Radiological Algorithm in Cases of CSF Rhinorrhea

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INTRODUCTION

- **SKULL BASE CSF LEAK**
  - CSF (Rhinorrhea – Otorrhea).
  - Osseous and Meningeal defects.

AETIOLOGY

- Traumatic: Accidental, surgical.
- Non-Traumatic: ICP, Tumor, ...
- Spontaneous: Obese, middle aged, Female, IIH.
DIAGNOSIS

- Clinical.
- Lab (β2 Transferrin or β trace protien).
- Radiological: MSCT, MRI, CT Cisternography and Isotopic Cisternography.
- CSF pressure, fundus and visual field.
- Intra-operative / Endoscopic

MSCT

- Temporal bone included.
- Submillimiter cuts, Supine only.
- Skull base bone defect and any other concomitant pathology.
- Active leak is not required.
- Sensitivity: 92%. Specificity: 100%.
- Frequently the only study needed.
- Cisternography in patients with negative CT scans rarely confirms a CSF leak.
MRI

- Non-invasive.
- High T2 CSF signal passing through defect.
- Meningocele/Encephalocele.
- Lower sensitivity and accuracy than HRCT.
- Used if:
  - Suspected celes (soft tissue at HRCT).
CT Cisternography

- Before and after intrathecal contrast.
- Provocative maneuvers: Sneezing.
- Coronal Position.
- Only positive during active leak.
- Sensitivity:
  - 92% if active leaks.
  - 40% if no active leak.
  - 48% overall.

CT Cisternography - Disadvantages

- Infection.
- CSF leak.
- Meningeal irritation, Seizures.
- Relative Contraindications: Meningitis or elevated ICP.
- Double irradiation.
CT Cisternography - Indications

- Multiple osseous defects.
- Multiple sinus opacification.
- Inconclusive HRCT and MRI.

AIM OF THE WORK

The aim of this study was to determine a radiological algorithm in Cases of CSF Rhinorrhea in patients with clinically suspected CSF rhinorrhea.
SUBJECTS

The study was conducted on 30 patients presenting with suspected CSF rhinorrhea.

RESULTS

- 30 patients included in the study:
  - 24 with direct defect detection by plain MSCT.
  - 2 patients with suspected cephaloceles → Confirmed by MRI and operatively.
  - 4 patients with signs suggestive of associated IIH → Confirmed clinically.
CONCLUSION

- HRCT combined with MR cisternography are accurate and non-invasive methods for detection and localization of the skull base defect in cases of CSF rhinorrhea.
- They can replace the current invasive "gold standard", namely intrathecal CT cisternography in the majority of cases.
- A stepwise imaging algorithm is presented.

Revised Imaging Algorithm

1. Clinical
2. β2 transferrin
   - positive
   - negative
3. MSCT
   - Multiple defects, Opacified sinuses, Celes
4. MRI
   - Non conclusive
   - CT Cisternography