LATIN Neurosurgery

Case Report

Is postoperative imaging mandatory after drainage of chronic subdural hematoma? Illustrative case

¿Es obligatoria la obtención de imágenes posoperatorias tras el drenaje de un hematoma subdural crónico? Caso ilustrativo

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ABSTRACT

Introduction: *Chronic subdural hematoma (HSDC) has been a frequent neurosurgical condition. Its diagnosis is made using neurological and imaging examinations. The initial treatment has been surgical, and complications due to surgery are hematoma recurrence and pneumocephalus.* **Case presentation:** *75-year-old male patient. History of progressive headache, difficulty in moving the right upper and lower limbs, and behavioral disturbance. Cranial tomography (CT) of the skull without contrast showed bilateral hypodense frontoparietal lesion. Bifrontoparietal trepanation and drainage of the hematoma were performed. In the immediate postoperative period, the neurological condition worsened and it was difficult to move the left side of the body. A control cranial CT scan showed an acute right parietal epidural hematoma. Conservative treatment was performed with progressive improvement of the neurological condition.* **Conclusion:** *The indication of CT control in the immediate postoperative period of DCS drainage is indicated when the neurological condition worsens.*

Keywords: *chronic; subdural hematoma; outcome; postoperative, computed tomography.*

RESUMEN

Introducción: *El hematoma subdural crónico (CSDH) ha sido una condición neuroquirúrgica común. Su diagnóstico se realiza mediante exploración neurológica e imágenes. El tratamiento inicial ha sido quirúrgico y las principales complicaciones de la cirugía son la recurrencia del hematoma y el neumoencéfalo.* **Reporte de caso:** *Paciente masculino de 75 años. Historia de dolor de cabeza progresivo, dificultad para mover los miembros superiores e inferiores derechos y alteración del comportamiento. Tomografía craneal (TC) sin contraste de cabeza con lesión hipodensa frontoparietal bilateral. Se realizó trepanación bifrontoparietal y drenaje del hematoma. En el postoperatorio inmediato su estado neurológico empeoró y tuvo dificultad para mover el lado izquierdo. La TC de cabeza de control mostró un hematoma epidural parietal derecho agudo. Se realizó tratamiento conservador con mejoría progresiva del estado neurológico.* **Conclusión:** *La indicación de control por TC en el postoperatorio inmediato del drenaje HSDC está indicada cuando el cuadro neurológico empeora.*

Palabras clave: *crónico; hematoma subdural; desenlace; tomografía computarizada, postoperatoria.*

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1 INTRODUCTION

Chronic subdural hematoma (CSDH) is a common neurosurgical condition that predominantly affects the elderly population[1,2]. Predisposing factors include the use of anticoagulant drugs, mild traumatic brain injury, cerebral atrophy, and chronic abusive alcohol consumption[1]. Diagnosis is primarily based on neurological examination, which includes symptoms such as headache, psychiatric disturbances, and focal neurological deficits, e.g. hemiparesis or aphasia, in addition to computed tomography (CT) imaging[1-3].

The authors report a case of CSDH that underwent surgical drainage and presented new neurological symptoms in the immediate postoperative period. A follow-up CT scan revealed the presence of a right parietal epidural hematoma. The authors discuss the necessity of performing postoperative CT monitoring for patients with CSDH.

2 CASE PRESENTATION

Patient JPS, 75 years old, male, presenting comorbidities of arterial hypertension, diabetes mellitus, and benign prostatic hyperplasia. Presented with progressive headache, difficulty in moving the right arm and leg, and behavioral disturbances. No history of previous traumatic brain injury was reported. Neurological examination revealed alert but disoriented patient, in time and space, with right-sided hemiparesis. Fundoscopic examination was impaired due to lens opacity. Non-contrast cranial CT scan showed bilateral frontoparietal hypodense lesions, more pronounced in the left hemisphere (Figure 1). The patient underwent surgical treatment with bilateral trepanation, hematoma drainage, and irrigation of the cavities with saline solution. Twelve hours after surgery, the patient developed delirium and mild left hemiparesis, with no improvement in the previous neurological symptoms. A new non-contrast cranial CT scan showed the postoperative status of the left chronic subdural hematoma (CSDH) drainage and the presence of a hyperdense lesion in the right parietal region, consistent with acute epidural hematoma (Figure 2). The patient's treatment was managed conservatively, resulting in progressive improvement of the neurological deficit.

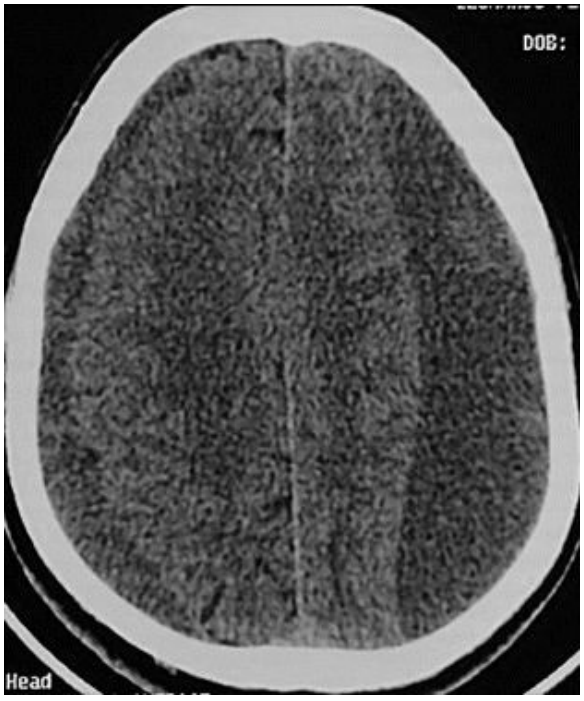

Figure 1. Non-contrast-enhanced cranial CT demonstrating bilateral frontoparietal hypodense lesion, compatible with chronic subdural hematoma.

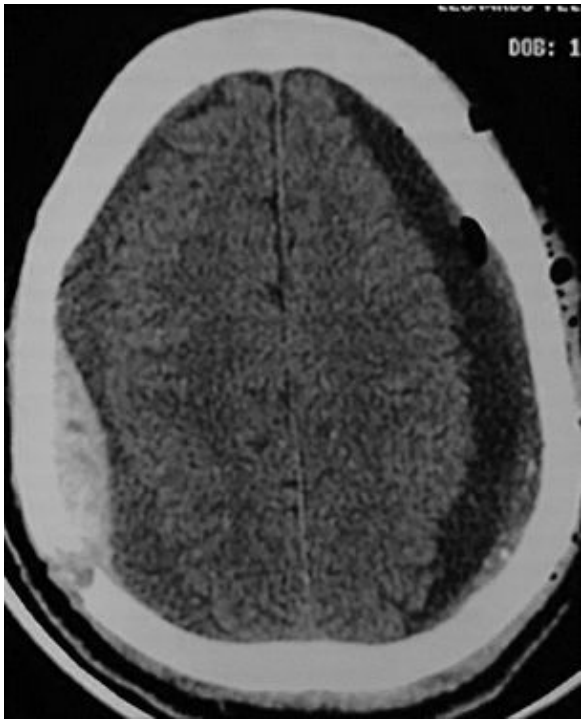

Figure 2. Non-contrast-enhanced cranial CT control 12 hours after surgery, demonstrating post-surgical status and presence of right parietal epidural hematoma.

3 DISCUSSION

Surgical treatment has been considered the best method to manage symptomatic chronic subdural hematoma (CSDH), but there is no consensus regarding the optimal surgical procedure[4]. Various approaches such as trepanation, craniotomy with or without drainage, and craniectomy have been employed, based on the patient's age, hematoma location, clinical condition, and the surgeon's preference. The primary goal of surgical intervention is to decompress the affected cerebral hemisphere and reduce the risk of complications, thereby lowering morbidity and mortality. The main complications associated with surgical treatment of CSDH include recurrence and pneumocephalus[5-10].

According to Manninen et al.[11], neurosurgical procedures tend to have more postoperative complications compared to other surgical specialties. Computed tomography (CT) examinations are associated with significant radiation exposure[12] and operational costs[3]. Routine postoperative CT scans in neurosurgical procedures are commonly performed to predict the possibility of early complications, such as hemorrhage or cerebral edema[13]. Some procedures are routinely followed by CT scans to assess the extent of lesion resection or to confirm the location of a ventricular catheter in cases of shunting procedures[14-16]. Although the risk of hematoma occurrence is low[15], routine postoperative CT has been considered for medico-legal reasons in other studies[15,17]. In a series of craniotomies presented by Wen et al.[17], only 1.9% required reoperation due to hematoma presence.

According to Broalet et al.[5], postoperative complications can be severe and sometimes fatal, necessitating close postoperative monitoring to detect early signs of deterioration. Garrett et al.[18] retrospectively analyzed the use of CT in all neurosurgical patients, and concurred that routine imaging without any change in neurological status would unlikely be beneficial in patients after CSDH drainage. According to Rahimi-Moraghar et al.[19], individual surgeons may opt to perform immediate postoperative CT scans for various reasons, including complication evaluation and to assess potential residual hematoma reduction or enlargement and document surgical outcomes.

A Swiss study with 361 randomized patients showed that routine CT scans did not improve clinical outcomes but led to increased treatment costs, partly due to prolonged hospitalization[20]. Therefore, for these authors, the utility of routine CT follow-up to predict symptomatic recurrence is questionable. On the other hand, Dudoit et al.[21] reported that routine postoperative CT scans can potentially detect CSDH recurrence before clinical deterioration occurs. In a Danish study with 202 patients, neurological symptom recurrence preceded the planned postoperative CT scan (four to six weeks after the initial surgery) in all patients who underwent a second surgery, leading to increased hospital costs[1]. Rauhala et al.[22] pointed out that routine CT scans may reveal significant hematoma recurrence in some clinically asymptomatic patients, leading to a decision for a second surgery. They suggest performing CT control only in clinically symptomatic patients.

According to Ng et al.[3], routine postoperative cranial CT after trepanation for CSDH drainage may be unnecessary, considering the good predictive value of preoperative hematoma volume and because it is not predictive of clinical outcomes. Moussa et al.[23] indicate that early CT scans are generally performed for detecting significant residual hematoma before the late development of symptoms[23] or as part of routine postoperative care [24]. Stanisic et al. [10] demonstrated in their study that the presence of residual hematoma or pneumocephalus is predictive of hematoma recurrence.

In a study on 433 neurosurgical procedures, Fontes et al.[25] showed that early CT did not improve reoperation rates based solely on imaging findings. Pedersen et al.[1] reported on routine CT control - four to six weeks after CSDH drainage - and concluded that it had no clinical value. CT control is only indicated if there is a clinical suspicion of hematoma recurrence or in selected cases when the patient cannot adequately communicate, although clinical follow-up can still be equally effective. According to Brokinkel et al.[26], there are controversies regarding whether to indicate CT control when the drain is still in place or after its removal. These authors recommend CT control after drain removal because it can reveal both clinical and subclinical damages caused by removal, and additionally early subclinical recurrence of CSDH. For Qoqandi et al.[27], routine postoperative CT does not alter the course of clinical treatment, even in the presence of significant radiological findings. Any abnormality observed in CT is usually accompanied by clinical deterioration; hence, routine postoperative imaging is not necessary unless indicated.

4 CONCLUSION

The routine postoperative CT control after CSDH drainage does not hold significant clinical value. Imaging examinations in the postoperative period of CSDH are recommended if the patient's clinical condition does not improve or if there are concerns about the patient's evolution. The authors suggest that postoperative imaging should be considered when there is clinical deterioration, as in the case with our patient. Additionally, specialized healthcare services should establish guidelines for cases where early CT control is deemed necessary after a specific surgical procedure.

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