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Fibrous Metaplasia of Smooth Muscle Tissue of the Tunica Media in Tortuous Arteries

INTRODUCTION. Tortuosity is known as the twisting and bending of blood vessels causing a deficient blood supply to the distal organs. The etiology is not widely understood, however there have been several clinical observations linking the following factors to the development of tortuosity: aging, atherosclerosis, hypertension, genetic defects, and diabetes mellitus. RESOURCES. This research was conducted through Missouri Southern State University's cadaver lab. Six human cadavers were dissected and used for tortuous and non-tortuous arterial sample collection. Histology preparation was performed through HistoWiz. DESCRIPTION. The objective of this cadaveric study is to determine the role of metaplasia of smooth muscle tissue within the tunica media leading to the development of arterial tortuosity. This study involved analysis of 17 arterial samples. H&E staining was performed on eleven samples and the other six were stained with smooth muscle actin antibodies. The samples were subjectively analyzed and a reduced appearance of smooth muscle cells and an increase of fibroblast and collagen fibers within the tunica media was observed in tortuous samples when compared to non-tortuous arterial samples. SIGNIFICANCE. Metaplasia is a reversible condition; understanding its role in the development of tortuosity could lead to less invasive interventions of symptomatic tortuosity. This study was designed to support and validate a continuation study in which immunofluorescent staining will be used to objectively verify cells within the tunica media.