

Histologic structure and innervation of the carotid baroreceptor region in the rock hyrax (*Procavia capensis*)

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Abstract:

Semi-thin plastic sections reveal that the carotid baroreceptor region in the rock hyrax comprising the origin of the internal carotid artery has a preponderantly elastic structure and a thick tunica adventitia. In contrast, the common carotid artery has a musculoelastic structure, whereas the cranial segment of the internal carotid artery (immediately distal to the baroreceptor areas) shows the features of a muscular artery. Electron microscopy discloses the presence of sensory nerve endings within the parts of the tunica adventitia adjoining the preponderantly elastic zone of the internal carotid artery. These nerve endings are characterized by varicose regions containing a large quantity of mitochondria. Bundles of collagen fibers in the tunica adventitia form convolutions or whorls around the nerve terminals and often terminate on the surface of the elastic fibers or into the basement membranes of the neuronal profiles. The large content of elastic tissue in the tunica media of the baroreceptor region may render the vessel wall highly distensible to intraluminal pressure changes. This, in turn, would facilitate the transmission of the stimulus intensity to the sensory nerve terminals located in the tunica adventitia. It is suggested that the stretching of elastic fibers may form the main mechanical event leading to the distortion of the associated nerve terminals. However, a change in the geometrical configuration of the bundles of collagen under the influence of the elastic fibers may provide a better insight into the mechanisms of distortion of the baroreceptors related to and/or in contact with collagen fibers.