Chronic subdural hematoma recurrence risk factors

see Oslo grading system

For Coffano et al. no association was found between the chronic subdural hematoma recurrence risk after surgical evacuation and age, use of antithrombotic medication, or laterality. Burr hole trephination was found to be associated with lower recurrence rates, when compared to other surgical procedures. Placement of surgical drain and Dexamethasone therapy were significantly associated with reduced risk of recurrence of CSDHs [1)]

Among many factors, clopidogrel or warfarin use, hematoma loculation on preoperative CT, and the amount of hematoma evacuation on the first postoperative CT were the strongest predictors of reoperation [2)].

Postoperative pneumocephalus

Postoperative pneumocephalus is associated with a higher risk of chronic subdural hematoma recurrence [3) 4)].

Drainage system

Little is known about the best type of drainage system and its relationship with recurrence. In a study, Takroni et al. compared the use of two drainage systems on the recurrence rate of CSDH. They retrospectively analyzed the charts of 180 CSDH patients treated with bedside twist drill craniostomy (TDC) and subdural drain insertion. Patients were divided into two groups: Group A (n=123) received our traditional drain (pediatric size nasogastric tube (NGT), while group B (n=49) had the external ventricular drain (EVD). Various demographic and radiological data were collected. Our main outcome was recurrence, defined as symptomatic re-accumulation of hematoma on the previously operated side within 3 months. Results 212 cases of subdural hematoma were treated in 172 patients. Majority of patients were male (78%) and had a history of previous head trauma (73%). 17 cases had recurrence, 11 in the NGT group drain and 6 in the EVD group. The use of antiplatelet or anticoagulation agents was associated with recurrence (P= 0.038 and 0.05, respectively). There was no difference between both groups in terms of recurrence [OR=1.42, 95% CI:0.49 to 4.08, P=0.573].

Chronic subdural hematoma is a common disease with a high rate of recurrence. Although using a drain postoperatively has shown to improve the incidence of recurrence, little remains known about the best type of drain to use. The analysis showed no difference in the recurrent rate between using the pediatric size NGT and the EVD catheter post TDC [5)].

see also Subdural drain for chronic subdural hematoma

Recurrence rate and functional outcome after surgical drainage of CSDH does not appear to be affected by surgical technique (craniotomy vs burrhole) and drainage location [6].

Hyperdense hematoma components were the strongest prognostic factor of recurrence after surgery. Awareness of these findings allows for individual risk assessment and might prompt clinicians to tailor treatment measures [7].

In the series of Santos et al. it was possible to demonstrate an age-related protective factor, analyzed as a continuous variable, regarding the recurrence of the chronic subdural hematoma (CSDH), with a lower rate of recurrence the higher the age.

The results indicate that, among possible factors associated with recurrence, only age presented a protective factor with statistical significance. The fact that no significant difference between the patients submitted to trepanning or craniotomy was found favors the preferential use of burr-hole surgery as a procedure of choice due to its fast and less complex execution [8].

In the series of Han et al. independent risk factors for recurrence were as follows: age > 75 years (HR 1.72, 95% CI 1.03-2.88; p = 0.039), obesity (body mass index ≥ 25.0 kg/m2), and a bilateral operation [9].

Chon et al. shown that postoperative midline shifting (≥5 mm), diabetes mellitus, preoperative seizure, preoperative width of hematoma (≥20 mm), and anticoagulant therapy were independent predictors of the recurrence of chronic subdural hematoma.

According to internal architecture of hematoma, the rate of recurrence was significantly lower in the homogeneous and the trabecular type than the laminar and separated type [10].

The recurrence rate of chronic subdural hematoma cSDH seems to be related to the excessive neoangiogenesis in the parietal membrane, which is mediated via vascular endothelial growth factor (VEGF). This is found to be elevated in the hematoma fluid and is dependent on eicosanoid/prostaglandin and thromboxane synthesis via cyclooxygenase-2 (COX-2).

Anticoagulant therapy

see Chronic subdural hematoma and anticoagulant therapy.

Antiplatelet therapy

Antiplatelet therapy significantly influences the recurrence of CSDH [11].

Timing of Low-Dose Aspirin Discontinuation for chronic subdural hematoma

Timing of Low-Dose Aspirin Discontinuation for chronic subdural hematoma.

Septation

Jack et al.found a 12% reoperation rate. CSDH septation (seen on computed tomogram scan) was found to be an independent risk factor for recurrence requiring reoperation (p=0.04). Larger post-operative subdural haematoma volume was also significantly associated with requiring a second drainage procedure (p<0.001). Independent risk factors of larger post-operative haematoma volume included septations within a CSDH (p<0.01), increased pre-operative haematoma volume (p<0.01), and a greater amount of parenchymal atrophy (p=0.04). A simple scoring system for quantifying recurrence risk was created and validated based on patient age (< or ≥80 years), haematoma volume (< or ≥160cc), and presence of septations within the subdural collection (yes or no).

Septations within CSDHs are associated with larger post-operative residual haematoma collections requiring repeat drainage. When septations are clearly visible within a CSDH, craniotomy might be more suitable as a primary procedure as it allows greater access to a septated subdural collection. The proposed scoring system combining haematoma volume, age, and presence of septations might be useful in identifying patients at higher risk for recurrence [12].

Membranectomy

Opening the internal hematoma membrane does not alter the rate of patients requiring revision surgery and the number of patients showing a marked residual hematoma six weeks after evacuation of a CSDH [13].

In the study of Lee et al, an extended surgical approach with partial membranectomy has no advantages regarding the rate of reoperation and the outcome. As initial treatment, burr-hole drainage with irrigation of the hematoma cavity and closed-system drainage is recommended. Extended craniotomy with membranectomy is now reserved for instances of acute rebleeding with solid hematoma [14].

Diabetes

Surgeons should consider informing patients with diabetes mellitus that this comorbidity is associated with an increased likelihood of recurrence

[15] [16] [17].

Balser et al. report 11% recurrence, which included individuals who recurred as late as 3 years after initial diagnosis [18].

Close imaging follow-up is important for CSDH patients for recurrence prediction. Using quantitative CT volumetric analysis, strong evidence was provided that changes in the residual fluid volume during the 'self-resolution' period can be used as significantly radiological predictors of recurrence [19].

A structural equation model showed a significant association between increased antiinflammatory activity in hematoma fluid samples and a lower risk of recurrence, but this relationship was not statistically significant in venous blood samples. Moreover, these findings indicate that anti-inflammatory activities in the hematoma may play a role in the risk of a recurrence of CSDH [20].

Irrigation with artificial cerebrospinal fluid (ACF) decreased the rate of CSDH recurrence [21].

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