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Anatomical variation of the carotid arterial system within the South African population: implications for the treatment of carotid arterial disease

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ABSTRACT

Knowledge of the anatomical variation in the carotid arterial system is important in understanding the pathogenesis and surgical treatment of atheroma. Thus, this study investigated the anatomical variation of the carotid arterial system and the frequency of atheroma within a South African population.

The carotid arterial systems were exposed bilaterally in 77 adult cadavers using standard dissection. The level of the carotid bifurcation, position and curving of the carotid arteries and frequency of common trunks and atheroma were recorded. In addition, the lengths and diameters of the carotid arteries and branches as well as the bifurcation angle were measured. Data was analyzed using descriptive and inferential statistics.

The carotid bifurcation most commonly occurred at the C3-C4 intervertebral disc. White males had longer common carotid arteries than white females. The lengths of the internal and external carotid arteries were longer in white males compared to black males. There was a higher frequency of curving of the carotid arteries in white females compared to white males. The thyro-lingual trunk was the most common trunk within the sample. The internal carotid artery was postero-lateral to the external carotid artery within most individuals. In addition, atheroma was observed at the carotid bifurcation in all individuals.

The level of the carotid bifurcation, positioning, length and diameter of the carotid arteries in the South African population are similar to descriptions in anatomical texts. The differences found within the study may be attributable to the age of the sample as well as the embryological development of the carotid arteries within the South African population. These variations may influence blood flow within the carotid arteries. Thus, knowledge of these variations may aid in understanding the aetiology and the surgical treatment of atheroma.