

Name :- Hameed ullah

ID :- 13884

programme :- RADIOLOGY

Paper :- MRI

Date :- 23-06-2020



## Question No: 01

Answer:

### MRI Brain :- Magnetic

resonance imaging (MRI) of the brain uses magnetic resonance imaging to produce high quality two-dimensional or three dimensional images of the brain and brainstem without the use of ionizing radiation (x-rays) or radioactive tracers.

### Important Sequences of MRI Brain

The following are some of important sequences of MRI

- (i) T<sub>1</sub> weighted Sequence
- (ii) T<sub>2</sub> weighted Sequence
- (iii) PD weighted Sequence
- (iv) Gradient & Spin echo Sequence
- (v) Fat Suppression
- (vi) MRI Contrast
- (vii) Diffusion weighted image
- (viii) In/out-of phase.

Contrast differences are required to distinguish normal anatomy from pathology.



## Procedure of MRI:

An MRI of the Brain usually takes 30-45 minutes to perform.

- Your child or patient will lie on the movable scanning table while the technologist places him or her into position.
- A special plastic device called a coil may be placed around your child's head.
- The table will slide into the tunnel and the technician will take images of the head. Each scan takes a few minutes. To detect the problems, your child may be given a contrast solution through an IV. The solution is painless as it goes into the vein. The contrast highlights certain areas of the brain, such as blood vessels, so doctors can see more detail in specific areas.
- The technician will ask if your child is allergic to any medications or food before the contrast is given.
- As the exam proceeds, your child will hear repetitive sounds from the machine, which are normal.



- your child maybe given headphones to listen to music or earplugs to block the noise.
- Once the exam is Over, the technician will help your child off the table, if sedation way used, your child may be moved to a recovery area.

- X. ~~~~~ X.



## Q 5 :- Preparation of patient MRI knee

- Preparation for an MRI vary between testing facilities. your doctors or attending technician will give you complete instructions on how to prepare for your specific test.
- Before your MRI, your doctor will explain the test and do a complete physical and medical history. Be sure to tell them about any medication you're taking, including over-the-counter drugs and herbal supplements.
- mention any <sup>known</sup> allergies. let them know if you have any implanted medical devices, because the test can affect them.
- Tell your doctor if you have had allergic reactions to contrast dye in the past or if you have been diagnosed with kidney problems.
- let them know if you are pregnant or breastfeeding.



## Procedure of Knee MRI:-

- Before MRI Scan, you will change into a hospital gown and remove all Jewelry and body piercings. If you are using a Contrast dye, an intra venous (IV) line will be inserted into your arm to inject the dye into your bloodstream.
- An MRI Machine looks like a giant wheel. The center is open so a flat table can slide in and out of the machine. The rounded wheel like part sends out the magnetic and radio waves used to produce images of your body.
- You'll lie on your back or side on a padded table. The technician may use pillows or straps to make your knee more comfortable during the test. This will also help keep your leg still so the machine can take the clearest images.
- The Technician will then slide you into a machine feet first. They will then slide you tell you when to hold still and hold your breath. These instructions will be given over a microphone, since the technician will be in a separate



③

- room, watching will be in the monitors as they collect images.
- you won't feel the machine working.
  - The test typically takes between 30-40 mins.
  - Once the technician has recorded the images they need, you will be free to change back into your clothes, and go about your day.
- X. ~~~~~ X.

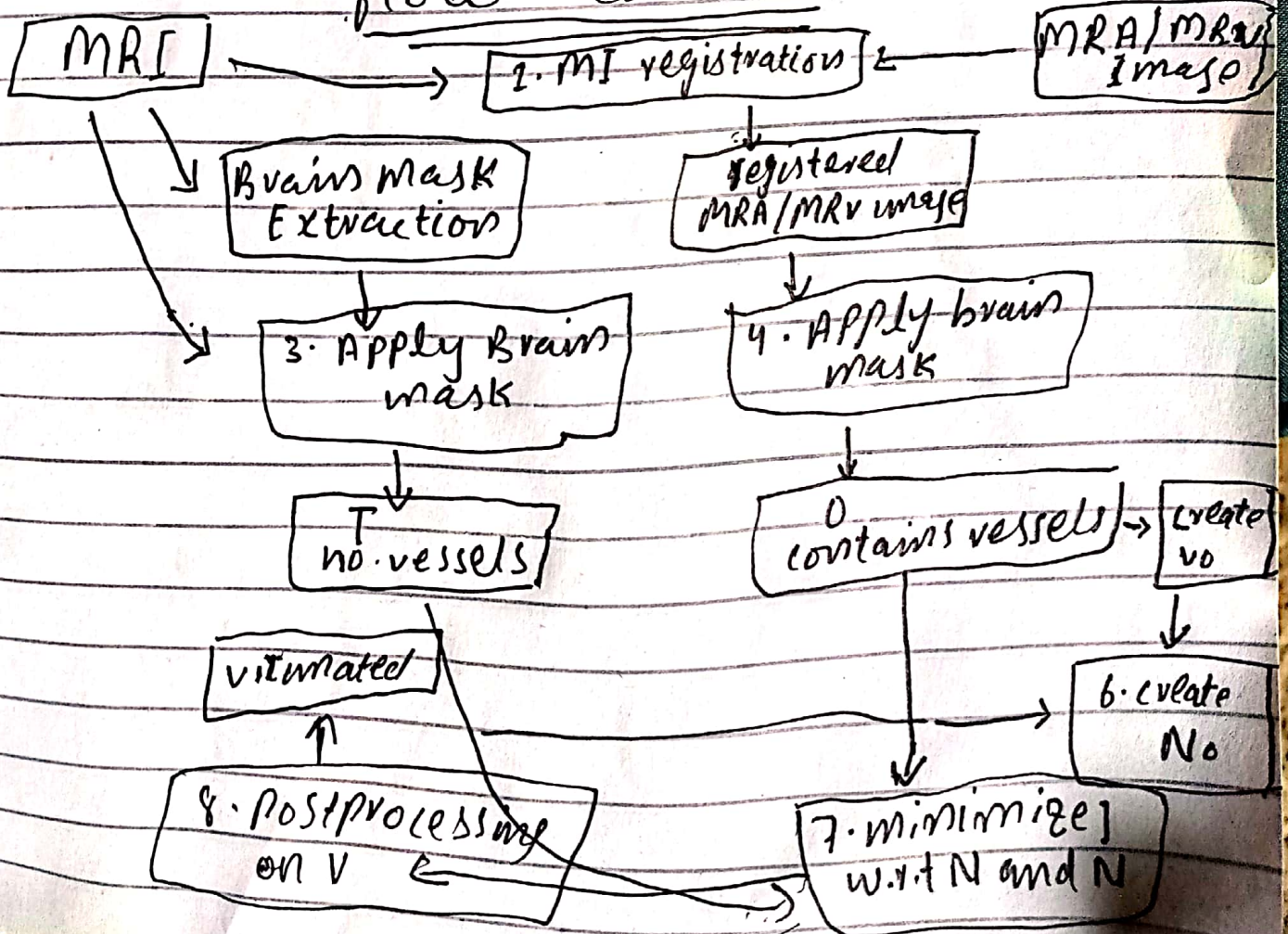


Q4:->

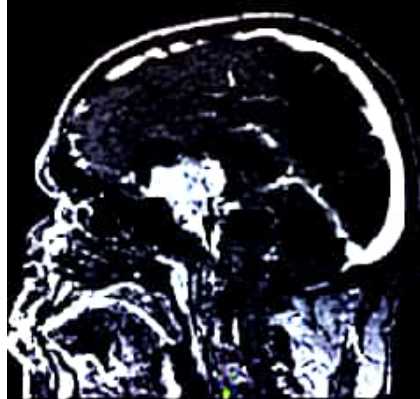
# MRA and MRV

Your doctor has recommended you for either magnetic resonance imaging (MRI) MR angiography (MRA) or for magnetic resonance ~~angiography~~ venography (MRV) of your head. All of these procedures use a magnetic field, radio waves and a computer to create detailed images, which our team of specialist physicians can use to distinguish normal, healthy tissue from disease tissue. The MRA and MRV specialist is lead by Barry D. Pressman & -

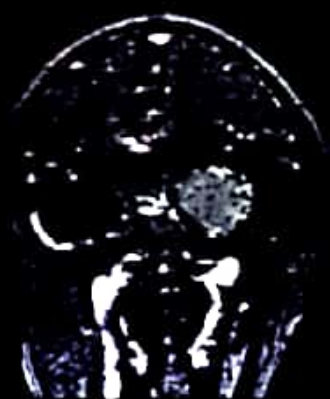
## flow chart & -







**MRV**



**MRV-MPR**



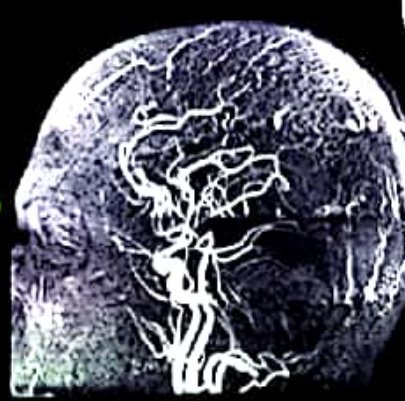
**MRV-MIP**



**MRA**



**MRA-MPR**



**MRA-MIP**



Q 2:-

## ⇒ Indication of liver MRI

One of the most common indications of liver MRI is to characterize hypervascular lesion on CT or MRI that may represent and FNH. Hepatocyte agents are useful in this application of liver imaging.

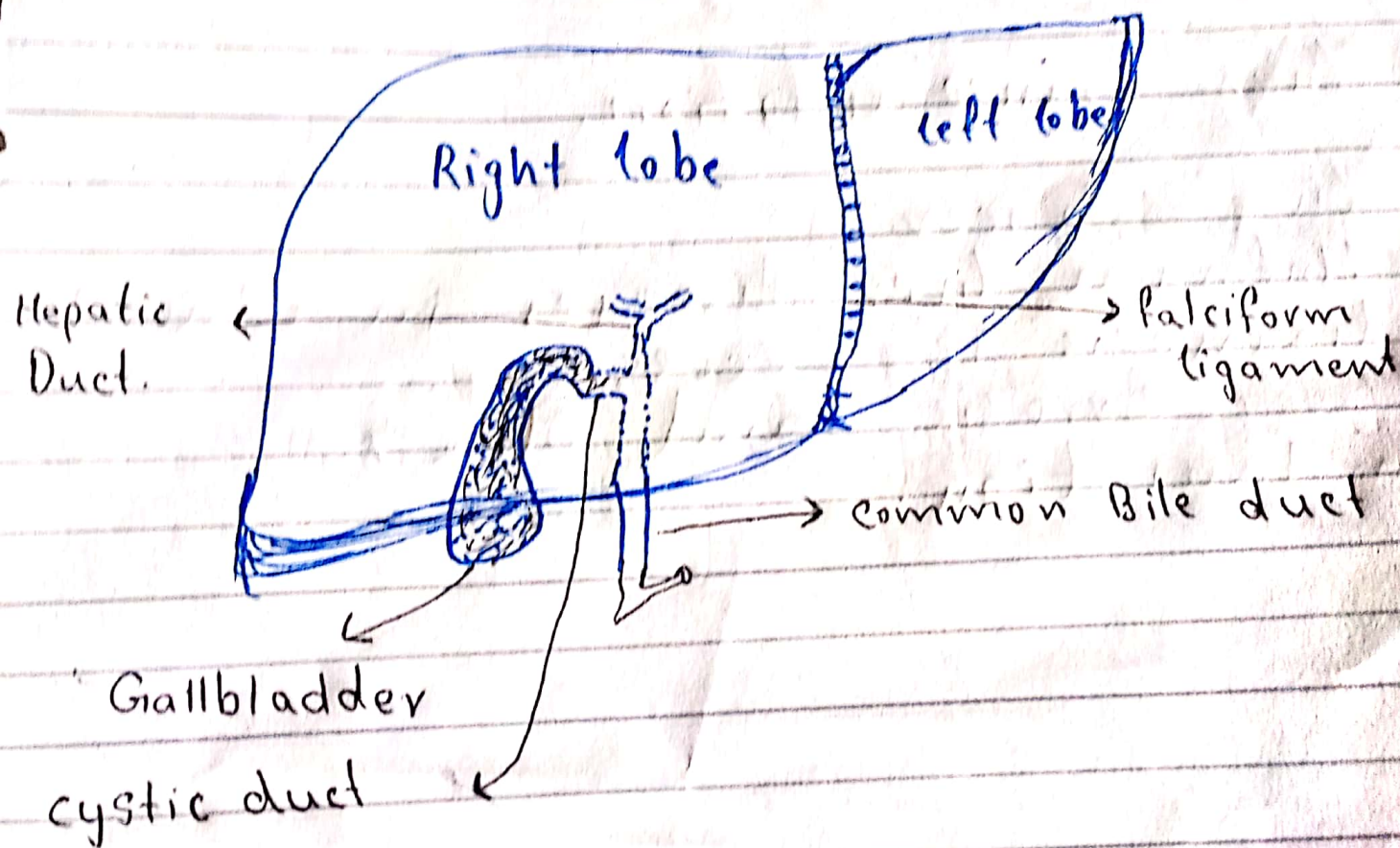
- ~~Liver tract~~ Liver Transplantation
- Liver cancer,
- unknown liver disease in which diagnosis is necessary.
- liver cirrhosis and other inflammation

## ⇒ Contraindication of liver MRI

Include active uncontrolled infection or sepsis, active alcohol or substance use, extrahepatic malignancy, compensated cirrhosis with no complications, autoimmune deficiency syndrome (AIDS), severe cardiopulmonary disease, an inability to comply with a medical.



# Liver Diagram





Q 3 :->

## MRI of spine :-

Magnetic resonance imaging (MRI) is a noninvasive test used to diagnosis medical conditions.

MRI uses a powerful magnetic field, radio waves and a computer to produce detailed pictures of internal body structure. MRI does not use radiation (x-rays).

Detailed MRI allow doctors to examine the body and detect a disease. The image can be reviewed on a computer monitor. They may also be sent electronic, printed or copied to a CD, or uploaded to a digital cloud server. Currently, MRI is the most sensitive imaging test available for the spine.



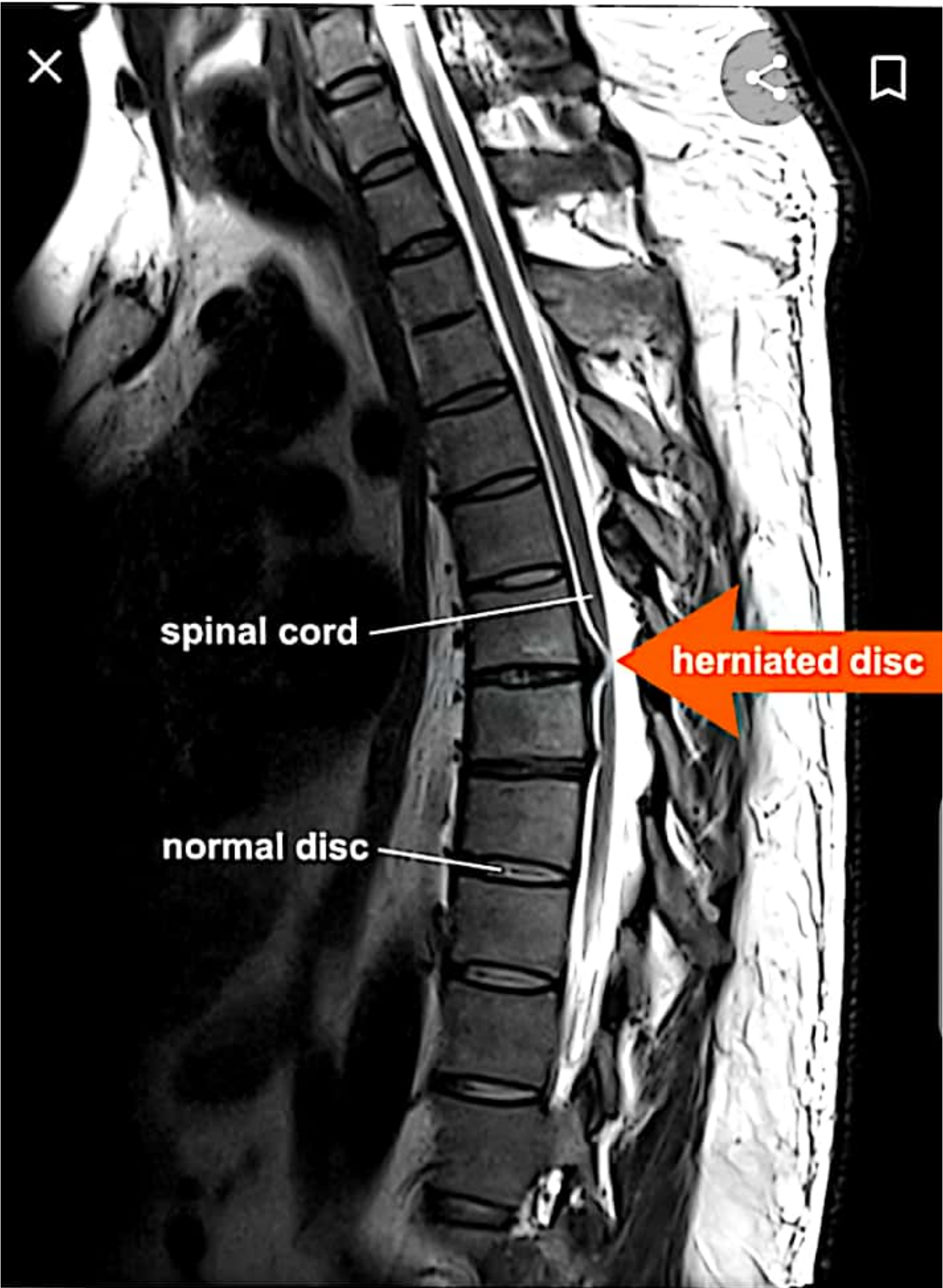
(2)

## • Sequences and Techniques in Spinal MR Imaging:-

The optimal protocol in spinal MRI is not evident. Sagittal T<sub>2</sub> weighted FSE, sagittal T<sub>1</sub> weighted SE and axial T<sub>2</sub> weighted FSE sequences are widely accepted for imaging patient with sciatica and low lumbar pain. Because of the limited amount of CSF compared to the lumbar spine, the choice of sequence is much more complex in the study of the cervical spine. Sagittal T<sub>2</sub> FSE, sagittal T<sub>1</sub> SE and axial 2D GE image are suggested in routine cervical spine imaging.

• Disc slip case :- An MRI can detect which disc is damaged and if there is any nerves compression. It can also detect bony overgrowth, spinal cord tumor, or abscesses. MRI and illustration show a disc herniation b/w the L5 vertebra and the sacrum.





**spinal cord**

**normal disc**

**herniated disc**



Lateral Lumbar MRI with massive L4-5 disc herniation causing significant stenosis

Note: The lower 3 discs are showing signs of decay. The discs are now blackened which is a sign of loss of hydration and disease.

Normal Disc

[www.osteofisioluciani.com](http://www.osteofisioluciani.com)

Massive L4-5 Disc Herniation with black disc which indicates a diseased disc

