Göteborg, 2022

Surgical treatment strategies of chronic subdural hematoma

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Förmaket, Vita Stråket 12, fredagen den 13 januari 2023, klockan 09.00

av **Andreas Bartley**

Fakultetsopponent:

Associate Professor Niels van der Gaag

University of Leiden, the Netherlands.

Avhandlingen baseras på följande delarbeten

I. Bartley A, Jakola A S, Tisell M. The influence of irrigation fluid temperature on recurrence in the evacuation of chronic subdural hematoma. Acta Neurochirurgica (Wien). 2020; 162(3): 485–8

II. Bartley A, Jakola A S, Bartek Jr J, Sundblom J, Förander P, Marklund N, Tisell M. The Swedish study of Irrigation-fluid temperature in the evacuation of Chronic subdural hematoma (SIC!): study protocol for a multicenter randomized controlled trial. Trials. 2017; 18(1): 471

III. Bartley A, Bartek Jr J, Jakola A S, Sundblom J, Fält M, Förander P, Marklund N, Tisell M. Effect of irrigation fluid temperature on recurrence in the evacuation of chronic subdural hematoma – a randomized clinical trial. Accepted for publication in JAMA Neurology (Sept 23, 2022).

IV. Bartley A, Hallén T, Tisell M. A drainage time of less than 24 hours is sufficient after chronic subdural hematoma evacuation. Manuscript, submitted to Acta Neurochirurgica (Oct 3, 2022).

SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR NEUROVETENSKAP OCH FYSIOLOGI

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Surgical treatment strategies of chronic subdural hematoma

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Abstract

Background: A subdural collection of old blood is called a chronic subdural hematoma (cSDH). A cSDH of sufficient volume becomes symptomatic and neurosurgical evacuation is then necessary. The recurrence rate (5-21%) after surgery is high and evidence-based guidelines regarding the optimal treatment to diminish recurrence is lacking. The aim of this thesis was to explore whether different irrigation fluid temperatures used in cSDH-surgery as well as different postoperative drainage times had an impact on recurrence, mortality or complication frequency.

Patients and Methods: Adult patients undergoing burr-hole evacuation for cSDH were screened for study inclusion. Study I retrospectively compared the intraoperative use of irrigation fluid at room temperature vs. irrigation at body temperature. Endpoints were recurrence, mortality, and complications. Paper II is the study protocol for study III. Study III was a multicentre randomised controlled trial (RCT) in which we compared irrigation at room temperature vs. body temperature. The endpoints were the same as in study I but with the addition of health-related quality of life (HRQL). Study IV was a retrospective study exploring postoperative drainage times of more or less than 24 hours after cSDH-surgery. The endpoints were length of hospital stay, recurrence, complications, and mortality. All studies had a follow-up of 6 months. In study IV, a separate cohort consisting of 10 patients were also prospectively observed regarding drainage volume per hour after surgery.

Results: Both study I and III demonstrated a significant reduction of recurrence when irrigation fluid at body temperature was used compared with irrigation at room temperature. No significant difference was seen regarding HRQL, complications or mortality. The retrospective cohort of study IV showed no difference between the study groups related to recurrence, complications, or mortality. However, length of hospital stay was significantly shorter in the group with < 24 hours of drainage. The prospective cohort in study IV revealed that most drainage occurred within 9 hours after burr-hole evacuation for cSDH.

Conclusion: The results from study I and III provide high level evidence that irrigation fluid at body temperature is superior to irrigation at room temperature in the surgical evacuation of cSDH. Study IV showed that a drainage time < 24 hours did not lead to more cases of recurrence, mortality or complications compared to a drainage time > 24 hours. Length of hospital stay was reduced with a drainage time of less than 24 hours. Evidence from a RCT is needed to confirm the results of study IV.

Keywords: chronic subdural hematoma, irrigation, recurrence, temperature, drainage time, drainage duration, surgery

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