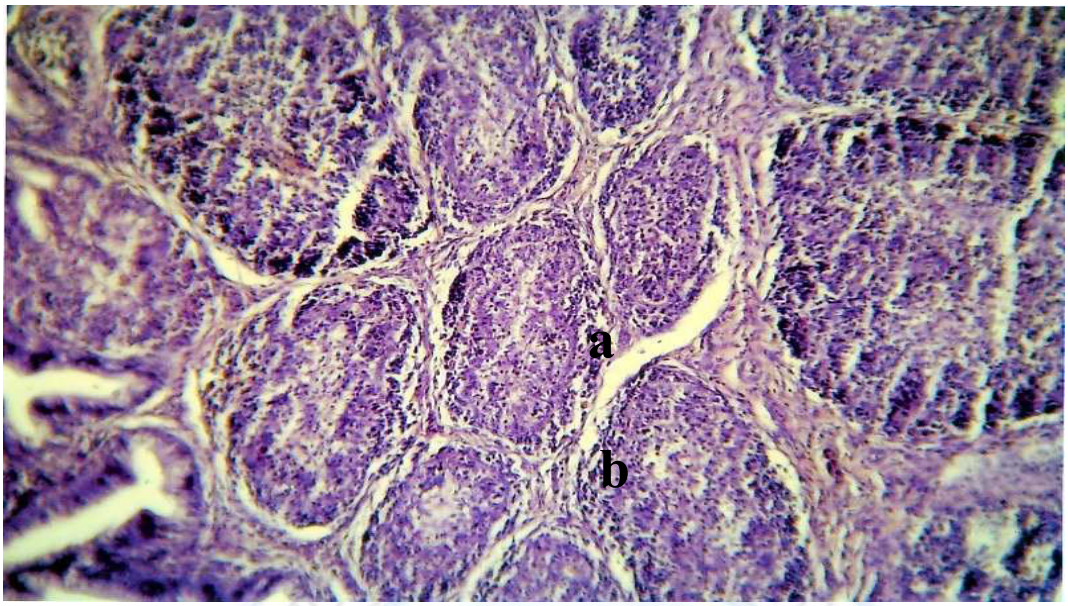
b-Infected gland



(Figure – 2)

Infected Bursa gland

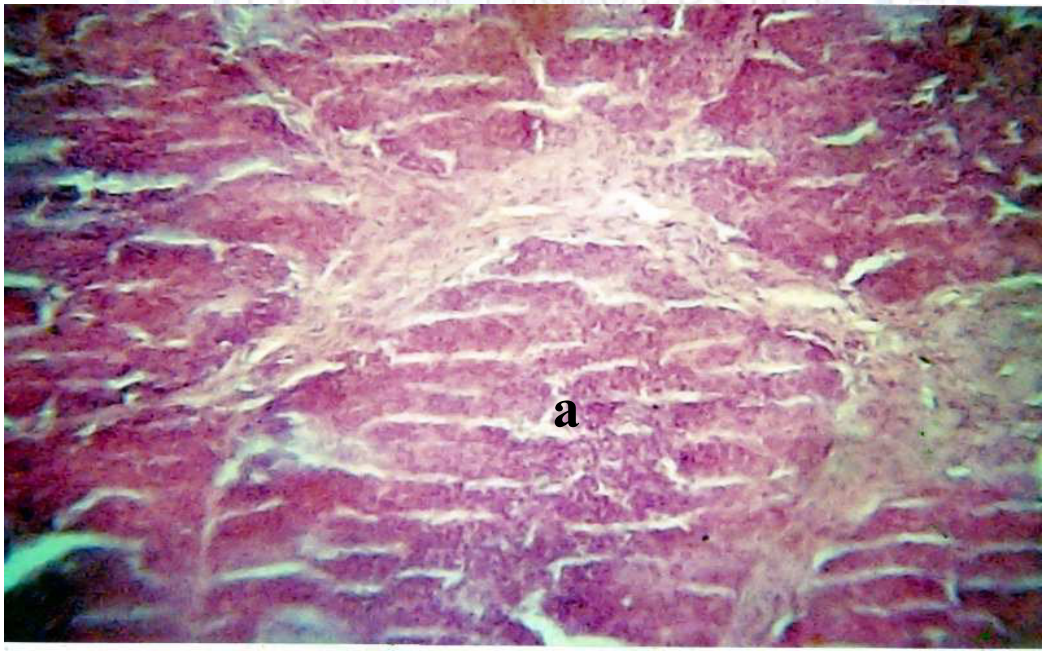
Enlargement , oedema , and congested



(Figure – 3)

Cross section of non infected Bursal gland showed a. large active follicles with little b. inter follicular tissue

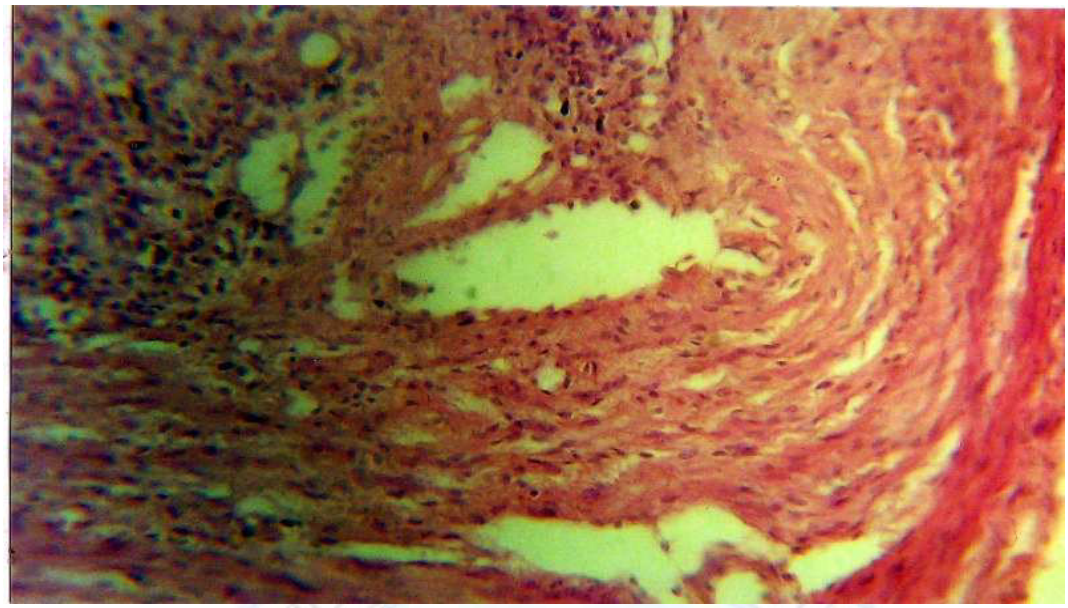
(H and E) 10 – X



(Figure – 4)

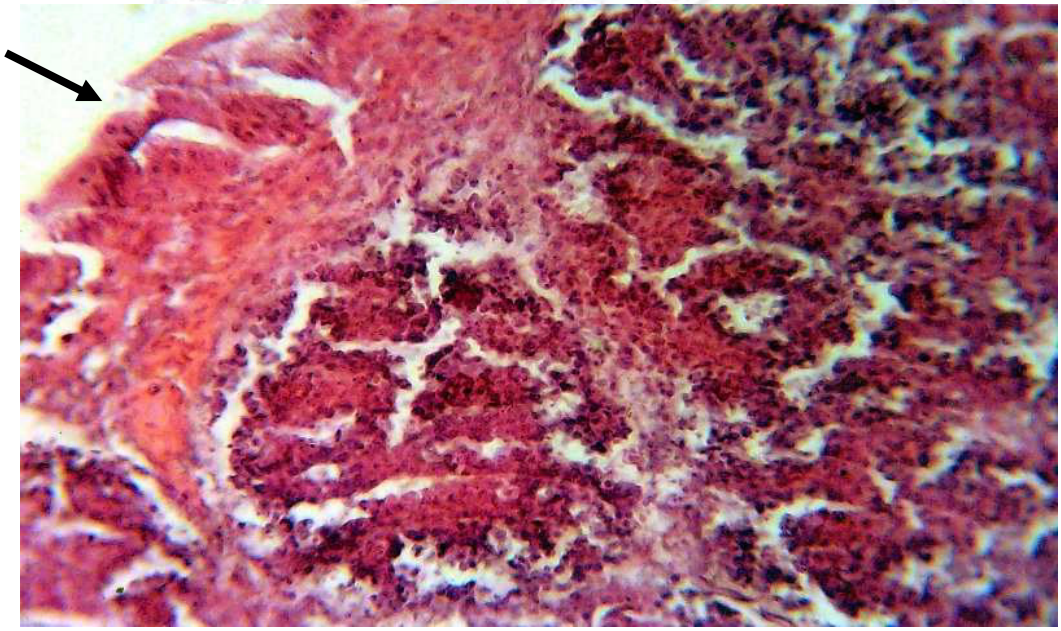
Infected Bursal gland , a. necrotic follicles with degenerate

(H and E) 40 - X



(Figure – 5)

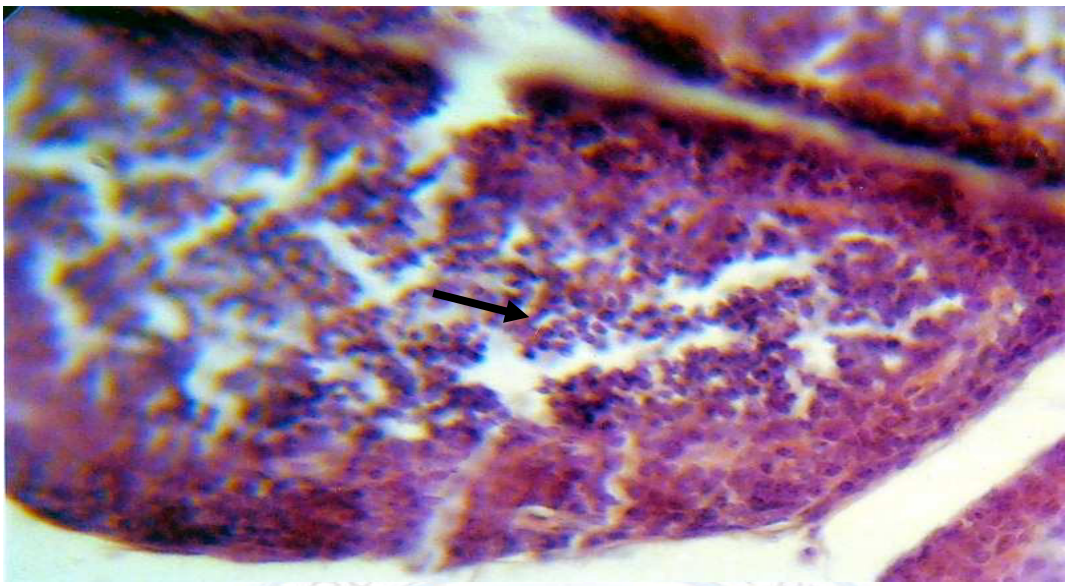
Fibroplasia in interfolicular connective tissue (H and E) 40- X



(Figure – 6)

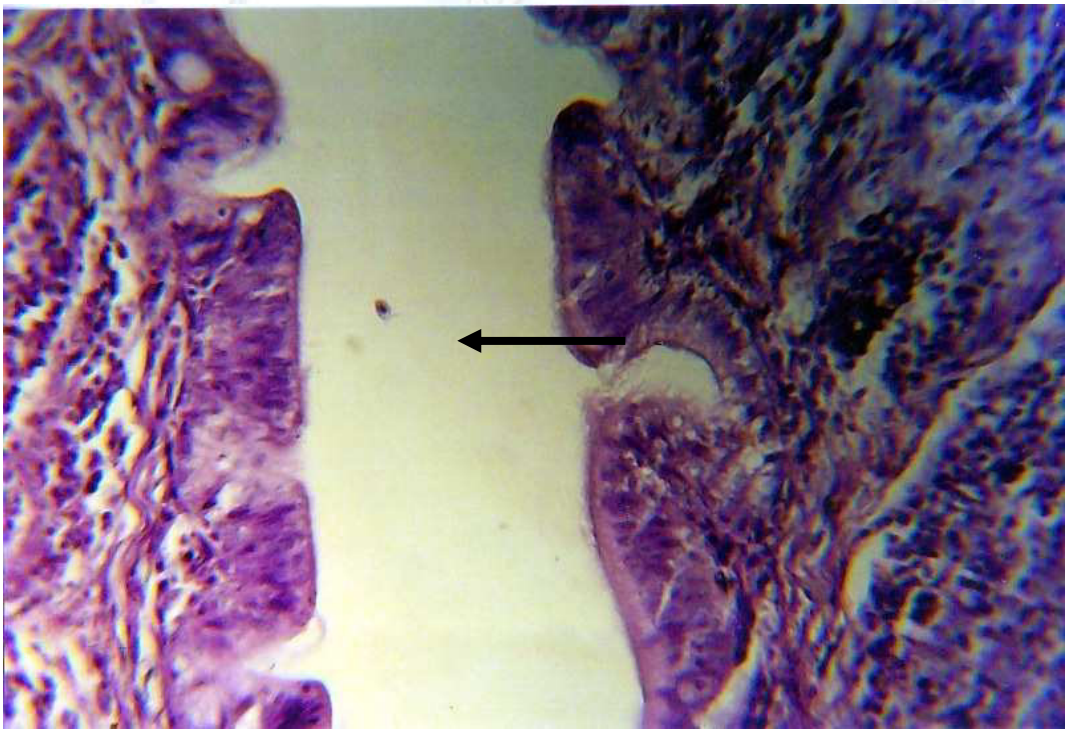
Thickness in the epithelium layer cover gland

(H and E) 40- X



(Figure – 7)

Degeneration and necrosis of lymphocytes in the Medulla (H and E) 40 - X



(Figure – 8)

Proliferation of bursal columnar epithelial cells

(H and E) 40-X

Discussion

Bursa of fabricious gland is important in protection of birds against many disease as its' responsible for formation of B- cells which is important for humoral immunity . This gland started in early embryonic development and completed in size while – shape after hatchelling and enlarged in size until 6-8 weeks after that started to become small in size or atrophied in adults (11) . infections bursal disease what is called Gumboro or immune – suppression disease sfertel in the world in 1970 and transferred to lraq 1978 after that's heavy looses in chickens industry due to the disease occurred (12) .

However the disease infected the bursa of fabricious glands and destroyed the ability of glands to produce B- cells for immunity and that's similar to Aides in human especially in chickens during early development 2-8 weeks age as the birds become with out defense mechanism so at become target for any other disease like Hydro syndrome or coccidian , Marks smareeks (13) . In this study we noticed that the chickens infects with severity of disease different with the maternal immunity and vaccination programmers , with mortality also different according to infections . Bursa of fabricious .

Destroyed with the disease and changes occurred in shape , size weights and many pathological changes according to age and infections , oedmatur, loss of striation , mucous material , and congested , blood spot which occurred with the disease . Also Histological changes occurs in lymphocyte cells and hetrophils cells with shape of follicles .

Microscopic lesions of infection bursal disease occurred primary in the lymphoid structures , but changes were most sever in the cloacal bursa as early as one day post – infection . There was degeneration and necrosis of lymphocytes in the medullary area of bursal follicles . The increase in bursal weight seen at was caused by sever odema hyperemia and marked accumulation of heterophils and this is agreement with (14) .

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