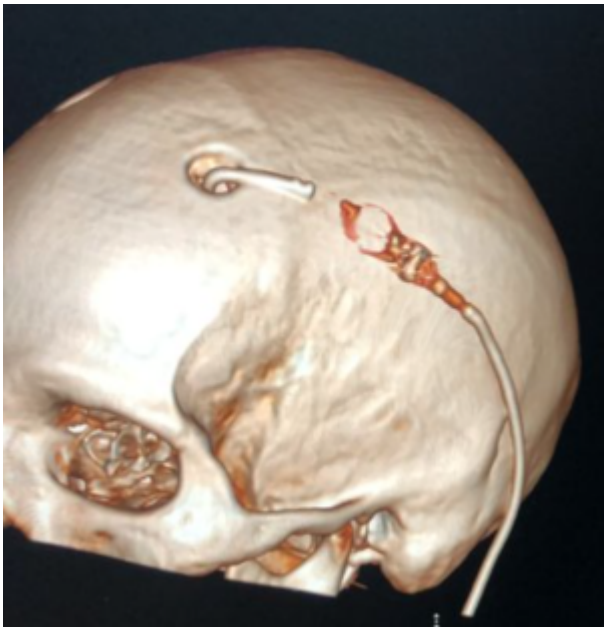
Ventriculoperitoneal Shunt Disconnection

- Case Report: A modified approach to converting ventriculoperitoneal shunt to ventriculoatrial shunt due to recurrent encapsulation of the peritoneal catheter
- Comparison of failure rates between full-barium and striped barium distal shunt catheters: a matched case-control study
- The clinical spectrum and management outcome of adult-onset aqueductal stenosis: Insight from South-West Nigeria
- Slit-ventricle syndrome masking shunt disconnection in adulthood
- Accurate Preoperative and Intraoperative Evaluation Reduces Surgical Costs and Patient Invasiveness in Ventriculoperitoneal Shunt Revision
- Does Valve Design Affect the Tensile Strength of Ventriculoperitoneal Shunts?
- Spontaneous Intraventricular Tension Pneumocephalus
- Migration of atrial catheter of ventriculo-cysto-atrial shunt into heart and pulmonary artery - case report and literature review



Ventriculoperitoneal (VP) shunt disconnection is a mechanical failure of the shunt system characterized by physical separation of one or more components, such as the ventricular catheter, valve, or peritoneal catheter. This interruption in CSF flow can lead to increased intracranial pressure and clinical deterioration.

Clinical Features

Symptoms typically reflect shunt malfunction and raised intracranial pressure:

- Headache
- Nausea or vomiting
- Lethargy or altered level of consciousness
- Papilledema

- Ventricular enlargement on imaging
- Swelling or palpable gap along the shunt tract
- Pediatric patients may present with rapid head growth

Diagnosis

- **Shunt series X-ray**:
  - Cervical, thoracic, and abdominal views.
  - May show discontinuity or disconnection of tubing.
- **CT scan of the brain**:
  - Assesses for hydrocephalus or ventricular dilation.
- **Radionuclide shuntogram or contrast study**:
  - Evaluates CSF flow through the shunt.
- **Shunt tap (valve puncture)**:
  - Measures proximal pressure and patency.

Common Disconnection Sites

Site	Risk Factors
Valve-catheter junction	Poor fixation, surgical technique
Proximal connector (ventricle)	Growth in pediatric patients, repeated revisions
Distal connector (peritoneum)	Traction, abdominal adhesions, fibrosis

Management

- Urgent surgical revision.
- Replace or reconnect affected components.
- Consider complete shunt replacement if the system is old or damaged.
- Obtain CSF cultures if infection is suspected.

Prevention

- Secure fixation of all components during initial surgery.
- Minimize tension on connectors.
- Regular follow-up, especially in growing children.

Mechanical shunt failure from shunt disconnection or shunt fracture is a significant cause of shunt failure [1].

Shunt catheter disconnection has been well described in the literature as a cause of shunt malfunction.

The distal component among the valve and the peritoneal catheter is the most probable site of

disconnection [2].

Risk factors

Ventriculoperitoneal shunt disconnection risk factors.

Diagnosis

Suspect with Undershunting.

see Shunt evaluation.

Prevention

Ventriculoperitoneal shunt disconnection prevention.

Complications

Shunt catheters that migrate peritoneally bring the possibility of visceral injury, predominantly perforation of the bowel. These disconnected or fractured shunts can be revised by substituting or reconnecting the components, or by replacing the whole shunt system. In the modern era, the laparoscopic retrieval of migrated shunt catheters can be done safely, either as an emergency or an elective process [3].

Case reports

A 5-year-old boy with a right-sided ventriculoperitoneal shunt presented with a 3-month history of progressively enlarging subperiosteal fluid collection in the scalp, which started in the right parietal region and had spread and extended across the midline to occupy both parietal regions. There were no changes in symptoms or signs from those observed 3 months previously. A CT scan confirmed the collection of fluid under the scalp over both parietal regions. The peritoneal catheter was found to be disconnected from the distal end of the functioning valve, which drained cerebrospinal fluid into the subperiosteal space. Distention of the parietal subperiosteal space led to stretching and tearing of the emissary veins. This resulted in the formation of a hydrohematocele. The spread of fluid to the opposite parietal region may be due to a disorganized and loose attachment of the periosteum to the widely separated sagittal suture [4].

An 8-year-old boy with a right VP shunt was referred because of progressive loss of consciousness in the morning. A CT scan of the head established moderate hydrocephalus. A shunt series presented a disconnection of the distal tube of the shunt as the distal part was free in the abdominal cavity. The

patient experienced a complete shunt revision. The abdominal incision was revived and the tube removed from the abdominal cavity gently. The patient was discharged 72 h later [5].

References

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