Hinged craniotomy complications

- Meta-Analysis Comparing Outcomes of Hinge Craniotomy to Decompressive Craniectomy in Patients Suffering from Elevated Intracranial Pressures
- Contralateral subdural effusion following decompressive hinged craniotomy: A case report and narrative review
- Comparison of Outcomes of Hinge Craniotomy Versus Decompressive Craniectomy in Patients With Malignant Intracranial Hypertension: A Prospective, Randomized Controlled Study
- Complications Following Decompressive Craniectomy
- Decompressive craniectomy in trauma: What you need to know
- Decompressive craniotomy in split-technique (DCST) for TBI in infants: introducing a new surgical technique to prevent long-term complications
- Decompressive Bone Flap Replacement (Decompressive Cranioplasty): A Novel Technique for Intracranial Hypertension-Initial Experience and Outcome
- Hinge craniotomy versus standard decompressive hemicraniectomy: an experimental preclinical comparative study

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While **hinged craniotomy (HC)** offers advantages over decompressive craniectomy (DC), such as avoiding the need for cranioplasty and preserving skull integrity, it is not without complications. Below are the key complications associated with this technique:

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Postoperative Brain Swelling and Herniation

- **Limited decompression** compared to DC may lead to **insufficient pressure relief** in cases of severe brain edema.

- **Delayed brain swelling** can cause secondary herniation, necessitating reoperation.

- In rare cases, the **bone flap may compress the brain** if swelling exceeds expectations.

Mitigation: Careful patient selection, intraoperative ICP control, and monitoring for delayed swelling.

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Bone Flap-Related Issues

- **Bone flap resorption**: Although HC avoids complete removal, the hinged bone may undergo **osteolysis or necrosis** over time.

- **Osteomyelitis**: Infection of the bone flap is a risk, especially if it becomes revitalized.

- **Bone flap mobility**: The flap may become unstable, leading to **pain, cosmetic deformity, or functional impairment**.

Mitigation: Secure fixation using absorbable plates or sutures, antibiotic prophylaxis, and close postoperative imaging follow-up.

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CSF Dynamics and Hydrocephalus

- **CSF circulation changes** may result in **subdural effusions, hygromas, or hydrocephalus**.

- Some studies report **ventricular enlargement** after HC, though less frequently than after DC.

Mitigation: Routine imaging to detect early hydrocephalus, lumbar punctures for effusions, and shunt placement if necessary.

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Infection and Wound Healing Complications

- **Scalp necrosis**: Poor vascularization, particularly in **elderly or diabetic** patients. - **Superficial or deep infections**: Can lead to osteomyelitis or **meningitis**.

Mitigation: Proper wound closure techniques, adequate skin flap perfusion, and perioperative antibiotic coverage.

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Seizures

- **Post-craniotomy seizures** are common due to cortical irritation.

- HC does not eliminate the risk and may be associated with **higher seizure rates** compared to standard craniotomy.

Mitigation: Prophylactic anticonvulsants in high-risk patients, monitoring for seizure onset, and EEG follow-up when necessary.

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Long-Term Neurological Outcomes

- Some patients may have **persistent neurological deficits**, similar to DC.

- Inadequate decompression in severe cases may contribute to **worse functional recovery**.

Mitigation: Careful **preoperative ICP and brain edema assessment** to determine if HC is the

optimal choice over DC.

— While **hinged craniotomy** is a valuable alternative to DC, **complications such as swelling, bone resorption, infection, and CSF disturbances** must be considered. Proper **patient selection, surgical technique, and postoperative monitoring** can help minimize risks. Would you like details on how it compares to **other decompressive techniques**?

There is no consistent literature about the complications of hinged craniotomy. In particular, there are no reported cases of contralateral subdural effusion (CSE) after HC. In this article Kuptsov et al. present a case of a 55-year-old man who developed CSE after a hinged craniotomy (HC) for intracranial hypertension, and how they handled it [1].

1)
Kuptsov A, Rocca A, Gómez-Revuelta C, Flores-Justa A, Fernández-Villa J, Nieto-Navarro JA. Contralateral subdural effusion following decompressive hinged craniotomy: A case report and narrative review. Neurocirugia (Astur : Engl Ed). 2025 Mar 14:500660. doi: 10.1016/j.neucie.2025.500660. Epub ahead of print. PMID: 40090487.