CAROTID AND ORBITAL AUSCULTATION

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INTRODUCTION

This chapter includes a review of:

- Loss of vision testing
- Carotid artery auscultation
- Orbital auscultation

LITERATURE REVIEW

PURPOSE

If a patient presents with a VA deficit that does not improve with refraction, it is necessary to pursue further testing. The following tests are used to aid in the diagnosis for the **non-refractive** VA deficit:

Types of Diagnostic Tests	
Amsler Grid	Electroretinography (ERG)
Brightness & Color Comparison	Visual-Evoked Potentials (VEP)
Photostress Recovery	Electro-Oculography (EOG)
Contrast Sensitivity Function	Carotid Artery Auscultation
Glare Evaluation	Orbital Auscultation
Potential Acuity Assessment	Deceptive Testing
Ultrasound	

Table 8.1: *Types of diagnostics tests that can be conducted to investigate non-refractive VA deficit*

CAROTID ARTERY AUSCULTATION

Carotid Artery Auscultation is usually performed when the patient is suspected of having carotid artery occlusive disease caused by atherosclerosis. In carotid artery occlusion, the blood supply to the eye (Fig. 8.1) may be decreased or be completely diminished, resulting in loss of vision. Carotid ausculation is usually done to complement retinal findings associated to carotid artery disease, such as Hollenhorst plaque, venous occlusive disease, or assymetric diabetic retinopathy. Symptoms of amaurosis fugax should also prompt carotid auscultation.

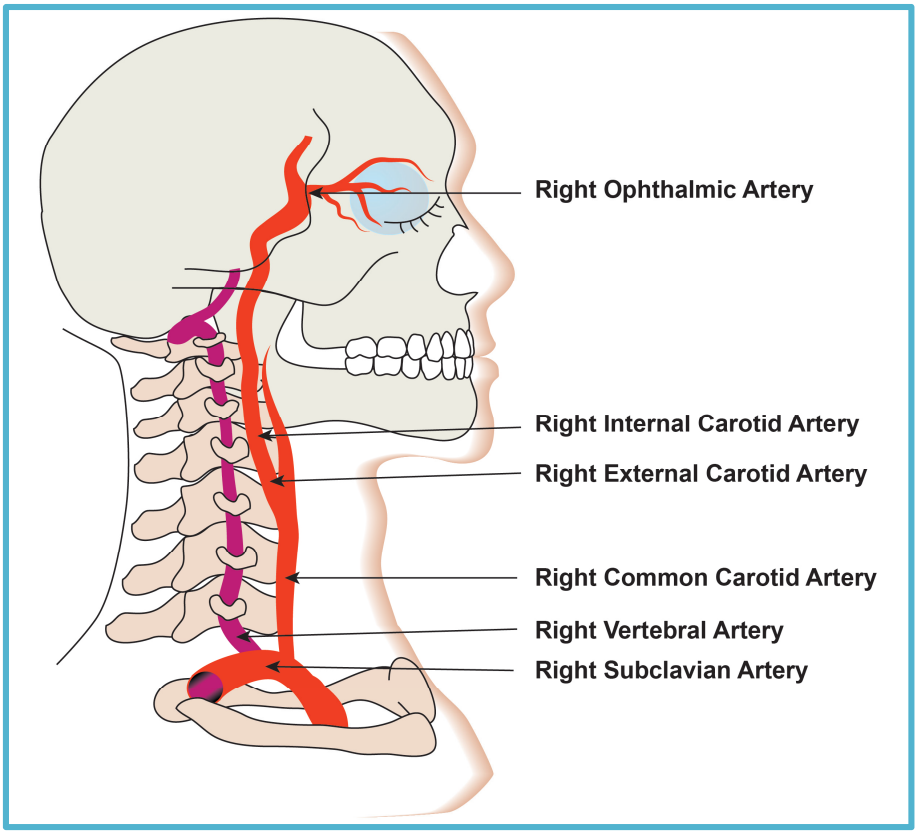

Figure 8.1: *Anatomy of the blood supply to the eye from the carotid artery*
Inspired by: Fingeret M, et al., Atlas of Primary EyeCare Procedures

AUSCULTATION

Auscultation is defined as using a stethoscope to listen to the physical signs of the body. Carotid auscultation involves placing the stethoscope over the area of the carotid artery and listening to the sound of the blood flow within. If a patient suffers from carotid occlusive disease the clinician may hear a **bruit**. A carotid bruit is heard as a **"swishing"** sound that results from the turbulence of blood flowing through a partially occluded artery. Carotid bruits are **low-pitch sounds** and are best heard with the bell of the stethoscope.

Procedure

- Perform in a room free of noise
- Turn the patient's head slightly to one side
- Scan down the artery along the side of the trachea (Fig. 8.2a).
- Place the **bell** on the carotid artery just below jaw (Fig 8.2b).
- To intensify the noises, ask the patient to stop breathing.
- Listen for bruit or "**swishing**" sound.

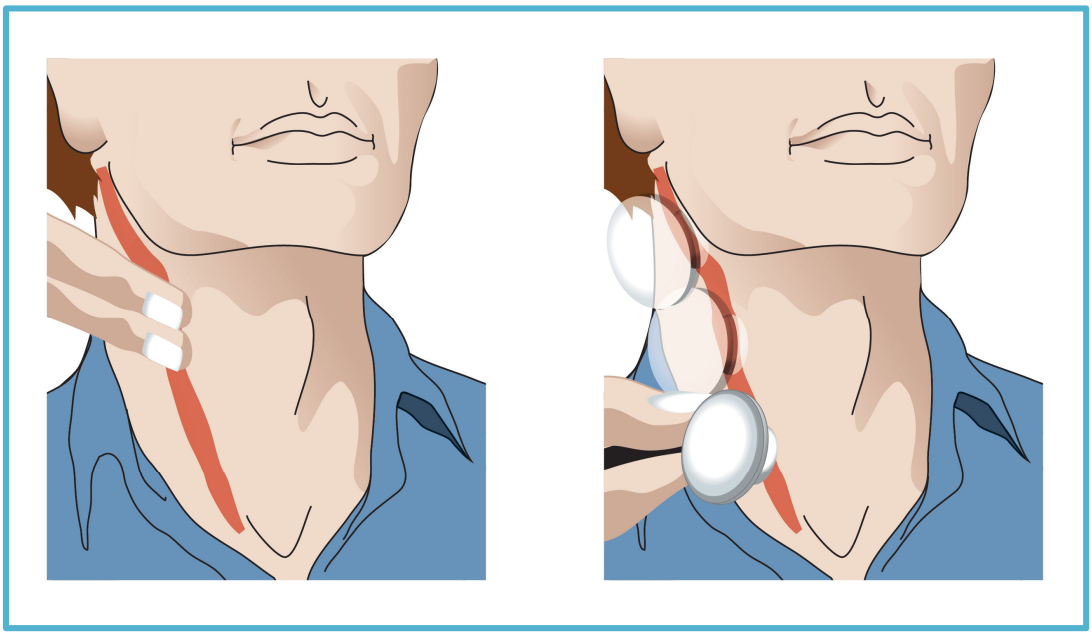

Figure 8.2a *Palpation of the carotid artery* ***Figure 8.2b:*** *Placement of the bell of the stethoscope*
Inspired by: Fingeret M, et al., Atlas of Primary EyeCare Procedures

CLINICAL RELEVANCE

This technique is not very sensitive and often yields negative or incorrect results. Carotid occlusive disease may have serious consequences if left untreated. One must therefore interpret carotid auscultation with utmost caution.

However, if a bruit is heard it may signify that the patient has carotid occlusive disease. There must be 50% occlusion of the carotid artery to hear a bruit. If the bell is placed with too much pressure on the carotid artery, one can partially occlude the vessel and induce a bruit sound, even on a healthy artery. If the bell is placed with too much pressure over a vessel that is partially occluded, one may completely occlude the vessel. Therefore, one must gently place the bell over the carotid artery to eliminate error and risk of complete artery occlusion.

If no bruit is heard, caution should be taken - if there is a 100% occlusion, a bruit will not be heard, because there is no blood flow through the vessel. Ocular findings such as retinal plaques, rubeosis iridis, neovascular glaucoma, venous stasis retinopathy, central and branch retinal artery occlusion, ischemic optic neuropathy or asymmetric hypertensive retinopathy may indicate carotid artery disease and warrant a referral to general medicine. The patient needs a cardiac and blood work up, as well as imaging of the carotid arteries with ultrasonography (carotid duplex ultrasound).

ORBITAL AUSCULTATION

Orbital auscultation is indicated when a patient presents with a unilateral pulsating exophthalmos. Possible etiologies of unilateral pulsating exophthalmous include orbital congestion due to space-occupying lesion, vascular anomaly (Arterio-venous malformation), and edema (carotid-cavernous sinus fistula).

The patient may present with eyelid swelling, conjunctival injection and telangiectasia, chemosis, exophthalmos, extra-ocular muscle restriction, diplopia, decreased visual acuity, and ocular discomfort.

Procedure

- Perform in a room free of noise
- Place the stethoscope bell over the closed eyelid (Fig. 8.3)
- Ask the patient not to breathe as the sound may obscure the vascular noise
- Listen for bruit or “swishing” sound for 10 seconds
- Ask the patient to listen for a swishing sound like running water (subjective response)
- Move the bell to the lateral canthus to enhance orbital sounds
- Auscultate the fellow eye for comparison of orbital sounds

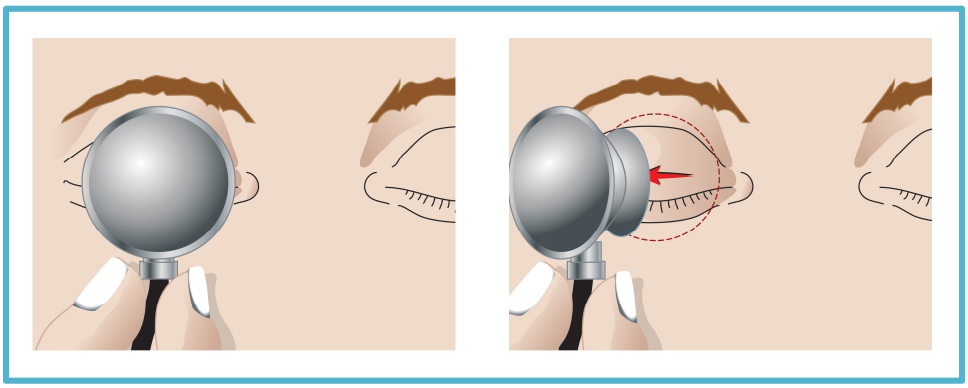

Figure 8.3: *Placement of the stethoscope over the eye*
Source: Fingeret M, et al., Atlas of Primary EyeCare Procedures

CLINICAL RELEVANCE

If a bruit is heard, it may signify that the patient has one the above mentioned conditions. The patient should have a neurological exam to differentiate between the various conditions in order for proper treatment to be initiated.