

Dexamethasone treatment in chronic subdural hematoma - a case report

Upotreba deksametazona u liječenju kroničnog subduralnog hematoma - prikaz bolesnice

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Summary

The topic of this research, chronic subdural hematoma (CSH), is one of the most common pathologies in neurosurgery, and it is more frequent in the elderly. Surgical evacuation has been widely considered the gold standard treatment. Despite the excellent outcomes, sometimes some cases require a different approach. The treatment choice depends on the general condition of the patients, as well as the clinical presentation and hematoma volume. Also, preexisting comorbidities in elderly patients, postoperative complications, and the ability to recover must be considered. Consequently, conservative treatment can be effective in carefully selected cases, and can be considered if the patient's neurological and physical conditions allow. Some drugs contribute to CSH resolution by changing the capsule membrane permeability and inhibiting the fibrinolytic and inflammatory systems. Our work is based on the efficacy of dexamethasone as a method of conservative therapy, and it was demonstrated in the case of a 91-year-old patient.

Keywords: chronic subdural hematoma, dexamethasone, neurosurgery, pharmacological treatment, spontaneous remission

Sažetak

Tema ovoga rada, kronični subduralni hematom, jedna je od najčešćih patologija u neurokirurgiji, a češće se javlja kod starije populacije. Kirurška evakuacija hematoma smatra se zlatnim standardom u liječenju. Usprkos izvrsnim rezultatima, postoje slučajevi koji zahtijevaju drugačiji terapijski pristup. Izbor liječenja ovisi o općem stanju bolesnika, kliničkoj slici i volumenu hematoma. U obzir se moraju uzeti i komorbiditeti kod starijih bolesnika, te poslijeoperacijske komplikacije i mogućnost oporavka. Posljedično, konzervativno liječenje može biti uspješno kod pažljivo odabranih bolesnika i može se primijeniti ukoliko to bolesnikovo neurološko i fizičko stanje dopušta. Neki lijekovi dovode do rezolucije hematoma, mijenjajući permeabilnost kapsule membrane ili inhibirajući fibrinolitičke i inflamatorne procese. Naš rad temelji se na učinkovitosti deksametazona kao metode konzervativnog liječenja koje je prikazano na slučaju 91-godišnje bolesnice.

Ključne riječi: kronični subduralni hematom; deksametazon; neurokirurgija; farmakološki tretman; spontana remisija

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Introduction

Chronic subdural hematoma (CSH) is a hemorrhagic brain injury that persists for more than 21 days after its initial formation.¹ The CSH incidence in the general population is estimated at 1-13.1 cases per 100,000 inhabitants per year, and it can increase with the aging of the population.² It can occur even after a minor head injury, but about 50% of patients deny a history of trauma. In addition to trauma, common risk factors related to the development, malabsorption, or recurrence of CSH include the following: long-term use of anticoagulants or antiplatelet drugs, repeated or a sudden increase in chest and abdominal pressure, craniotomy, and coagulopathy.^{2,3} Symptoms related to a CSH include headache, gait disturbance, falls, cognitive decline, focal neurological deficit, speech disturbance, decreased consciousness, and seizures.³ Surgical treatment is the gold standard for symptomatic individuals, but some patients receive conservative treatment with clinical measures and serial radiological follow-up. However, spontaneous resolution may occur in some cases without surgical intervention with an extremely variable epidemiology incidence: lower than 1% to 20%. Some drugs, such as mannitol, corticosteroids, tranexamic acid, and atorvastatin, contribute to CSH resolution because they change the capsule membrane permeability and inhibit the fibrinolytic and inflammatory systems.¹

Case report

A 91-year-old female patient was admitted to the Emergency Care Unit of Zenica Cantonal Hospital after being hit by a truck as a pedestrian when she fell on her right hand and her head. She was conscious, hemodynamically stable, orientated, communicative, mobile, with symmetrical and reactive pupils, and recalled the event completely. The initial Glasgow Coma Scale score (GCS) was 15. There was a 1 cm laceration on the lateral edge of the periorbital region, affecting the skin and subcutaneous tissue and the excoriation and hematoma in the right infraorbital and frontal region. The performed CT (computed tomography) of the head showed discrete traumatic subarachnoid hemorrhage (tSAH) on the left side of the parietal lobe without signs of cerebral edema (Figure 1).

The neurosurgical exam excluded the lateralization or signs of focal brain deficit. During the examination, she complained of a headache without nausea and vomiting. After a short observation, the patient felt well subjectively, so she was dismissed. Two months later, she was admitted

to the Emergency Care Unit due to intense headache in the frontal region, nausea, vomiting, and back pain. She was conscious, with symmetrical and reactive pupils, an unremarkable neurological status, and a GCS score of 15. CT showed bilateral chronic subdural hematoma without the lateral shift of the midsagittal structures (Figure 2).



Figure 1 CT scan of the head (axial scan): acute traumatic subarachnoid hemorrhage, left subdural hygroma

Slika 1. CT glave (aksijalna snimka): akutno traumatsko subarahnoidno krvarenje, lijevi subduralni higrom

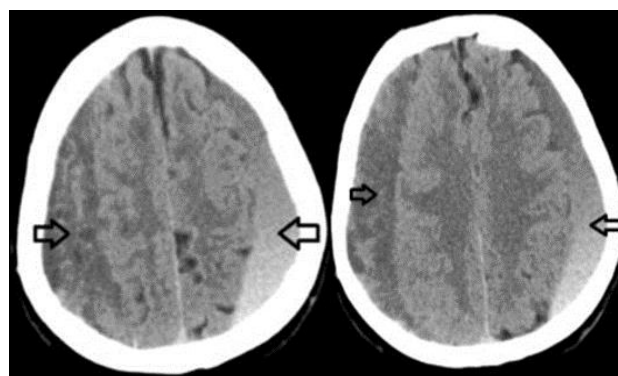


Figure 2 CT scans of the head (axial scans): bilateral compressive massive chronic subdural hematoma

Slika 2. CT glave (aksijalne snimke): bilateralni kompresivni masivni kronični subduralni hematom

The neurosurgeon in charge indicated urgent surgical treatment, but the patient declined surgery. The neurosurgeon then offered conservative therapy with corticosteroids, which she consented to. She

received dexamethasone 4 mg BID i.m. per the nursing patronage service for five days, along with pantoprazole 20 mg BID to prevent gastrointestinal complications. She received dexamethasone 4 mg along with gastroprotection for the next ten days. A follow-up CT scan after four weeks showed the complete resorption of hematoma on both sides (Figure 3).

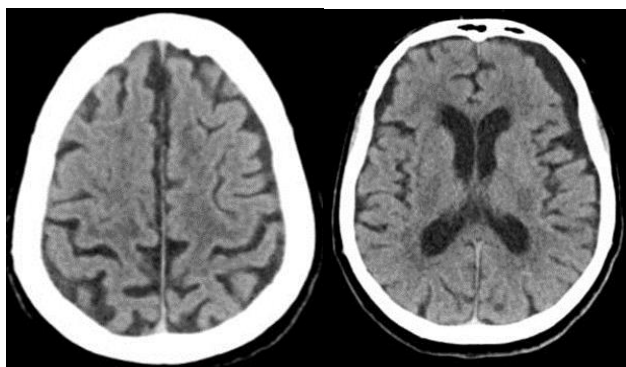


Figure 3. Follow-up CT scans of the head (axial scans): small residual bilateral subdural hygromas - resorbed subdural hematomas

Slika 3. Praćenje CT-a glave (aksijalne snimke): mali rezidualni bilateralni subduralni higromi - resorbirani subduralni hematomi

Discussion

Surgical evacuation of a chronic subdural hematoma (cSDH) by burr hole craniostomy, with or without subdural or subperiosteal drainage, is the standard of care for symptomatic patients, although it carries a risk of mortality and other complications, including the recurrence of the subdural fluid collection. Glucocorticoid therapy, such as dexamethasone, has been proposed as an alternative, nonoperative treatment because of its anti-inflammatory effect in subdural space, but may cause side effects such as hyperglycemia and fluid retention. Spontaneous resorption without the use of dexamethasone can also occur.⁴ Given the current information, the precise causative factor of hematoma's resorption in our case remains ambiguous. This emphasizes the need for further investigation. Embolization of the middle meningeal artery has recently also been imposed as a treatment method for chronic subdural hematoma. It has the advantage of targeting the vascular supply of the neomembranes implicated in chronic subdural hematoma pathophysiology and avoids surgical or bedside drainage, which is suitable in a population associated with significant comorbidities. It can be used in both primary and recurrent cases.^{5,6,7}

The choice of treatment depends on the individual patient's circumstances.^{8,9}

The indications of drug treatment for promoting hematoma absorption are: stable vital signs, Markwalder's Grading Scale (MGS) grade 0-2, midline shift less than 1 cm, patient with multiple comorbidities, patient with coagulation disorder, patient refusing surgery and the prevention of recurrence of SDH after surgery.² Atorvastatin, tranexamic acid, and dexamethasone are commonly used drugs for the treatment of CSDH, and atorvastatin and dexamethasone decreased the incidence of CSDH recurrence requiring surgery compared to placebo.¹⁰

The study of Chaturbedi shows that at six months of follow-up, the functional outcome of patients measured by the modified Rankin Score scale was not statistically significant between a group of exclusively Dexamethasone-treated group and a surgery group, and the adverse effects or morbidity related to Dexamethasone therapy was not markedly higher compared to surgical treatment.¹¹

In a study by Miah et al., a randomized trial assessed the noninferiority of a 19-day tapering course of dexamethasone therapy compared to surgery by burr-hole drainage for functional outcomes in patients with CSDH. The trial was terminated early due to safety concerns and inferior outcomes in the dexamethasone group. Based on the available outcomes at the time of termination, noninferiority of dexamethasone could not be established within the prespecified margin. While the trial was not designed to assess the superiority of either approach, most results numerically favored surgery. The mortality rate was higher in the dexamethasone group than in the surgery group, and patients in the dexamethasone group experienced more complications and required longer hospitalizations.¹²

These findings correlate with the conclusions of the study by Hutchinson et al., where dexamethasone therapy for CSDH was also associated with inferior outcomes compared to placebo.¹³

Despite reports of the beneficial effects of dexamethasone for chronic subdural hematoma (CSDH) in uncontrolled studies, these studies were limited by small sample sizes and a lack of control groups.¹⁴

The potential role of dexamethasone therapy in selected cases of chronic subdural hematoma (CSDH), such as those with specific imaging characteristics or smaller hematomas, was not investigated in the aforementioned studies. However, other studies are underway to address this question.¹⁵

Despite the interest and potential impact of conservative treatment options for CSH patients, further research is needed to assess which treatment is the most beneficial for each individual patient. However, several studies have supported the use of dexamethasone and shown some evidence of its efficacy in reducing recurrence after classic surgical treatment, consisting of hematoma drainage or as stand-alone therapy to avoid surgery. As a result, some clinicians are beginning to adopt dexamethasone as a treatment option in their routine practice, especially in patients with CSH with minimal or moderate symptomatology and relatively small subdural collection without midline shift shown on CT scans.

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