

Chronic subdural hematoma recurrence prevention

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Systematic reviews and meta-analyses

In total, 402 studies were included in this analysis and 32 potential risk factors were evaluated. Among these, 21 were significantly associated with the postoperative recurrence of CSDH. Three risk factors (male, bilateral hematoma, and no drainage) had convincing evidence ¹⁾.

Randomized controlled trials

In a [Randomized controlled trial](#) Shotar et al. assessed the efficacy of [middle meningeal artery embolization](#) in reducing the [risk](#) of [chronic subdural hematoma recurrence](#) at 6 months compared with [standard care](#) in patients who underwent an [operation](#) and were at high risk of CSDH recurrence.

Design, setting, and participants: Multicenter, open-label, randomized clinical trial with blinded end point assessment. Patients who underwent an operation for CSDH recurrence or a first CSDH episode at high risk of recurrence were recruited from July 2020 to March 2023 in 12 French neurosurgical or comprehensive neurosurgical and interventional neuroradiology centers. Last follow-up took place on November 2, 2023.

Intervention: Participants were randomized 1:1 to undergo MMA embolization with microparticles within 7 days of surgery (171 patients, intervention group) or standard medical care alone (171 patients, control group).

Main outcomes and measures: The primary end point was the rate of CSDH recurrence at 6 months assessed by an independent, blinded adjudication committee. There were 5 secondary end points,

including rates of repeat surgery for homolateral CSDH recurrence during the 6-month follow-up period and embolization procedure-related complications.

Results: Among 342 randomized patients (median [IQR] age, 77 [68-83] years; 274 [80.1%] male), 308 (90.1%) completed the trial. The primary end point was observed in 24 of 162 (14.8%) and 33 of 157 (21.0%) patients in the intervention and control groups, respectively (after imputation: odds ratio, 0.64 [95% CI, 0.36-1.14]; adjusted absolute difference, -6% [95% CI, -14% to 2%]; $P = .13$). The groups did not significantly differ in any of the secondary end points. Repeat surgery was performed in 7 of 162 (4.3%) and 13 of 157 (8.3%) patients in the intervention and control groups ($P = .14$), respectively. Minor and major embolization procedure-related complications occurred in 3 of 171 (1.8%) and 1 of 171 (0.6%) patients, respectively.

In this randomized clinical trial, among patients who underwent an operation for CSDH recurrence or a first CSDH episode at high risk of recurrence, MMA embolization did not lead to a significantly lower rate of recurrence at 6 months compared with standard medical care alone. However, the magnitude of the effect estimate is consistent with other recent trials, including some that demonstrated the benefit of MMA embolization with nonadhesive liquid embolic agents, and these findings considered together may inform future studies and potential use of this therapeutic approach for CSDH management. ²⁾

Subdural drain

The single most important factor appears to be the residual [subdural space](#) after [drainage](#) of the [chronic subdural hematoma](#) and an effort should be made by the surgeon to facilitate the [expansion](#) of the underlying brain. The presence of a functioning [drain](#) for 48-72 h draining the [subdural fluid](#) and promoting brain [expansion](#) will reduce the [subdural space](#), thus reducing the recurrence of the CSDH. Some of the relevant surgical nuances include placement of at least two [burr holes](#) with the burr holes located to drain multiple cavities, copious irrigation of the subdural space, placement of the drain in the dependent burr hole site, near-total filling of the subdural space with irrigation to prevent a pneumocephalus and placing a subdural drain. Closure of the site with a large piece of Gelfoam prevents the subgaleal blood to migrate into the subdural space.

Postoperative [subdural drain](#) of maximal 48 h is effective in reducing recurrent hematomas. However, the shortest possible drainage time without increasing the recurrence rate is unknown

see [Subdural drain for chronic subdural hematoma](#)

Middle meningeal artery embolization

see [Middle meningeal artery embolization for chronic subdural hematoma](#)

Effect of Irrigation Fluid

The effect of a physical property of [irrigation solution](#) (at body vs room temperature) on the [chronic subdural hematoma recurrence](#) rate needs further study.

Objective: To explore whether irrigation fluid temperature has an influence on cSDH recurrence.

Design, setting, and participants: This was a multicenter randomized clinical trial performed between March 16, 2016, and May 30, 2020. The follow-up period was 6 months. The study was conducted at 3 neurosurgical departments in Sweden. All patients older than 18 years undergoing cSDH evacuation during the study period were screened for eligibility in the study.

Interventions: The study participants were randomly assigned by 1:1 block randomization to the cSDH evacuation procedure with irrigation fluid at room temperature (RT group) or at body temperature (BT group).

Main outcomes and measures: The primary end point was recurrence requiring reoperation within 6 months. Secondary end points were mortality, health-related quality of life, and complication frequency.

Results: At 6 months after surgery, 541 patients (mean [SD] age, 75.8 [9.8] years; 395 men [73%]) had a complete follow-up according to protocol. There were 39 of 277 recurrences (14%) requiring reoperation in the RT group, compared with 16 of 264 recurrences (6%) in the BT group (odds ratio, 2.56; 95% CI, 1.38-4.66; $P < .001$). There were no significant differences in mortality, health-related quality of life, or complication frequency.

Conclusions and Relevance: In this study, irrigation at body temperature was superior to irrigation at room temperature in terms of fewer recurrences. This is a simple, safe, and readily available technique to optimize outcome in patients with cSDH. When irrigation is used in cSDH surgery, irrigation fluid at body temperature should be considered standard of care.

Trial registration: ClinicalTrials.gov Identifier: NCT02757235 ³⁾.

Half-saline solution

A study aimed to evaluate the [efficacy](#) and [safety](#) of [half-saline solution](#) for [irrigation](#) in [burr hole trephination for chronic subdural hematoma](#).

This [randomized clinical trial](#) was conducted in [university hospital referral centers](#) from 2020 to 2021. Sixty-three patients with [chronic subdural hematoma](#) eligible for [burr hole trephination](#) were primarily enrolled. Two patients were excluded because of concurrent [stroke](#). Sixty-one patients were randomly allocated into case (HS=30) and control (normal-saline [NS]=31) groups. HS was used to irrigate the [hematoma](#) in the case group and NS was used in the control group. The patients were followed-up. Clinical variables including demographic and medical findings, [postoperative computed tomography](#) findings, postoperative complications, hospitalization period, [recurrence](#) rate, and [functional status](#) measured by the Barthel type B index were recorded.

Forty-six of 61 patients were male (75.4%), and the patients' mean age was 65.4 ± 16.9 years, with equal distribution between the 2 groups. Postoperative effusion and postoperative hospital stay duration were significantly lower in the HS group than in the NS group ($p=0.002$ and 0.033 , respectively). The postoperative recurrence within 3 months in both groups was approximately equal (6.6%). In terms of functional outcomes and postoperative complications, HS showed similar results to those of NS.

Conclusion: HS as an irrigation fluid in BHC effectively reduced postoperative effusion and hospital stay duration without considerable complications.

Trial registration: Iranian Registry of Clinical Trials Identifier: IRCT20200608047688N1 ⁴⁾.

Goreisan

[Goreisan for chronic subdural hematoma recurrence prevention.](#)

1)

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