

Septate Chronic Subdural Hematoma: A Rare Presentation and Surgical Management

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Abstract

Chronic subdural hematoma (CSDH) is an accumulation of aged blood between the dura mater and the arachnoid. It is a liquefied and encapsulated effusion located in the subdural space. The majority of chronic SDH cases arise as a *de novo* disease following minor head trauma without a prior acute stage of SDH. Additionally, many patients with chronic SDH do not have a clear history of trauma. We report the case of a 66-year-old patient who was assaulted three months ago and sustained a deliberate head injury (a blow to the head from a metal object). Four days before presentation, the patient developed left-sided weakness, prompting a consultation with a cardiologist, where a brain CT scan was performed. The scan revealed a frontoparietal septate chronic SDH on the right side. The patient underwent surgery with evacuation of the hematoma through two trephine holes, one frontal and one parietal, on the right side. The surgical outcome was favorable. The overall incidence of SCDH is reported to be approximately 10 per 100,000 people in the general population and may be as high as 100 per 100,000 among the elderly. Clinical signs vary and may include headache, mental status changes, weakness, seizures, gait disturbances, nausea, vomiting, and even disturbances of consciousness or coma. Chronic subdural hematoma is a common neurosurgical condition, especially in older male patients, and treatment is often surgical.

Keywords: Chronic Subdural Hematoma; Neomembrane; Burr Hole

Introduction

Chronic subdural hematoma (CSDH) is an accumulation of aged blood between the dura mater and the arachnoid. It is a liquefied and encapsulated effusion located in the subdural space [5]. CSDH is common in elderly patients, with a clear male predominance [5,6,8]. It represents the most common neurosurgical emergency and one of the most frequent types of intracranial hemorrhage, with a favorable prognosis when treated appropriately [1-3,7,8]. Despite medical and surgical treatment, recurrence rates remain high [1]. The incidence of CSDH is increasing due to the aging population and the widespread use of antiplatelet agents and oral anticoagulants [1-3,7,8]. The pathogenesis of chronic subdural hematoma, particularly its relationship to head trauma, is not fully understood. Some patients develop CSDH following acute traumatic SDH that persists and matures into a chronic state [1]. In contrast, the majority of CSDH cases arise as a *de novo* disease following minor head trauma without a prior acute stage of SDH. Additionally, many patients with CSDH do not have a clear history of trauma [1]. Management of this pathology includes evacuation via twist-drill craniostomy, burr hole drainage, or craniotomy. The first two approaches are less invasive, but they have a higher recurrence rate due to limited exposure and insufficient drainage [2]. In recent decades, corticosteroid therapy has become an essential adjunct treatment [6].

Case Report

We report the case of a 66-year-old patient who was assaulted three months ago, sustaining a deliberate head injury (a blow to the head from a metal object). Four days before admission, the patient developed left-sided weakness, prompting a consultation with a cardiologist. A brain CT scan was performed, revealing pathological findings, leading to the patient’s admission. Clinical examination revealed a conscious, cooperative patient with a Glasgow Coma Scale (GCS) score of 15/15. Neurological evaluation showed left hemiparesis graded 4/5, with clumsiness of the left leg. The brain scan revealed a right frontoparietal septate chronic subdural hematoma with significant rebleeding (Figure 1).

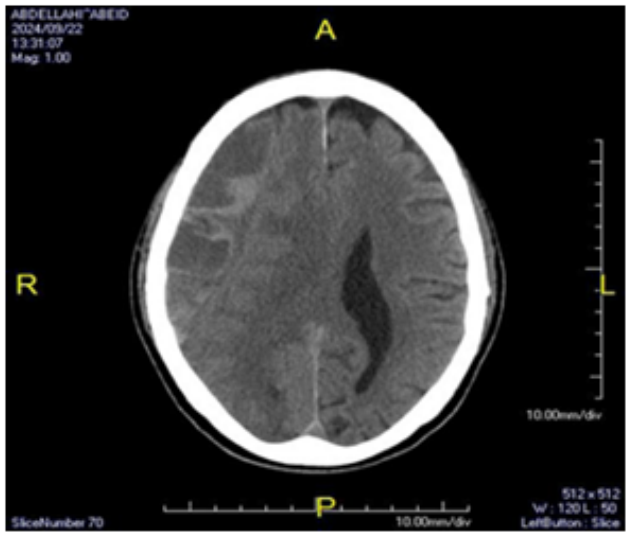


Figure 1: Right septal chronic subdural hematoma.

The patient underwent surgery, benefiting from the evacuation of the hematoma through two frontal and parietal burr holes on the right, with the installation of a Redon drain for 24 hours (Figure 2-5). The surgical outcomes were favorable.



Figure 2: Cranial trepanation after preparation of the surgical site cutaneous incision and placement of the self-retaining retractor.



Figure 3: Opening of the dura mater after coagulation using bipolar forceps.



Figure 4: Drainage of the septate hematoma, with hematoma ejection in a jet.



Figure 5: Complete evacuation of the hematoma and irrigation of the cavity through the second burr hole.

Discussion

The overall incidence of chronic subdural hematoma (CSDH) in the general population is reported to be approximately 10 per 100,000 people, rising to as high as 100 per 100,000 among the elderly population [1]. According to a study conducted on 133 patients who underwent surgery for CSDH, this incidence increases after the age of 65 to approximately 58.1 per 100,000 inhabitants per year, as observed in our 66-year-old patient [4]. According to Chen H., *et al.* by 2030, the incidence of CSDH is expected to surpass that of intracranial tumors, becoming the most common cranial neurosurgical disease [1]. Chronic subdural hematoma is a common neurosurgical condition with an increasing incidence, likely due to the aging global population and the widespread use of antithrombotic medications [1]. The average age of affected patients is 70 ± 13 years. This could be explained by cerebral atrophy, which facilitates blood collection in the subdural space even with minor trauma, as well as by the vascular fragility of the elderly due to hypertensive or diabetic angiopathy and the use of antiplatelet agents. Cerebral dehydration, to which the elderly are predisposed, also plays a role [4-7]. Regardless of the initiating event, Chen H., *et al.* suggested that CSDH formation begins with injury and irritation of the dural border cell layer and is considered an angiogenic and chronic inflammatory disease. Minor trauma to this layer triggers various reparative, angiogenic, and inflammatory processes similar to wound healing [1]. Most chronic subdural hematomas eventually become encapsulated and partitioned by internal neomembranes, growing progressively due to recurrent bleeding from the outer layer [7]. Most studies have found a history of head trauma in three-quarters of patients with CSDH. This trauma is often minor and can go unnoticed, confirming that CSDH is a late complication of head trauma. Other major risk factors for CSDH include hypertension, diabetes, and the use of anticoagulants [3-5,8]. According to A. Riyad., *et al.* chronic alcoholism accounts for 20 - 30% of risk factors. Additionally, blood clotting disorders, particularly idiopathic thrombocytopenic purpura, have been reported in numerous cases [5,8].

The clinical presentation of CSDH is varied and may include headache, mental status changes, weakness, seizures, gait disturbances, nausea, vomiting, and even disturbances of consciousness or coma [2,6,7]. Headaches associated with intracranial hypertension syndrome were the most frequently reported symptom, while motor deficits were the most commonly observed physical signs [5]. A study conducted in the neurosurgery department of University Hospital Center of Oran over 13 years, involving 468 cases, found that the most common reason for consultation was hemiparesis with gait disturbances, occurring in 58% of cases [6]. A brain scan without contrast is typically sufficient to diagnose CSDH when neurological symptoms develop progressively [4]. Surgical treatment remains the most effective option [4,8]. Various techniques are available, including one or two burr holes with drainage catheters, small craniotomies with endoscopic hematoma removal, subdural shunting (mainly for pediatric cases), and wide craniotomies with hematoma evacuation and membrane resection [8]. The preferred surgical approach typically involves burr-hole drainage, which is less invasive but associated with a higher recurrence rate due to limited exposure and insufficient drainage [2,8].

Although craniotomy allows for membrane removal and may reduce recurrence rates, it is associated with a higher risk of complications, morbidity, and mortality due to its invasiveness [2,8]. The recurrence rates were found to be 33% for twist-drill evacuation, 12% for burr-hole drainage, and only 10.8% for craniotomy. Consequently, burr-hole evacuation remains the first-line surgical approach [2,3,8]. The overall recurrence rate of CSDH ranges between 5% and 33%. Despite advancements, the overall prognosis of CSDH has not improved significantly over the past three decades, prompting neurosurgeons to explore alternative treatments [2]. Recently, minimally invasive surgery using a neuroendoscope has shown promising results for treating CSDH and septated subacute subdural hematoma (SASDH) [2]. This technique provides enhanced visualization, allowing for membrane separation within the hematoma cavity, which may reduce recurrence rates. Middle meningeal artery embolization (MMAE) has also emerged as a promising adjunct or standalone treatment for preventing CSDH recurrence [1,3]. Traditionally, CSDH has been managed through either surgical evacuation (for larger, symptomatic cases) or conservative medical management [1]. While some chronic SDH cases resolve without surgery, many patients initially treated conservatively eventually require drainage. Surgical evacuation provides rapid symptom relief but carries a recurrence rate of up to 20%, suggesting that drainage alone is insufficient to address the chronic, relapsing nature of CSDH [1]. Neuroendoscopic hematoma removal,

first introduced for CSDH in 1988, has been extensively discussed in the literature. Studies have found that endoscope-assisted techniques do not increase morbidity and, by improving intraoperative visualization, allow for the identification and removal of neomembranes, septa, and solid clots, as well as coagulation of bleeding sources-making this approach safer and more effective [2,9]. However, attempting evacuation in hematomas consisting entirely of solid membranes is likely to fail. Large craniotomies with membranectomy may reduce recurrence rates by removing the source of persistent bleeding, but they also carry significant risks and may not be suitable for older patients with comorbidities, particularly coagulation disorders [1,9].

Currently, medical treatments for CSDH remain limited. The efficacy of dexamethasone remains controversial, with data not supporting its routine use [1,3]. Atorvastatin has shown promise in clinical trials, demonstrating potential for hematoma resorption [1,3,9]. However, larger studies are required to confirm its effectiveness. Other agents, such as tranexamic acid (a procoagulant) [1,3] and bevacizumab (an anti-angiogenic agent), are also being investigated [1]. Risk factors for recurrence include advanced age, male gender, brain atrophy, the use of anticoagulant or antiplatelet medications, and the presence of mixed or high density hematomas on CT scans [2,8].

Conclusion

Chronic subdural hematoma is a common neurosurgical condition, particularly in older male patients. The clinical presentation is variable, and treatment is primarily surgical, with several available evacuation techniques. In our country, the most commonly used approach is the creation of one or two trephine holes adjacent to the hematoma. The prognosis depends on age and associated comorbidities.

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