



جامعة المستقبل
قسم تقنيات البصريات

L2

مشاكل العين بالامراض الباطنية و العصبية

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Circulatory disorders

➤ Cardiovascular Disease & Effects on Eye:

- Cholesterol Deposits in or Around the Eyes
- Transient Vision Loss
- congenital cardiac defects lead to changes in the retinal vascularity
- untreated endocarditis present with Roth spots (fig.2), retinitis, embolic retinopathy, or sub-retinal abscesses

Cholesterol Deposits in or Around the Eyes (Xanthelasma) (Fig.1)



(Fig.1)

Roth's spots in endocarditis and the leukaemias (Fig.2)



(Fig.2)

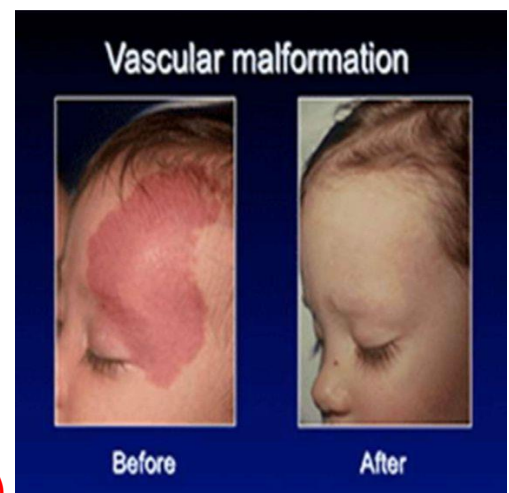
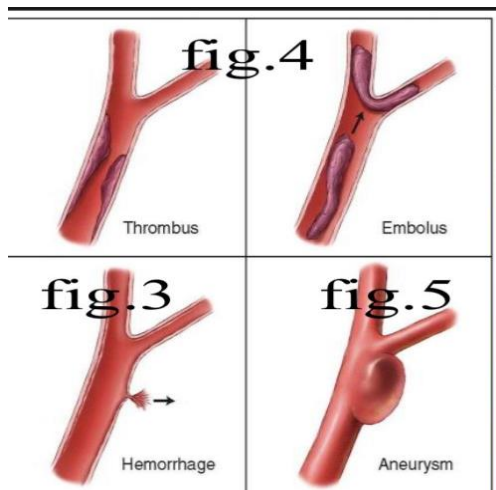
- superficial retinal hemorrhages ovally shaped, with pale center .It is commonly seen near the optic disk.

➤ **Common conditions cause C.D for the eye :**

- Diabetes :(diabetic retinopathy).
- High blood pressure (hypertensive retinopathy).
- The eye is very sensitive to changes in blood flow.
- Note: Smoking can worsen vascular problems.

➤ **Causes of C.D**

- Traumatic(fig.3)
- Compressive
- Occlusive (fig.4)
- Tumors or malformations(fig.6)
- Aneurysms(fig.5)
- Vessel spasms
- Anemias
- leukemia(fig.2)



(fig.6)

- **Anemias:** are common groups of C.D affecting the red blood cells.
 - Ocular features of anemias : Retinopathy, Optic neuropathy

- Leukemia: are groups of abnormal proliferation of white blood cells.
 - Ocular features of leukemia's: all of the ocular structures may be involved

- **Diagnostic workup:**
 - Blood pressure measurement
 - Full blood count
 - Lipid profile
 - Diabetes Tests
 - Electrocardiogram (ECG)/fig.7
 - Echocardiography/ fig.8



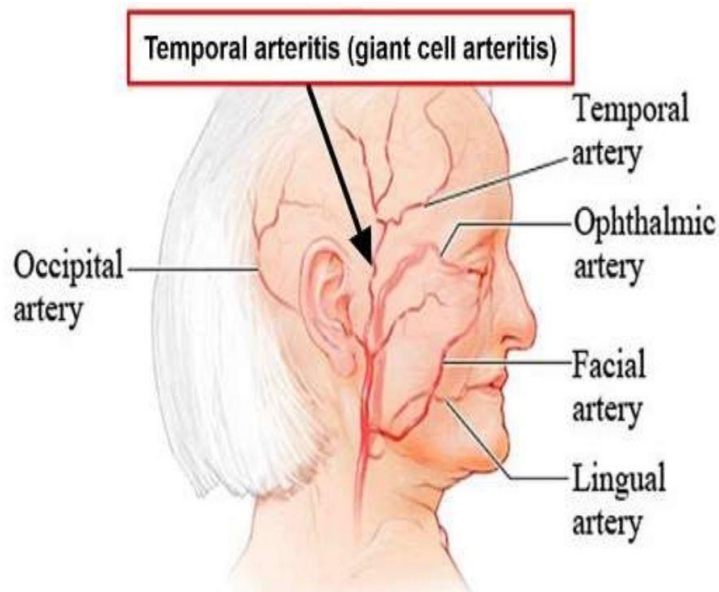
(Fig.7)



(Fig.8)



- **Giant cell arteritis:** is an idiopathic vasculitis in elderly, includes the superficial temporal and ophthalmic artery. fig.9



(Fig.9)

• **Systemic features:**

- Headache
- Weight loss, anorexia, fever, sweats
- Pain on speaking and chewing
- Polymyalgia fig.9

➤ **Ocular features in giant cell arteritis:**

- Sudden uni ocular blindness.
- Reduced visual acuity.
- Swollen, pale and hemorrhages of optic nerve head.
- Thickened and tortuous superficial temporal artery (fig.10)



(Fig.10)

➤ **Investigations for giant cell arteritis:**

- Erythrocyte sedimentation rate ESR(very high).fig.11
- C-reactive protein is raised.
- Hb% low and high white blood cells
- Antinuclear antibodies +ve .
- Temporal artery biopsy

- **Treatment for giant cell arteritis:**

- Hydrocortisone and Actemra (tocilizumab) to prevent vision loss

➤ **Carotid artery disease:**

- Transient ischemic attacks(TIA): rapid onset of hemianesthesia, hemiparesis or difficulty with speech lasting less than 24 hours.
- Ocular features: obstruction to the retinal arterioles, painless unilateral loss of vision.

- **Investigations of carotid disease:**

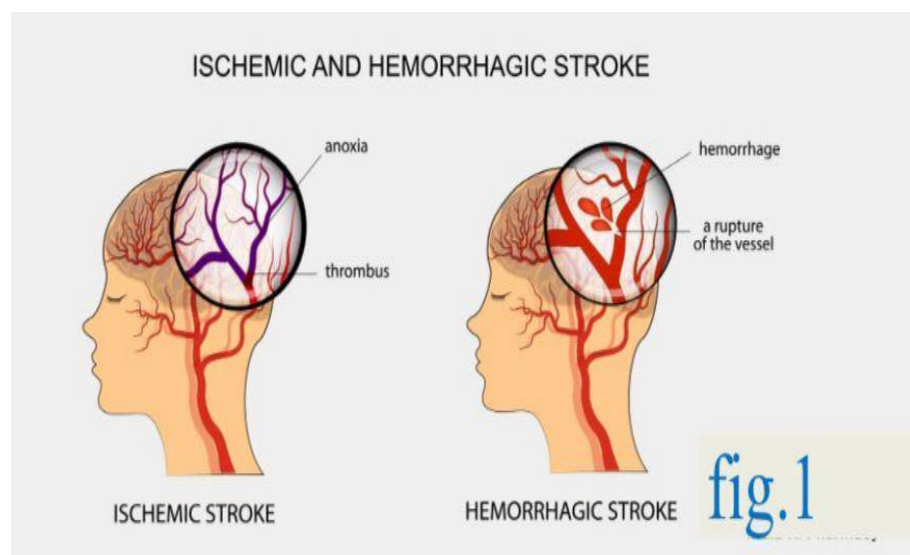
- Physical examination
- Doppler flow analysis.
- Magnetic resonance imaging MRI
- Angiography

- **Treatment of carotid disease:**

- Medical
- Surgical

➤ **Cerebro Vascular Accident (stroke)**

- **Stroke** is the sudden onset of a neurological deficit from the death of brain tissue. (fig.11)



(Fig.11)

➤ Cerebrovascular Accident Risk Factors:

Modifiable risk factors for stroke are:

- high blood pressure
- cigarette smoking
- hyperlipidemia
- heart disease
- Physical inactivity
- diabetes
- TIA /Lec.1
- obesity
- contraceptive
- carotid stenosis

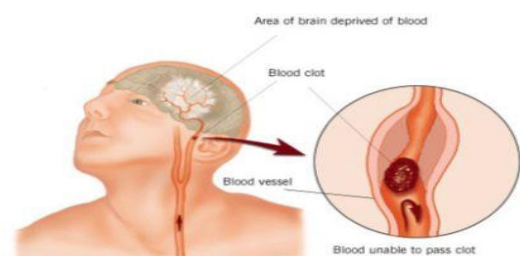
Nonmodifiable risk factors for stroke are :

- Age: Occurrence in >55 years old
- Gender: men > women;
- Family history

Etiology

Stroke is caused by a sudden blockage in the flow of blood to the brain in 85% of cases and by bleeding in 15% of cases.

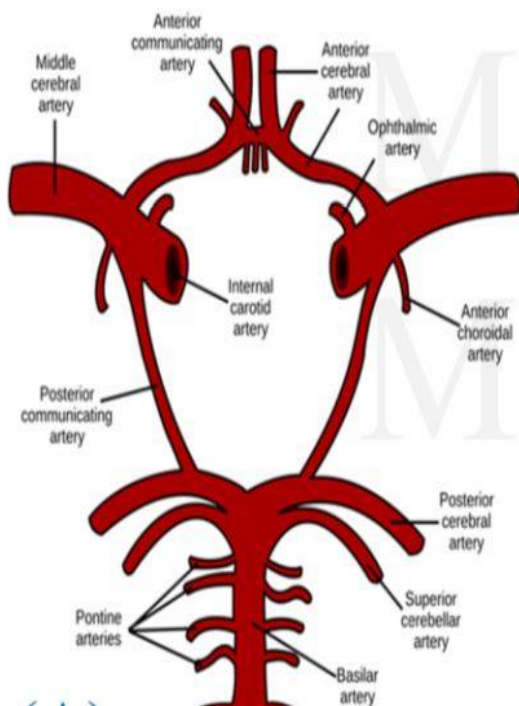
- A cerebral vessel is blocked either by:
- Emboli
- Carotid stenosis



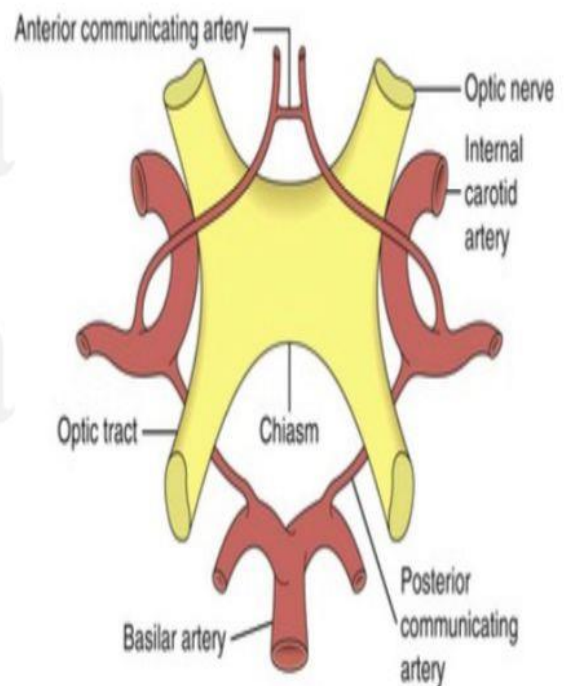
(Fig.12)

➤ Anatomy of Cerebral Circulation

- Anterior cerebral artery(c . a)
- Middle c. a.(more than 90% of cases)
- Posterior c. a.
- Circle of Willis.fig.13 (The optic nerves conjoin to form the optic chiasm, which is supplied by Circle of Willis. fig.14)



(Fig.13)



(Fig.14)

Presentation: depend on the area of the brain affected

The most common symptom :

- weakness of one side of the body with partial or complete loss of voluntary movement or sensation in a leg or arm.
- speech problems and weak face muscles, causing drooling.
- Numbness or tingling.

The visual aspects of cerebrovascular disease

Monocular visual loss due to prechiasmal ischemia ,can be caused by retinal ischemia secondary to occlusion within the ophthalmic artery (fig.15)



(fig.15):cherry red spot' in the macula

➤ **Homonymous Hemianopia(HH)**

A left-sided stroke results in loss of the right visual fields. The eyes can't see the right side, so the eyes deviate to the left. Hence the eyes "look towards the side of the lesion." (fig.4)

HH is the most common form of visual field loss following stroke (fig.16)



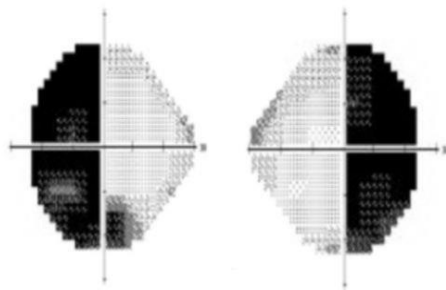
(Fig.16)

➤ **Bitemporal hemianopia due to chiasmal ischemia**

Chiasmal strokes are rare, owing to the rich supply of collateral circulation provided by the Circle of Willis to the optic chiasm. When chiasmal strokes do occur, patients experience acute onset bitemporal hemianopia (fig17)

Bitemporal hemianopia due to chiasmal ischemia

Bitemporal hemianopia



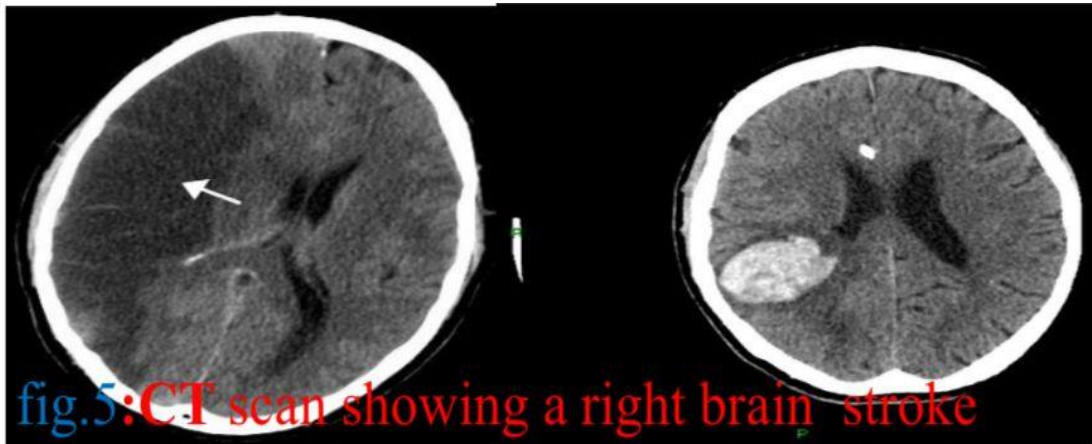
(Fig.17)

- Diagnostic Tests

The best initial test in any kind of stroke is a CT scan , the most accurate test is an MRI.fig.18

Stroke Classifications:

- Ischemic Stroke :Thrombotic and Embolic
- Hemorrhagic Stroke :Intracerebral Hemorrhage . fig.18



(fig.18)

fig.5:CT scan showing a right brain stroke

fig.6:MRI scan showing a brain stroke

- Treatment

The best initial therapy for anonhemorrhagic stroke is:

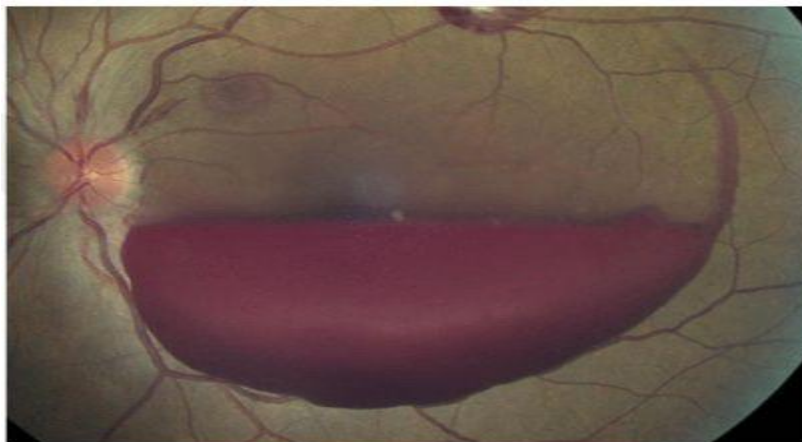
- Thrombolytics
- Aspirin
- Hemorrhagic stroke: nothing
 - Statins every patient with a stroke should be started on a statin medication

• Transient Ischemic Attack (TIA)

- Temporary focal loss of neurologic micro emboli, temporary blockage of blood flow.
- Lasts less than 24 hrs.
- Most resolve within 3 hours
- double vision, or vision loss
- weakness numbness typically on one side of the body, difficulty speaking or understanding others
- **Diagnosis:** CT scan without contrast
- **Treatment:** Medications that prevent platelet aggregation

➤ Terson's syndrome

- pole hemorrhages occurring as a consequence of subarachnoid or intracranial hemorrhage.(fig.19)



(fig.19) Terson's syndrome showing a subretinal hemorrhage after an acute intracranial hemorrhage

➤ Control of Risk Factors for Stroke:

- High blood pressure, or hypertension, the most significant controllable risk factor.
- Diabetes mellitus is an independent risk factor for stroke. Many people with diabetes also have high blood pressure, high blood cholesterol and are overweight — increasing their risk even more. While diabetes is treatable, the presence of the disease still increases your risk of stroke.
- Diets : high fat and cholesterol, high in (salt),and high calories .
- The use of birth control pills combined with cigarette smoking can greatly increase the risk of stroke.
- Physical inactivity : Aim for being active at least 150 minutes a week ,or just move more and sit less