Subdural Effusion

Subdural effusion refers to the accumulation of cerebrospinal fluid (CSF) or CSF-like fluid in the **subdural space**, located between the **dura mater** and the **arachnoid mater** of the brain.

Definition

A **subdural effusion** is a **non-hemorrhagic fluid collection** in the subdural space, typically composed of **CSF** or **protein-rich CSF-like fluid**. It may develop due to:

- Arachnoid membrane tears
- CSF leakage
- Postoperative changes
- Inflammatory processes

Synonyms

- Subdural hygroma (commonly used synonym)
- CSF subdural collection
- Non-hemorrhagic subdural collection
- Subdural cerebrospinal fluid accumulation

> ⚠ `Note`: While “subdural hygroma” is often used interchangeably, it technically refers to **pure CSF collections**, whereas “effusion” may contain **reactive or inflammatory components**.

Radiological Appearance

- **CT**: Hypodense crescent-shaped fluid collection
- **MRI**: Signal intensity similar to CSF on T1 and T2 (if uncomplicated)
- Typically **no enhancement** unless associated with inflammation

Etiology

- Traumatic brain injury
- Decompressive craniectomy or hinged craniotomy
- Overdrainage from CSF shunting
- Post-infectious or inflammatory states
- Idiopathic (rare)

⚖ Differential Diagnosis

- Chronic subdural hematoma

- Subdural empyema
- Hygroma
- Reactive subdural collections

Clinical Relevance

Subdural effusions may be:

- **Asymptomatic** (incidental findings)
- Symptomatic with **headache**, **confusion**, or **focal deficits**
- Risk factor for **mass effect** or **progression to hematoma**

Management

- Observation (if small and asymptomatic)
- Serial imaging
- Surgical drainage (if mass effect or deterioration)
- Address underlying cause (e.g. revise shunt, treat infection)

Case reports

In a **case report**, *Artem Kuptsov* et al., from the **Department of Neurosurgery, Hospital General Universitario de Alicante Dr. Balmis** (Alicante, Spain) and the **Department of Medicine and Surgery, University of Milan Bicocca** (Milan, Italy), published in *Neurocirugía (English Edition)* the **first documented case** of **contralateral subdural effusion (CSE)** following a **hinged craniotomy (HC)**. Through a **narrative literature review**, they explore the **pathogenesis**, **clinical management**, and **preventive strategies** related to this rare complication [1].

They conclude that **hinged craniotomy** is a **promising alternative** to **decompressive craniectomy (DC)**, as it avoids the need for secondary cranioplasty while still providing effective control of intracranial pressure. However, the case demonstrates that **CSE may occur postoperatively**, a complication **not previously reported** in association with HC.

The authors emphasize the need for:

* Greater **awareness** of rare HC-related complications * A better **understanding of cerebrospinal fluid dynamics** * Further **research** into **postoperative monitoring and prevention** following HC

While Kuptsov et al. attempt to highlight a novel postoperative complication—**contralateral subdural effusion (CSE)**—following **hinged craniotomy (HC)**, their report ultimately contributes more **anecdote than evidence**, and raises more **questions than it resolves**.

1. **Type of Study: Weak Evidence by Design**

The article is a **single case report**, the **lowest tier of clinical evidence**, accompanied by a **narrative (non-systematic) review**. No attempt is made to quantify incidence, establish causality, or define a reproducible clinical protocol. The “review” lacks a defined methodology, inclusion criteria, or critical synthesis—thus offering no more than a selective literature commentary.

 2. **Absence of Diagnostic Rigor**

The diagnosis of CSE is **radiological and speculative**, without histological confirmation, CSF analysis, or demonstration of a clear mechanism. No preoperative imaging is presented for comparative purposes. The pathophysiological discussion remains vague, relying heavily on **inference rather than demonstration**.

 3. **Narrative Review Without Substance**

Despite the authors’ claim of reviewing the literature to explore “pathogenesis, management, and prevention,” the review is **methodologically hollow**. It fails to:

* Classify subdural fluid collections appropriately * Differentiate effusion from hygroma or subacute hematoma * Address alternative explanations (e.g., iatrogenic CSF redistribution, intracranial compliance issues)

The few cited sources are **descriptive** and **non-critical**, reflecting a **technophilic bias** rather than analytical depth.

 4. **Overstated Conclusions**

The authors describe HC as a “promising alternative” to decompressive craniectomy. Yet their own case illustrates a **potentially serious, unreported complication**, which undermines rather than supports this claim. They paradoxically recommend greater adoption of HC while simultaneously exposing its unknown risks—without providing actionable safety recommendations.

 5. **What Is Actually New?**

The only novelty is the **location of the fluid collection**—contralateral rather than ipsilateral. However, this may simply reflect variations in CSF dynamics already well described in literature on hygromas after DC. As such, the **clinical value** of the article is limited, and its **generalizability is nonexistent**.

 Final Verdict

Kuptsov et al.’s report **falls short of scientific rigor**, offering a **poorly substantiated hypothesis**, disguised as a clinical insight. Rather than clarifying the risks of hinged craniotomy, it leaves readers with **a sense of uncertainty amplified by weak evidence and speculative conclusions**. Until supported by **prospective data or mechanistic studies**, the clinical significance of this case remains **dubious at best, misleading at worst**.

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 (Engl Ed). 2025 Mar 14:500660. doi: 10.1016/j.neucie.2025.500660. Epub ahead of print. PMID: 40090487.