REG NO. 305

CT Guided Targeted Epidural Blood Patch: A Case Series

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• What is Intracranial Hypotension?

•Types:

- Primary – Spontaneous Intracranial Hypotension
- Secondary – Acquired

• Diagnostic features:

- Clinical
- Imaging

Bern/SICH scoring system
Major criteria (2 points each)
Venous sinus engorgement
Pachymeningeal enhancement
Suprasellar cistern of 4 mm or less
Minor criteria (1 point each)
Subdural collection
Prepontine cistern of 5 mm or less
Mamillopontine distance of 6.5 mm or less

Low: <2
Intermediate: 3-4
High: 5 and above

•CSF Leaks:

Type 1 - Dural tear: SLEC positive
- **1A**—Ventral tear
- **1B**—Lateral tear

Type 2A - SLEC positive - proximal nerve root sleeve tear/meningeal diverticular/ dural ectasia
Type 2B - SLEC negative - distal nerve root sleeve tear

Type 3 - CSF venous fistula (CVF)

Type 4 - No identifiable cause

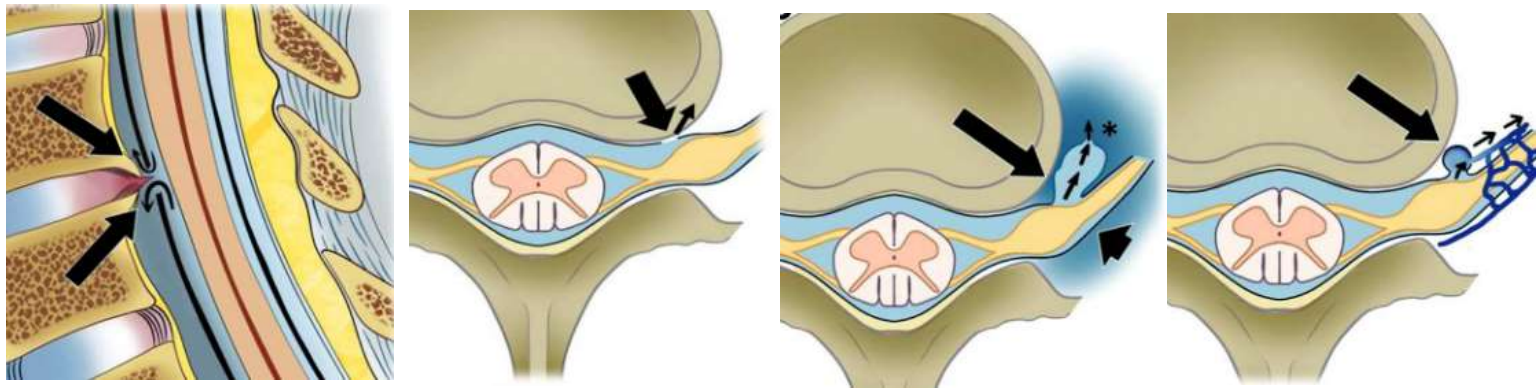


Image ref: Spontaneous Intracranial Hypotension Goddu Govindappa et al., IJRI 2023

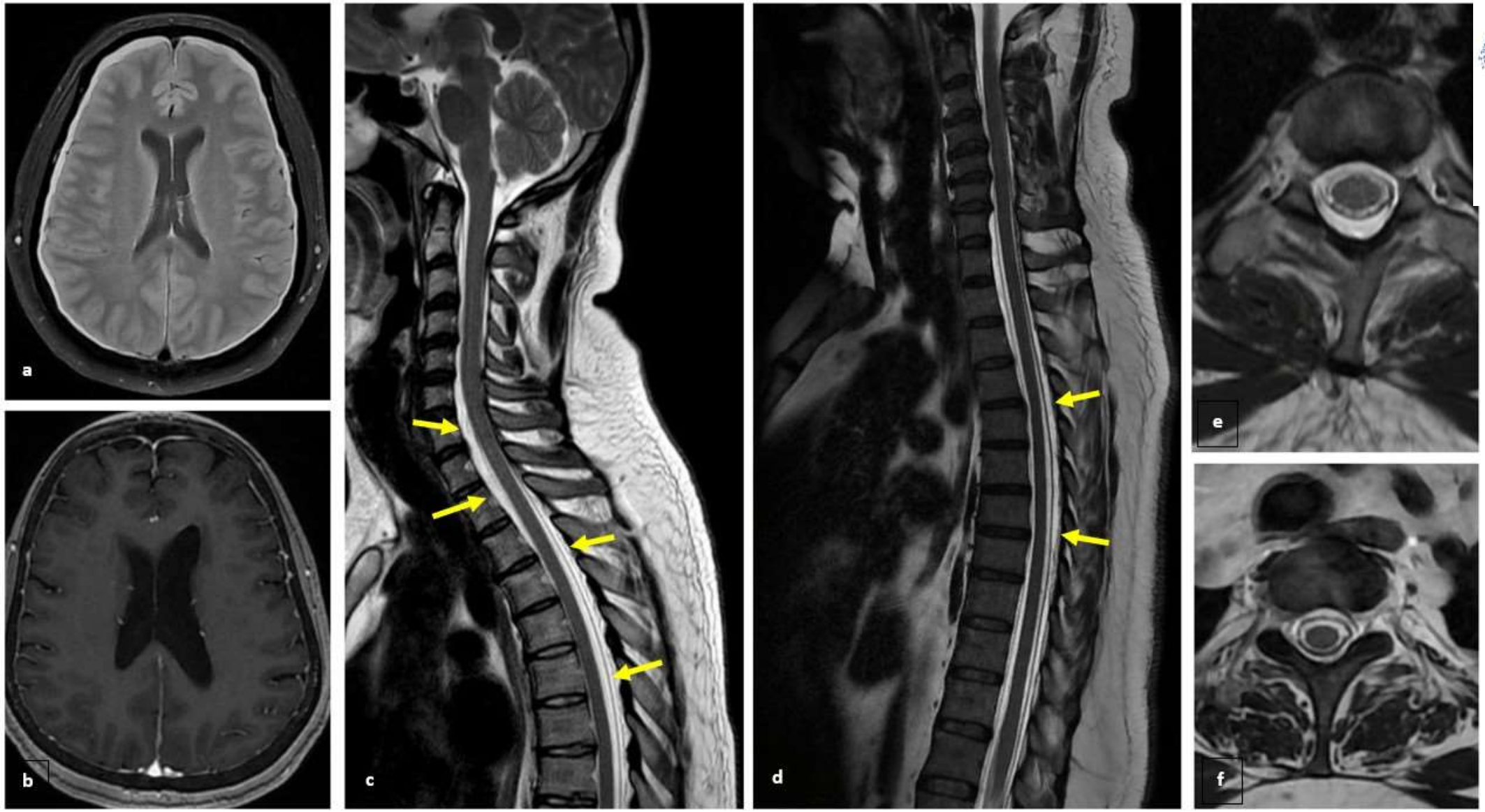


Image 1: Imaging findings in Intracranial hypotension: (a) bilateral subdural collections, pachymeningeal enhancement (b). Patients with SIH present with a spinal longitudinal extradural CSF collection (SLEC) (*yellow arrows)* as seen in the sagittal (c,d) and axial images (e,f).

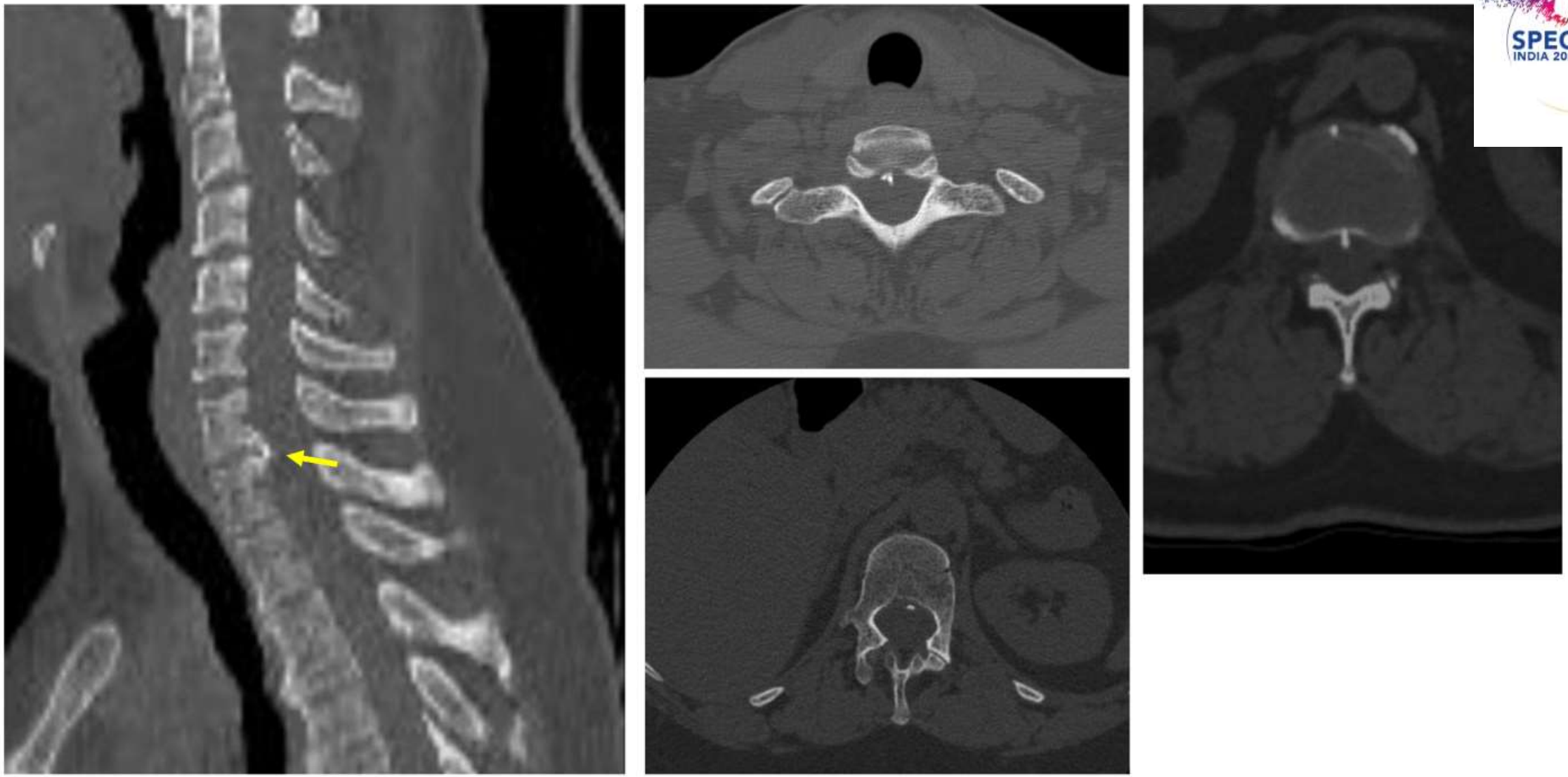


Image 2: Plain CT of the spine shows calcified disc protrusions or osteophytes which are commonly the cause of dural tears and CSF leak which can be identified with CT myelography.

AIMS AND OBJECTIVES

- Assessing the efficacy of Epidural blood patch in patients with spontaneous intracranial hypotension, in whom conservative management has failed.
- Establishing that Ultra Fast Dynamic CT Myelogram with Guided Autologous Epidural Blood Patch is a faster and effective method to cure SIH, with minimal post-procedural risks

METHODOLOGY

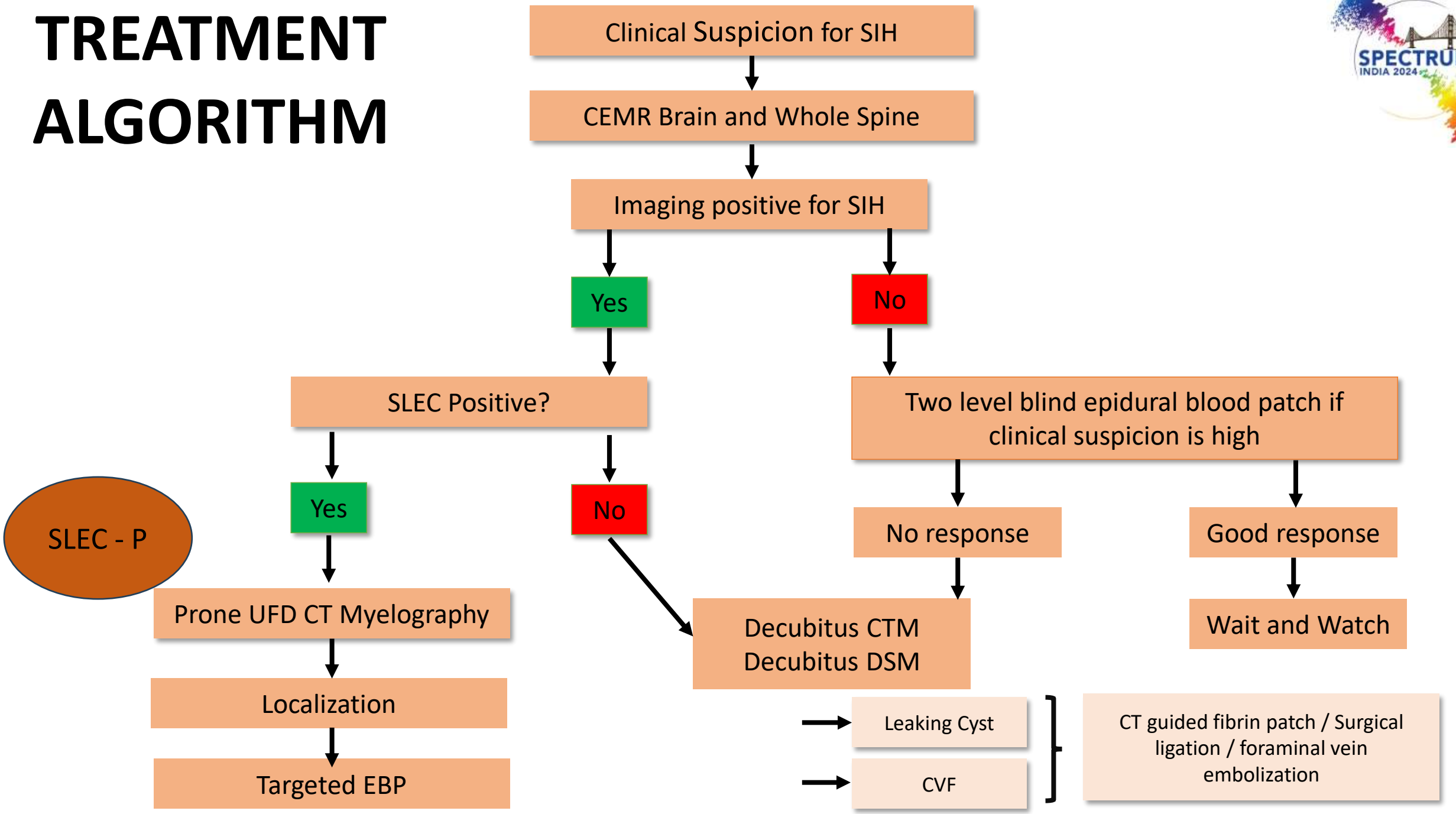
Inclusion Criteria:

- Patients who presented with spontaneous intracranial hypotension, and not responding to conservative treatment.
- Blood culture negative.

Exclusion Criteria:

- Contraindications for the procedure such as anti-coagulation/coagulopathy, infection at the injection site.
- Patient refusal or lack of cooperation

TREATMENT ALGORITHM



PROCEDURE

Consent and positioning

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Prone Trendelenburg position, Plain CT

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Target areas were painted and draped, under sterile precautions.

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Thecal sac was accessed at the L3-L4 level using a 22G LP needle.

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UFD CT Myelogram performed with a gap of 4 seconds between each phase; Delayed acquisition, after 5 minutes.

Targeted Epidural Blood Patch

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The target epidural space was accessed under CT guidance using an 18G epidural needle.

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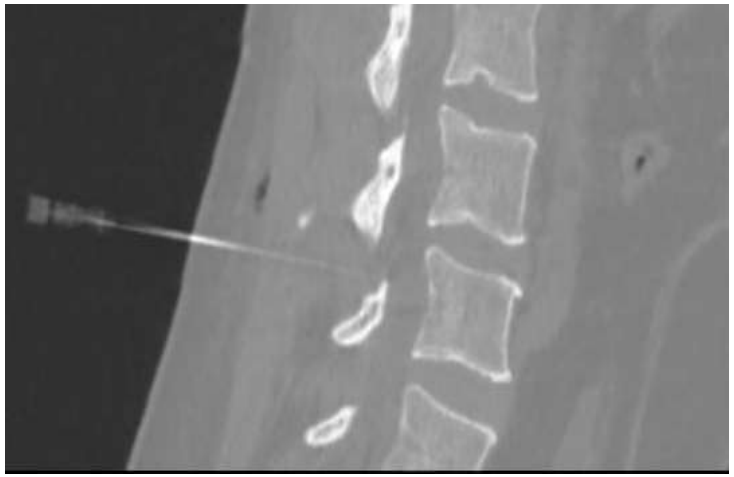
10-20 ml of autologous blood, mixed with contrast medium was injected.



End point:

Terminated once adequate extension of the contrast was seen along the epidural space, or the patient complained of discomfort.

Monitoring:

- Patients remained in a prone position for a minimum of 1-2 hours
- Followed by supine for 8 hours
- Monitored in the ward to look for fever, worsening focal pain, bruising/bleeding, lower extremity numbness or weakness, or any other signs of cord compression.

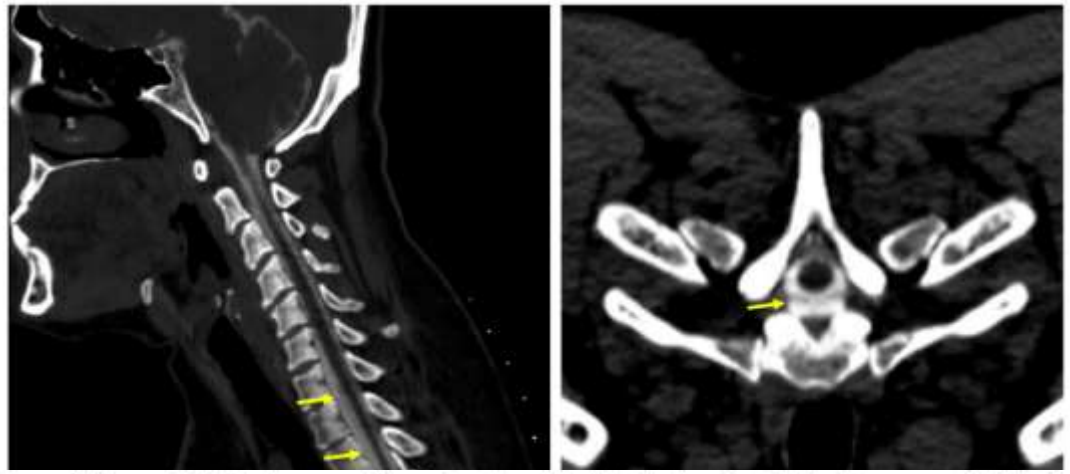


Image 3: Dynamic CT Myelogram of the spine shows the 'double density sign' (*yellow arrows*) which is suggestive of CSF leak.

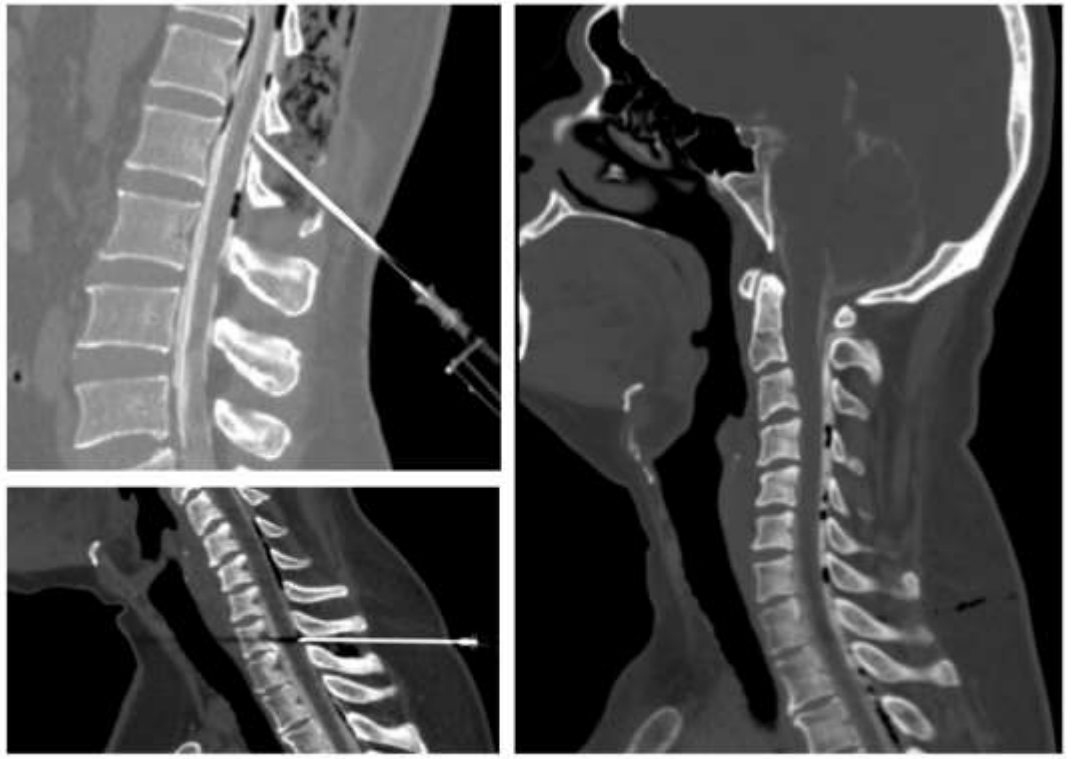


Image 4: CT guided Epidural blood patch injection at the level of the identified dural tear and CSF leak

RESULTS

- Over a period of **9 months** (from November 2022 to August 2023), a total of **6 patients** were selected, aged between 32 to 57 years, who were diagnosed with SIH based on typical imaging findings and clinical symptoms.
- The cause for the spontaneous intracranial hypotension in all these patients was **dural rent** due to **osteophytes**.
- The locations of the same were at C7-D1, D3-D4, two at D12-L1, and L1-L2, which was confirmed on **CT myelography** with the presence of double layered epidural contrast. In all the cases, the spinal cord was normal.
- All patients tolerated the procedure (as described above) well, and no intra-procedural complications were encountered. Post procedure, the patients remained in a prone position for a minimum of 1-2 hours. All patients experienced symptomatic relief from headache almost **within 1 day** post procedure.
- Available long term follow up (~6months) showed no recurrence of symptoms in these patients

CONCLUSION

- Epidural blood patch remains a safe and effective method to have near total resolution of headaches due to spontaneous intracranial hypotension.
- Through extensive clinical research, it has been demonstrated to be safe.
- Diagnosis and treatment are finished in the same sitting, due to the use of UFDCT.
- Further prospective studies are required to assess the efficacy of CT guided EBP versus the use of fibrin glue or surgical dural closure.

References:

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