Postoperative seizures after chronic subdural hematoma surgery

Postoperative seizures after chronic subdural hematoma surgery is a not well-understood complication. Kramer et al. investigated surgical and non-surgical risk factors that are commonly considered causal in provoking epileptic seizures, paying special attention to the intracranial course of the subdural drain (SDD) and the configuration of the hematoma. Data of patients with chronic subdural hematoma, that were treated at our neurosurgical department between 2008 and 2014 were analyzed. Patients suffering from severe pre-existing conditions and those who have been treated conservatively were excluded. Epidemiologic data as well as relevant clinical data were collected. Pre- and postoperative CT scans were analyzed regarding morpho- and volumetric parameters. In order to objectify the influence of the SDD, its intracranial course and localization (entering angle as well as the angle between drain and brain surface) were measured. For statistical analysis, univariate and multiple logistic regression models as well as Fisher's exact test were used. Two hundred eleven consecutive patients have been included. The mean age was 75.6 years, and 69% were male. Nineteen (9%) patients suffered from postsurgical seizures. Membranes within the hematoma were present in 81.5%. Pre- to postoperative haematoma reduction was significant (mean of difference - 12.76 mm/ - 9.47 mm in coronal/axial CT planes, $p = 0.001/ < 0.001$). In 77.9%, SDD showed cortical contact with eloquent regions and had an unfavorable course in 30 cases (14.2%). Surgical complications consisted of cortical bleeding in 2.5%, fresh subdural hematoma in 33.5%, and wound infections in 1.4% of patients. Neither in univariate nor in multiple regression analyses any of the following independent variates was significantly correlated with postsurgical seizures: pre-existing epilepsy, alcohol abuse, right-sided hematomas, localization and thickness of hematoma, presence of septations, SDD-localization and to-brain angle, subdural air, and electrolyte levels. Instead, in multiple regression analyses, they found the risk of postsurgical seizures to be significantly correlated and increased with left-sided cSDH treated via craniotomy ($p = 0.03$) and an unfavorable course of the SDD in left-sided cSDH ($p = 0.033$).Burr hole trepanation should be preferred over craniotomy and care must be taken when placing an subdural drain to avoid irritating cortical tissue. The configuration of the hematoma does not appear to affect the postoperative seizure rate [1)].

A retrospective study of 134 consecutive patients with acute or acute-on-chronic SDH who underwent surgical treatment at the authors' institution between January 2004 and July 2008. Detailed information was collected regarding baseline clinical data (including preexistent functional impairment); Glasgow Coma Scale (GCS) sum scores before and 24 hours after surgery; presence of clinical seizures; EEG findings; and functional outcome on discharge and up to the 6-month follow-up. All brain CT scans were reviewed to calculate SDH volume and midline shift. The Glasgow Outcome Scale (GOS) score was used for functional assessment, and GOS scores of 1-3 were considered indicative of poor outcome. Univariate and multivariate logistic regression analyses were performed to identify statistical associations.

Results: Clinical seizures or epileptiform changes on EEG were observed during the acute postoperative period in 33 patients (25%). Preexistent functional impairment and seizures/epileptiform EEG findings after surgery were independently associated with poor functional outcome upon hospital discharge ($p < 0.001$ for both). Preexistent functional impairment ($p < 0.001$), lower GCS score before surgery ($p = 0.04$), and lower GCS score 24 hours after surgery ($p = 0.007$), but not seizures/epileptiform EEG findings, were independently associated with poor functional

recovery at 1- to 6-month follow-up evaluations. Seizures/epileptiform EEG findings had a strong association with lower GCS scores after surgery (p = 0.01), and they were more common in patients who underwent evacuation by craniotomy (p = 0.02).

Conclusions: Epileptic complications are common after acute SDH evacuation, and should be suspected in patients with an unanticipated depressed level of consciousness after surgery. Seizures worsen early functional outcome, but delayed favorable recovery is possible. Therefore, one should be cautious when discussing prognosis in the early postoperative period of patients with epileptic complications [2].

Antiepileptic drug for chronic subdural hematoma

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Kramer A, Degenhartt X, Gutenberg A, Ringel F. Risk factors for postoperative seizures in patients with chronic subdural haematomas. Neurosurg Rev. 2022 Sep 12. doi: 10.1007/s10143-022-01858-5. Epub ahead of print. PMID: 36097085.

2)

Rabinstein AA, Chung SY, Rudzinski LA, Lanzino G. Seizures after evacuation of subdural hematomas: incidence, risk factors, and functional impact. J Neurosurg. 2010 Feb;112(2):455-60. doi: 10.3171/2009.7.JNS09392. PMID: 19698050.