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**Radio diagnosis**  
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ  
لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ  
أَنْتَ الْعَلِيمُ الْحَكِيمُ



**THE SEEDS OF KNOWLEDGE  
REMAIN TO GIVE PERCEPTION AND  
DEPTH TO OUR UNDERSTANDING**

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## **ABSTRACT**

**This study was designed to determine the value of MR imaging of the extra-cranial carotid artery disease. At first we started by introduction and aim of work folowed by, anatomy of the carotid artery, then the pathology of lesions affecting the carotid artery extracranially, review of methodology for evaluation of carotid artery and basic principles of magnetic resonance angiography, then the technique of examination is discussed breifly and the MRI manifestations of the different lesions affecting the C.A. extracranially followed by the summary and conclusion.**

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## Introduction and Aim of Work

Stroke is the most common disabling and life threatening neurological disease of adult life. Over the past decades a relationship between thromboembolic stroke and arteriosclerotic diseases of the carotid arteries has been established ( Pessin et al., 1977 ) .

Such pathologic lesions have lead to consideration of therapeutic options in patients with carotid lesions demonstrating stenosis or ulceration, particularly in patients who develop a transient symptom or a small permanent stroke in the distribution of such a diseased artery. They become a prime candidate for consideration of surgical reconstruction of the carotid artery (Zawadzki and Gillan, 1992 ) . Thus the preoperative evaluation of cervical carotid arteries gained importance.

Arteriography provides accurate delineation of the morphology of vessels and their territory, however being invasive and potentially have unacceptable risks. A good deal of effort was made to develop noninvasive methods for evaluating the extracranial carotid disease.

Doppler ultrasonography become widely available, yet it suffered from suboptimal accuracy, the limited field of view offered, and a clear relationship to operator skill.

Recently attention quickly turned to the capability of Magnetic Resonance as a noninvasive method for angiography. MRA can depict the cervicocranial vasculature with an accuracy (Masaryk et al., 1989, Edelman et al ., 1990 and Litt et al ., 1991).

The aim of this study is to emphasize the role of Magnetic Resonance Angiography in extra-cranial carotid arterial disease .

# **Anatomy of the carotid arteries**

## **Anatomy of the carotid arteries**

### **THE CAROTID SYSTEM OF ARTERIES**

The principal arteries of the head and neck are the two common carotids they ascend in the neck as far as the level of the upper border of the thyroid cartilage, where each divides into two branches. 1) The external carotid supplying the exterior of the head, the face and greater part of the neck, 2) The internal carotid, supplying the parts within the cranial and orbital cavities.

The common and internal carotid arteries, together with the veins and nerves which accompany them, are situated in a cleft on each side of the neck. This cleft may be said to possess three walls, a posterior, formed mainly by transverse processes of the cervical vertebrae with their attached muscles, a medial, consisting of the trachea, oesophagus, thyroid gland, larynx the constrictor muscles of the pharynx, and an anterolateral, made up of the sternocleidomastoid with, at different levels, the omohyoid, sternohyoid, thyroid, and the digastric and stylohyoid (Williams,1980).

Fig(1):A dissection of the lower part of the front of the neck and of the superior mediastinum. The manubrium sterni and the sternal ends of the clavicles and the first costal cartilages have been removed, and the pleural sac and lung have been retracted on each side. In this specimen each superior thyroid artery arose from the common carotid artery. [Quoted from Williams & Warwick, 1980].

Fig(2):A dissection to show the course of the right vertebral and internal carotid arteries and some of their branches.  
(Quoted from Williams and Warwick, 1980).

## **THE COMMON CAROTID ARTERIES**

The common carotid arteries differ in length on their mode of origin. The right artery begins at the bifurcation of the brachiocephalic trunk behind the right sternoclavicular joint and is confined to the neck. Left artery springs from the biggest part of the aorta immediately behind and to the left of brachiocephalic trunk, and therefore consists of a thoracic and cervical portions ( fig 1-4).

The thoracic part of the left common carotid artery, ascends from arch of the aorta to the level of the left sternoclavicular joint, where it is continuous with the cervical portion. It lies at first in front of the trachea, but later inclines to its side.

The cervical part of the common carotid arteries have similar courses. Each passes obliquely upwards and passes laterally, from behind the sternoclavicular joint, to the level of the upper border of the thyroid cartilage, where it divides into the external and internal carotid arteries.