

CASE STUDY

Chronic Subdural Hematoma After Decompressive Craniotomy for Acute Epidural Hematoma: A Case Report

Emmanuel Olave Nsengiyumva^{1,*}, Chaimaa Amry¹, Abdelhamid Jehri^{1,2}, Espoir Irakoze¹, Khadija Ibahioin^{1,2}, and Abdelhakim Lakhdar^{1,2}

ABSTRACT

Introduction: The formation of a chronic subdural hematoma at the same surgical site after evacuation of an extradural hematoma is a rare phenomenon.

This article discusses a rare case in which a chronic subdural hematoma developed following decompressive craniectomy performed to treat an acute epidural hematoma.

Case Presentation: We report the case of a 61-year-old male patient who underwent surgery in December 2024 for evacuation of a left parietal extradural hematoma. The patients presented with symptoms, including headache, confusion, and focal neurological deficits, which were indicative of a chronic subdural hematoma.

Computed tomography revealed a crescent-shaped hypodense lesion over the convexity of the brain, characteristic of chronic subdural hematoma.

Discussion: The development of chronic subdural hematoma after decompressive craniotomy may be due to factors such as brain re-expansion, changes in intracranial pressure, and the formation of new blood vessels in the subdural space.

The patients underwent surgical evacuation of the chronic subdural hematoma via a burr hole procedure, which led to the resolution of symptoms and improved neurological function.

Conclusion: Maintaining a high index of suspicion is essential, particularly in patients who develop delayed neurological symptoms. Establishing standardized follow-up and imaging protocols may help prevent delayed diagnoses and improve overall patient outcomes.

Keywords: Hematoma extradural, postoperative complication, subdural chronic.

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¹MD, Department of Neurosurgery, Ibn Rochd, University Hospital, Casablanca, Morocco.

²MD, Laboratory of Research on Neurology, Neurosensorial Diseases and Disability, Faculty of Medicine, Hassan II University, Casablanca, Morocco.

*Corresponding Author:
e-mail: nseolave@gmail.com

1. INTRODUCTION

Chronic subdural hematoma occurring after evacuation of an acute extradural hematoma is an extremely rare postoperative complication. Although uncommon, it remains a possibility that clinicians should be aware of during postoperative monitoring.

Extradural hematomas account for approximately 1%–2% of all head injuries and are typically associated with skull fractures that rupture the middle meningeal artery [1]. The standard treatment involves immediate surgical decompression, usually through a craniotomy.

Most patients experience favorable outcomes following timely intervention. However, in rare cases, a delayed complication may arise in the form of chronic subdural hematoma, which is not commonly anticipated after extradural hematoma surgery [2].

In such cases, a hematic collection forms beneath the dura mater, often on the side opposite to the original surgical flap created for extradural hematoma evacuation. This presentation is particularly unusual, especially when compared to the more frequently documented inverse scenario



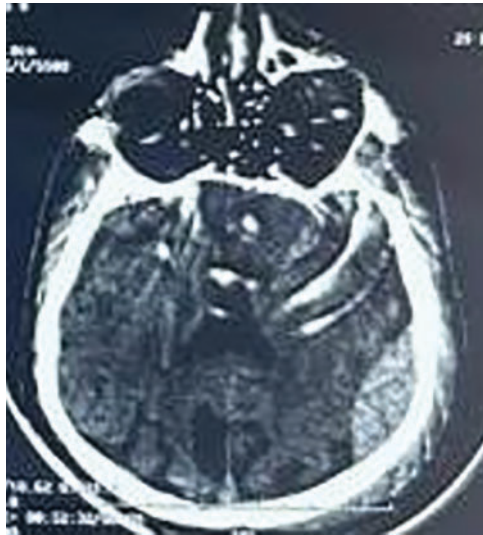


Fig. 1. Cerebral CT scan finding a left parietal EDH of 16 millimeters.

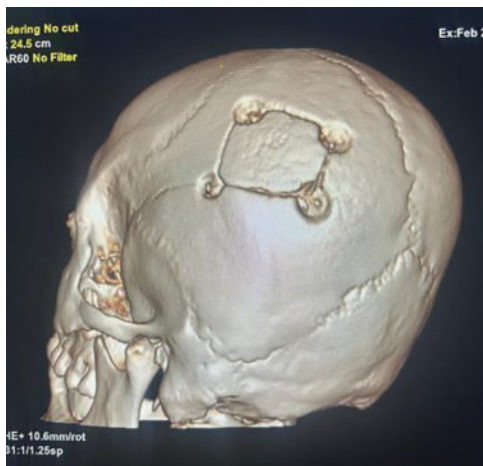


Fig. 2. 3D bone window section showing the flap made for EDH evacuation.

of an extradural hematoma developing after subdural hematoma evacuation [3].

2. CASE PRESENTATION

We report the case of a 61-year-old male patient who underwent surgery in December 2024 for evacuation of a left parietal extradural hematoma (Fig. 1), by realization of parietal trepanation (Fig. 2) with an uncomplicated postoperative course. He presented in February 2025, two months post-operatively, with moderate headache (VAS 5) and right-hemisphere heaviness.

Clinical examination revealed a conscious patient with 4/5ths right hemiparesis. A brain scan showed a left hemispheric chronic subdural hematoma with a maximum thickness of 21 millimeters (Fig. 3), and blood pressure was correct, as was the laboratory work-up, with notably no thrombopathy.

The patient benefited from the evacuation of the subdural hematoma using the flap already made. The patient

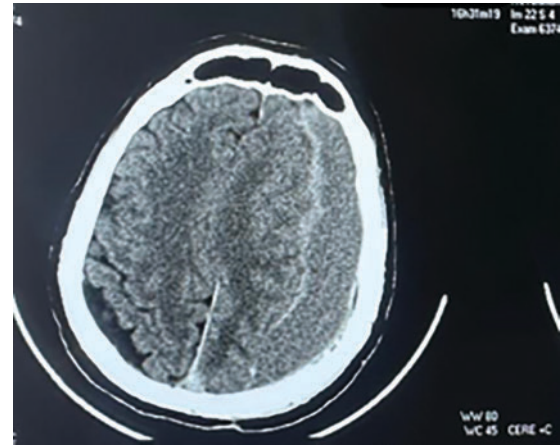


Fig. 3. Brain scan showing a left hemispheric chronic subdural hematoma with a maximum of 21 millimeters.

recovered from his deficit immediately post-operatively and was administered an analgesic and hydration regimen.

3. DISCUSSION

The development of chronic subdural hematoma (CSDH) as a postoperative complication, especially at a distance from the initial surgical site of an acute epidural hematoma (EDH), is a rare but potentially serious complication. This complication may manifest several weeks after surgery and can significantly impact clinical outcomes if not promptly recognized and managed [2].

Several pathophysiological mechanisms have been proposed to explain the development of CSDH after EDH evacuation. First, rapid decompression can result in cerebral displacement, which increases the risk of bridging vein rupture [3]. Second, changes in intracranial pressure gradients may cause tension and subsequent tearing of subdural veins. Additionally, persistent cerebrospinal fluid leakage or subdural hygromas can evolve into chronic subdural hematomas [4]. Finally, surgical manipulation may trigger local inflammatory responses, leading to membrane formation and chronic, low-grade bleeding [5].

Cranial computed tomography (CT) is the first-line imaging modality for the diagnosis of postoperative CSDH. It typically reveals a crescent-shaped subdural collection with radiodensity that varies according to the age of the hematoma. In symptomatic cases, hematoma may exert a mass effect on the adjacent cerebral parenchyma, sometimes displacing midline structures such as the diencephalon [3].

Management of postoperative CSDH should be individualized, considering each patient clinical presentation, risk factors, hematoma size, and its impact on the surrounding brain structures. Surgical intervention is generally indicated for symptomatic or large hematomas. Ideally, the previously performed craniotomy site should be used to evacuate the hematoma, perform subdural lavage, and remove any fibrous membranes to prevent recurrence [5].

This case highlights the importance of close postoperative monitoring in patients undergoing EDH surgery, as delayed complications, such as CSDH, although uncommon, can occur and require timely surgical intervention.

4. CONCLUSION

Although rare, chronic subdural hematoma following surgery for extradural hematoma is a potentially serious postoperative complication. Maintaining a high index of suspicion is essential, particularly for patients who develop delayed neurological symptoms. Establishing standardized follow-up and imaging protocols may help prevent delayed diagnoses and improve overall patient outcomes.

DATA AVAILABILITY STATEMENT

The original contributions of this study are included in the article/supplementary material. Further inquiries can be directed to the corresponding authors.

ETHICS STATEMENT

Ethical review and approval were not required for the study of human participants in accordance with local legislation and institutional requirements. Patients and participants were informed to give consent to participate in the study. Written informed consent was obtained from each individual(s) for publication of potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

NEO and AL conceived of and designed the study. NEO drafted the manuscript. AL critically revised the manuscript. All authors have contributed to the manuscript and approved the submitted version.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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