Drain Insertion in Chronic Subdural Hematoma: An International Survey of Practice

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■ OBJECTIVE: **To investigate whether, after the publication of grade I evidence that it reduces recurrence rates, the practice of drain insertion after burr-hole drainage of chronic subdural hematoma has changed. Further, we aimed to document various practice modalities concerning the insertion of a drain adopted by neurosurgeons internationally.**

■ METHODS: **We administered a survey to neurosurgeons worldwide with questions relating to the surgical treatment of chronic subdural hematoma, with an emphasis on their practices concerning the use of a drain.**

■ RESULTS: **The preferred surgical technique was burr-hole drainage (89%). Most surgeons prefer to place a drain (80%), whereas in 56% of the cases the reason for not placing a drain was brain expansion after evacuation. Subdural drains are placed by 50% and subperiosteal drains by 27% of the responders, whereas 23% place primarily a subdural drain if possible and otherwise a subperiosteal drain. Three quarters of the responders leave the drain for 48 hours and give prophylactic antibiotic treatment, mostly a single-shot dose intraoperatively (70%). Routine postoperative computed tomography is done by 59% mostly within 24–48 hours after surgery (94%). Adjunct treatment to surgery rarely is used (4%).**

■ CONCLUSIONS: **The publication of grade I evidence in favor of drain use influenced positively this practice worldwide. Some surgeons are still reluctant to insert a drain, especially when the subdural space is narrow after drainage of the hematoma. The insertion of a subperiosteal drain could be a good alternative solution. However, its outcome and efficacy must be evaluated in larger studies.**

INTRODUCTION

The incidence of chronic subdural hematoma (cSDH) is estimated at 1.7–18 per 100,000 people, increasing to 58 per 100,000 in patients older than the age of 65 years, making it one of the most common neurosurgical conditions.[1,2] Most physicians would agree that surgical evacuation of the hematoma is the preferred treatment for symptomatic patients.[3] In small hematomas or asymptomatic patients, several medical agents have been investigated; however, there remains a lack of evidence concerning their efficiency.[4] Surgical treatment via burr-hole drainage (BHD) is well established[2,3,5]; however, recent studies show comparable outcomes for twist drill craniostomy (TDC).[6]

Despite its high incidence, high-class evidence for the management of cSDH is limited. The only well-designed randomized trial on cSDH showed that a subdural drain reduces the rate of recurrence and improves functional outcome.[7] Recommendations on the amount of burr holes that should be undertaken, where the drain should be placed (e.g., subdural or subperiosteal), the duration of drain placement, application of perioperative antibiotics, and performing postoperative imaging are based mostly on case series, hence on low-grade evidence.[3] Because of the lack of evidence, a vast variety of treatment modalities exist when neurosurgeons treat cSDH. The aim of this international survey was to investigate whether practice concerning drain insertion after burr hole drainage of cSDH after the publication of Santarius et al.[7] has changed. Furthermore, we aimed to document various practice modalities concerning the insertion of a drain adopted by neurosurgeons internationally.

Key words
- Burr-hole drainage
- Chronic subdural hematoma
- Subdural drain
- Subgaleal drain
- Subperiosteal drain
- Survey

Abbreviations and Acronyms
BHD: Burr-hole drainage
cSDH: Chronic subdural hematoma
TDC: Twist drill craniostomy

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Citation: World Neurosurg. (2017) 104:528-536.
http://dx.doi.org/10.1016/j.wneu.2017.04.134

Journal homepage: www.WORLDNEUROSURGERY.org

Available online: www.sciencedirect.com

MATERIAL AND METHODS

Survey Design

In October 2014, neurosurgeons from various international clinics were invited by e-mail to complete an online survey. The survey was prepared and launched through a Web-based anonymous survey platform (kwiksurveys.com). The online survey included 19 questions, 6 on demographics, 2 on the surgical technique, 6 on drain placement, 2 on adjacent treatment, and 3 on postoperative imaging (**Table 1**). The survey clearly stated: "The questionnaire is regarding treatment of primary (not a re-operation) chronic subdural hematoma in adults (above the age of 18 years)." Four weeks after the first invitation, reminder requests were sent to all invitees. All responders were assured of confidentiality of the data. Institutional review board approval was not required for this physician survey.

Data Analysis

All data were collected through the online survey platform and subsequently exported into SPSS Statistics, Version 21.0 (IBM Corp, Armonk, New York, USA), where descriptive statistics were completed and contingency tests were done with the Fisher exact test. A P value of <0.05 was considered significant.

Table 1. Distributed Online Survey

Question	Possible Answers
Demographics	
1. Are you male or female?	Male/female
2. What kind of institution do you work?	Private praxis or hospital/public hospital
3. How many years of neurosurgical experience do you have?	<1/1/2/3/4/5/6/7/8/9/10/11–15/11–20/>20
4. What function do you have at your department?	Resident/attending/vice chairman/chairman
5. In which country do you practice Neurosurgery?	(open text)
6. Approximately how many surgeries for cSDH are performed at your institution per year?	<20/20–40/41–60/61–80/81–100/>100
Surgical technique	
7. What is your preferred surgical method of treating a symptomatic primary (not a reoperation) chronic subdural hematoma (cSDH) in adults?	Burr-hole drainage/craniotomy/twist drill craniostomy
8. How many burr holes do you preform?	One/two/more than two/one or two, depends on the hematoma configuration
Drain placement	
9. Do you insert a drain?	Yes/no/sometimes
10. Under which condition do you not insert a drain? (multiple answers possible)	Anticoagulated patients/old patients/too risky to place a drain in the subdural space/hygroma
11. Where do you routinely place the drain?	Subdural/subperiosteal (subgaleal)/if possible subdural otherwise subperiosteal/other (please specify)
12. How long do you leave the drain in place postoperatively?	<24/24/48/72/>72 hours
13. Do you give antibiotics perioperatively?	Yes/no
14. For how long do you give antibiotics?	Only for the operation (single shot)/as long as the drain is in place/ other (please specify)
Adjunct treatment	
15. Do you give any other medical treatment adjunct to surgery (e.g., steroids, ACE inhibitors etc.)?	Yes/no
16. Which medication do you give adjunct to surgery? (multiple answers possible)	Steroids/tranexamic acid/mannitol/platelet-activating factor receptor antagonist/statin/angiotensin-converting enzyme inhibitor
Postoperative imaging	
17. Do you routinely perform postoperative imaging?	Yes/no
18. What kind of imaging do you preform?	CT/MRI/ other (please specify)
19. When do you preform imaging? (multiple answers possible)	24–48 hours postoperatively/after 2 weeks/after 4–6 weeks/after 1 year

ACE, angiotensin-converting enzyme; CT, computed tomography; MRI, magnetic resonance imaging.