Name = M. Ishaq

ID = 14069

Department = Radiology

Paper = MRI

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Q1

Date:

Important Sequence:

The brief talk about the MRI brain Sequence which is used in neurologist and might be used it the rotation of the medical students so now we discuss about the brain perfusion and a lot of sequence of MRI and also include the experimental experiments which can be focused The pulse sequence is happend the inside of the MRI machine that give you image so each pulse sequence two basic components the one is Radiofrequency and second is the acquisition phase.

we give the energy of excite proton spine after that we turn off the phase. The observe energy you set back which means the excited tissue and also we say it the rate of relaxation.

The differences of relaxation of a proton. The MRI sequence is a number radiofrequency pulse and gradients that result in a set of image with a particular appearances to recognize the common MRI Sequence but does not concern particular of each sequence. The comparison of the T1 weighted and T2 weighted image.

T1 :-

Gadolinium enhancement
fat suppressed

T2 :-

fat suppressed
fluid attenuated
Susceptibility Sensitivity.

T1 weighted Sequence :-

The T1 weighted sequence are the part of almost all MRI protocols and are best thought are the most anatomical of images resulting in a image that most closely approximate the apperance of tissue microscopically In fluid eg urine, CSF low signal intensity (black) (muscle) intermediate signal intensity (Grey) fat high signal intensity (white)

Brain :-

The Grey matter intermediate signed Intensity (Grey)
white matter hyperlense compared to grey matter white ish.

Contrast Enhancement:-

The most commonly used contrast agents in MRI are Gadollinium based at the concentration used these agents have the effect on causin Ti signal to in increased. The doctors prefferd to Ti weighted image after gives the contrast. In Sometim the Ti is shortening the contrast is injected intravenously typically 5 to 15ml and Scan are obtained few minutes after.

Fat Suppression

Fat suppression or attenuation or saturation is perform many Ti weighted image suppress the bright signa from the fat it is done by two steps.

firstly the most commonly after the administration of Gadollinium contrast this is the advantage of enhancement of tissue.

Secondly the Some particular is fatty want to prove it showing that become dark the sequence of handy.

T2 weighted Sequence:-

The T2 weighted Sequence are the type of all the MRI protocols withaut modification the dominant signal intensities the different tissues.

fluid eg urine and csf high signal intensity (white)

(muscle) intermediate signal intensity.

(Grey) fat high signal intensity

Brain:-

The (Grey matter intermediate signal intensity (Grey)

white matter hypointense compared to da

Susceptibility sensitivity Sequence.

Being able to detect the blood products da calcium is important for a many pathological processes. MRI offers to a number of technique that are sorts of compounds. Generally these Sequence T2 highly sensitive to small perturbations.

Flow sensitive Sequence:-

one of the Great advantage of the that Sequence ability image to physiological flow. eg blood flow. This allows arteries, vein csf etc.

Explanation:

Ans: MRI Brain

The MRI Brain is a safe and a painless test that used a megnetic field and radiowaves to produced the detail images of brain and brain stem highlly detail. The MRI is differ from the computed tomography and also axial CT Scan because it not use radiation. The radiation is harmful for patients. The MRI can detect a variety of a condition of a brain such as cyst, tumors, bleeding swelling developmental and structural abnormalities infection and inflamantory conditions or Problems with blood vessels it can determine the demage of the brain and injury of stroke.

The MRI brain is useful evaluting the problems headach, dizzeness, weakne blurry vesions. and detect the certain chronic dlegease. for nervous systems such as multiple schlerosis.

The MRI can provide the clear image parts of brain can't seen as well Pituary slands and brain stem not vavalzed proper.

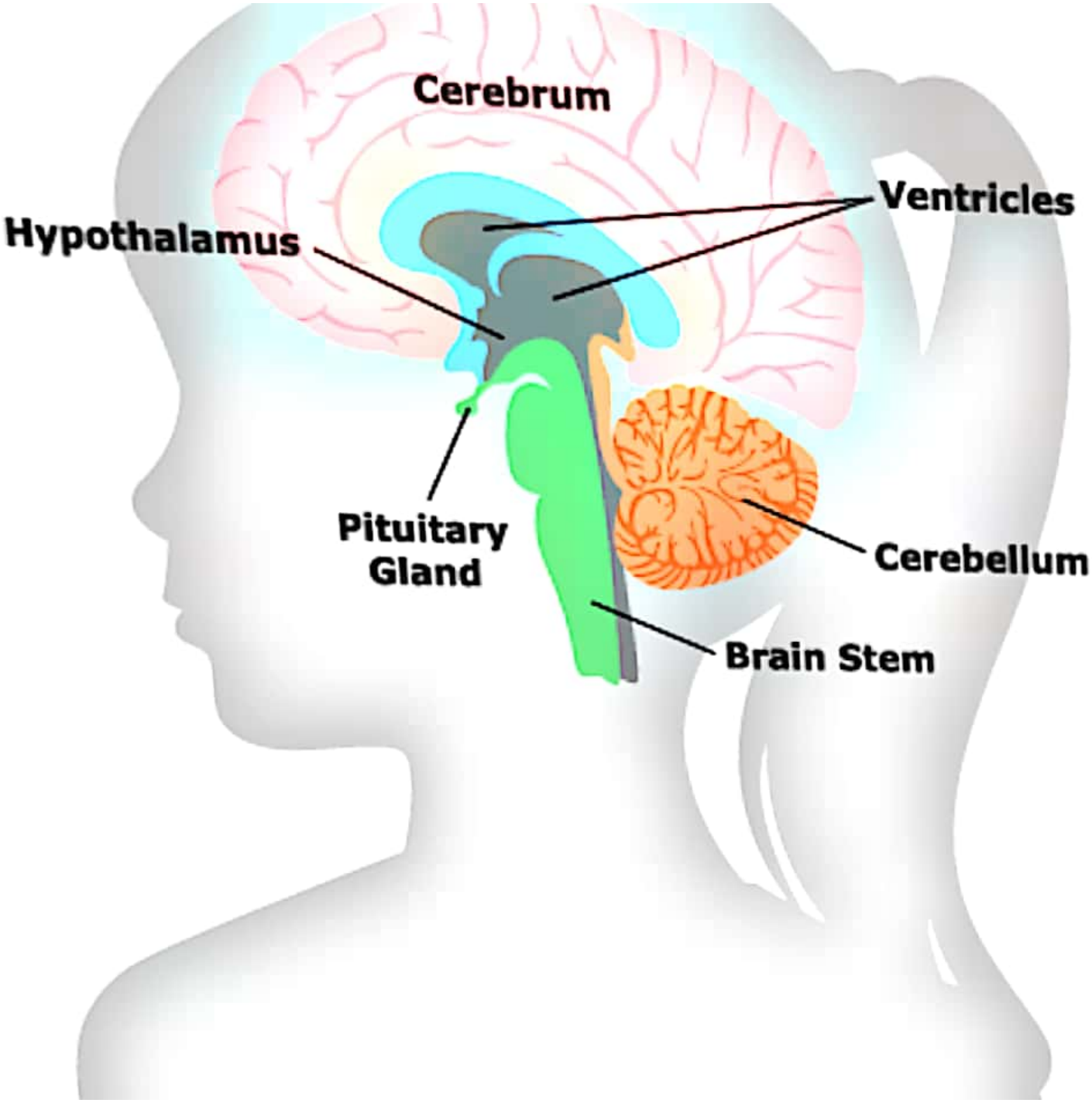
Preparation:

The MRI brain no required special preparations remove metal things, eye glasses, jewellery because is harmful from the patient and produce the black spot. But in some patient placed the metal things its permitted but the strong magnetic field can't permitted the scan.

In children used moving the before the scan acedate gives the children that may sleep and scan done it. Because children moving during scans. The MRI need no movements.

Procedure:

An MRI brain usually takes 30-45 minutes per scan. d patient lies the table the plastic mean coid hold and place the patient inside it. The table will slide the tunnels the technician will take images of the head. If detect any problem the advice the contrast solution through iv. The solution is painless into vein contrast highlights the certain area of brain. The allergic history first take before the contrast while exam proceed it. Patient monitored all the time. Time. heart beat, oxygen level etc. exam over child move recovery area.



Q2?

Ans: Indication of MRI Liver:-

primary indication:-

1) Detection of focal hepatic lessions.
2) Lesion characterization ie cyst focal fat bemangioma hepatocellular carcinoma., hepatic adenoma focal nodular, metastasis.
3) Evalution known suspected metastasis
4) Evalution of vascular potency
5) Evalution of diffuse liver diesease fatty inflatration
6) Evalution of cirohic liver
7) clarification imaging studies and laboratory abnormalities.

Extended indication.

1) Potential liver donor
2) Evalution of tumor response, chem embalization post chemotheraphy
3) Evalution suspected congenital abnormalities.

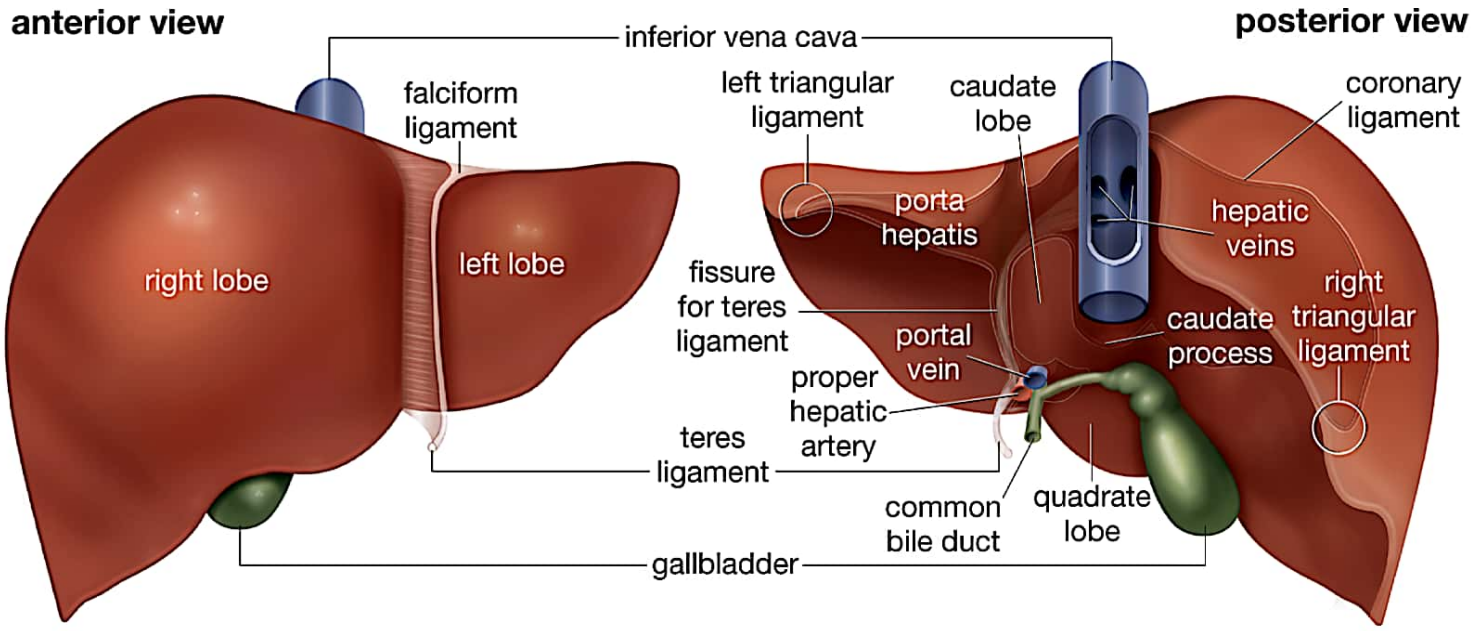
contraindication:-

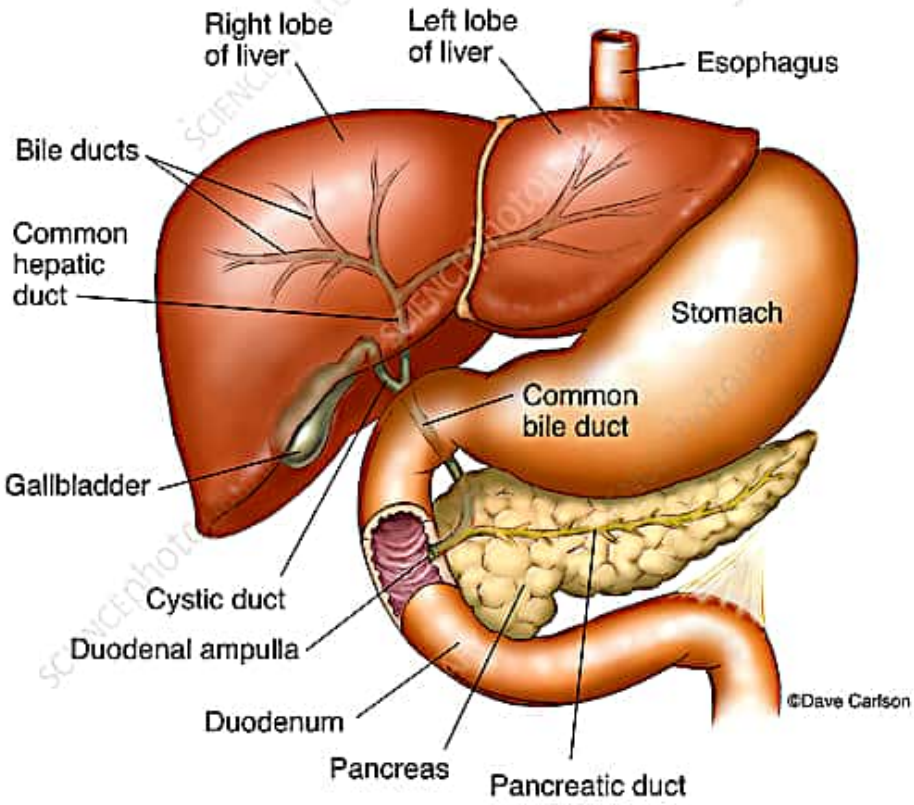
* Metallic Implants, metallic silver
claustrophobia, aneurisam clip in Brain
face maker

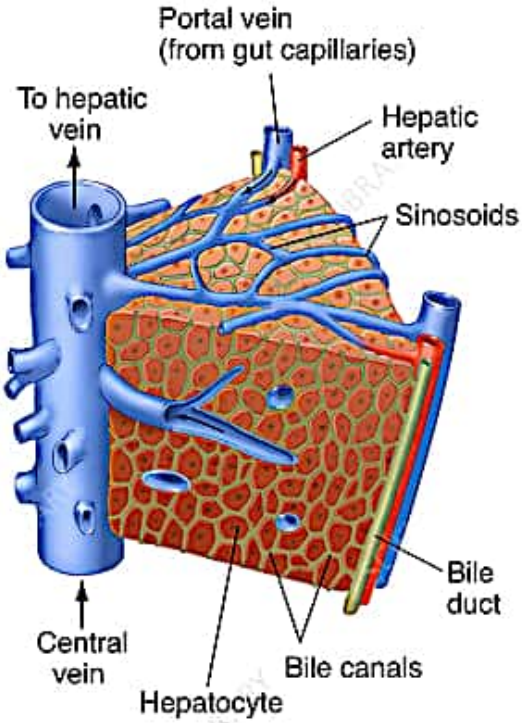
PTO

Contraindication:- (8)

- Any electrically, megnetically, activated implants.
- Insulin pump
- Pregnancy
- Ferromegnetic Surgical clips or staple
- Metallic foreign body in eye
- Metal shrapnel or bullets.
- hearing aids.
- Intracranial aneurysm.
- Clustrophobia patient
- face malee.







Section of liver lobule

Q3:

Answer Explanation:

The lumber spine is safe and painless test that was used in meghetic field and radiowaves to produced the detailed images of the lumber spine bone, disks and other structure of the lower back.

The MRI is better to computed tomography. MRI does not having the radiation its safe from patient.

The variety condition the MRI done it vertebra, soft tissue such as the spinal cord nerves, cartillage dics. etc.

The MRI sometimes perform to assess the anatomy of lumber spine to help plain surgery to the spine after an operation. e.g. The area where the spinal canal is abnormally narrowed it meight be require surgery to seen and noticed the buldge, rapture, pressing, herniated dics, spinal cord rapture or nurves etc. The MRI lumber is useful is evaluting such as lower back pain, leg pain numbness, tingling, or weakness. and help to diagnose tumor, bleedings and infection and also inflammatory condition.

Nomenclature :-

Normal disc :-

A normal disc is composed of centr nucleus pulposus and peripheral annulses fibrosis. The degeneration of disc is include dessication, fibrosis, narrowing disc space difuse, bulge, annular fissures, mucinous degeneration inflamentory changes. sclerosis end of plat

Bulging disc :- The presence of disc extend beyond the edge of the ring apophyses throught circumferance of the called bulg annular fissure.

Annular fissure are Separation betwee annular fiber seen as high in tensity zone of t2weighted image representing the fluid and granulation fluid may enhance the gadollinium.

Disc herniation

Disc herniation is focal displacement of disc materials <25% circumferenc beyond the intervertebral disc Space. A herniated disc around the outer annular fiber or uncountaind.

Contained herniation :-

Disc herniation are contained the displace portion is coverd by outer annulas fiber. posterior gadollinium ligament disc herniation contain wher no such covering.

Migration disc

The migration indicated the displacement of disc meteval away from the site of extrusion regardless of parent disc.

Intervertebral herniation:

Intervertebral herniation of scholar node is herniation of disc material in the vertical direction through a gap in the plate of vertebral plate.

Standard Spine Sequence:

Commonly used the Megnetic resonance imaging of the spine standard sequence are include the T1 is intermediate Te portion density or flair Tweighted Sequence: are given below.

Sequence	Slice thickness	Gap
cervical spine	≤3mm	≤1
cervical axial	≤3mm	≤1
Thoracic spine sagittal	≤4mm	≤1
Thoracic spine axial	≤4mm	≤1
Lumber spine sagittal	≤4mm	≤1
Lumber Spine axial	≤4mm	≤1

The more common MRI Sequence are T1 weighted and T2 weighted Scans. T1 Weighted image produce Short TE and short TR the contrast and brightness of the image are predomaintly determined by the T1 properties of tissue conversely T2 weighted image is produced longer TE and TR times.

T2 weighted image sagittal and axial (Pathology)
T1 weighted image sagittal + axial Anatomy.
STIR or T2 weighted fat sat sagittal Bone edema.

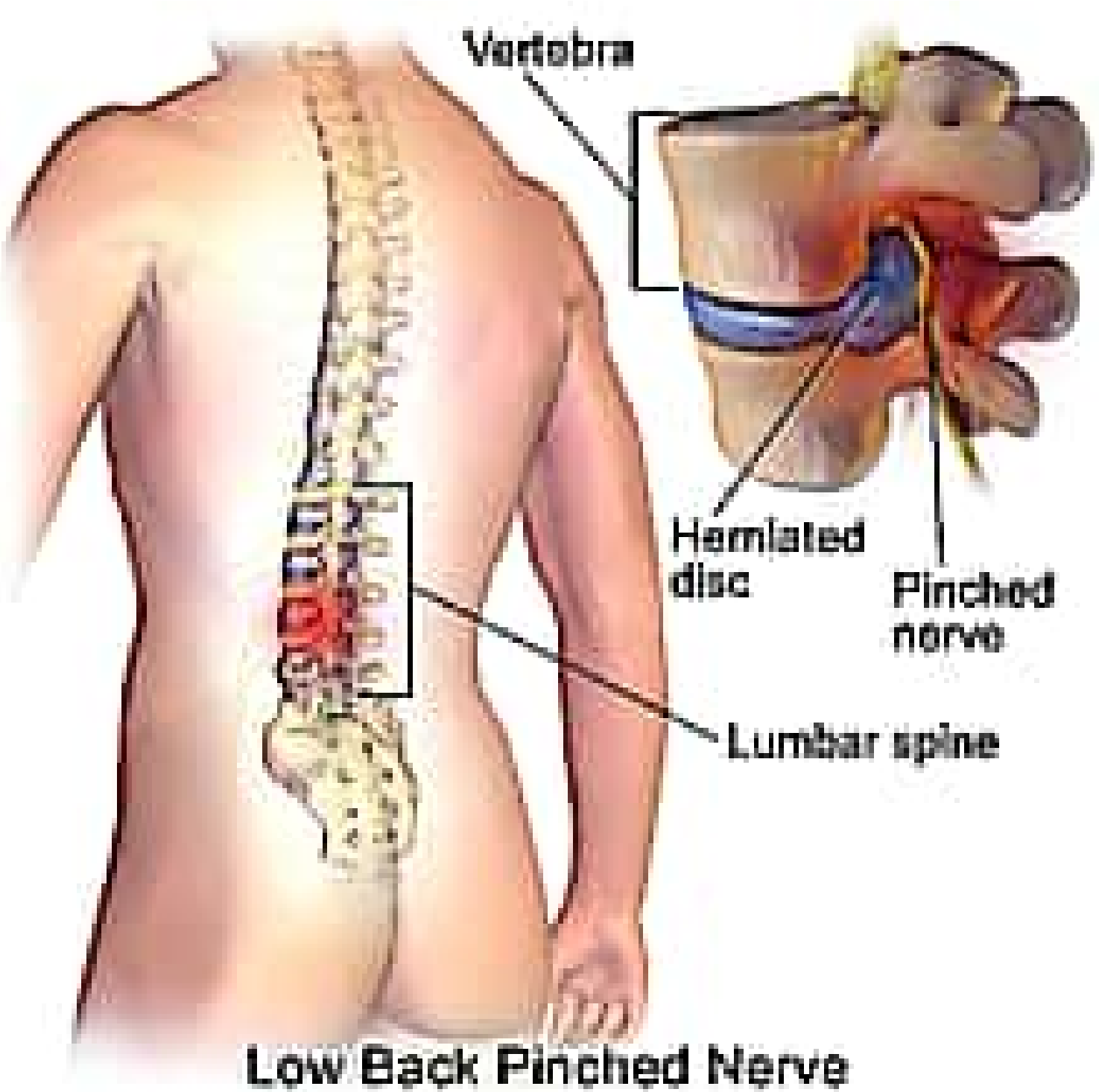
Diagram and slipcase disc.

Explanation.

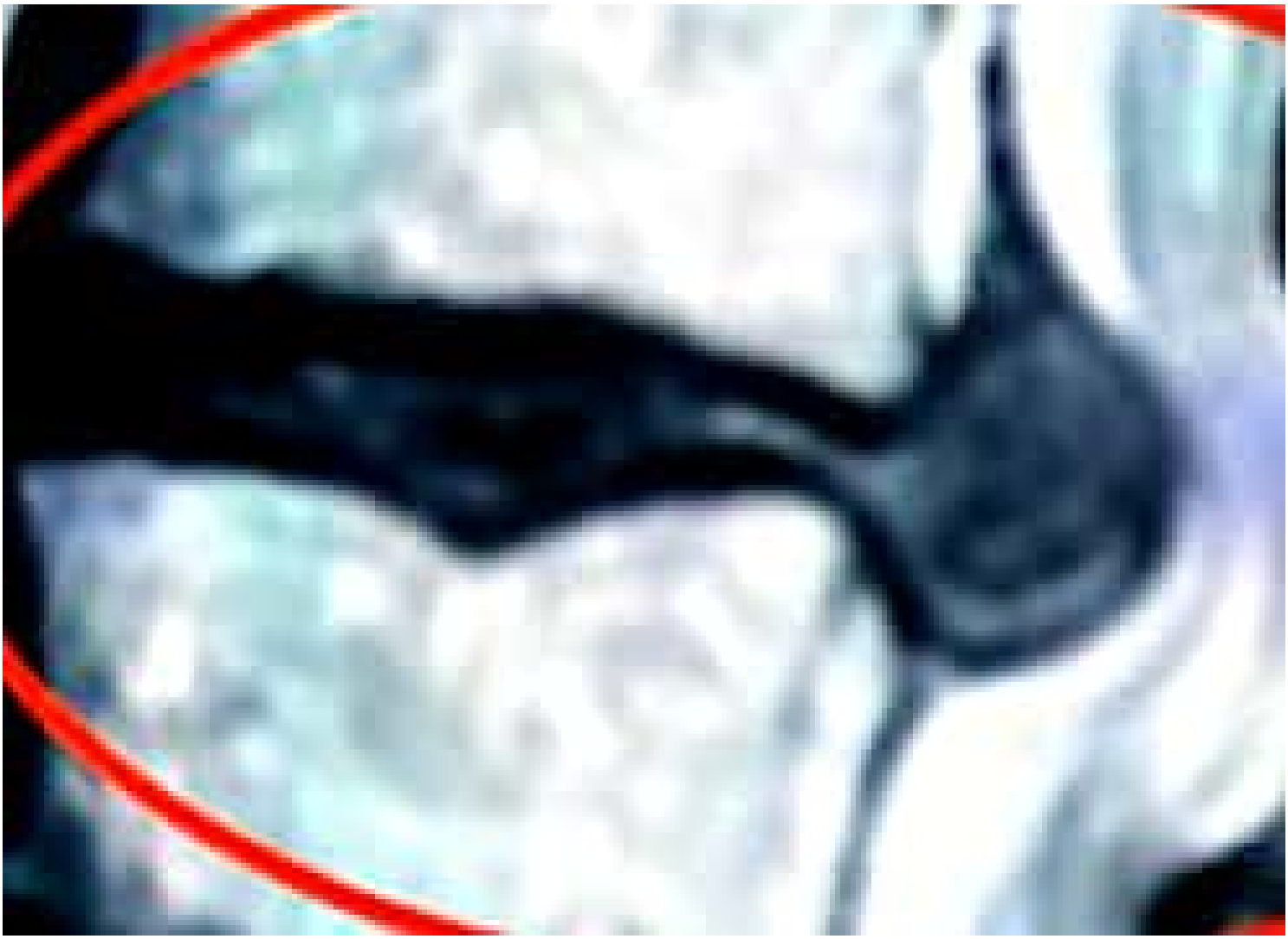
A slipcase disc occurs when the disc is demaged and presses on the nurves. The spinal column is made of series of bones vertebras stacked with each other from top to bottom. Seven bones of cervical spine 12 bone in thoracic spine and five in lumber spine followed by the sacrum and coccyx: coccx in the base. these bones are absarbing shocks from daily activities lik walking twisting lifting, sitting, etc.

Symtoms:

You can have slipped disc in any



Low Back Pinched Nerve



part of your spine the lower back is more common areas of slipped disc. Slipped disc can place extra pressure on the nurves and muscle around it.

Pain and numbness most commonly one side of the body.
Pain extend to your arms and leg
Pain worsen at night.

Complication of slipcase disc:
untreated severe slipped disc can lead to permanant nerve demage its rare case slipped disc can cut off nurve impulse cauda equina nurves in your back legs. you may loss bowel and bladder controle.

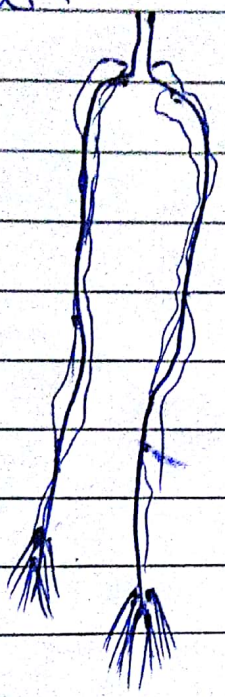
Diagnoses:
x-rays
CT scan
MRI
Mylogram

Treatment:
Treatment of slipped disc range from conservative Surgical, Mast of patient relive slipcase disc during a exercise stretches and strengthens, taking over pain relief and avoiding having lifting painful Position.

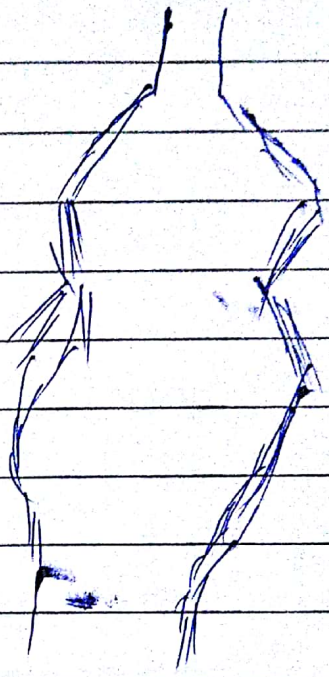
Q4

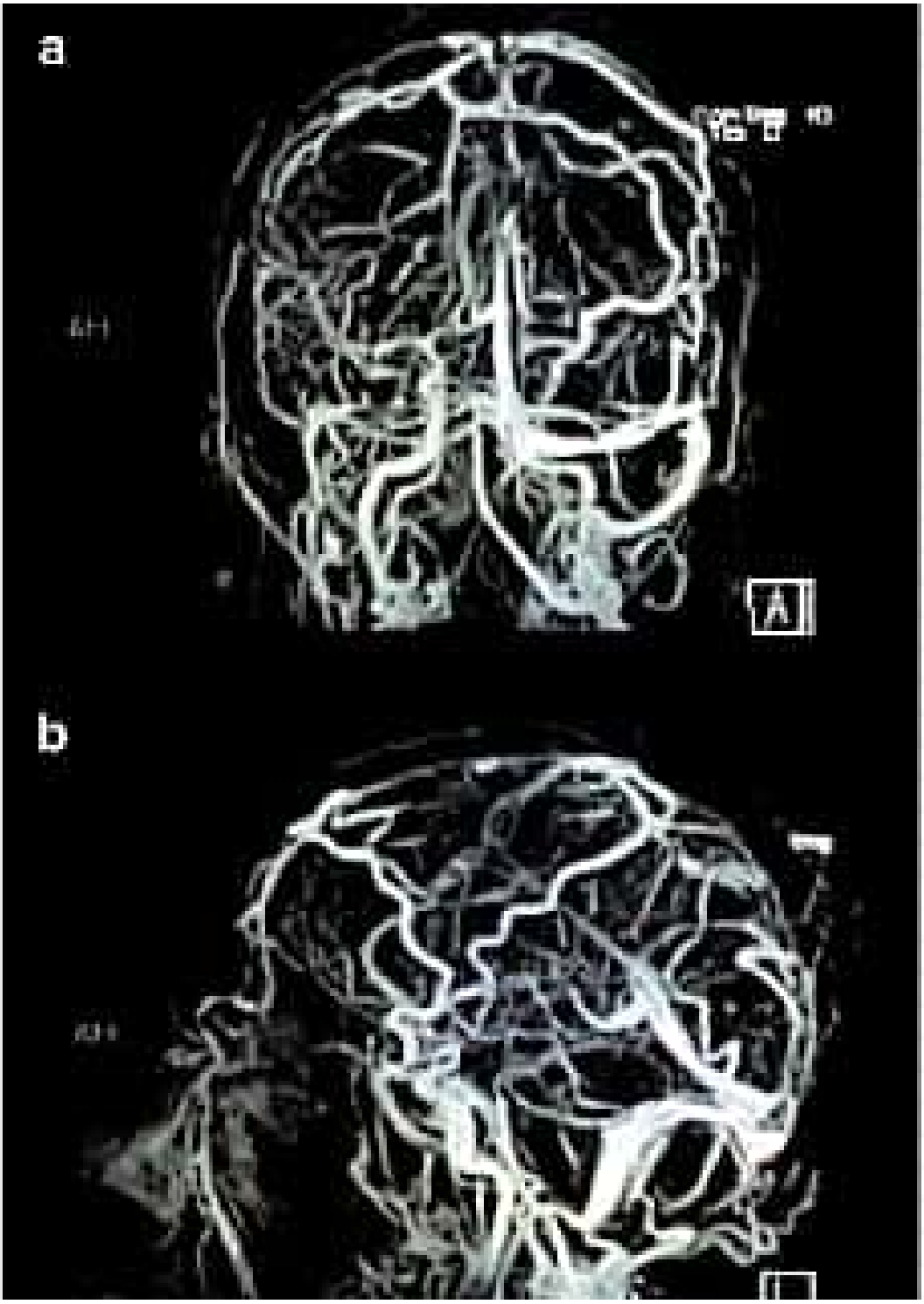
Diagram:-

MRA
Show the arteries



MRV
Show the veins





PS:2

Preparation of knee MRI

Preparation of knee MRI your doctor technician gives you complete instructio to prepare to your tests.

Before your MRI your doctor guide you before the any diagnose write do a complete physical and medical history Be sure it about any medication you take it and also your personel history take it. Speak freely with him and also tell about allergic. The MRI machine is not safe for a dye to pregnant women The MRI machine is enclosed space if you are clustrophobic or scared small spaces. They help you to give accedate to to relax and MRI easily perform it. If you severve clustrophobic then the doctor advise you to open MRI in that machine does not enclose your body. Don't move while MRI knee is started just lies is one position and placed in your knee in coid. The attendent also sit with you in any side. You can take and breath freely but not motion.

Procedure of Knee MRI:

You well laying the scanning the table feet first with arm at your side coils. (special device to improve the image quality) well be placed around your arm or a part of your arm.

The scaning table will slide your lower body into the megnet during the scan you can not feel anything but you hear the thrumbing, humming clicking knoucking sounds ear plug provided to help mask the nose.

In some cases provided the dye to the patient. it take the time about 30 to 60 minutes and four fims are included. The MRI machine like a giant machine the center is open flat table the rounded wheel send the megnetic and radio waves used to produce image on your body. The technician use pillows straps to make your knee more comfortable during the scan. keep your leg still the machine clearst machine. The time spend in machine the technician noted the necessary images. The technician have the separate room and he monitored you and made your knee images.