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دراسة هستولوجية على الغدة جار الكلية لأبي القردان المصري

" أرديولا أبس أبس "

عبدالله بكر

يقوم هذا البحث بدراسة التركيب الهستولوجي للغدة جار الكلية في أنثى أبي القردان " أرديولا أبس أبس " مع إشارة الى أوجه الشبه بين هذا التركيب ومثيله في البجعة • وفيما يلي النتائج التي ظهرت في هذا البحث •

- ١- تقع الغدة جارة الكلية اليمنى بجوار الكلية اليمنى، أما الغدة جار الكلية اليسرى فتتصل بالمبيض الأيسر ولا يوجد أي اتصال بينهما وبين الكلية اليسرى •
- ٢- تتركب الغدة جار الكلية هستولوجيا من المحفظة من الخارج ونوعين من الخلايا مختلطين معا هما : الخلايا الكرومافينية ، والخلايا بين الكلوية الا في الحافة حيث يكون هذين النوعين من الخلايا على الترتيب طبيقتين أسفل المحفظة •
- ٣- تتركب المحفظة من طبقة صغيرة من الألياف البيضاء حيث يوجد خارجها مجموعات قليلة في العدد من الخلايا السمبتاويه العقدية •
- ٤- توجد الخلايا الكرومافينية على هيئة مجموعات غير منتظمة الشكل منتشرة بين الخلايا الكلوية وهي أقل عدد من الخلايا الأخرى •
- ٥- توجد الخلايا بين الكلوية على هيئة مجموعات من الخلايا العمادية وتتفصل هـذـه المجموعات الخلوية عن بعضها بجيوب دموية كبيرة الحجم •

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**A HISTOLOGICAL STUDY ON THE ADRENAL
GLANDS OF EGYPTIAN BUFF-BACKED HERON
ARDEOLA IBIS IBIS
(With 8 Figures)**

By

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SUMMARY

The histology of the adrenal gland was studied in the females of adult Egyptian heron, *Ardeola ibis ibis*. Also, the present study declares the simillarity between the histology of the adrenal glands of both two birds, the heron, *Ardeola ibis ibis*, and the pelican, *Pelecanus accidentalis*.

In the heron, the left gland is mainly connected with the tunica albuginea of the left ovary while the right gland is closely related to the right kidney since the right ovary is missing. Two types of cells, chromaffin and interrenal cells, are mixed in the internal regions of the gland, while they constitute two layers of chromaffin and interrenal cells, just a capsular region. Outside this region, there are a few groups of sympathetic ganglion cells. The glands are richly supplied with blood spaces.

INTRODUCTION

The histological structure of the avian adrenal glands have received little attention, since most of the previous studies were mainly concerned with the chickens and pigeons (Müller, 1929; Miller and Riddle, 1942; Schumann, 1957 and Turner and Bagnara, 1976). The adrenal of the pelican, *Pelecanus accidentalis* was found to be different particularly in cellular arrangement and distribution from those of domestic birds and resemble the mammalian adrenal glands in their zonation (Knouff and Hartman, 1951). So, the heron attracts my attention to throw more light on histological structure of their adrenal glands to find out whether the adrenal glands of the heron have a structure similar to that of the pelican or not.

MATERIAL and METHODS

The adult females of the heron were collected from cultivated areas at Assiut province. For the anatomical study, Photographs were taken for the adrenals in situ directly after dissection.

For the histological study, the adrenals were rapidly removed out from the dissected bird and fixed in Bouin's, Carnoy's or Regaud's dichromate fixatives. Paraffin serial transverse sections were cut at 4-5 um thickness and stained with Harris's haematoxylin and eosin for general histological structure. Masson's Trichrome stain was applied for the detection of collagenous fibres which were stained green. Schmorl's modification for Giemsa's stain (Drury and Wallington, 1980) was used for the differentiation between the different cell types of adrenal tissues.

RESULTS

The adrenal glands of female heron are paired. The left gland is mainly connected with the outer sheath of the left ovary namely tunica albuginea while the right adrenal is closely related to the right kidney and separated from it by thin collagenous fibres. The microscopic examination of stained sections of the gland revealed that it consists of an outer fibrous capsule and two types of characterized tissue cells, chromaffin and interrenal cells (Figs. 1 to 4).

The adrenal capsule :

It is formed of thin collagenous fibres. Outside the adrenal capsule there are a few groups of sympathetic ganglion cells surrounded by thin collagenous fibres. These fibres extend on the lateral side to connect with the adrenal capsule (Figs. 4 and 5).

Chromaffin cells :

For detailed histology of chromaffin tissue constituents, sections of the adrenal glands fixed in Regaud's dichromate fluid are stained with modified Giemsa's stain according to DRURY and WALLINGTON (1980). The chromaffin cells are stained brown but the interrenal cells are stained violet blue (Fig. 6). The chromaffin cells are arranged in irregular clumps intermingled with the interrenal cells mostly (Fig. 7). They form however, a more or less regular layer under the adrenal capsule (Figs. 5). The chromaffin cells are polygonal in shape having central, spherical nuclei containing prominent nucleoli. The cytoplasm of the chromaffin cells is basophilic. In between chromaffin cells and the other type of cells (interrenal), there are numerous irregular blood spaces. These blood spaces have wide lumina and blood cells. They are lined by a thin endothelial layer (Fig. 7).

Interrenal cells :

The adrenal glands of this bird contain numerous interrenal cells which are mixed with the chromaffin cells throughout the gland. Some of them are arranged in masses forming a layer beneath the peripheral chromaffin cells (Figs. 5). Each mass of the interrenal cells contains a central blood sinus and consists of double layers or columns of tall columnar cells. These cells have deeply stained, oval nuclei in acidophilic ground cytoplasm. The nuclei contain one or two prominent nucleoli in a diffuse chromatin (Fig. 8).

DISCUSSION

The right adrenal gland of the heron lies close to the right kidney and is separated from it by thin collagenous fibres because the right ovary is missing. LEAK (1975) and TURNER and BAGNARA (1976) reported that the adrenals are located near the anterior pole of the kidney in chickens and pigeons respectively. The left gland of the heron is mainly connected with the tunica albuginea of the left ovary by thin collagenous fibres.

The present investigation revealed that the adrenal gland is surrounded by thin collagenous fibres which form the outer capsule. Also groups of sympathetic ganglion cells are present in the outer surface of the gland. Similar results have been obtained in the gland of pelican by KNOUFF and HARTMAN (1951). On the other hand, the sympathetic ganglion cells are present in the medulla of the mammalian adrenal glands (Windle, 1960 and Copenhaver, 1971).

A HISTOLOGICAL STUDY ON THE ADRENAL GLANDS OF HERON

The present study indicates that the interrenal and chromaffin tissue of the adrenal gland are intermingled in the center of the gland only and not in the periphery. This finding contrasts those of SCHÜMANN (1957) and WOOD (1963) in chickens, MARSHALL (1961) in ducks who found that the interrenal tissue is completely intermixed with the chromaffin tissue within the whole gland. On the other hand, KNOUFF and HARTMAN (1951) observed zonation of the gland of pelican into zona glomerulosa, zona fasciculata and zona reticularis which correspond in position and general appearance to the mammalian adrenal. At the periphery of the gland of heron, the chromaffin masses form a more or less regular layer under the adrenal capsule and also some of the interrenal cells are arranged in a layer beneath the chromaffin cells. However, LATIMER and LANDWER (1925) referred only to a peripheral grouping of enlarged cortical or interrenal masses in the glands of the fowl.

The chromaffin cells in the adrenal gland of heron are arranged as irregular clumps between the interrenal masses. A similar observation was recorded also by KNOUFF and HARTMAN (1951) in the adrenal glands of pelican.

The adrenal glands of heron contain a large amount of the interrenal cells. This result is similar to MILLER and RIDDLE (1942) in pigeon and contrastic to that recorded by SHEPHERD and WEST (1951) in chickens who observed small amounts of interrenal cells. The present study indicated that the interrenal cells are arranged in masses of double layers or columns of tall columnar cells. Also, MÜLLER (1929) found that the interrenal cells in the gland of fowl are arranged in strands of two to three layers of columnar cells. Each interrenal cell mass contains a central blood sinus. This finding agrees with those of KNOUFF and HARTMAN (1951) in pelican.

In conclusion, the histological structure of the adrenal glands of heron shows some similarity to the pelican as follows: a, Groups of sympathetic ganglion cells are present in the outer surface of the gland. b, The chromaffin cells are arranged as irregular clumps. c, Each interrenal cell mass contains a central blood sinus. However, the heron adrenal glands are characteristic by the presence of intermixing central part as well as an outer peripheral chromaffin layer followed by an interrenal layer.

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PLATE 1
EXPLANATION OF FIGURES

1. Adrenal gland of adult female heron. L.A., Left adrenal; L.O., Left ovary; R.A., Right adrenal; R.K., Right kidney.
2. Transverse section in the left adrenal, left kidney and left ovary stained with haematoxylin and eosin showing that the left adrenal gland is connected with the tunica albuginea of the left ovary. X 25. L.A., Left adrenal. L.K., Left kidney; L.O., Left ovary; T., Tunica albuginea.
3. Transverse section in the right adrenal and right kidney stained as above showing that the right adrenal is closely related to the right kidney. X 200. R.A., Right adrenal; R.K., Right kidney.
4. A part of the adrenal gland in a transverse section stained as above. X 160. Ca., Capsule; Ch.C., Chromaffin cell; In. C., Interrenal cell.

PLATE 2
EXPLANATION OF FIGURES

5. A portion of the adrenal gland in a transverse section stained with haematoxylin and eosin- X 400. Ca., Capsule; La.Ch.C., Layer of chromaffin cells; La. In.C., Layer of Interrenal cells; S.G.C., Sympathetic ganglion cell.
6. A portion of the adrenal gland in a transverse section stained with Schmorl's modification of Giemsa's stain for differentiating between two types of cells. X 640. Ch.C., Chromaffin cell; In.C., Interrenal cell.
7. A portion of the adrenal gland in a transverse section stained with haematoxylin and eosin- X 400. B.Sp., Blood space; Ch.C., Chromaffin cell; In. C., interrenal cell.
8. The same as above X800. B.Si., Blood sinus; In.C., Interrenal cell.

PLATE(1)



Fig.1



Fig.2



Fig.3

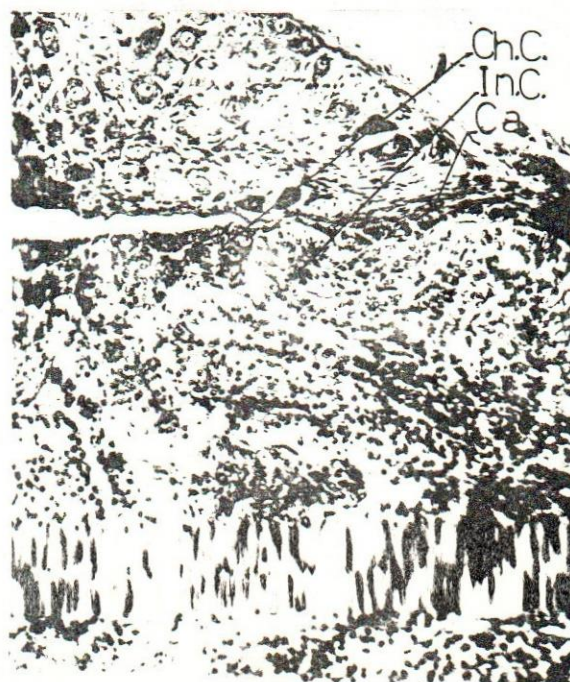


Fig.4

PLATE(2)

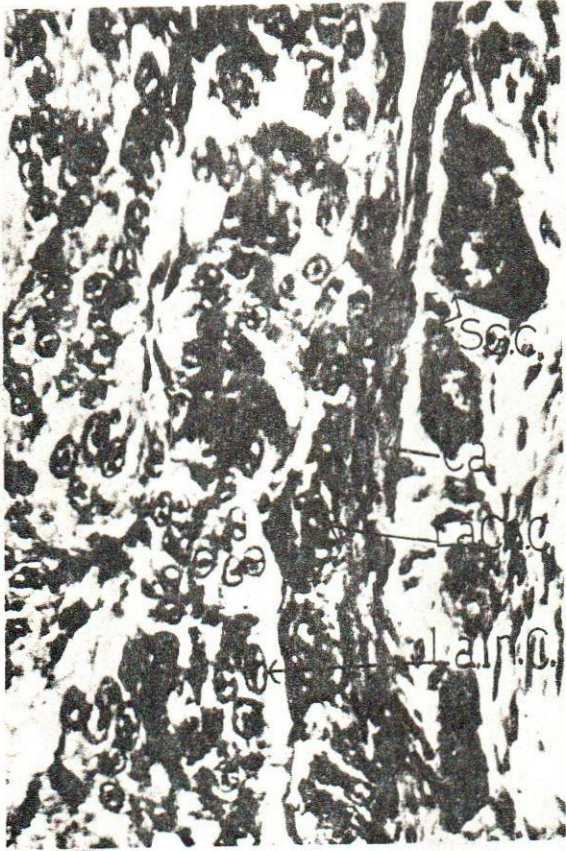


Fig.5

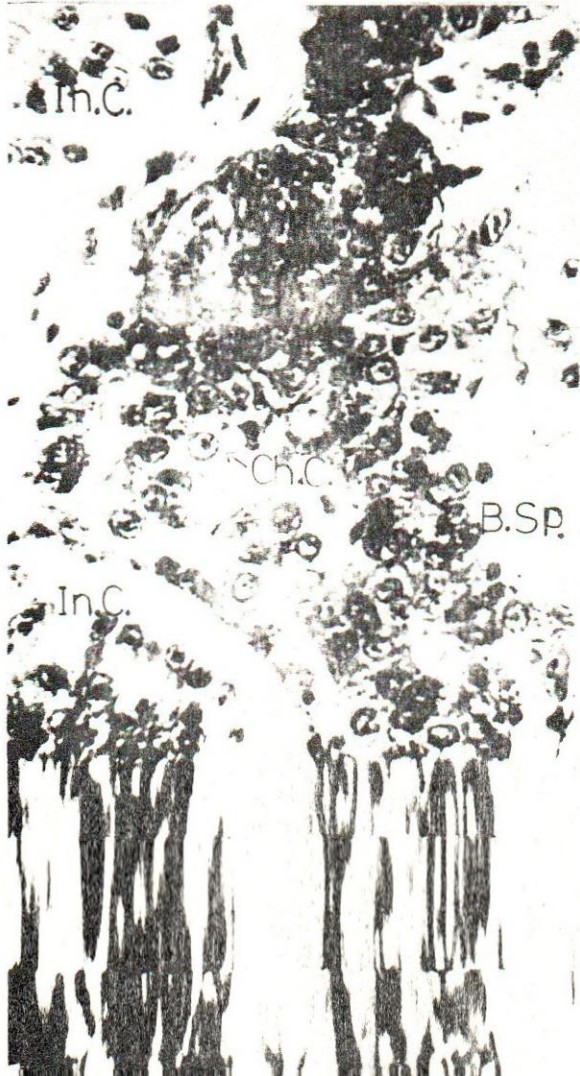


Fig.6

