

Gross anatomical study of the aortic ARC branches of the paca (*Agouti paca*, Linnaeus, 1766)

Estudo anatômico dos ramos do arco aórtico da paca (*Agouti paca*, Linnaeus, 1766)

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SUMMARY

It was described the distribution of the aortic arc in eight animals of the *Agouti paca* species, which were 2 adult females, 3 young males and 3 young females that came from the Wild Animal Sector at the Faculty of Agrarian and Veterinary Sciences of Jaboticabal - UNESP. After natural death, the animals had their arterial vessels injected with Neoprene latex 650[®] coloured by a specific pigment and set in a 10% formalin solution. After dissection, it was noticed that the aortic arc gives off the left subclavian artery and the brachiocephalic trunk. The latter originates the left carotid common artery and other trunk, that gives off the right carotid common artery and the right subclavian artery, that originates the vertebral artery, the costocervical trunk, the superficial cervical artery, the axillary artery and the internal thoracic artery, as well as it happens in the left subclavian artery. In just one animal, the left common carotid artery takes a siphon-shaped path just after its origin in the right subclavian artery. In other animals, the left common carotid artery occurs as a straight path.

UNITERMS: Pacas; Aorta; Thoracic aorta.

INTRODUCTION

The paca is a wild animal belonging to the Rodentia order. Because of the excellent taste of its meat, it is one of the most hunted animals in the Neotropical America since ancient period, and today it presents a great commercial interest.

The aim of this study is to contribute with the knowledge of the anatomy of this specie. It is described in this paper the branching of aortic arc of these animals. Information about the anatomy of the paca is rare. General information about lab rodents, as well as from the Rodentia order will be established.

In rabbits, Lesbre⁴ relates that the left brachial trunk and the brachiocephalic trunk derivate directly from the aortic arc. The latter bifurcates in right subclavian artery and left and right common carotid. It presents a short trajectory and either carotids or at least the right one is originated directly from the aortic arc. The same author explains that the subclavian artery gives off through a common trunk the dorsal intercostal, superficial cervical and vertebral arteries, and the inferior cervical artery and two thoracic arteries.

Grassé; Dekeiser¹ describe in rodents that the carotid common trunk keeps on the right side as a right brachiocephalic trunk. It bifurcates to originate the subclavian and carotid arteries. In castors, the right carotid artery becomes isolated from the subclavian artery and joins with the left carotid artery to form a common carotid trunk.

According to Hebel; Stromberg² in the lab rat, the descendant aorta leaves the heart and in its cranial way origins the aortic

arc that turns aside left and goes caudally as descendant aorta artery. This artery leaves the aortic arc more or less ten millimeters from the aorta's origin and after four millimeters it divides in right subclavian artery and right common carotid artery. Just after the aortic arc vertex, the aorta originates the left common carotid artery and near it the left subclavian artery is originated. The authors even explain that the right and left subclavian arteries give off the axillary artery, the costocervical trunk artery, the internal thoracic artery, the vertebral artery and superficial cervical artery. The left and right common carotid arteries run cranially through the trachea lateral side, without giving any branches.

MATERIAL AND METHOD

Eight pacas, being three young males, three young females and two adult females, which came from the Wild Animal Sector at the Faculty of Agrarian and Veterinary Sciences of Jaboticabal - UNESP, were used.

After the natural death of these animals, the preparation was made through an opening of the thoracic cavity in the left side, in the fourth intercostal space, and then the aorta was isolated (thoracic portion). Then, this vessel was canalized through a short cut, with a tube of compatible caliber to the vessel, and injected with coloured Neoprene latex 650[®] (Du Pont do Brasil S.A.), in caudal direction. The animals were put in a 10% formalin solution and dissected. The dissection was done with the animal on dorsal recumbency. The thoracic aorta was visualised and dissected.

RESULTS

The results show that in all animals the aortic arc gives off, in cranial direction, the left subclavian artery and the brachiocephalic trunk. This trunk, soon in its beginning, gives off the left common carotid artery, and just after, originates together the right common carotid artery and right subclavian artery (Fig. 1).

The right and left subclavian artery give off branches in its intrathoracic trajectory, from the cranial to the lateral way: vertebral artery, costocervical trunk, superficial cervical artery, axillary artery and internal thoracic artery (Fig. 2). The right and left common carotid arteries run accompanying the trachea cranially, and the left and right vertebral arteries, respectively, in a craniodorsal direction. In just one adult female, the left common artery takes a siphon shape just after its origin.

The axillary artery shows up as the largest calibre artery among the subclavian artery branches, seeming to be the continuation of it.

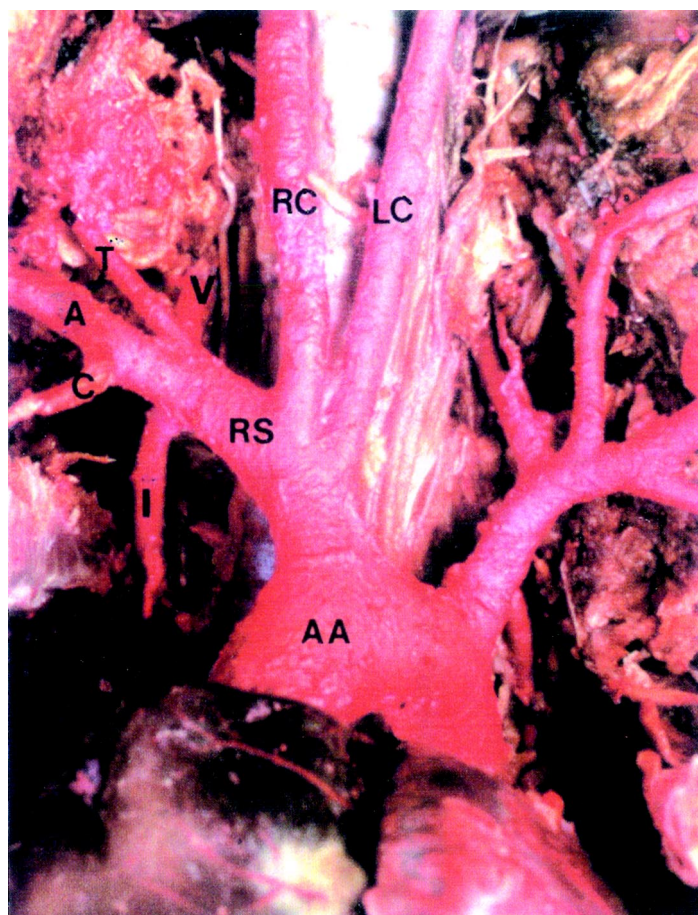


Figure 1

Photograph of the aortic arc of an adult female paca (AA), on dorsal recumbency, showing the origins of the left common carotid artery (LC), the right common carotid artery (RC) and the right subclavian artery (RS), the vertebral artery (V), the costocervical trunk (T), the superficial cervical artery (C), the axillary artery (A), the internal thoracic artery (I).

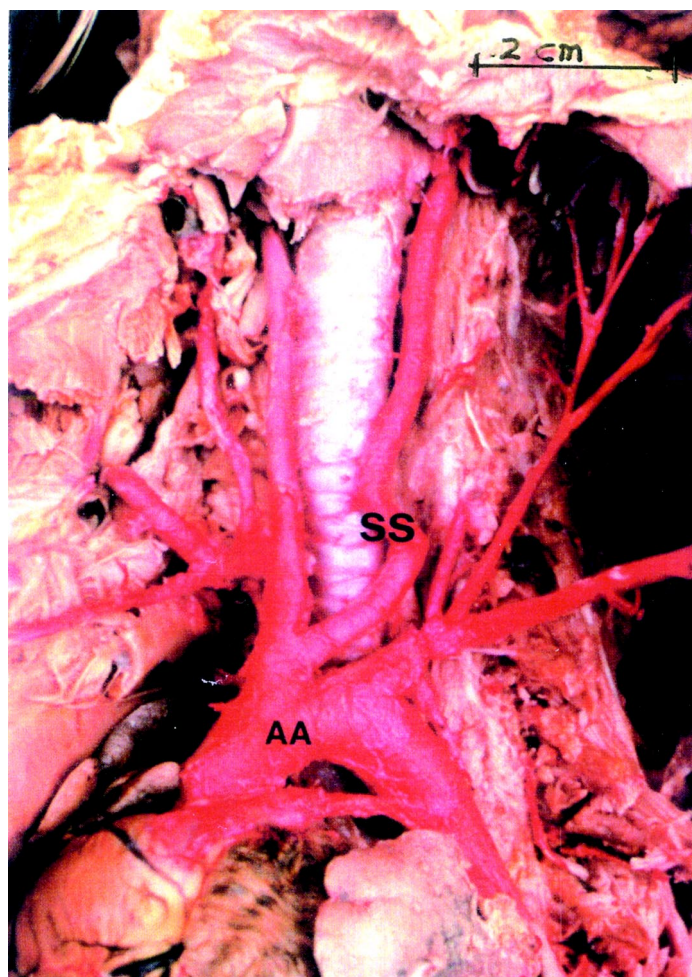


Figure 2

Photograph of the aortic arc of a young female paca (AA), on dorsal recumbency, where the left common carotid artery is in a siphon shape (SS).

DISCUSSION

In the lab rat, according to the descriptions of Hebel; Stromberg², the brachiocephalic trunk gives off the right common carotid artery and right subclavian artery, differently from the paca, in which these arteries and the subclavian artery have their origins in the cited trunk. According to the same authors, in the lab rat, the left common carotid emerges very close to the left subclavian artery, whereas in the paca the left subclavian artery emerges isolated from the aortic arc, and the left common carotid artery emerges from the brachiocephalic trunk.

In the paca, the branching of the brachiocephalic trunk in left and right common carotid arteries and right subclavian artery is similar to that described by Grassé and Dekeyser¹ in rodents, and different to that noted in castors, in which the right common carotid artery gets isolated from the right subclavian artery, and joins with the left common carotid, resulting in a common carotid trunk.

Lesbre⁴ doesn't make citations to the axillary artery in rabbits. He just relates the dorsal intercostal artery and inferior cervical artery in these animals, which are suggestive of being similar to vertebral artery and superficial cervical artery, respectively, in the paca.

According to the descriptions of Kent³ for rabbit, pig, dog and cat, the aortic arc originates the left subclavian artery and the brachiocephalic trunk, isolately. This trunk gives off the left common carotid artery and a short trunk, which originates the right common carotid and the right subclavian arteries, similarly to what occurs in the paca.

CONCLUSIONS

1. The paca aortic arc bifurcates in left subclavian artery and brachiocephalic trunk in all studied cases;

2. The brachiocephalic trunk gives off the left common carotid artery and a short trunk, which origins the right common carotid artery and the right subclavian artery;
3. The emergent branches of the left and right subclavian arteries are the same, and the left and right common carotid arteries behave the same way as in the intrathoracic course;
4. The distribution of the branches of the paca aortic arc shows one pattern among the analysed animals, and it is close to that noted in other rodents and lagomorfos, following a pattern for mammals.

RESUMO

Foi descrita a distribuição do arco aórtico de oito animais da espécie *Agouti paca*, sendo duas fêmeas adultas e seis filhotes jovens (3 machos e 3 fêmeas) que foram obtidos no Setor de Animais Silvestres da Faculdade de Ciências Agrárias e Veterinárias – Campus de Jaboticabal. Após morte natural, seus vasos arteriais foram injetados com Neoprene latex 650 (Du Pont do Brasil S.A.) coloridos e colocados em uma solução de formalina a 10%. Depois de dissecados, notou-se que o arco aórtico desses animais emite a artéria subclávia e o tronco braquiocéfálico. Este último dá origem à artéria carótida comum esquerda e a um tronco, do qual surgem a artéria carótida comum direita e a artéria subclávia direita. Estas emitem, em cada antímero, a artéria vertebral, a artéria tronco costocervical, a artéria cervical superficial, a artéria axilar e a artéria torácica interna. Em apenas um animal a artéria carótida comum esquerda apresenta-se na forma de um sifão, logo após sua origem na artéria subclávia direita. Nos demais animais, a artéria carótida comum esquerda apresenta um trajeto retilíneo.

UNITERMOS: Pacas; Aorta; Aorta torácica.

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