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[Intervention Review]

# External drains versus no drains after burr-hole evacuation for the treatment of chronic subdural haematoma in adults

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## ABSTRACT

### Background

Chronic subdural haematoma (CSDH) is one of the most common types of intracranial haematoma, and often occurs in older people. Burr-hole craniostomy, which is an evacuation through one or two burr holes drilled over the site of the haematoma, has been widely accepted as the most effective way to manage CSDH. Recurrences are a major problem and need reoperation, sometimes repeatedly.

### Objectives

To assess the effects and safety of the use of external drains versus no drains after burr-hole evacuation for the treatment of CSDH in adults.

### Search methods

We ran our first search on 27 November 2014. We searched the Cochrane Injuries Group's Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL, the Cochrane Library), MEDLINE (OvidSP), Embase Classic+Embase (OvidSP), PubMed, ISI WOS (SCI-EXPANDED, SSCI, CPCI-S and CPSI-SSH), Chinese databases, and clinical trials registers, and screened reference lists. In compliance with the MECIR conduct standard 37, the Cochrane Injuries Group Information Specialist ran an update search within 12 months of publication (25 April 2016). We have screened these results but not incorporated the findings into the current review; as a result of the update search, one trial is awaiting classification.

### Selection criteria

We included randomized controlled trials (RCTs) that compared external subdural drains with no drains after burr-hole evacuation for the treatment of CSDH in adults.

### Data collection and analysis

Two review authors identified potential articles from the literature search, extracted data independently using a data extraction form and assessed risk of bias using the Cochrane 'Risk of bias' tool. For dichotomous data, where statistical heterogeneity was low, we calculated summary risk ratios with 95% confidence intervals using a fixed-effect model.

### Main results

Nine RCTs, including a total of 968 participants, reported outcomes specified by this review. Only one RCT reported the use of an adequate method of allocation concealment; this trial was a large, single-centre, high quality study and was adequately reported. All included trials reported a reduced recurrence of CSDH with external subdural drains. We found a significant reduction in the risk of recurrence

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with subdural drains (RR 0.45, 95% CI 0.32 to 0.61,  $I^2 = 38\%$ ; 9 studies, 968 participants; moderate-quality evidence). There was no strong evidence of any increase in complications (RR 1.15; 95% CI 0.77 to 1.72,  $I^2 = 0\%$ ; 7 studies, 710 participants; low-quality evidence), mortality (RR 0.78, 95% CI 0.45 to 1.33,  $I^2 = 22\%$ ; 5 studies, 539 participants; low-quality evidence), or poor functional outcome (which included deaths) (RR 0.68, 95% CI 0.44 to 1.05,  $I^2 = 31\%$ ; 5 studies, 490 participants; low-quality evidence).

### Authors' conclusions

There is some evidence that postoperative drainage is effective in reducing the symptomatic recurrence of CSDH. Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. Due to the low quality of the evidence for the secondary outcomes, the effect of drainage on the occurrence of surgical complications, mortality and poor functional outcome is uncertain. This uncertainty can be clarified with data from high-quality studies which may be conducted in the future. There is no strong evidence of any increase in complications when drains are used.

## PLAIN LANGUAGE SUMMARY

### Use of drains in adults after surgery for chronic subdural haematoma

#### What is a chronic subdural haematoma (CSDH)?

A chronic subdural haematoma (CSDH) is the slow accumulation of blood between the brain and the membrane that surrounds it. CSDH is a common type of brain (intracranial) haematoma and occurs more frequently in older people. Up to 75% of CSDHs are caused by trauma to the head, though this trauma can be trivial, with no loss of consciousness, vomiting or seizures, or any other post-trauma symptoms. Symptoms of CSDH depend upon the size of the haematoma and the parts of the brain on which it exerts pressure, but may include confusion or coma; memory problems; difficulty speaking, swallowing or walking; drowsiness; headaches; seizures; and weakness or numbness of limbs and face.

#### How is CSDH treated?

CSDH is treated most effectively through surgery with 'burr-hole evacuation'. In this procedure one or two holes (5 mm to 30 mm wide) are drilled through the skull over the haematoma. The accumulated blood is washed out through these holes. Sometimes, at the end of surgery, surgeons insert a soft silicone drain through one burr hole to continue to drain the space previously occupied by the blood (subdural drainage). These drains remove any fluid that accumulates into an external collection vessel, and stay in place for 24 to 48 hours after surgery before being removed. Alternatively, at the end of surgery, the wounds are closed surgically without insertion of external drains.

#### Why might drains be important?

Recurrence (i.e. formation of another CSDH in the same place) is a major problem with CSDH, and patients may need additional, repeated surgical procedures to remove them. Drains might reduce recurrence, but are not used routinely. The authors of this Cochrane Review wanted to discover whether the use of external drains after burr-hole surgery for CSDH reduces the risk of recurrence of CSDH.

#### Study characteristics and key results

The review authors conducted extensive searches of the medical literature up to November 2014 for relevant randomized controlled trials (RCTs), which provide the most reliable evidence. They identified nine RCTs, involving 968 participants, that compared the use of external drains in some patients versus no drains in other patients after burr-hole surgery for CSDH. The trials were conducted in India, Turkey, Iran, Germany, the UK and Japan. All participants were adults, mostly over 60 years of age. All the trials used very similar surgical procedures. Six trials followed participants for six months, the remaining trials followed them for three months, one month, or three weeks (one trial each).

The authors were able to pool the results of the trials statistically, and this showed that use of drains does reduce the risk of recurrence of CSDH after burr-hole surgery by about 50% compared to the risk in the group of patients who did not have drains (the control group). However, there were no clear differences between the drain and no-drain treatment groups for postoperative complications (i.e. infection, seizures or sudden bleeding), death, or functional outcome (i.e. regaining abilities affected by the CSDH).

#### Quality of the evidence

The results of this review may change in the future when data are available from additional studies. The existing studies have either too few participants or events to give a reliable result, even when the results are pooled. Some of the studies did not describe the randomisation procedures in detail, and are considered to be of lower quality because of this.

Further research will also help to establish:

- the effects of external drains on postoperative complications, death, and functional outcome;
- whether it is better to use one or two burr holes during surgery;

- the best way to position the drain's tube within the brain;
- the best duration of drainage.