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THE GROSS AND MICROSCOPIC ANATOMY OF THE CAROTID BODY OF AN ENDOGENOUS DUCK

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SUMMARY

The carotid body in an endogenous duck was closely related to the ventral surface of the common carotid bifurcation zone caudal to the parathyroid glands. The carotid body was characterized by its compact and fusiform shape. Taking into account all carotid bodies, the mean length was 1.058 ±0.95 micrometers. The blood supply of the carotid body in duck was not detected easily but caudal and cranial thyroid arteries gave many branches to it. Histologically, the carotid body of an endogenous duck was consisted of two types of cells; chief cells which occurred in groups and were invested by sustentacular cells. These cells were embedded within a connective tissue fibers to form glomic tissue. A collection of ganglionic cells were observed in the vicinity of the carotid body .

INTRODUCTION

The study of the carotid body of mammals has recently attracted attention. It is specialized sense organ with the important homeostatic function of maintaining the partial pressure of carbon dioxide and oxygen in the blood at normal levels. This chemoreceptor organ was confirmed by several worker (1,2,3,4,5,6,7). The

receptors in the carotid body played a definite role in controlling breathing in birds and surgical denervation of the carotid body eliminate the ventilatory response hypoxia (8). The purpose of the present work is to study the topography and histology of the carotid body of an endogenous ducks in order to make it more accessible for experimental investigation .

MATERIALS AND METHODS

Ten of an endogenous ducks were killed by bleeding. Five ducks were used for gross dissection study after injection via aorta with coloured gum- milk latex. The carotid bodies of other five ducks were perfused and fixed with 10% formaline. Serial sections of five micrometers of paraffin- emdedded carotid bifurcation region blocks were stained with haematoxylin and eosin (9) and with silver nitrate staining (10) .

RESULTS AND DISCUSSION

Grossly, the carotid body of an endogenous duck was closely related to the ventral surface of the common carotid bifurcation zone below the level of the parathyroid glands (plate 1.). It is compact and fusiform in shape. The mean length was 1.058 + 0.95 micrometers. The carotid body in cat, dog and rabbit was revealed variable situation (11). In cat and dog, it was placed on the proximal portions of the occipital artery on the right side, while on the left side it was attached to the occipito-ascending pharyngeal trunk. The carotid body in rabbit was found on the dorso-medial aspect of the internal carotid artery or adhered to the muscular branches of the external carotid artery. While in buffalo, the carotid body was located in the periarterial connective tissue of occipital artery cranial to the bifurcation of the common carotid artery (4). The blood supply of the carotid body in an endogenous duck could not be detected easily but branches which originated directly from the cranial and caudal thyroid

arteries where observed to supply it, where as in the rabbit, cat, sheep and calf, there were several arteries originating from neighbouring vessels entered the carotid body and eventually formed a capillary network (11). Histologically, the carotid body in an endogenous ducks was consisted of small islands of epitheloid cells or glomus cells which dispersed by intervening fibrous tissue and studded with blood vessels (12). Two main types of glomic cells could be identified in the carotid body. These were the chief cells which had oval or spherical nuclei with denser chromatin pattern and pale, ill- defined cytoplasm, and the sustentacular cells. The sustentacular cells were elongated and had elongated nuclei (13,14). Clumps of unidentified cells, closely applied to one another, where associated with chief and sustentacular cells (15). Ganglionic cells were occasionally observed near the periphery of the carotid body tissue (16,17). In contrast to Ross (3) who indicated that the ganglionic cells were not restricted to the glomic tissue. The carotid body was surrounded by bundles of myelinated nerve fibers which penetrated it and dispersed into the fibrous tissues (12). Attention was drawn by some workers that the carotid body cells were modified sympathetic ganglionic cells similar to those of the adrenal medulla (18,19,20).

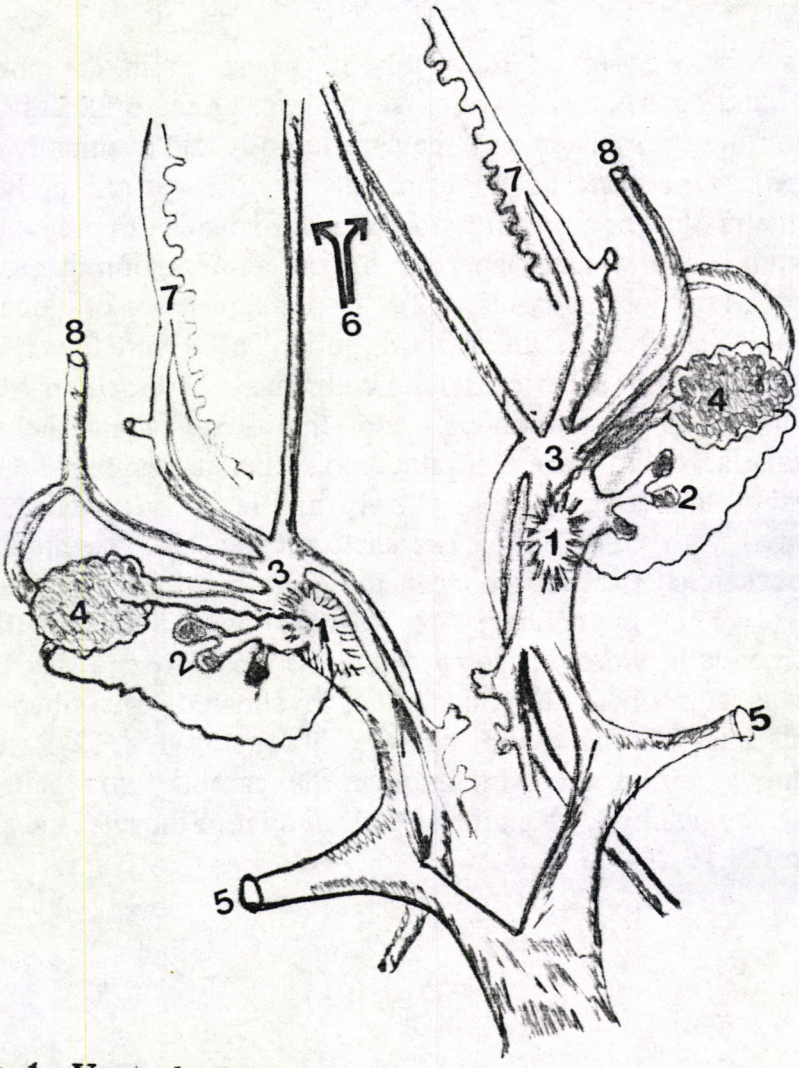

Plate 1. Ventral view , showing the location of the carotid body (1) of the duck caudal to the parathyroid glands (2) and closely related to the common carotid bifurcation zone (3). Thyroid gland (4), subclavian artery, (5), left and right common carotids (6), vertebral artery (7), cervical artery (8).

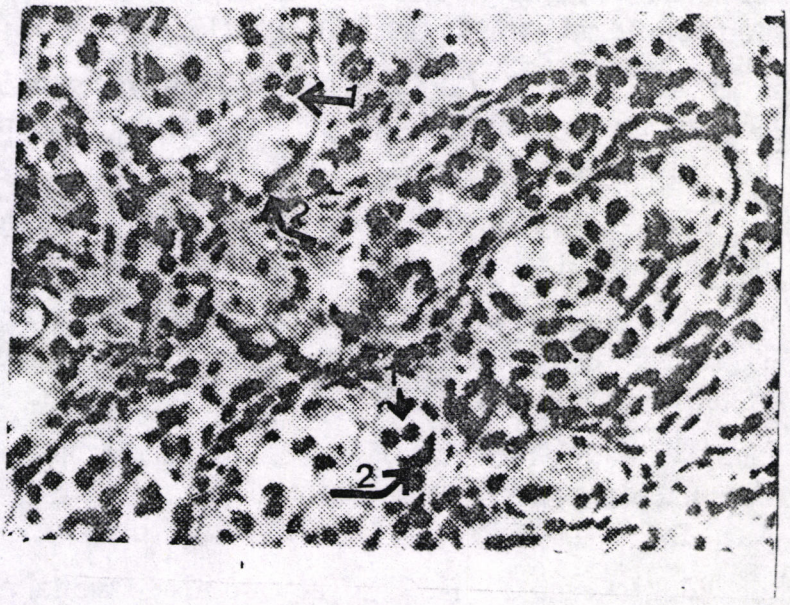

Figure 1.: Obvious clusters of glomic cells in the carotid body of an endognous duck. X500.

1. Chief cells. 2. Sustentacular cells.

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التشريح العياني والمجهري للجسم السباتي في البط المحلي .

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الخلاصـــــة

يقع الجسم السباتي في البط المحلي على السطح البطني لتفرع الشريان السباتي العام، ذيليا لغدد جنيب الدرق _ يتميز الجسم السباتي بشكله المغزلي المضغوط. كان معدل طول الجسم السباتيه 1/058 ± 095/ مايكروميتر.

ليس من السهل تشخيص المند الدموي للجسم السباتي في البط ولكن يزود بفروع شريانية من الشريان القحافي والشريان الذيلي الدرقي . يتكون الجسم السباتي في البط المحلي نسيجيا من نوعين من الحلايا ، الخلايا الرئيسية والتي تشكل مجموعات ومحاطه بخلايا ساندة . تقع هذه الخلايا في نسيج ظام ليفي لتشكيل نسيج كبيبي. لوحظ وجود خلايا عقيدية قرب الجسl السباتي .