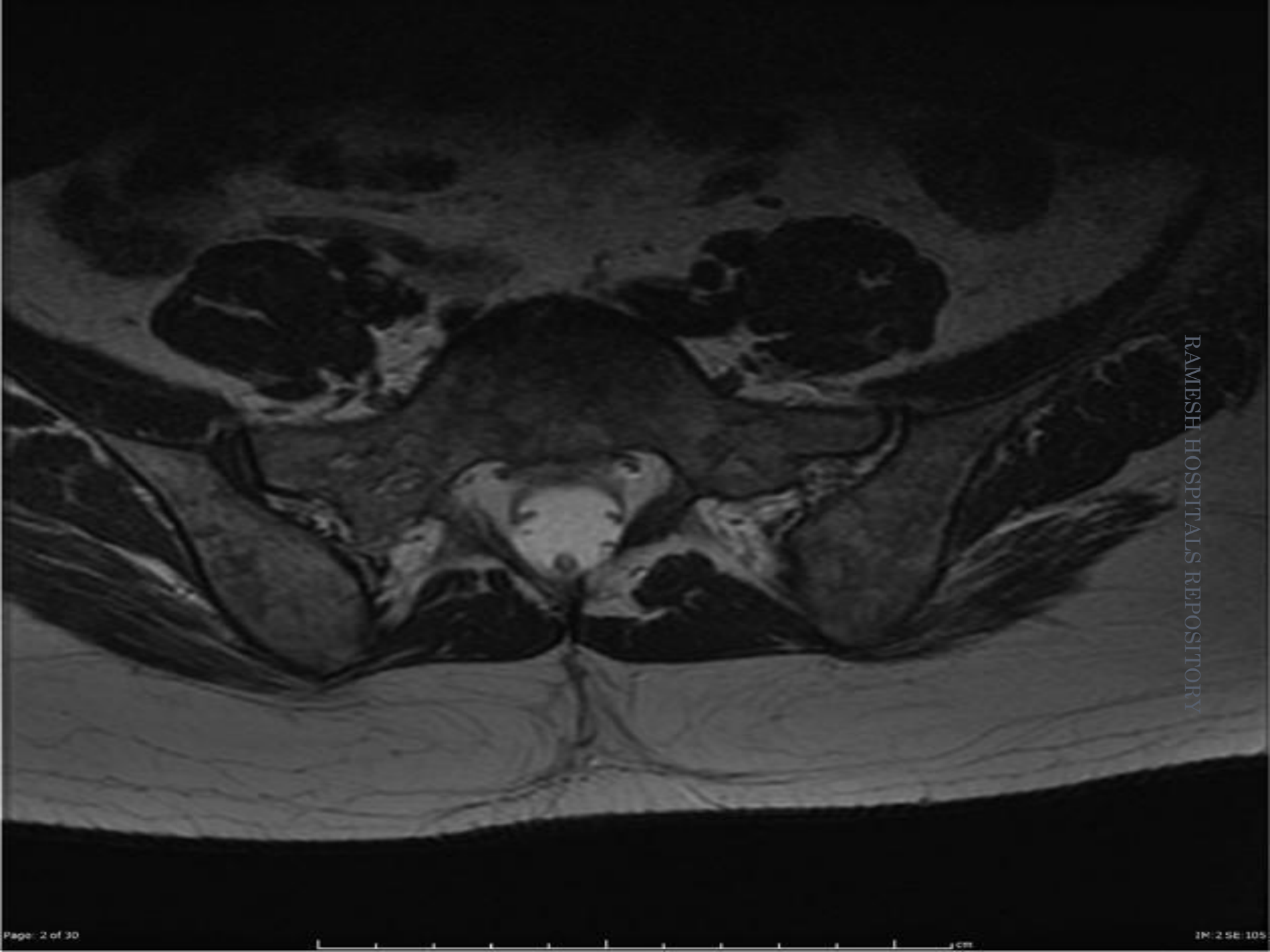
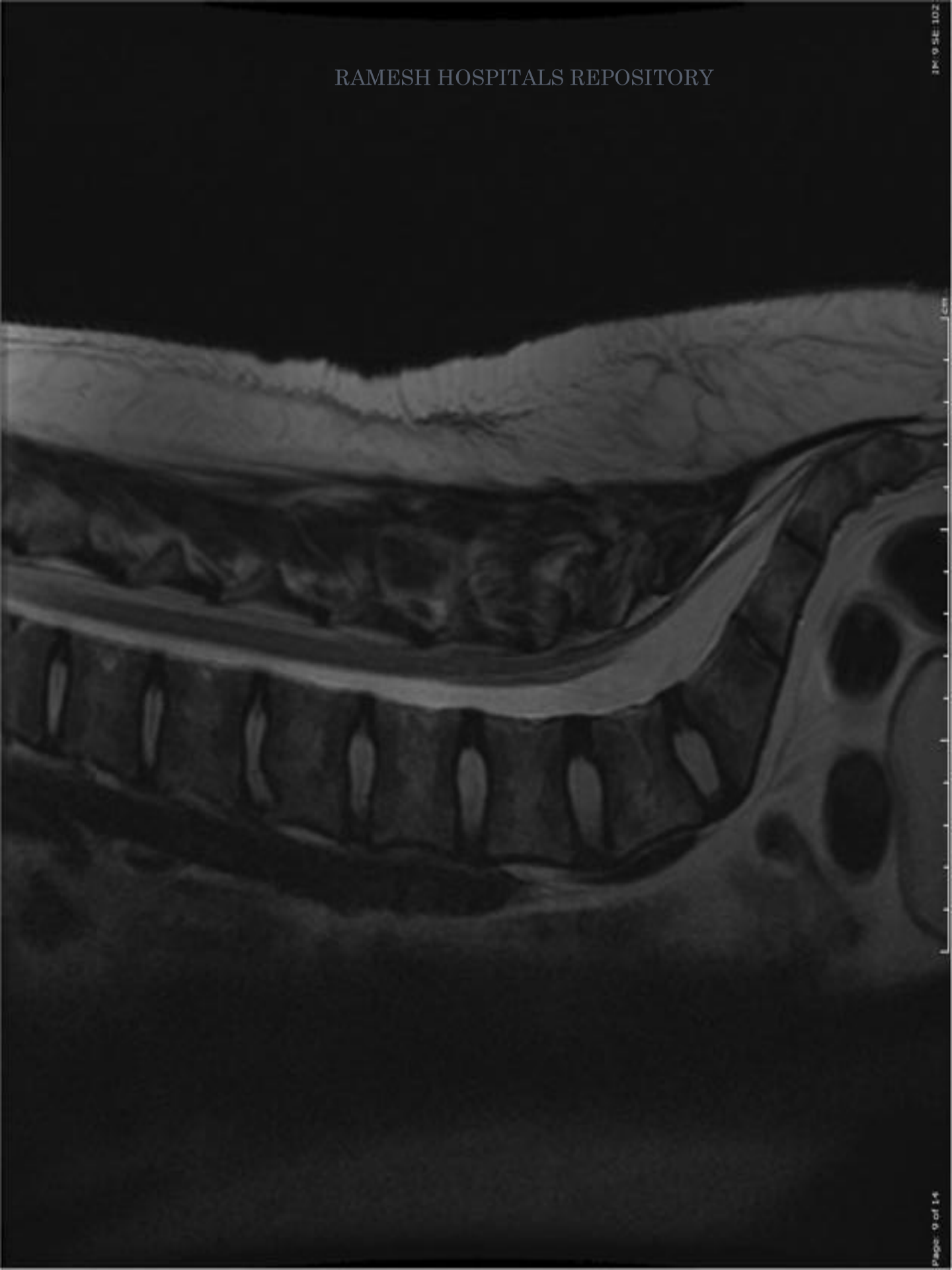
NEURORADIOLOGY CASES

RAMESH HOSPITALS REPOSITORY

Case 1

- 24 year old male with radicular pain
- The following is the incidental finding on workup


RAMESH HOSPITALS REPOSITORY
Page: 2 of 30
IM: 2 SE: 105



DIAGNOSIS

TETHERED CORD

- Tethered cord syndrome (tight filum terminale syndrome) refers to a constellation of symptoms and imaging findings that are likely the result of incomplete involution of the terminal cord or failure of the filum to properly lengthen during embryogenesis.

- Presentation

  most common in children during periods of rapid growth but can begin at any age..

- SYMPTOMS:

Results from abnormal perfusion to conus medullaris and its nerve roots.

1. Lower extremity weakness
2. Abnormal reflexes
3. Bladder dysfunction
4. Back pain

- The normal conus medullaris - terminate at or above the inferior endplate of L2.
- The normal filum terminale - measure 1 mm or less at the L5/S1 level.
- The short filum terminale is commonly thickened and contains a lipoma

Associated abnormalities

1. Syringohydromyelia
2. myelomalacia
3. Diastematomyelia
4. spinal dysraphism
5. scoliosis
6. VATER syndrome.

In a minority of cases, the spinal cord may be tethered but terminate at a normal level. Conversely, some patients with a low-lying conus medullaris may be asymptomatic

- INVESTIGATION OF CHOICE: MRI

Axial images should be obtained from the conus medullaris through the bottom of the thecal sac.

Axial T1-weighted images

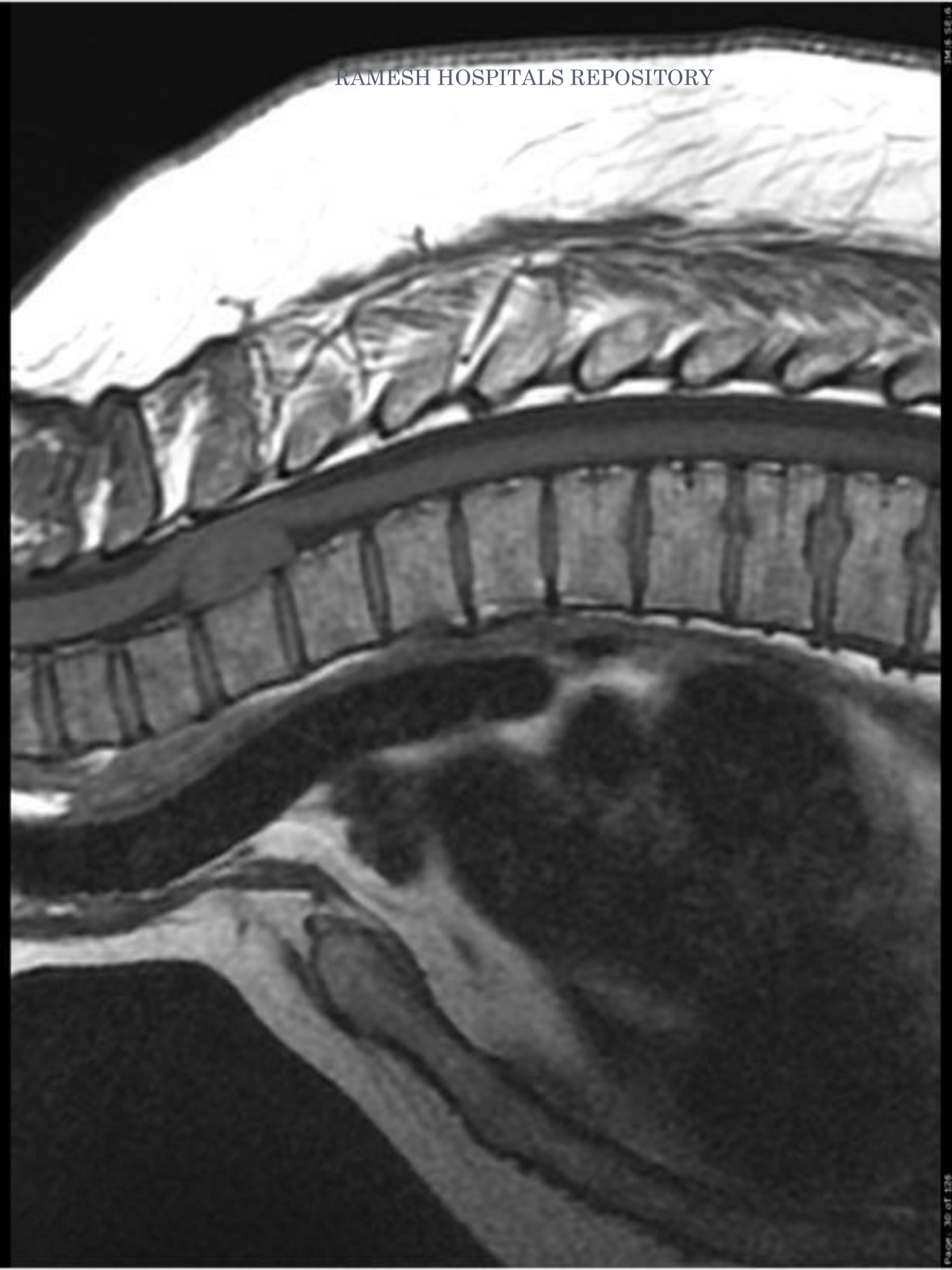
best for demonstrating lipomas of the filum terminale.

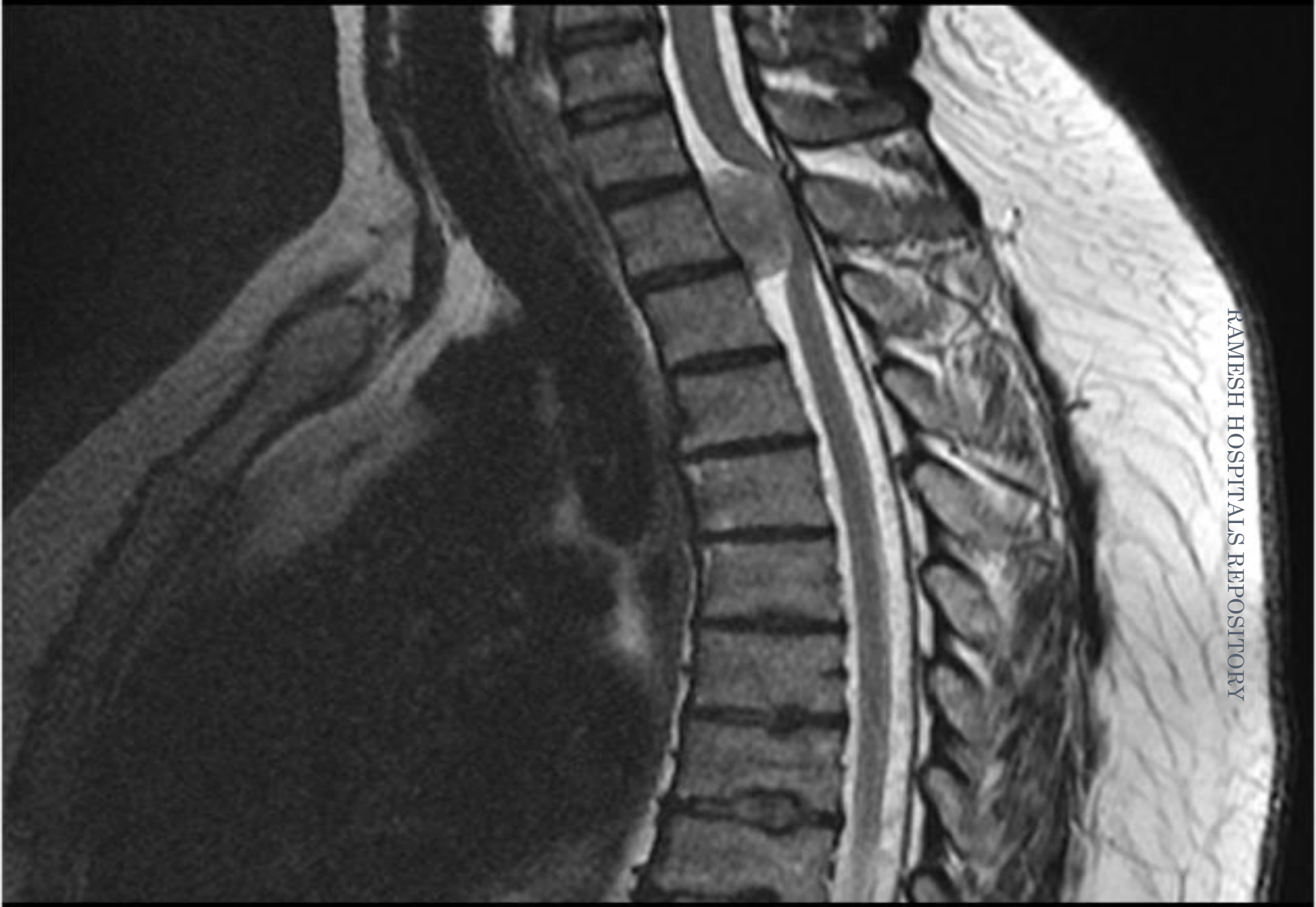
Axial T2-weighted images

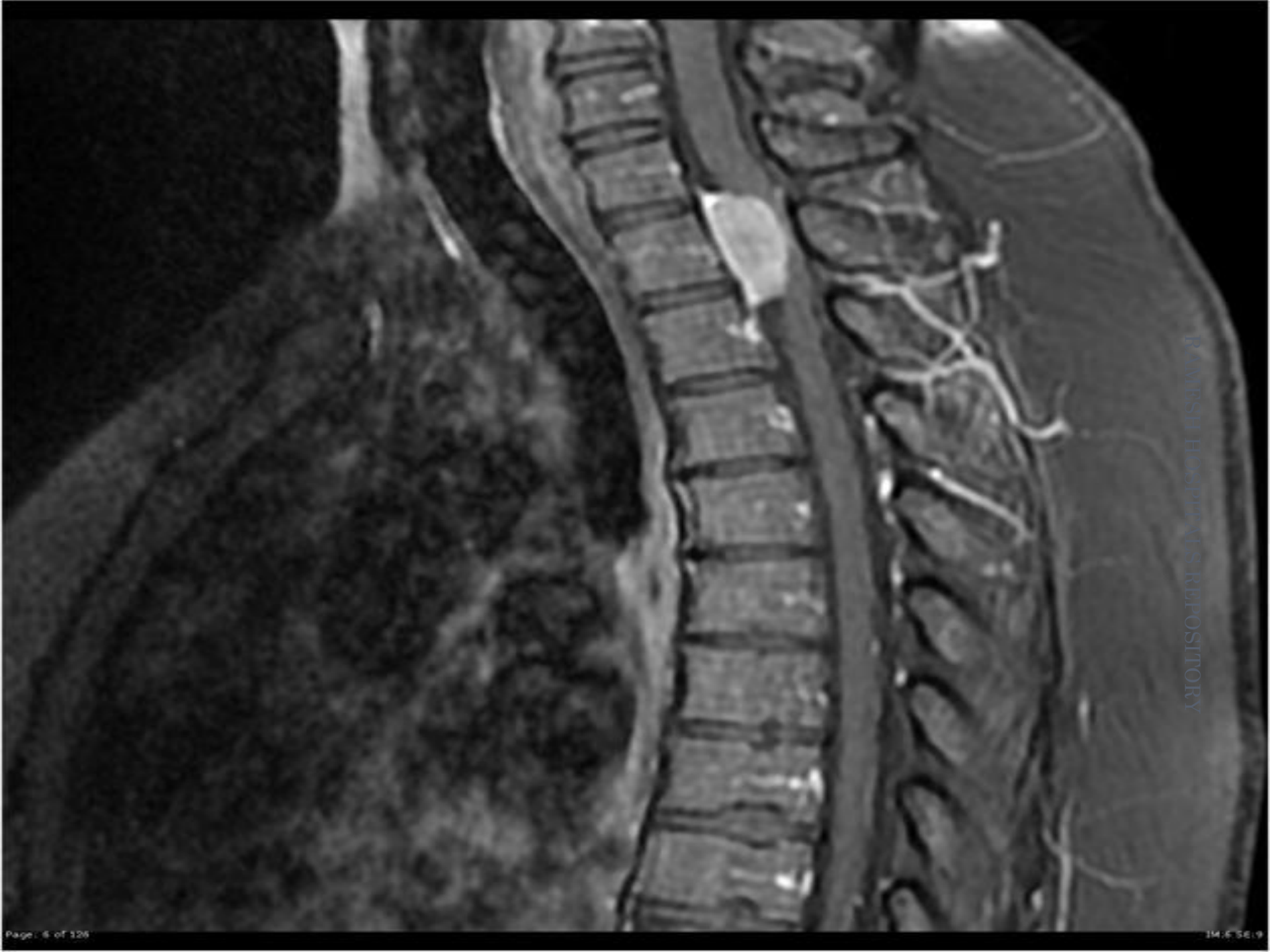
best to demonstrate the thickened filum

CASE 2

- A 50 year old female with progressive lower limb weakness







DIAGNOSIS

SPINAL MENINGIOMA

SPINAL MENINGIOMA

- Meningiomas - second most common intraspinal neoplasm, after nerve sheath tumors.

- ORIGIN: from persistent arachnoid remnants
- usually adhere to the dura.

PRESENTATION:

- The average age -fifth and sixth decades
- Most common in women.

SYMPTOMS:

1. Radicular pain
2. myelopathic pain

- Spinal meningiomas -intradural extramedullary masses. most frequently in the posterolateral thoracic spine
- well encapsulated
- Displace the cord and nerve roots without invasion.

IMAGING:

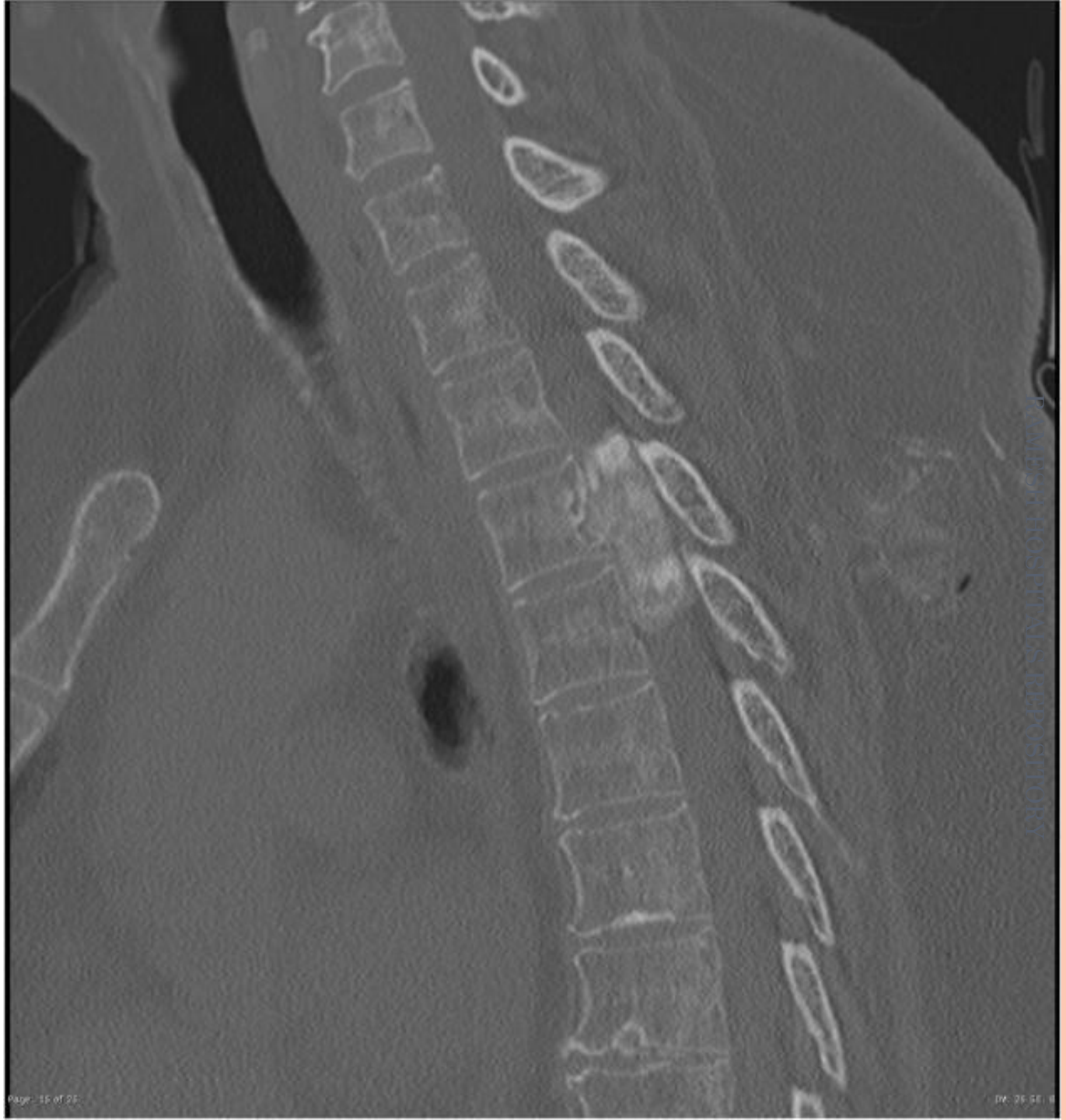
- CT

Typically hyper attenuating and may be calcified.

- Myelography

delineates the extramedullary (and usually intradural) nature of the mass and show its extent.

- Densely calcified extradural mass on CT



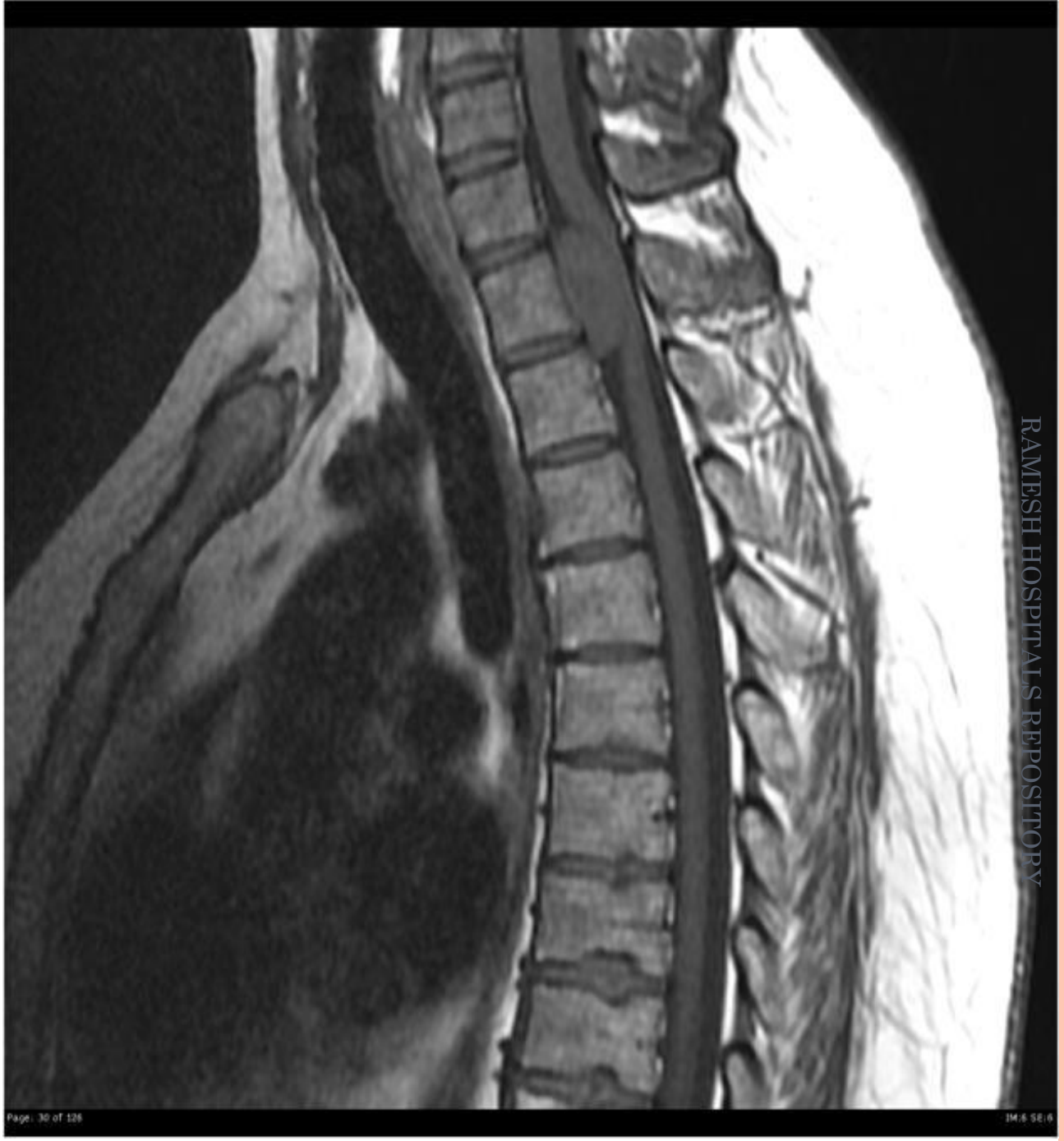
- MRI
- Iso-intensity to the cord on T1and T2-Weighted sequences. There is dense homogenous enhancement.

- It can be difficult to distinguish a meningioma from a nerve sheath tumor, but several discriminators can be helpful.

- Nerve sheath tumors are more commonly anteriorly positioned, neurofibromas are usually multiple and schwannomas are characteristically hyperintense on T2-weighted images.

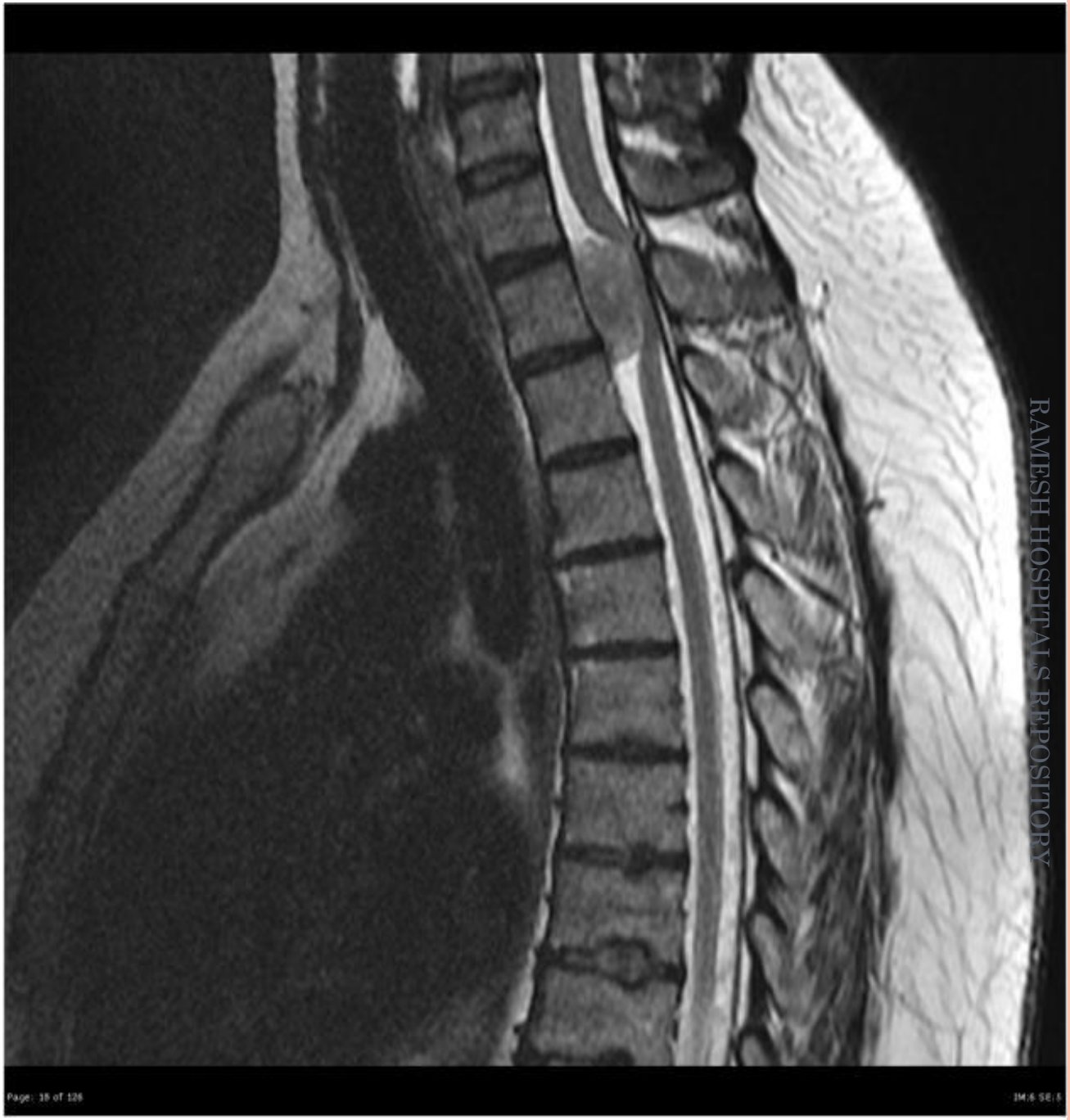
T1 WEIGHTED MRI

isointense to slightly hypointense, possibly heterogeneous

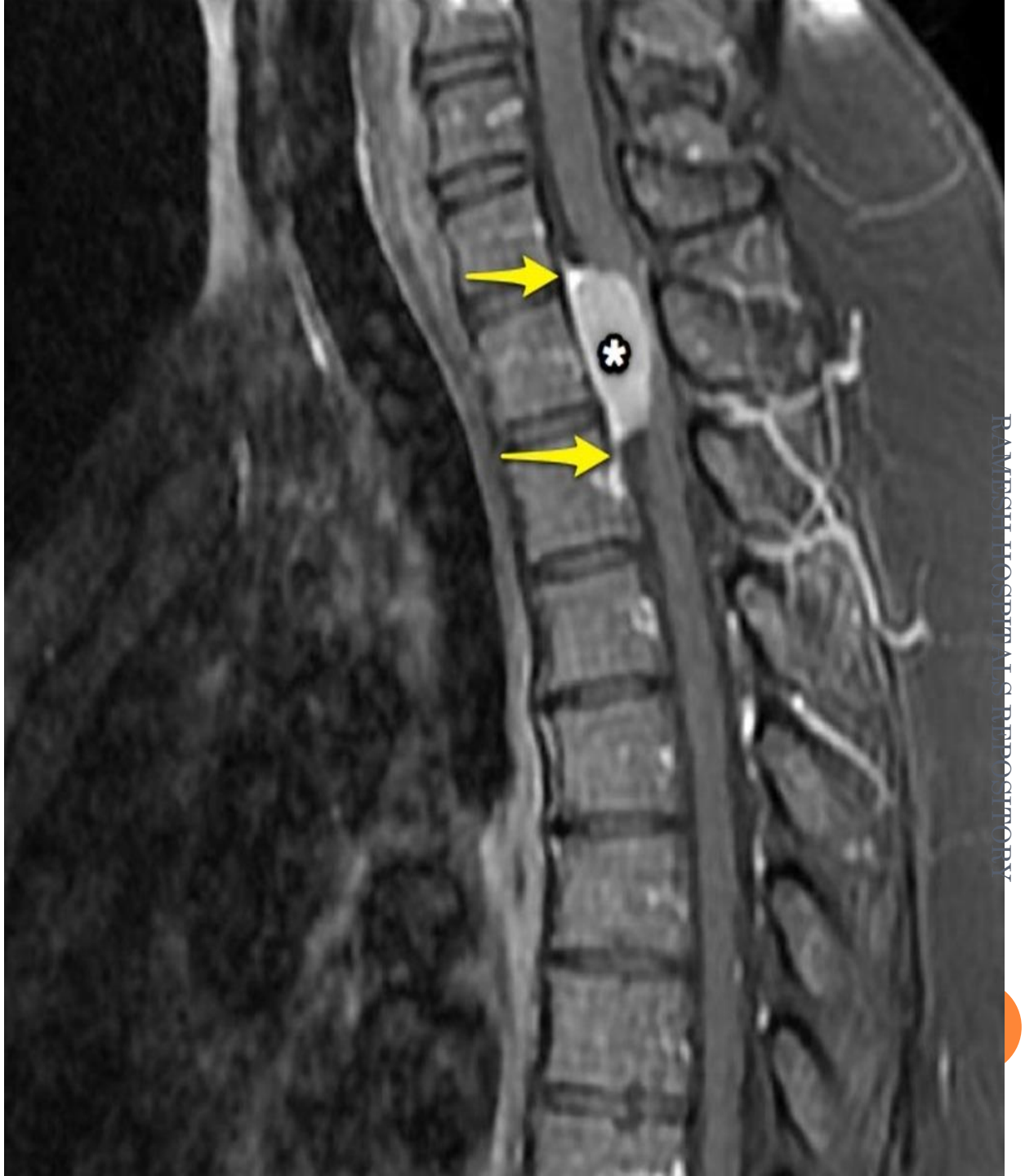


T2 WEIGHTED MRI

isointense to slightly hyperintense



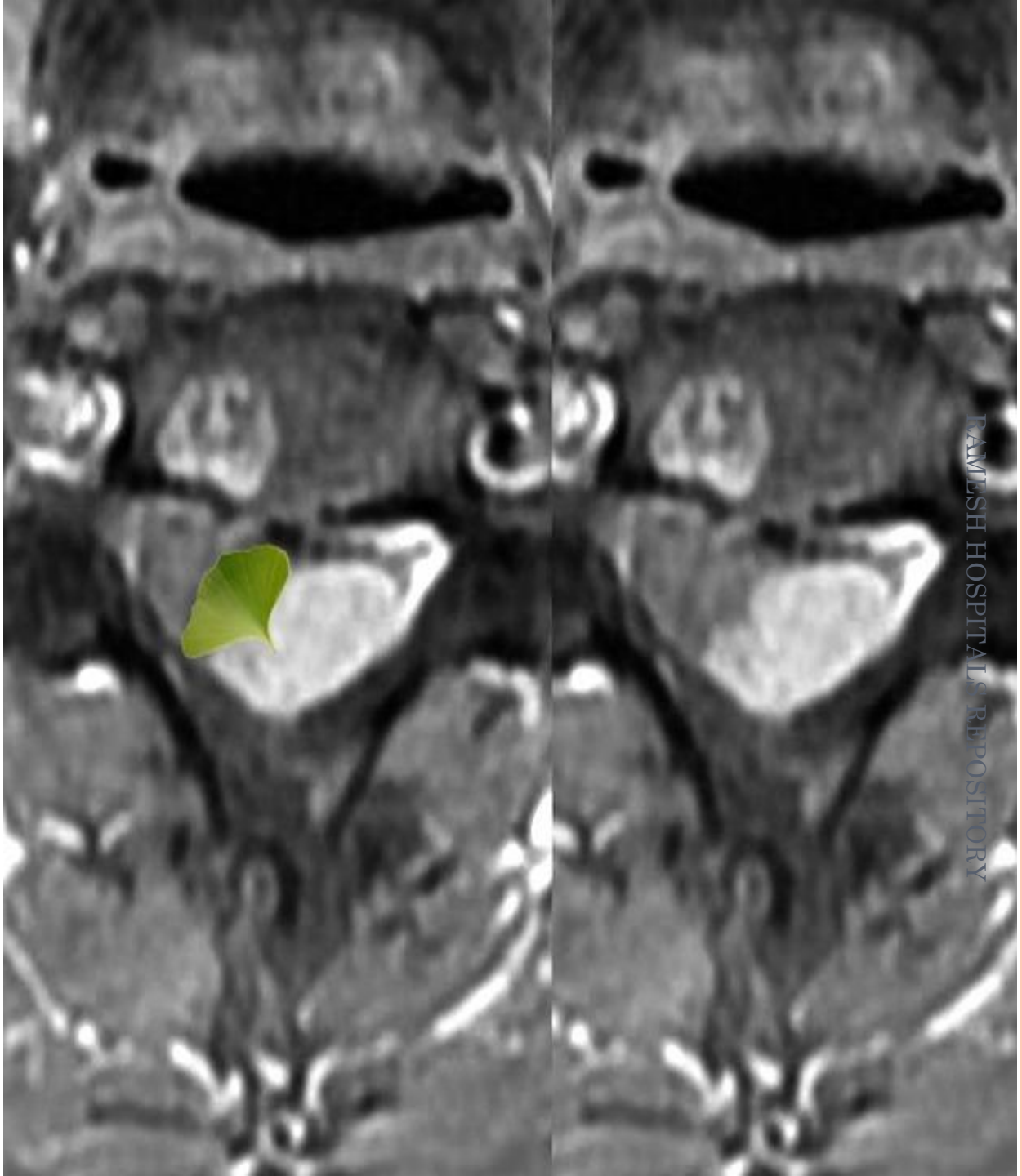
- Extradural mass (*) with dural tail extending above and below it results in marked compression of the upper thoracic cord



Ginkgo leaf sign

MRI sign in distinguishing a spinal meningioma from neurogenic tumor

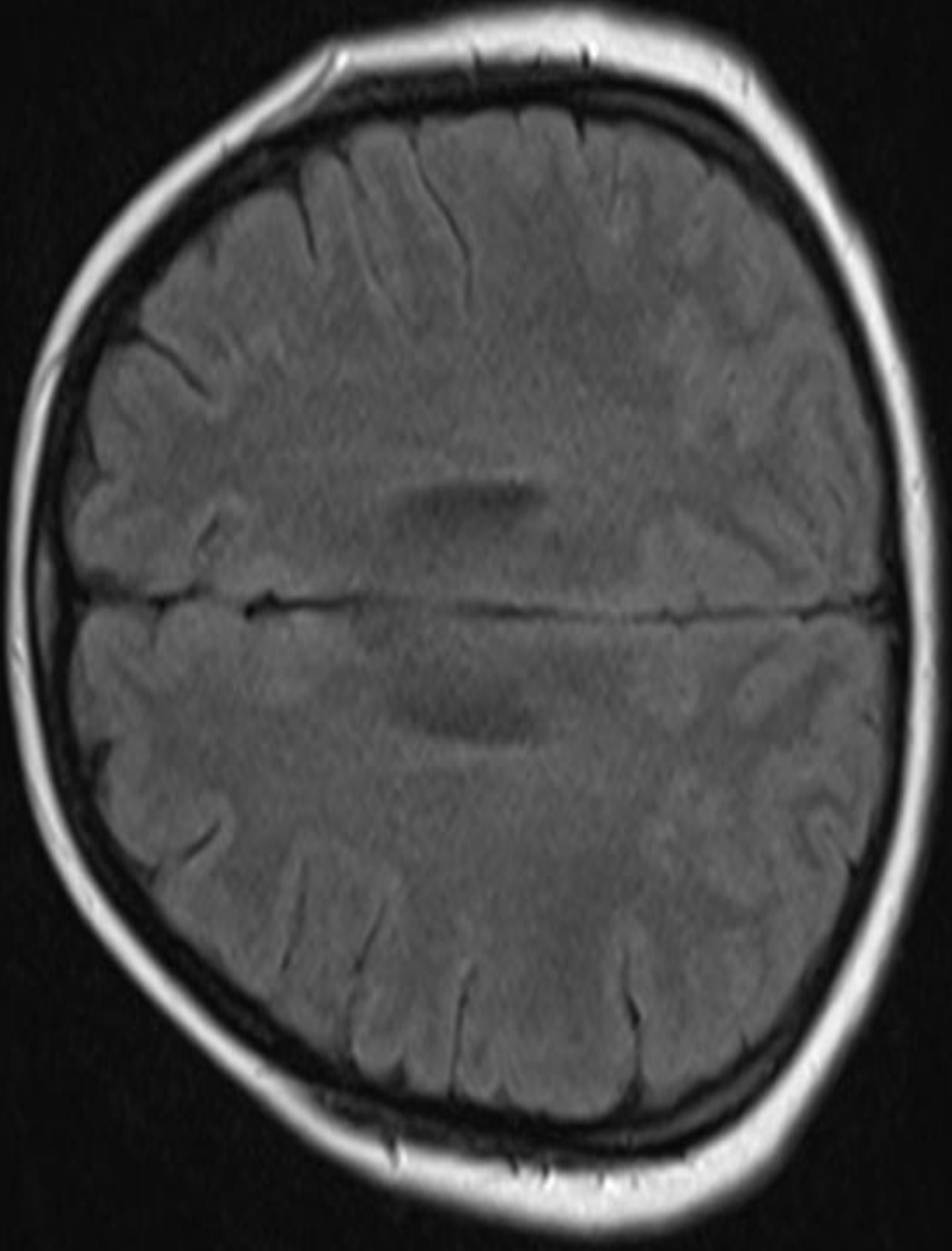
leaf representing the distorted spinal cord, pushed to one side of the theca by the meningioma, and the stem, seen as a non-enhancing 'streak', probably representing the stretched dentate ligament [1]

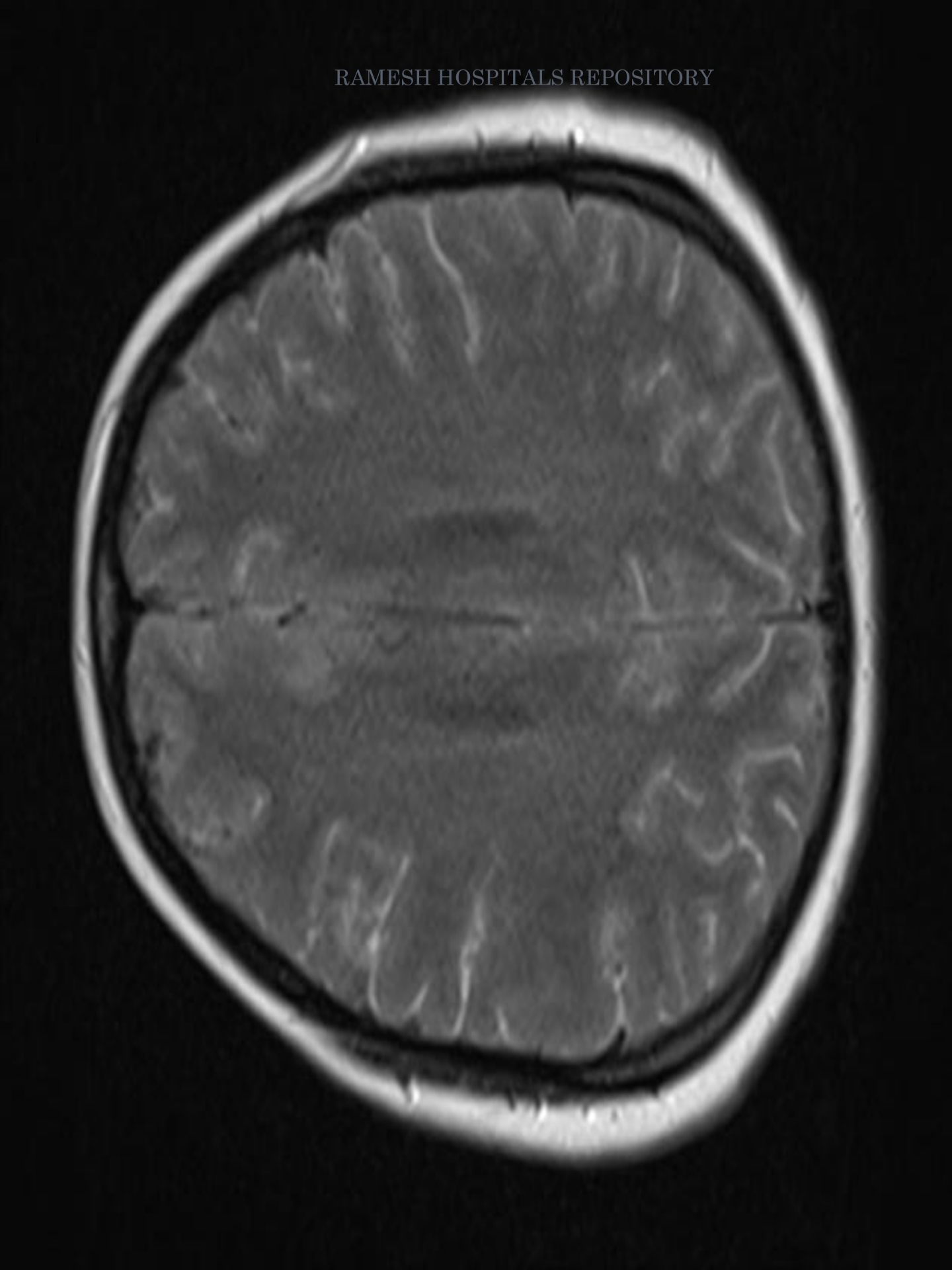


DIFFERENTIAL DIAGNOSIS

CASE 3

- 30 year old female with fever , headache and decreased vision





DIAGNOSIS

MENINGITIS

- Pyogenic meningitis - infection of the CSF and leptomeninges, usually by bacteria.
- Most common organisms in pyogenic meningitis vary with patient demographic.
- Neonate - E.Coli and group B streptococcus
- Older children and adults- S.Pneumoniae, N.Meningitidis, and L.Monocytogenes.
- Postoperative patients - staphylococcal species

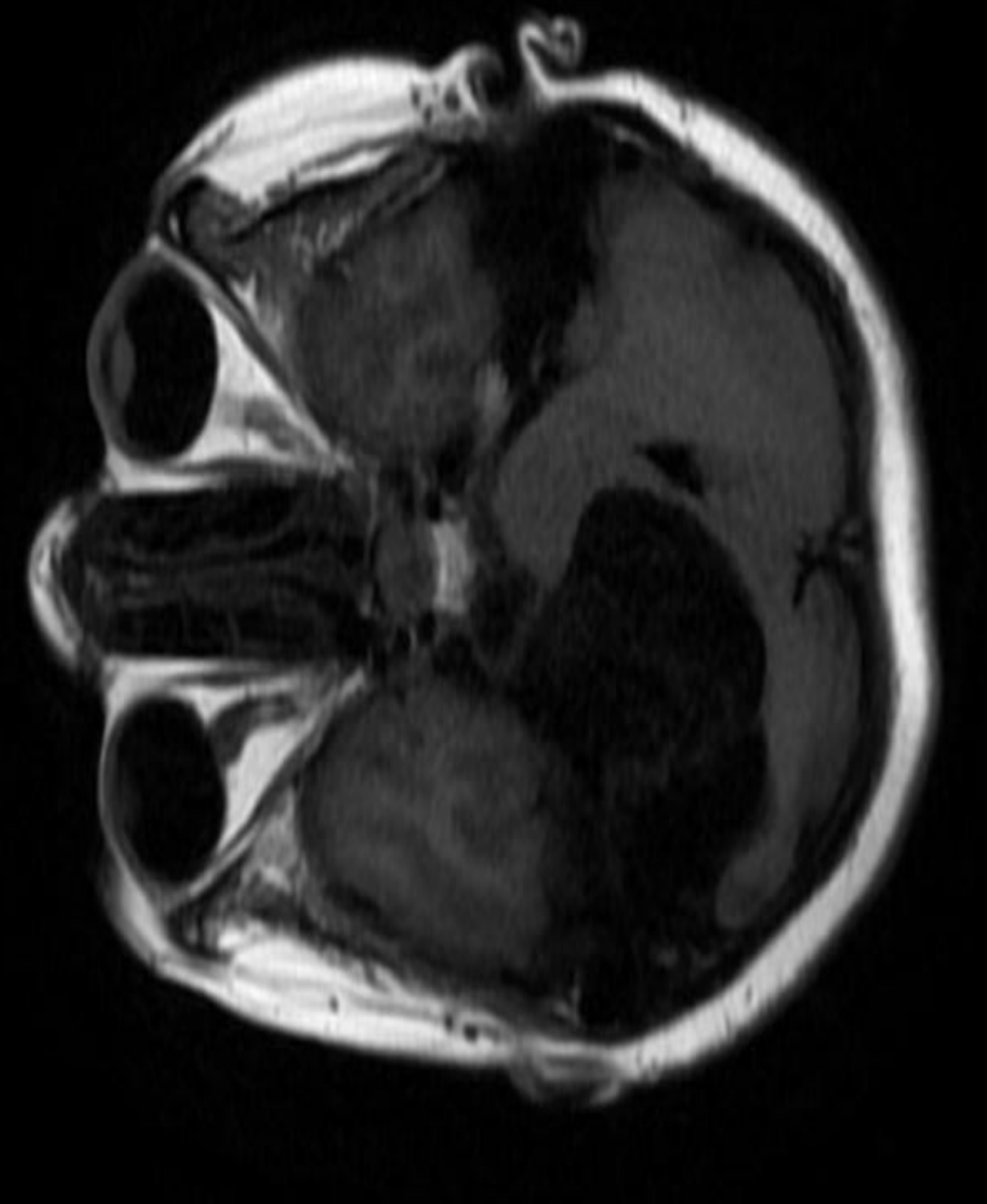
- Test of choice for diagnosis of meningitis – Lumbar puncture .
- The role of advanced imaging is to establish the absence of contraindication to lumbar puncture and to detect the complications of meningitis.
- The earliest imaging sign of meningitis - hyperintense signal in the subarachnoid space on FLAIR imaging.
- Thin leptomeningeal enhancement along the basal cisterns and sulci may be present.

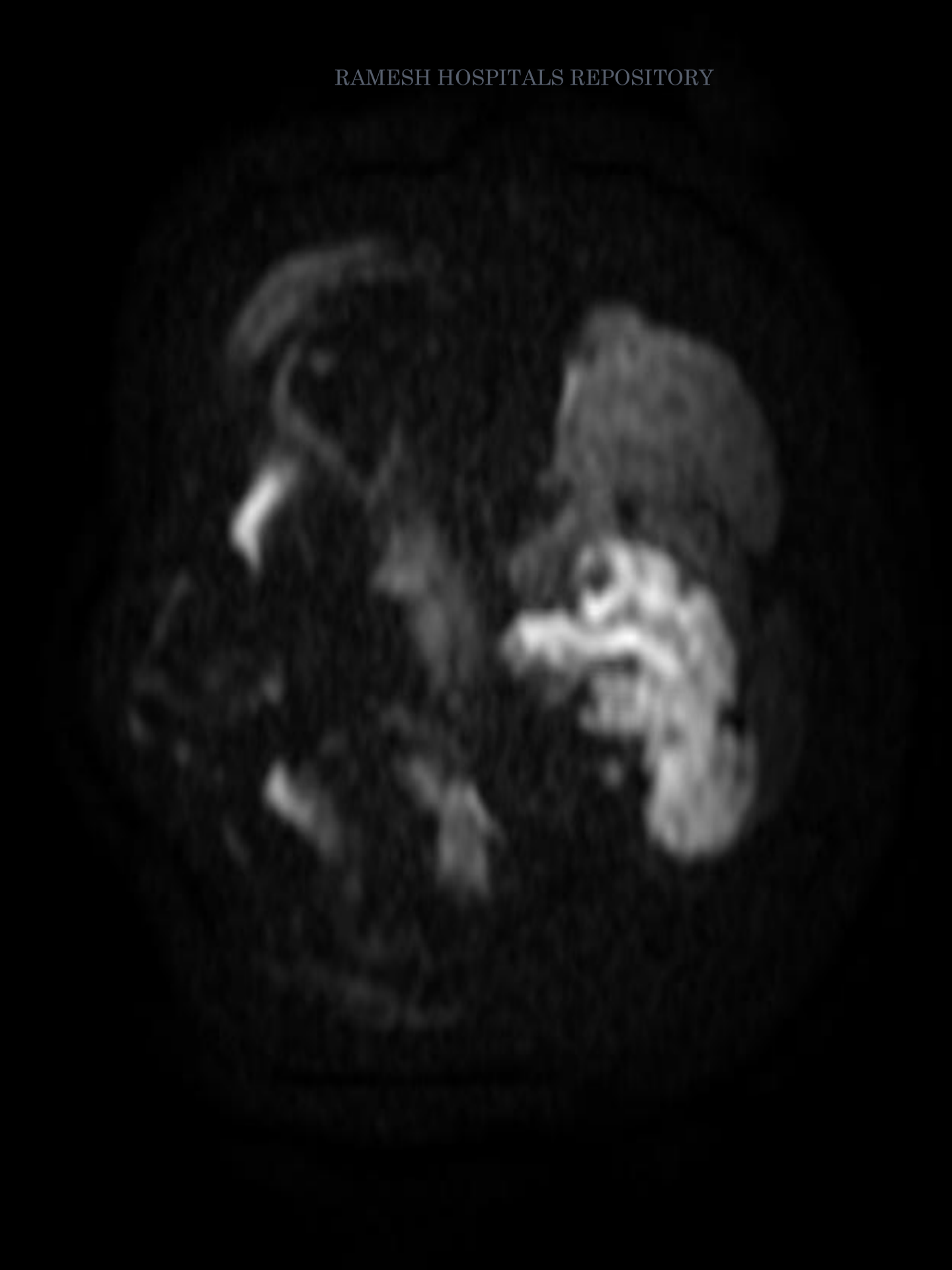
Complications of pyogenic meningitis

1. Hydrocephalus (communicating or obstructive)
2. Ventriculitis,
3. Venous thrombosis,
4. Arterial infarction (usually perforating arteries),
5. Subdural / epidural empyema,
6. Cerebritis and cerebral abscess.

CASE 4

- 30 year old female presented with headache and vestibular symptoms





DIAGNOSIS

EPIDERMOID CYST

- Epidermoid cysts - benign congenital ectodermal inclusion cysts arising from an anomaly of neural tube closure early in embryogenesis.
- Lesions grow slowly and remain clinically silent for years.

PRESENTATION:

Adults

1. Headache.
2. compressive symptoms (e.g., cranial nerve palsy) when present at the skull base.

LOCATION:

- cerebellopontine angle cistern (40% to 50%)
- Fourth ventricle (20%)
- Parasellar region (20%).

- Cyst contents:

Debris
Keratin
Cholesterol } laid down in a lamellar fashion.

- Epidermoid cysts - extra axial, infiltrative, lobulated masses.
- They may engulf neural and vascular structures.
- On they have

IMAGING

CT

- uniform attenuation consistent with fluid

MRI

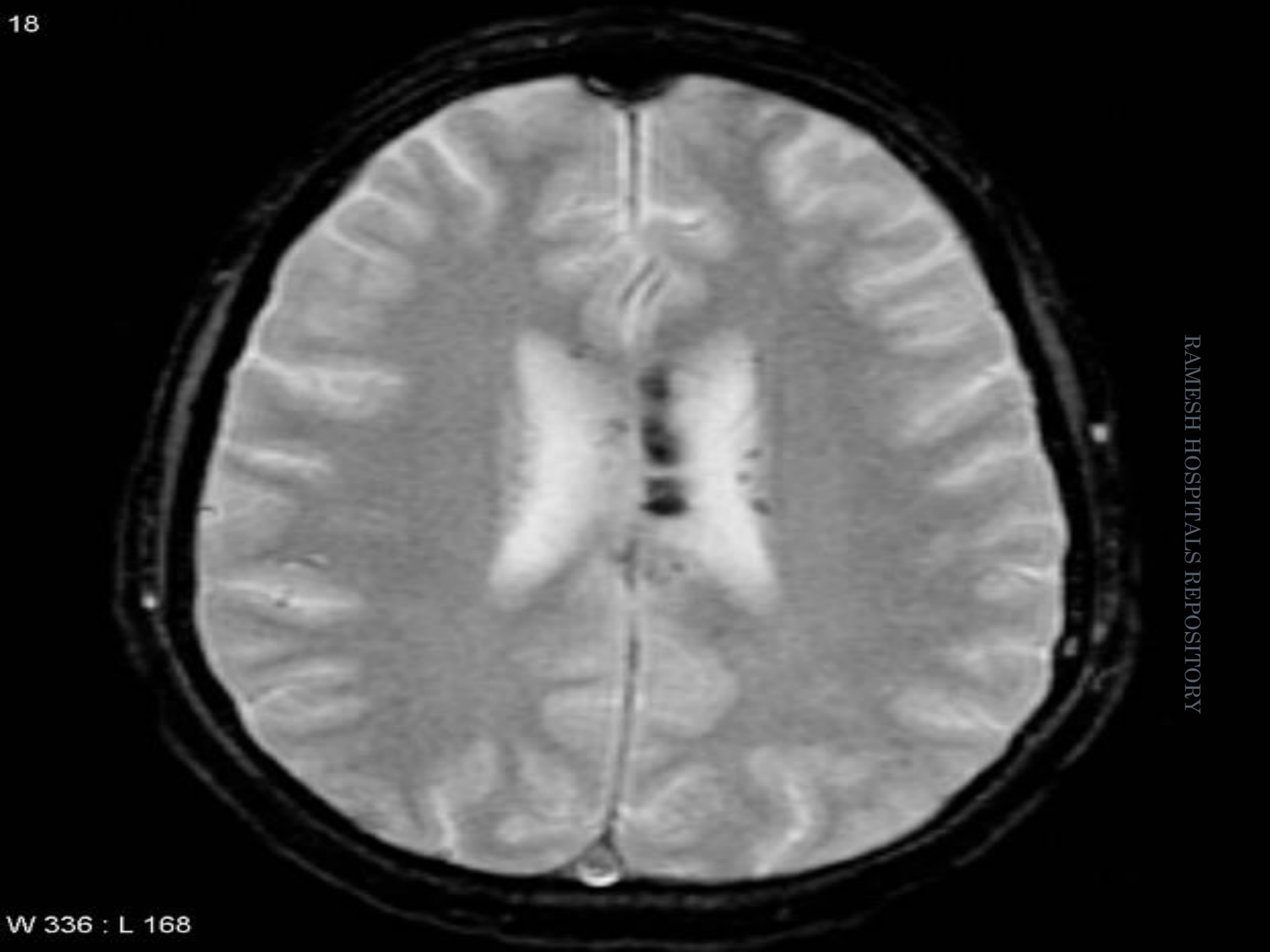
- On T1 and T2 weighted MRI, signal in the mass matches that of CSF.

The key imaging findings are

- FLAIR - incomplete nulling of the signal
- DWI – seen due to combination of true restriction and T2 shine through (to differentiate arachnoid cyst)

CASE 5

- A 19 year old male with motor vehicle accident


18
W 336 : L 168
RAMESH HOSPITALS REPOSITORY

DIAGNOSIS

DIFFUSE AXONAL INJURY

Diffuse axonal injury (DAI)

- result of traumatic axonal stretching
- seen in the setting of deceleration injuries, most commonly high speed motor vehicle accidents.
- The injury occurs where brain tissue of different densities intersect
- Most commonly involve the gray white matter junctions. severe injuries - corpus callosum and dorsolateral brain stem are involved.

PRESENTATION:

- mild cases - transient loss of consciousness
  - retrograde amnesia
- Severe cases – coma

IMAGING

CT

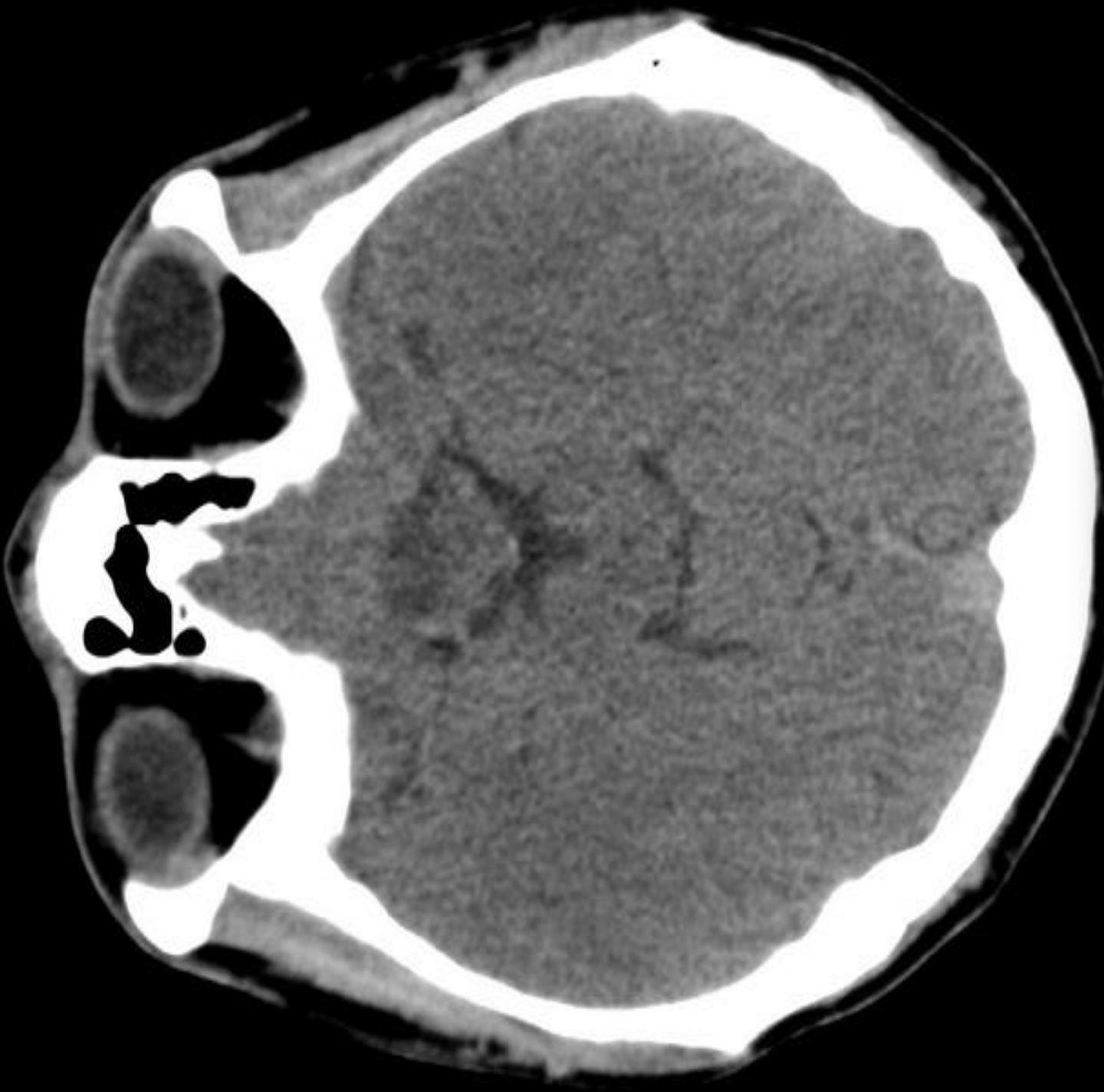
- punctate foci of hemorrhage that result from shearing of small vessels.

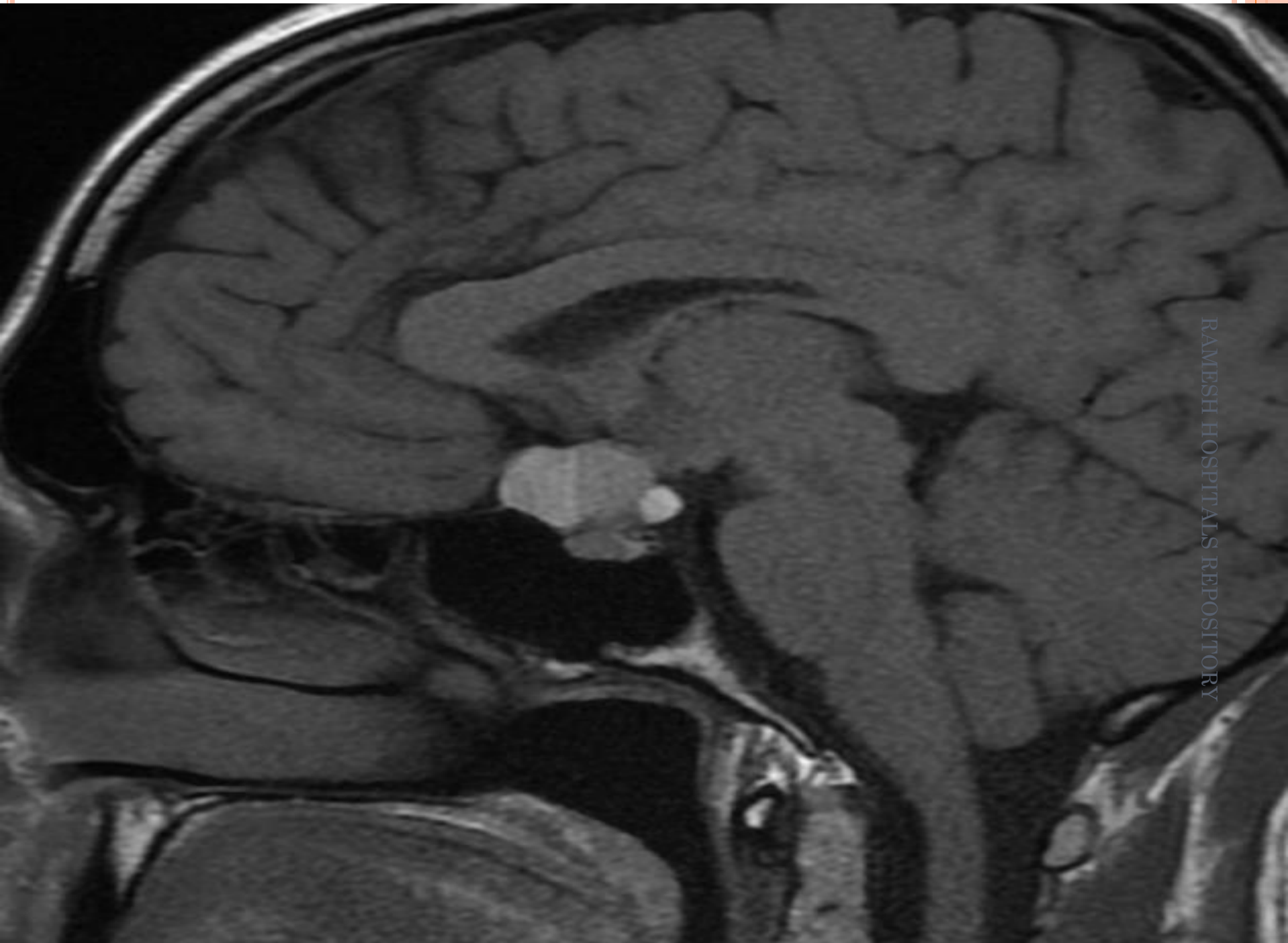
MRI

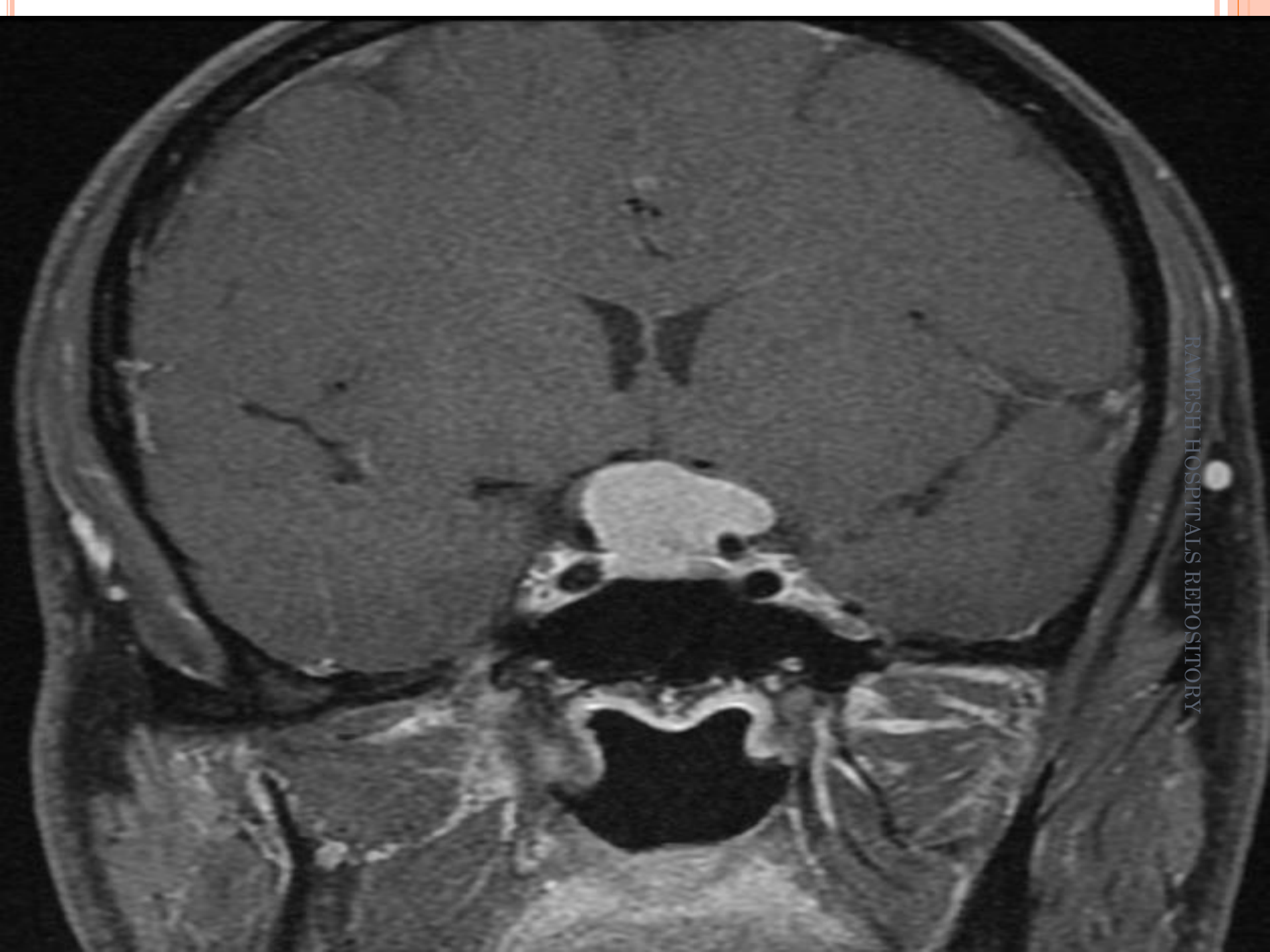
- T2 weighted or SWI sequence, provides more sensitive detection of micro hemorrhage
- also show non hemorrhagic shear injury as foci of edema and restricted diffusion

CASE 6

- A 55 year old female with visual disturbances







DIAGNOSIS

CRANIOPHARYNGIOMA

Craniopharyngioma

- benign epithelial neoplasm that arise from adenohypophysis metaplasia or ectopic remnants of Rathke's pouch.
- 5% to 10% of pediatric intracranial tumors
- the most common pediatric suprasellar tumor (~50%).

Histologic types:

- Adamantinomatous type

  more common in children

  usually cystic, calcified and enhancing.

- Papillary type

  in adults (>50years)

  solid enhancing tumor.

PRESENTATION:

Due to mass effect

- optic chiasm - visual disturbance
- pituitary gland - growth hormone deficiency in children
  - hypogonadism in adults
- ventricles - headaches and nausea / vomiting

- Craniopharyngioms are usually centered in the suprasellar (>90%) region with variable intra and parasellar extension.

- They can extend into all cranial fossae, the ventricles and the retroclival region.

IMAGING

CT

- To identify calcifications.
- Cysts - variable density due to proteinaceous or hemorrhagic contents.

MRI

- For better assessment of tumor extent.
- cyst contents have variable signal on T1 and T2 weighted sequences due to differences in protein, cholesterol and blood content.
- Significant enhancement should not be seen in Rathke cleft cysts, arachnoid cysts or dermoids / epidermoids.
- Germinomas and gliomas with cystic / necrotic components may appear similar to craniopharyngioma but calcification is uncommon.