

## Morphofunctional characterization of a rare extracranial internal carotid artery giant aneurism

Michela Relucenti<sup>1</sup>, Luciano Petruzzello<sup>1</sup>, Heyn Rosemarie<sup>1</sup>, Ezio Battagione<sup>1</sup>, Raffaele Dito<sup>2</sup>, Federico Filippi<sup>2</sup>, Maurizio Taurino<sup>2</sup> and Giuseppe Familiari<sup>1</sup>

<sup>1</sup>Laboratory of Electron Microscopy Pietro M. Motta, Section of Human Anatomy, Faculty of Pharmacy and Medicine, Sapienza University of Rome, Rome, Italy.

<sup>2</sup>Vascular Surgery Unit, Sant'Andrea Hospital, Department of Clinical and Molecular Medicine, Sapienza University of Rome, Rome, Italy

Aneurisms of the extracranial tract of the internal carotid artery (EICAA) are extremely rare, accounting for 0,4% to 2% of all carotid procedures (El-Sabrou et al., 2000); in females incidence is 2-11 times lower than in males (Siablis et al., 2004). A giant EICAA (32 x 35 mm) at C3 level was studied in a woman aged 81. Samples were prepared for standard transmission electron microscopy. Semithin sections were stained according to Relucenti et al. (2010). Ultrathin sections were contrasted with uranyl acetate and lead citrate. Images revealed the presence of many microvessels just beneath the tunica intima. They were patent, often showed sprouts and pericytes. Endothelial cells appeared metabolically active, with euchromatin, nucleoli, membrane blebs and junctional complexes. Their basal membrane was thickened and sometimes multilaminated. Leukocytes adhering to the endothelium were observed. The internal elastic lamina was so fragmented that it was very difficult to recognize it. The tunica media showed vascular smooth muscle cells (VSMCs) arranged in bundles encircled by collagen-rich extracellular matrix (EM), as well as scattered in the EM. VSMCs had perinuclear organelles, dense bands and caveolae. Collagen fibrils were arranged in a twisted or coiled fashion. Elongated fibroblasts were scattered among VSMCs. The external elastic lamina was conserved. Literature on EICAA is almost exclusively clinical, so this morphofunctional study elucidates structural and ultrastructural changes in the aneurism wall that can contribute to the knowledge of aneurism etiopathogenesis.

### References

- El-Sabrou et al. (2000) Extracranial carotid artery aneurysms: Texas Heart Institute experience. *J Vasc Surg* 31(4):702-12.
- Relucenti et al. (2010) Detecting microcalcifications in atherosclerotic plaques by a simple trichromic staining method for epoxy embedded carotid endarterectomies. *Eur J Histochem* 14;54(3):e33.
- Siablis et al. (2004) Extracranial internal carotid artery aneurysms: report of a ruptured case and review of the literature. *Cardiovasc Intervent Radiol* 27(4):397-401.

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