

GROSS AND MICROSCOPIC STRUCTURE OF THE CAROTID BODY IN  
THE ROCKY PIGEON (COLUMBA LIVIA).

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SUMMARY

Topographically, the carotid body in rocky pigeon has a silvery-white in colour and showed different localization. It located on or in the vicinity of the carotid and lateral to the caudal thyroid arteries. It was located in close apposition to the parathyroid glands. Histologically, the parenchyma of carotid body in rock pigeon was consisted of chief cells and sustentacular cells. These epithelioid tissue was interspersed by connective tissue with some sinuses and relatively number of capillaries. Nerve fibers were found also in the connective tissue between the parenchymal cells.

INTRODUCTION

The carotid body as chemoreceptor organ, reflexly controlling the respiratory and cardiovascular system was studied by several workers in mammals (1, 2, 3, 4, 5). Literatures concerning the anatomy and histology of the avian carotid body were not extensive (6, 7). The current study deals with the gross and microscopic structure of the carotid body in the rocky pigeon.

MATERIALS AND METHODS

Twenty five rocky pigeons of different sexes were killed by bleeding. Exposure of the left and right thoracic inlets were made immediately. A wash solution of normal physiological saline containing 1.000 I.U of



heparin was perfused through the heart to remove clotted blood. For the purpose of gross study, fifteen rocky pigeons used. For the purpose of histology, fixation with 10% formalin was carried out on ten rocky pigeon by perfusion through the root of aorta. The carotid bodies were excised, cleared of all adhering tissues and immediately post-fixed in 10% formalin, then routinely processed for obtaining five micrometers paraffin sections and stained with haematoxylin and Eosin, Masson trichrome and silver nitrate staining (8).

## RESULTS

The carotid body was appeared as silvery white glistening in colour in the cadaver. Topographical relationships between carotid body tissue and neighboring structures revealed that the parathyroid and thymus glands were appeared as yellowish-white in colour. Indeed, different macroscopic localization of carotid body tissue was found in the thoracic inlets of rocky pigeon. It was found on or in vicinity of carotid artery in four out of fifteen cases. It was also found lateral to the caudal thyroid artery in three cases or it was found on the dorso-lateral surface of the common carotid artery nearby its bifurcation in two cases. The carotid body of rocky pigeon was also located in close association with the parathyroid glands in six cases. Histological observations of the carotid body in rocky pigeon seemed that it was enclosed in loosely arranged connective tissue capsule which send delicate strands of connective tissue septa interspersed between the organ. The parenchyma of carotid body was consisted of epithelioid tissue interspersed by connective tissue fibers with some sinuses and relatively number of capillaries. Fibroblasts in the form of spindle shaped cells, macrophages and lymphocytes were distributed throughout the stroma of the carotid body. Two types of epithelioid tissue were designated as chief cells which were large, rounded with spherical nuclei and sustentacular cells which were elongated with oval nuclei. These two types of epithelioid cells were



mostly found in close vicinity to either sinuses or capillaries. Neural elements which consist of myelinated nerve fibers and some nerve endings could be detected inside the carotid body tissue after silver impregnation.

#### DISCUSSION

The localization of carotid body in the thoracic inlets of rocky pigeon was considerably variable. It was found to be situated either on or in the immediate vicinity of carotid artery in four out of fifteen dissected cases. The carotid body was found lateral to caudal thyroid artery in three cases. It was also found as compact mass nearby the bifurcation of the common carotid artery and on the dorsa-lateral surface in two dissected rocky pigeon. This agrees with finding of Mohammad et al (9) in an endogenous ducks, and Dreyer et al (6) in fowls. The position of the carotid body of rocky pigeon was also observed in six cases, in close relationship to parathyroid glands. This finding was similar to those described in a number of birds (6, 7, 10). The carotid body was appeared as silvery white glistening in colour which was distinguished from parathyroid and from the thymus. The later organs were seemed to be yellowish-white in colour (6, 7). Histological examination of above mentioned arteries revealed that the tunica media and tunica adventitia of the carotid and caudal thyroid arteries in rocky pigeon were studded by scattered type carotid bodies. Similar findings was described in sheep and goats (5) and in camel (11), The carotid body in rocky pigeon was found in the caudal region of parathyroid glands and was surrounded by connective tissue capsule which gives connective tissue septa interspersed between the various epithelioid elements. The epithelioid elements were consisted of two types of epithelioid cells, arbitrarily designated as chief cells and sustentacular cells (9). On the other hand, Dreyer et al (12), De Kock and Dunn (13) stated that the histological examination of epithelioid character of the carotid body



was reflected by the presence of three types of epithelioid cells arbitrarily designated as epithelioid cells types I, II, III. The epithelioid cells in the carotid body of pigeon were in intimate relation with sinusoidal capillaries. These capillaries were ramifying between epithelioid cells. Similar findings was found in the bird uroloncha (10, 14). Myelinated nerve fibers were also found in the connective tissue between the parenchymal cells and few fibers could be detected surrounded by lemmocytes without myelin (15, 16).

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التشريح العياني والمجهري للجسم السباتي في حمام الصخر  
(الطوراني)

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الخلاصة

طغرافيا، يكون لون الجسم السباتي في حمام الصخر ابيض  
فضي ويحتل اماكن مختلفة في التجويف الصدري. يقع الجسم  
السباتي على الشريان السباتي أو يتماس معه، أو وحشيا  
للشريان الدرقى الذيلي. كما يقع يتماس واضح مع الغدد جنيب  
الدرق. نسيجيا، يتكون متن الجسم السباتي في حمام الصخر من  
خلايا رئيسية وخلايا سائده. يتخلل النسيج الظهاري، نسيج  
ضام مع بعض الحبيبات وعدد من الشعيرات الدموية. توجد  
الياف عممية في النسيج الضام بين خلايا المتن.