

OCTOBER 21, 2016

IMAGING OF COMPLICATIONS OF TOBACCO CONSUMPTION : RADIOLOGIST'S PERSPECTIVE



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AIIMS, NEW DELHI**

COMMON DISEASES CAUSED BY SMOKING

LUNG DISEASES

- CARCINOMA LUNG
- PULMONARY EMBOLISM
- COPD
- BRONCHIECTASIS

STROKE (CVA)

HEART DISEASES

- CAD
- TRIPLE RULE OUT



PERIPHERAL VASCULAR DISEASES

- ATHEROSCLEROSIS
- BURGER'S DISEASE
- VENOUS THROMBOSIS

OTHER DISEASES

- Reduced fertility
- Premature, LBW babies
- Diabetes
- Blindness, cataract, ARMD
- Cancers: colon, cervix, stomach, pancreas

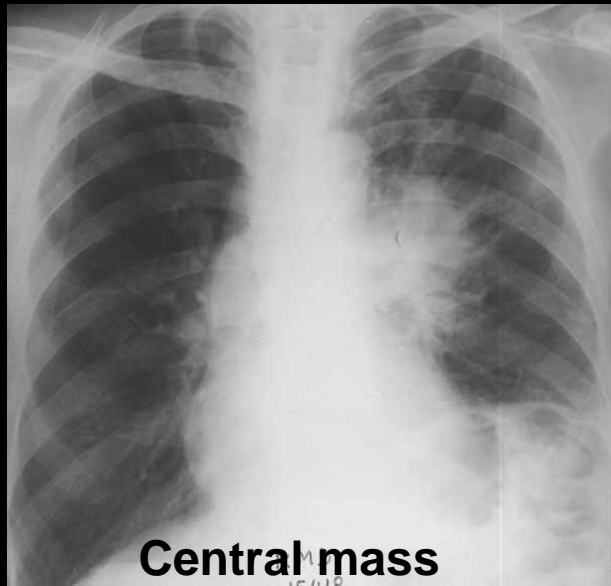
LUNG DISEASES



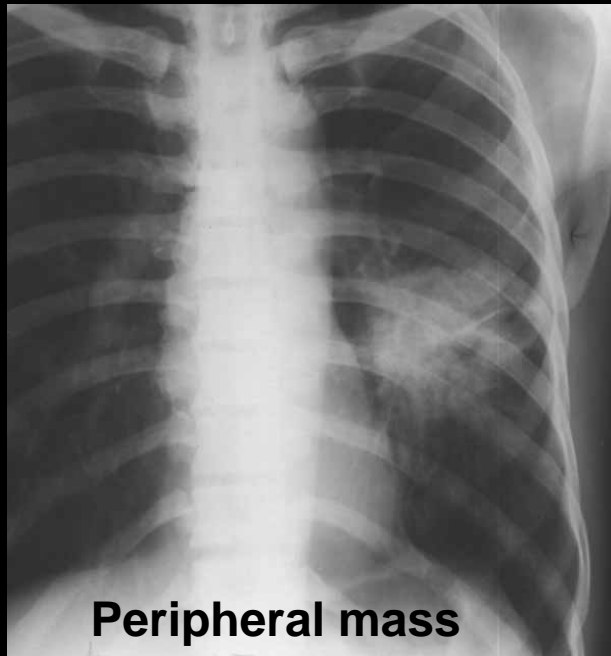
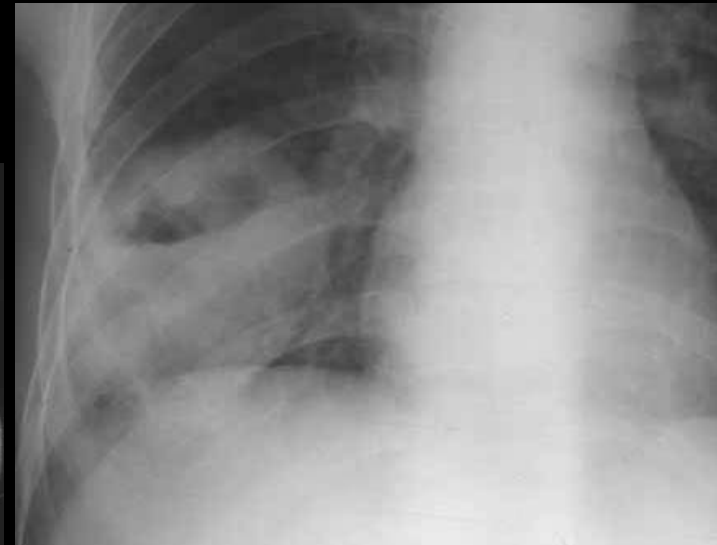
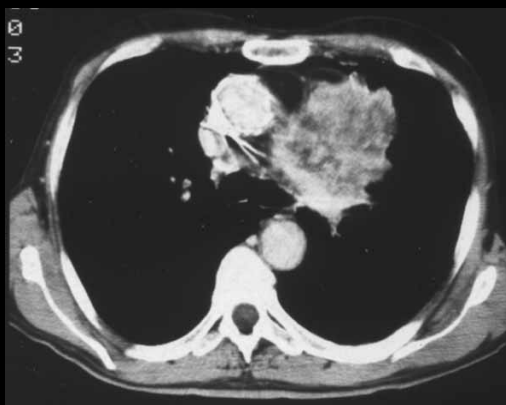
LUNG CANCER

ROLE OF RADIOLOGIST

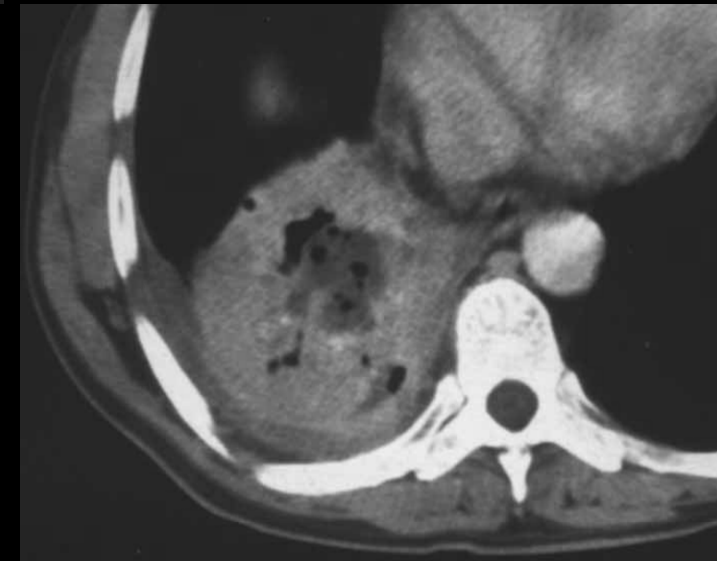
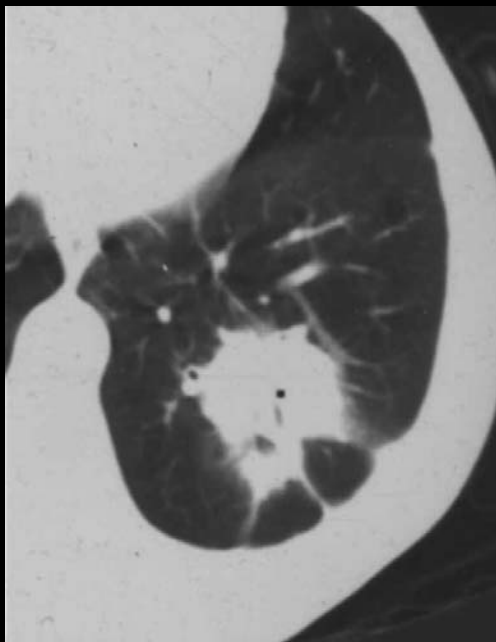
- DIAGNOSIS
- STAGING
- MANAGEMENT



Central mass



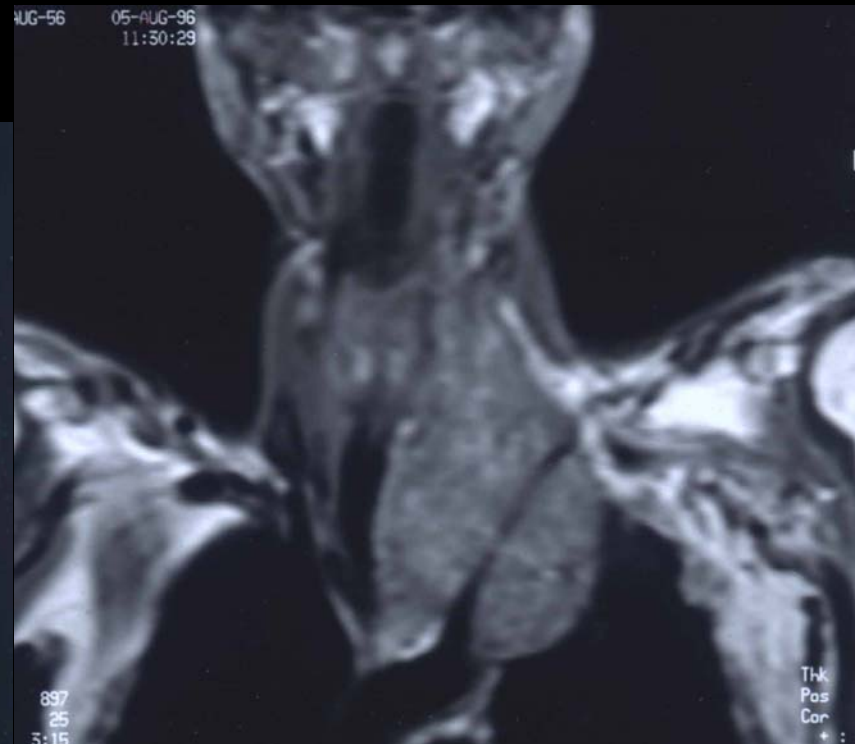
Peripheral mass



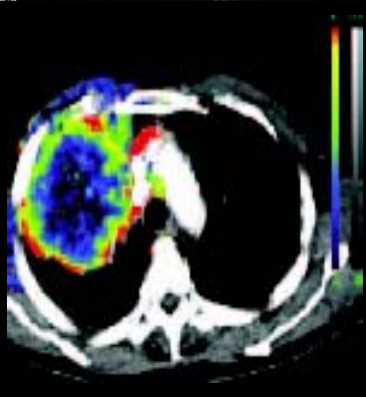
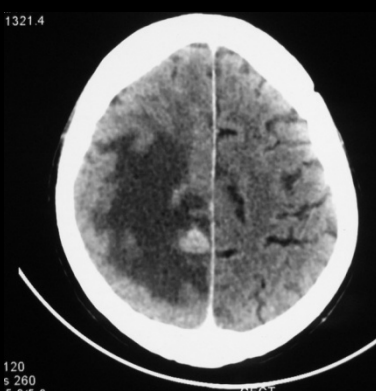
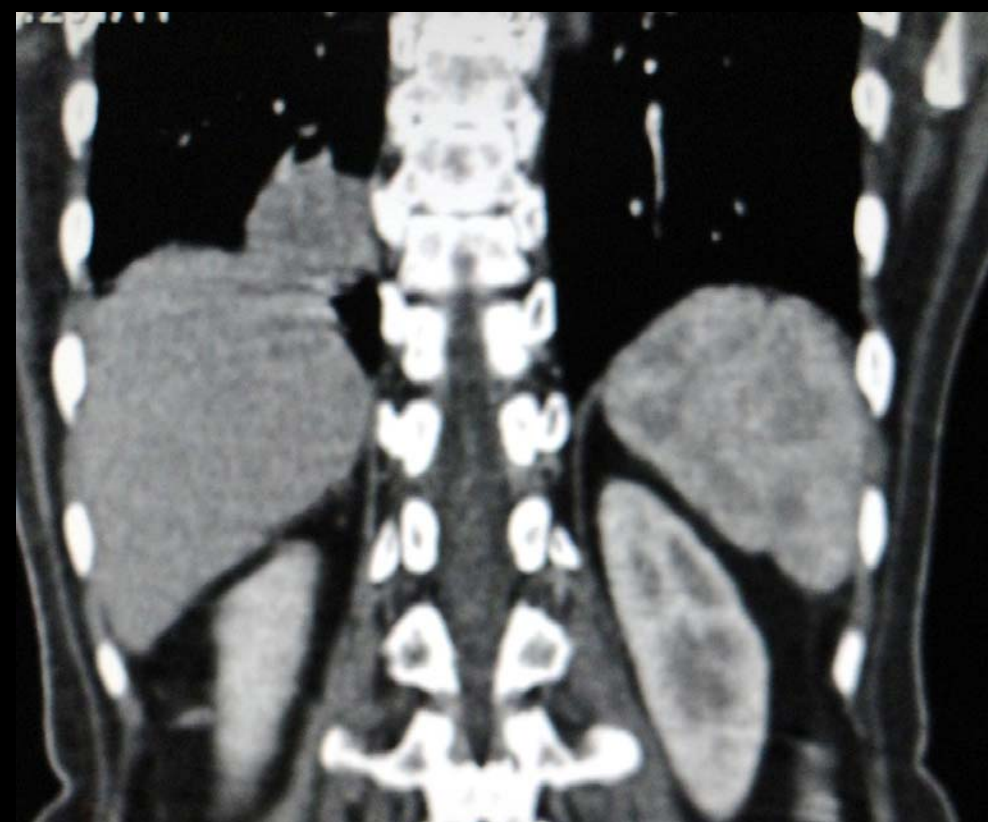
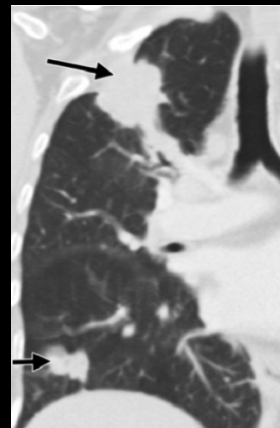
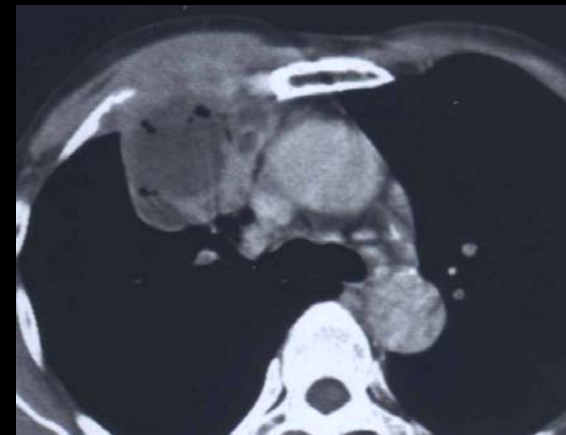
LUNG CANCER

PANCOAST TUMOUR

- Pulmonary apex tumour involving
- Brachiocephalic vein
- Subclavian artery
- Phrenic, recurrent L, Vagus nerve
- Sympathetic ganglion
- Horner's syndrome

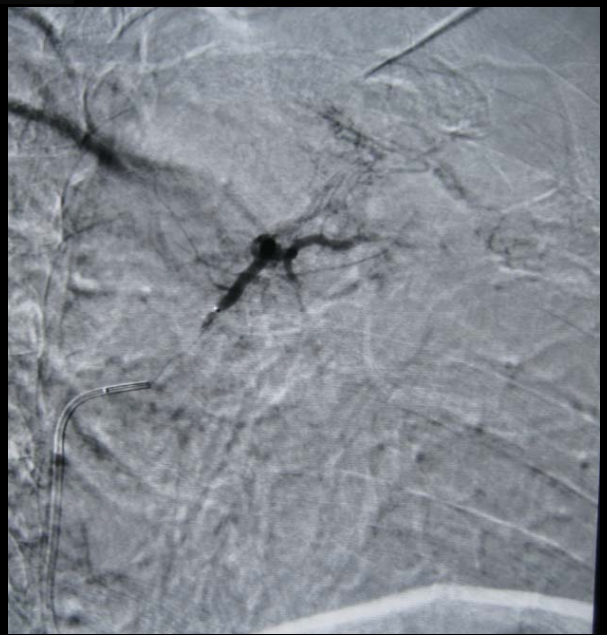
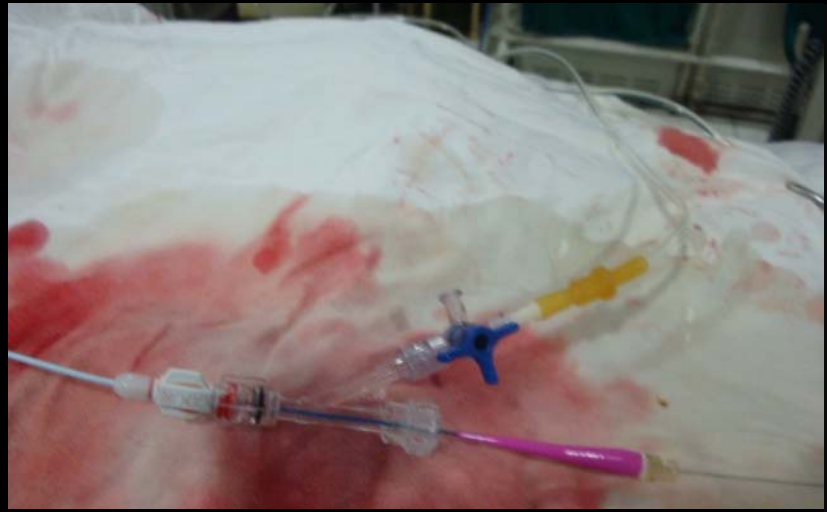


LUNG CANCER



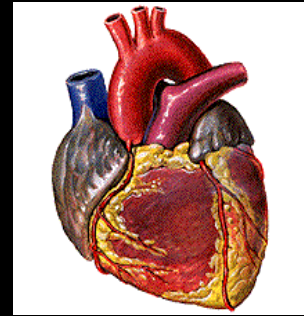
LUNG CANCER

SVC STENTING



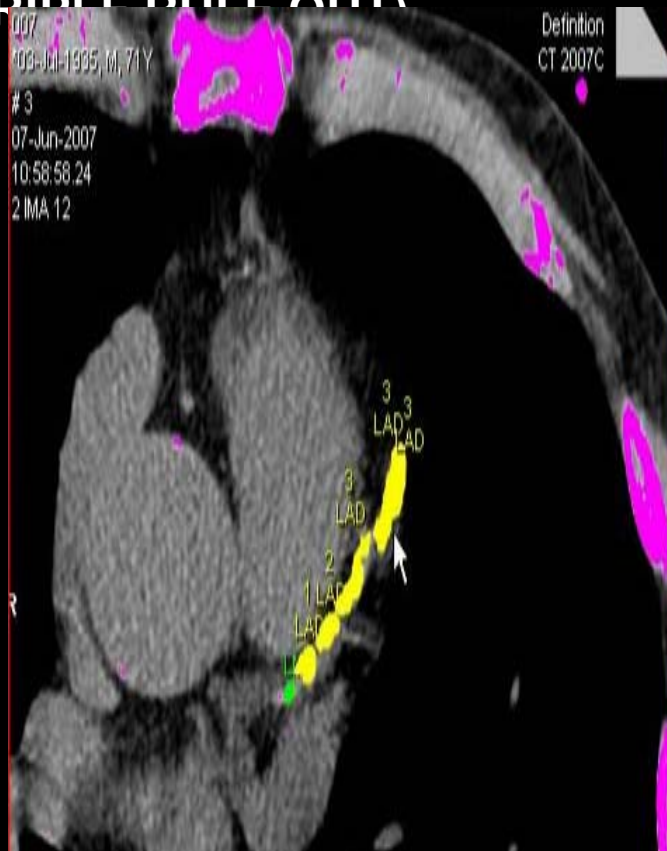
BRONCHIAL ARTERY EMBOLIZATION

HEART DISEASES



IMAGING OF CAD
CORONARY CALCIUM SCORING
CORONARY PLAQUE IMAGING
CT CORONARY ANGIOGRAPHY
ACUTE CHEST PAIN
EVALUATION

(TRIPLE RULE OUT)



Threshold = 130 HU
 (103.2 mg/cm² CaHA)

Artery	Number of Lesions (1)	Volume [mm ³] (3)	Equiv. Mass [mg CaHA] (4)	Calcium Score (2)
LM	1	81.5	16.46	93.7
LAD	4	418.3	110.40	507.7
CX	1	18.7	4.13	23.3
RCA	4	178.2	36.67	199.5
Total	10	696.7	167.66	824.3

- (1) Lesion is volume based
- (2) Equivalent Agatston score
- (3) Isotropic interpolated volume
- (4) Calibration Factor: 0.794

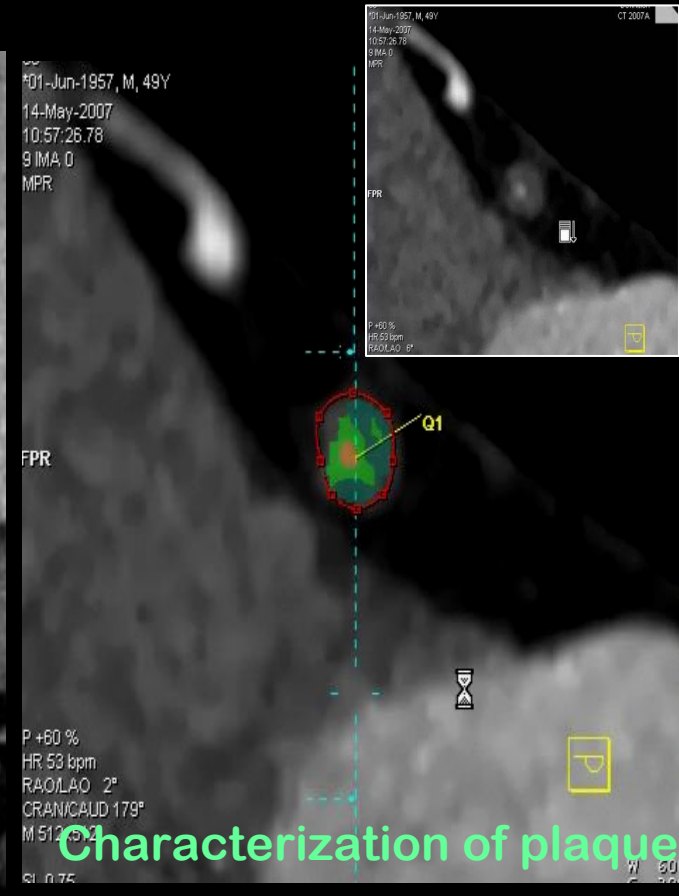
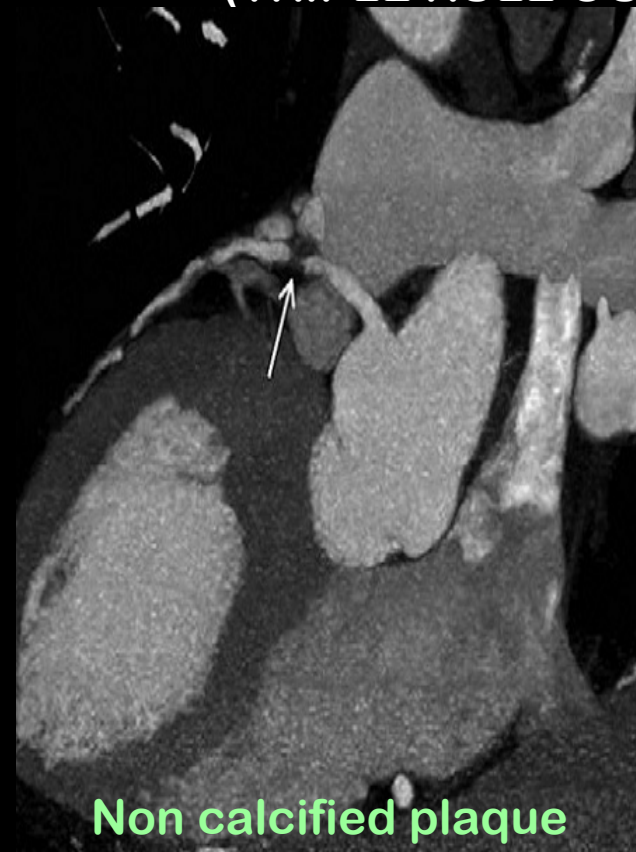
HEART DISEASES

IMAGING OF CAD

CORONARY CALCIUM SCORING
CORONARY PLAQUE IMAGING
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ACUTE CHEST PAIN
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TYPES OF PLAQUE

- Lipid-rich plaques
 - Intermediate plaques
 - Calcified plaques
- Lipid plaques more vulnerable than calcified plaques

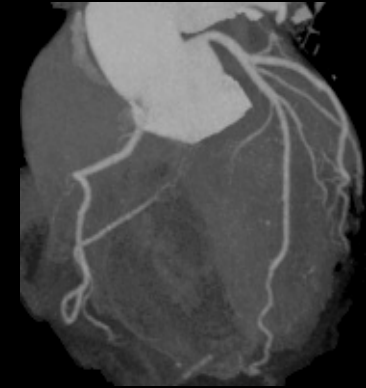


HEART DISEASES

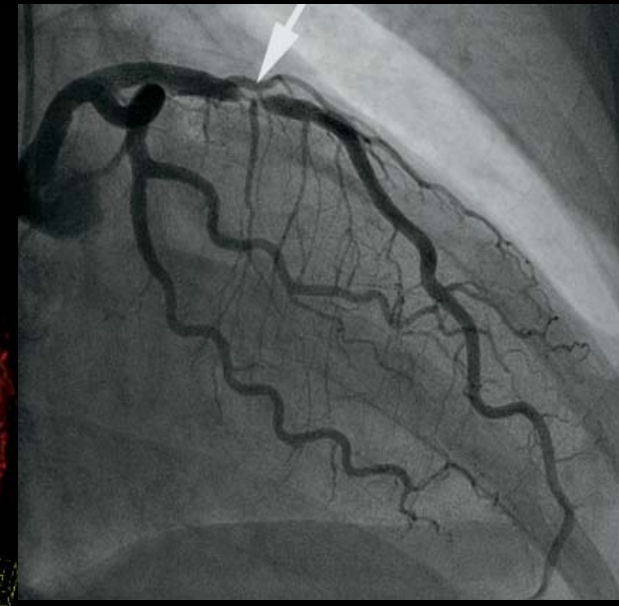
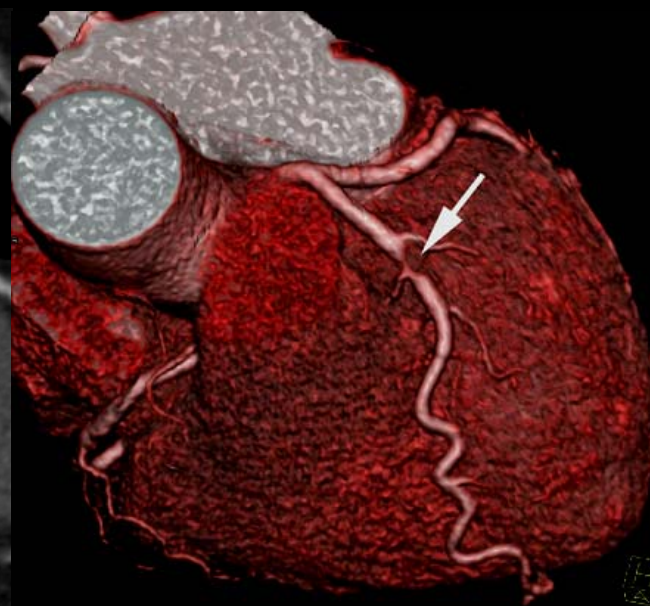
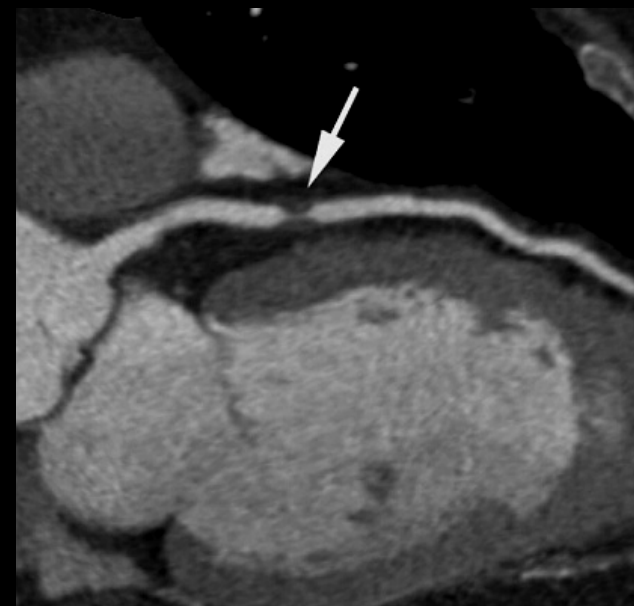
IMAGING OF CAD

CORONARY CALCIUM SCORING
CORONARY PLAQUE IMAGING
CT CORONARY ANGIOGRAPHY
ACUTE CHEST PAIN
EVALUATION
(TRIPLE RULE OUT)

Volume rendering Maximum Intensity Projection(MIP)

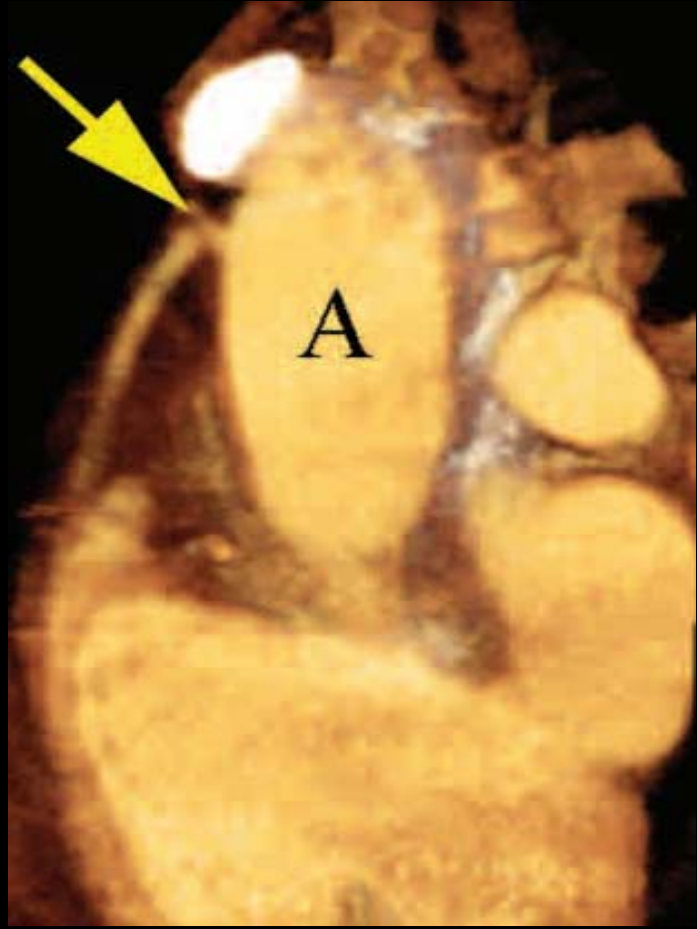
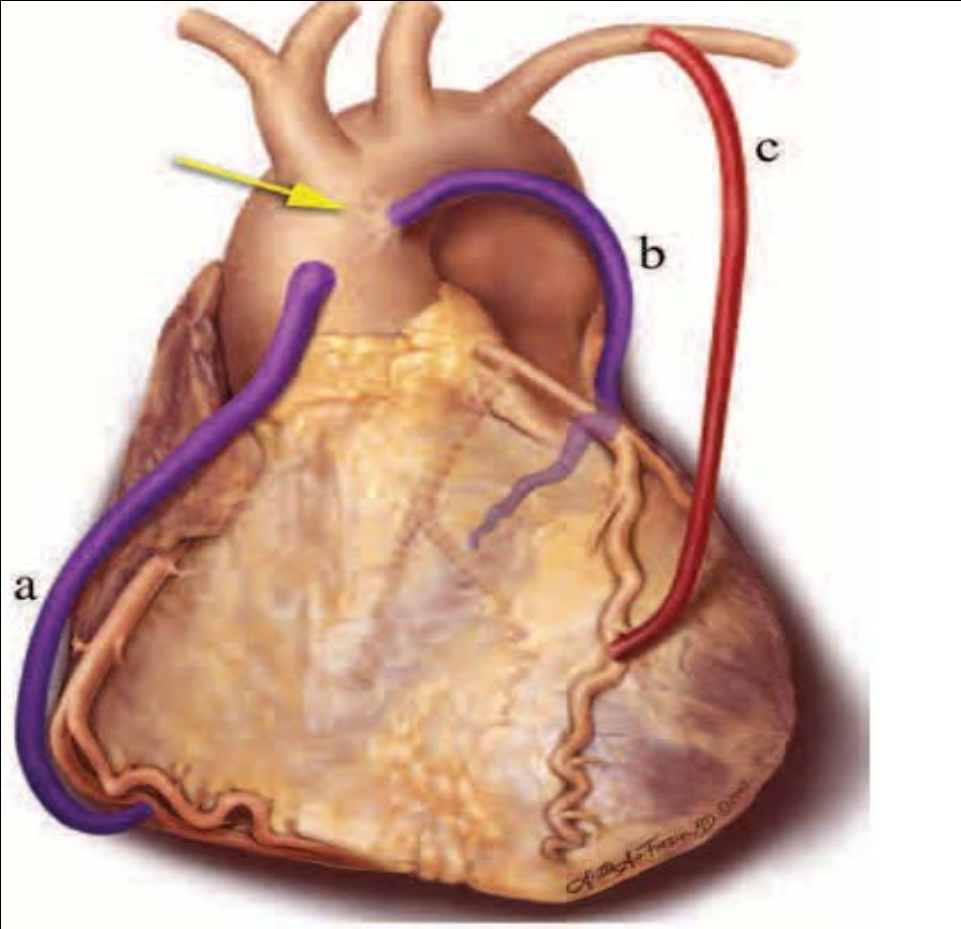


Coronary artery stenosis



HEART DISEASES

Coronary Artery Bypass Grafts



HEART DISEASES

IMAGING OF CAD

CORONARY CALCIUM SCORING
CORONARY PLAQUE IMAGING
CT CORONARY ANGIOGRAPHY

ACUTE CHEST PAIN
EVALUATION
(TRIPLE RULE OUT)

Rules out

- Acute coronary syndrome
- Aortic dissection
- Pulmonary embolism

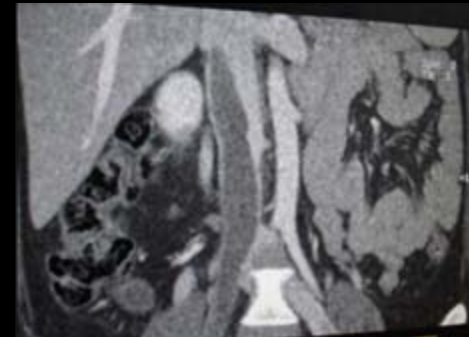
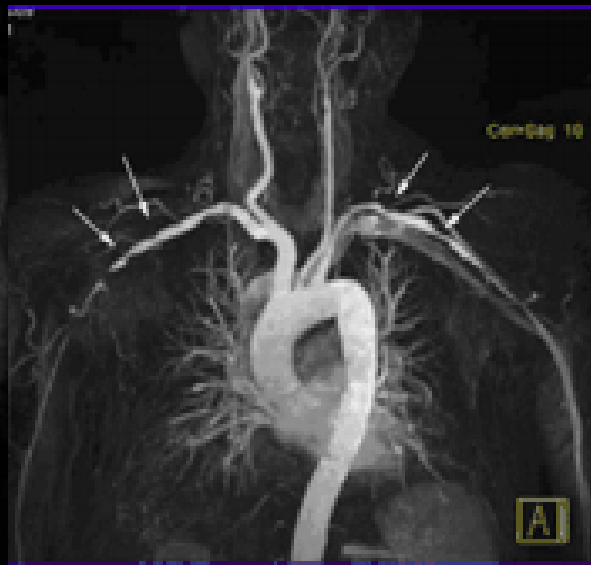
Pulmonary embolism



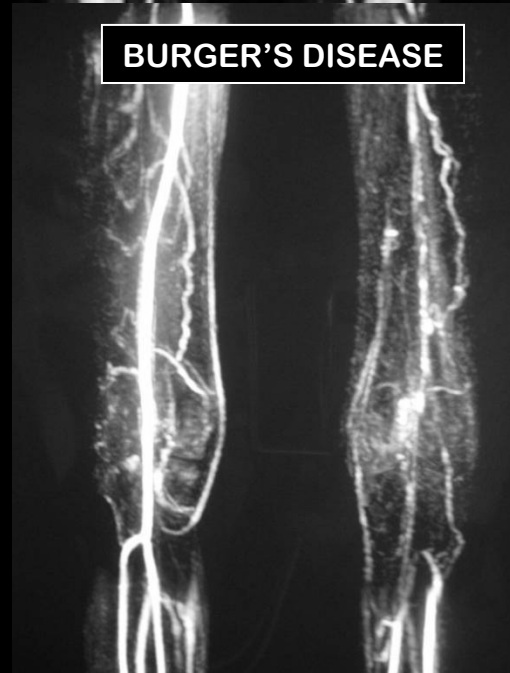
Aortic dissection



PERIPHERAL VASCULAR DISEASES



BURGER'S DISEASE



COMMON ILIAC ARTERY STENTING



STROKE / CVA

ROLE OF IMAGING

- ACCURATE & RAPID DIAGNOSIS
- CAUSE : Arterial / Venous
- INTERVENTIONAL TREATMENT
- COMPLICATIONS (HAEMORRHAGIC)



Role of Imaging in Acute Stroke

- Accurate and Rapid Diagnosis – Exclude Haemorrhage
- Determination of Mechanism/Cause of Stroke
- Patient Selection for Therapy/Clinical Trials
- Assess risk of complications/prognosis– predicting haemorrhagic transformation
- Future Developments

CT in Ischaemic Stroke

- Distinguishes haemorrhagic Vs ischaemic stroke
- Early signs of ischaemia detected as early as 2 h after stroke onset
- Identifies haemorrhages almost immediately
- Detects SAH in the majority of cases
- Helps to identify other neurological diseases

Benefits of CT

- Rapid, Inexpensive, More readily available, Low cost, Accurate in detecting hemorrhage



Limitations of CT in stroke intervention

- **Poor sensitivity**

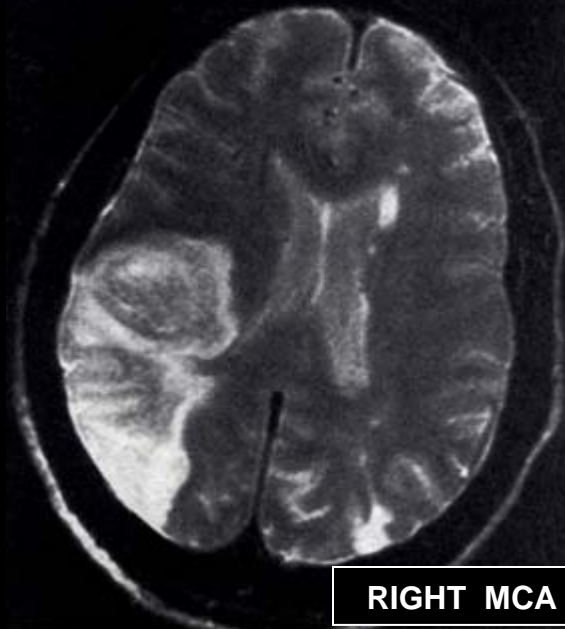
- Up to 60% of CT scans are normal in the first few hours after ischemic insult

- **Poor specificity**

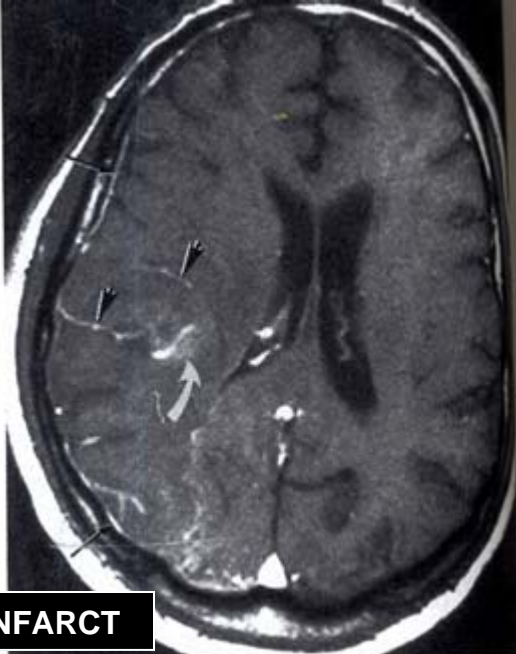
- Up to 20% of patients will have a negative angiogram, possibly due to early spontaneous lysis of clot

Advantages of MR

- Acute infarcts are more visible on MR images, with over 80% of MR images positive in the 1st day compared to 60% of CT scans.
- MR imaging is particularly superior in the detection of stroke in the posterior fossa
- Lacunar infarcts and small cortical strokes are also seen with higher conspicuity
- Diffusion- and perfusion-weighted MRI may help to differentiate between infarcted tissue and tissue at risk



RIGHT MCA INFARCT

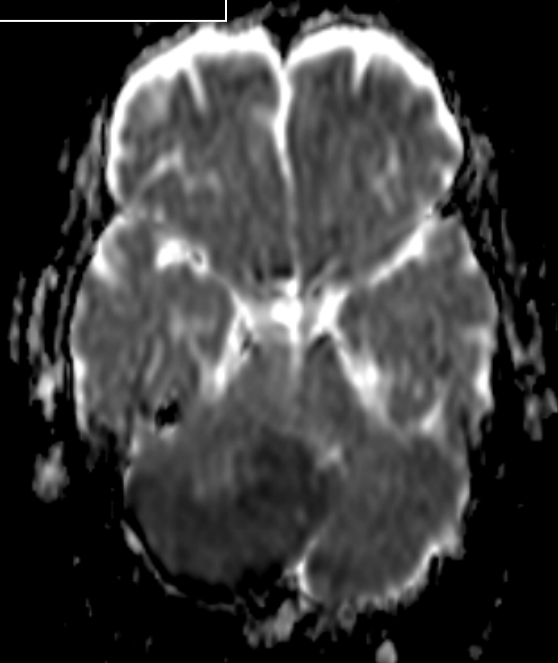
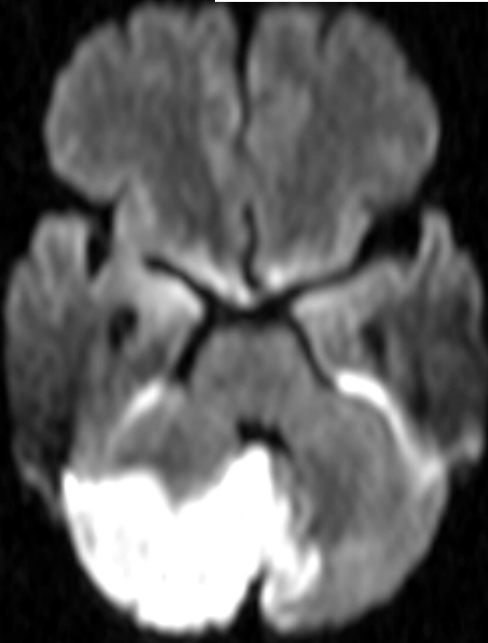


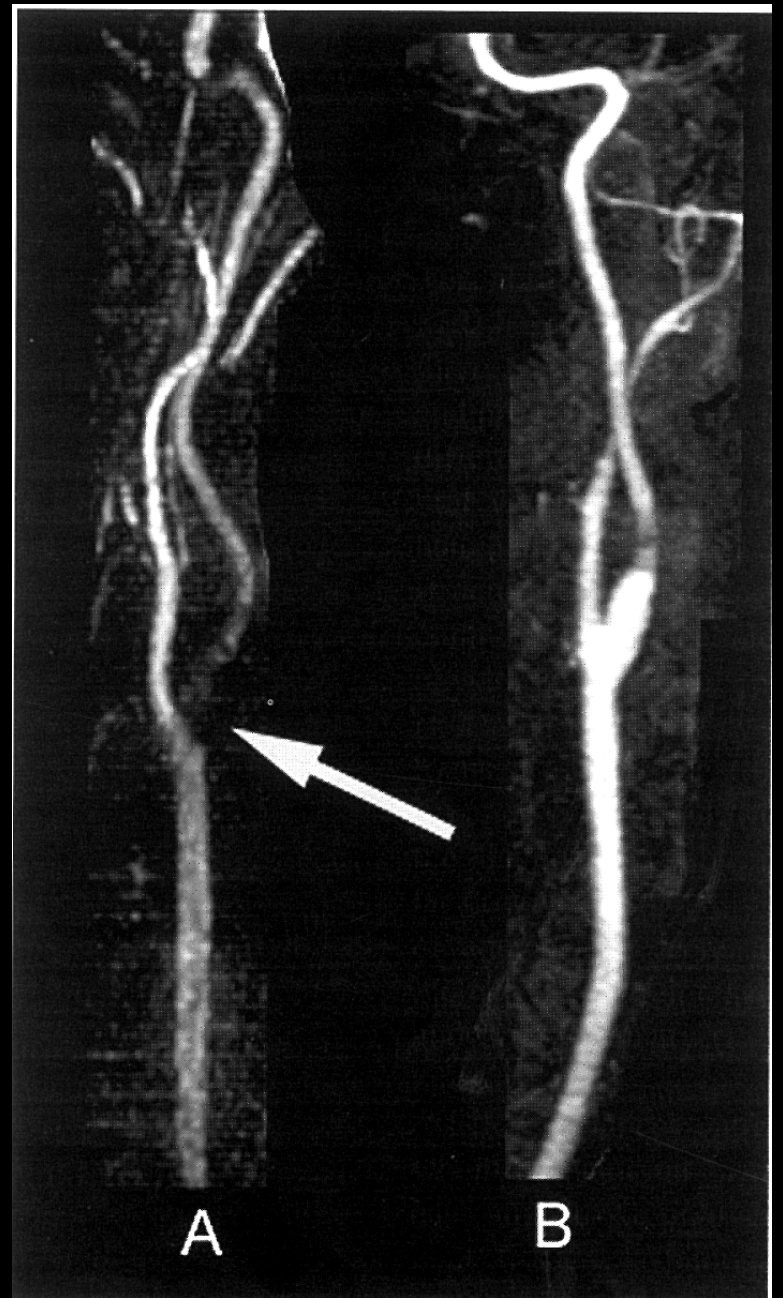
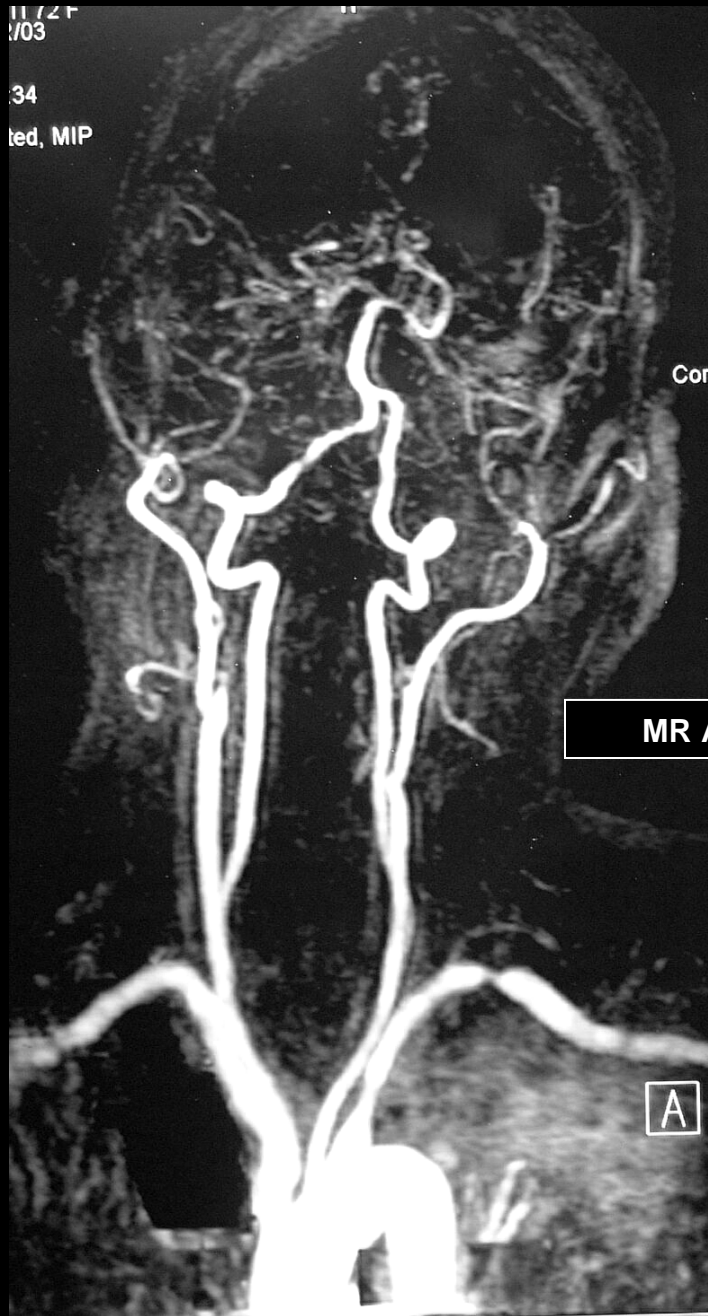
RIGHT PICA INFARCT : DWI - ADC



Absence of Arterial Flow Void

**HAEMORRHAGIC
RIGHT MCA INFARCT**





Catheter Angiography

- **DSA remains the gold standard**
- # **Most precise technique**
- # **Aortic arch & intracranial vessels**
- # **Tandem stenosis**
- # **Collateral circulation**
- # **Non atheromatous lesions (aneurysms)**
- # **Low complication rate in experienced hands (<1.5%)**

SUNITA 61/F NS3/4
NS-NR-21879

NEURORADIOLOGY, AIIMS
POLYTRON-TOP NS-NR-21879
H01A

NEURORADIOLOGY, AIIMS
POLYTRON-TOP NS-NR-21879
H01A

STUDY 3470
08-Aug-2003
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STUDY 3470
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STUDY 3470
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D0
0/0

RICA

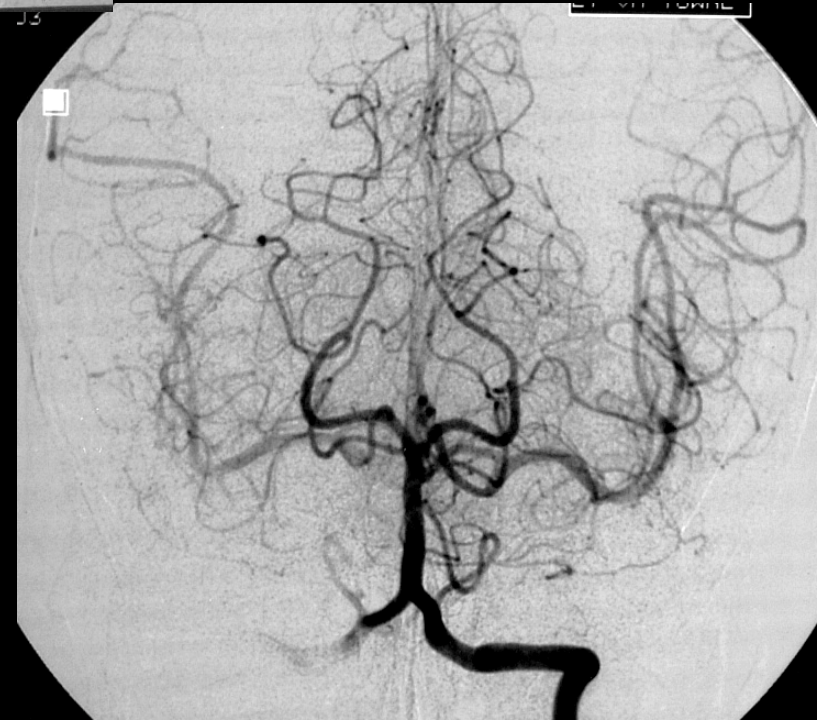
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RICA

C 512
W 1022

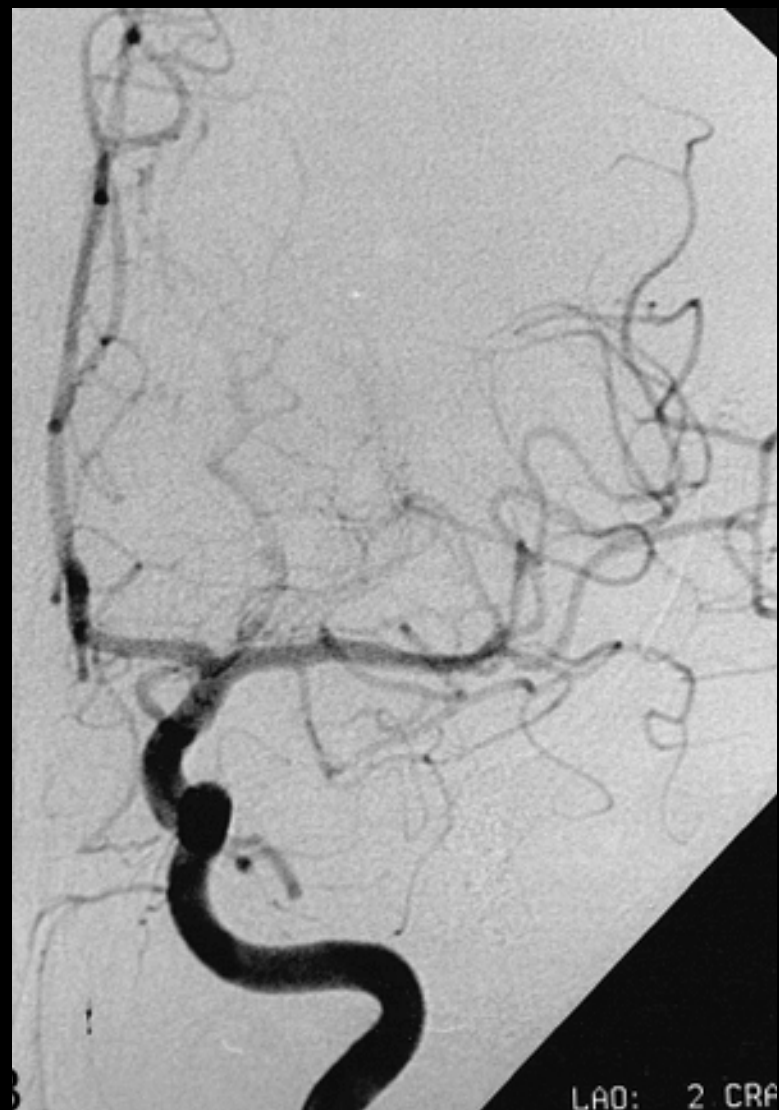
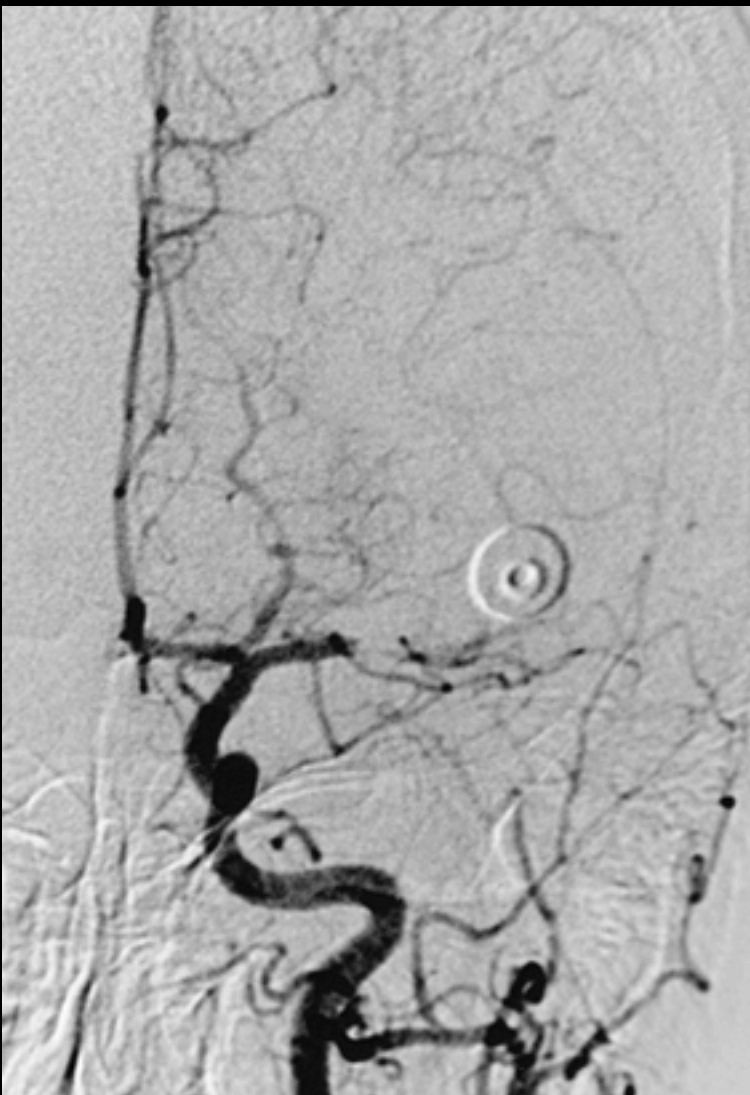
**INTRACRANIAL
STENOSIS**

**COLLATERAL
FLOW**



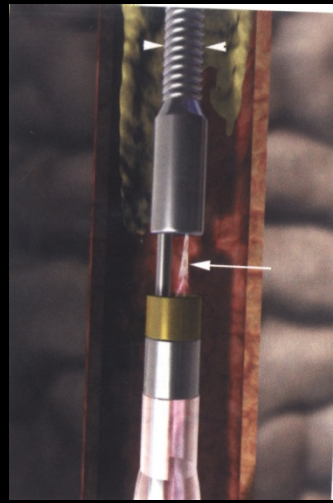
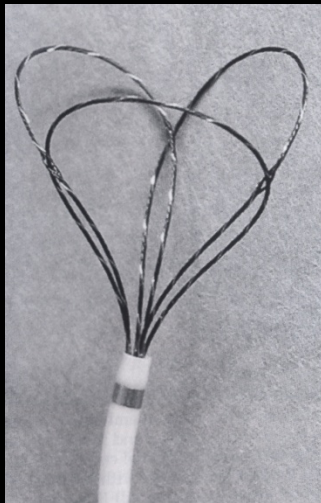
Interventions in cerebral Ischaemia

Thrombolysis of left MCA occlusion

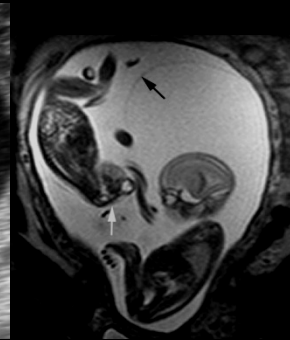
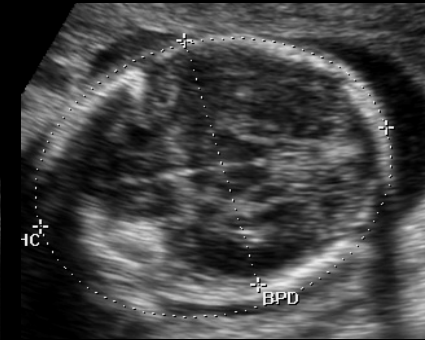
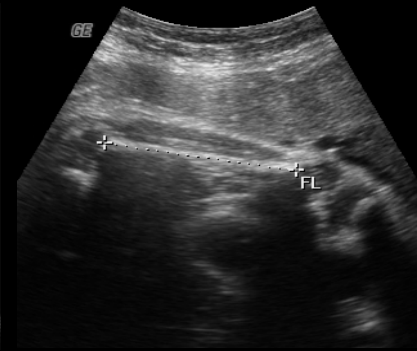


Clot removal devices

- Endovascular thrombectomy
- Mechanical thrombectomy
- Augmented fibrinolysis (these techniques are currently investigational and most reports are anecdotal)



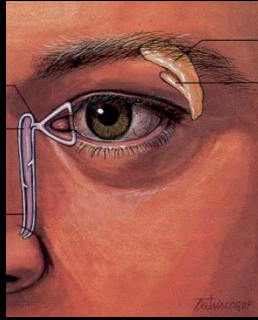
OTHER DISEASES



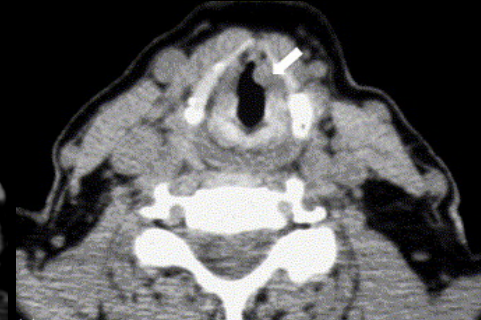
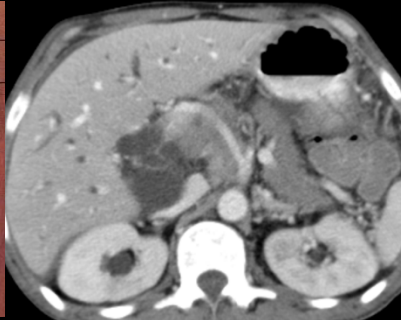
PREMATURE AND LOW BIRTH WEIGHT BABIES, CONGENITAL ANOMALIES



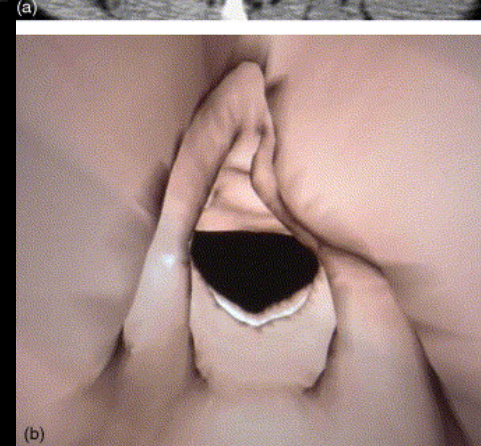
REDUCER FERTILITY



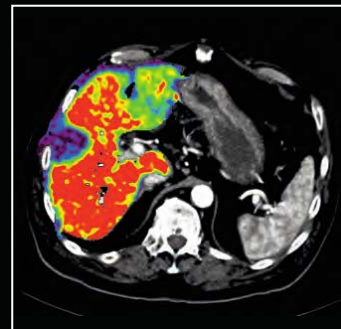
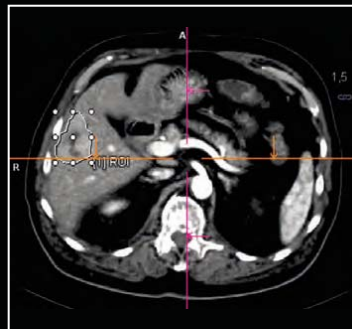
BLINDNESS, CATARACT..



OTHER CANCERS : LARYNX, COLON, CERVIX, STOMACH, PANCREAS....



(b)



SUMMARY

ROLE OF RADIOLOGIST

- **DIAGNOSIS**
- **STAGING**
- **MANAGEMENT**

ROLE OF RADIOLOGIST IN MANAGEMENT

- **Knowledge of Anatomy, Previous studies, Accurate planning, Correct hardware etc.....**



**GOOD TEAM WORK
IS KEY TO SUCCESS**

THANKS