

## Recurrence rates of Single or Double Burr Hole in Chronic Subdural Hematomas

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### Abstract

**Aim:** Analysis of recurrence rates of single versus double burr holes in patients with chronic subdural hematomas.

**Material and Methods:** The study was a prospective randomized controlled trial on patients with chronic subdural hematomas. A written consent was taken from the patient or patient party after explaining the procedure. A total of 191 patients were enrolled in the study over a period of 12-months in the Department of Neurosurgery, Patna Medical College and hospital, Patna.

**Results:** Recurrence rates in single and double-burr-hole groups were 7.44% and 5.55% respectively, which was not statistically significant.

**Conclusion:** The most effective procedure for the treatment of chronic subdural hematomas is single burr-hole drainage.

**Keywords:** Subdural hematoma, Chronic subdural hematoma, Burr-hole drainage, Recurrence, Compare

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### Introduction

Chronic Subdural hematomas (CSDH) are common pathological entity in the elderly, especially after minor head trauma<sup>(4,6)</sup>. The prevalence of CSDH seems to be increasing in a rapidly aging society<sup>(10)</sup>. The etiology of subdural hematomas is commonly due to head injury in about 50% of the cases<sup>(10,11)</sup> and not known in rest of the cases. Subdural hematomas are classified as acute, sub-acute and chronic depending on the time of diagnosis from the day of injury as acute within 3 days of injury, subacute from 3 days to 3 weeks of injury and chronic more than 3 weeks after injury<sup>(9,17)</sup>.

Subdural hematomas can also be classified on the basis of texture of the hematoma on plain CT scan with hyperdense hematoma as acute subdural, isodense as subacute and chronic as hypodense<sup>(14)</sup>. Several surgical techniques like Twist drill craniostomy, burr-hole drainage or craniotomy are the various methods to deal with subdural hematomas<sup>(12,16)</sup>. The recurrence rates vary from 3.1%-33.3%<sup>(13,15)</sup>. Various factors have been noted to have a bearing on recurrence rates that include multilocularity of the collection and presence of coagulopathy<sup>(7)</sup>. However the issue of effect of number of burr holes on the recurrence of subdural hematomas has not been established. So, above study was undertaken these issue.

### Material and Methods

The study was a Prospective Randomized Controlled trial conducted over a period of 12-months, from October 2021 to September 2022 in the Department of Neurosurgery at Patna medical College and Hospital, Patna, Bihar. Total 191 patients fulfilled the inclusion criteria as follows;

1. Diagnosed on Computed tomography (CT scan)
2. Unilateral hematoma
3. Burr hole trephination with closed system drainage
4. Follow up CT scan at 3 months or prior if needed

**Patient Population:** Total 191 patients were enrolled of which 108 males and 83 females with a mean age of 63.14 years. Patients were divided into two groups randomly as one receiving single burr-hole and the other, two burr-holes. At the end of the study i.e., 12 months period plus the 3-months period after the last patient was operated upon, the results of the study were analyzed. We lost 3 patients to follow-up and 4 patients died while in hospital after the evacuation of the subdural hematoma, these 7 patients were excluded from the study and hence analysis was done on 184 patients. Demographic characteristics, operative modalities, and recurrence rates were noted. Patients were followed-up in Neurosurgical outpatient-department. CT scan was done in follow-up patients only if patients would become symptomatic. Recurrence on follow-up on the opposite side of previous surgery was supposed to be counted as a new patient, however we did not have such a patient. Single burr-hole was put on parietal region and double burr hole was put on parietal and frontal regions under local anaesthesia and intravenous sedation. The subdural space was irrigated thoroughly with normal saline by means of a soft infant feeding tube in all the patients. The same tube was left in the subdural space and connected to a collection bag. The drain was put through parietal burr hole and taken out through a separate stab incision about 4cm away from the parietal burr hole site. Patients were nursed in flat position for 72 hours in the postoperative period. The subdural drain was kept for 72 hrs for all the patients.

### Statistical Analysis

Statistical analysis was done by SPSS version 19. The Fisher's exact test and Student's t-test were used for categorical and continuous variables respectively. A p value of 0.05 or less was considered as significant.

### Results

There were 94 patients who received single-burr hole and 90 patients received double-burr hole for drainage. The parameters of both the groups are given in Table I, and both the groups were comparable. The overall recurrence rate was 6.52%, it was 7.44% in the single-burr hole group and 5.55% in the double-burr hole group, statistically insignificant ( $p=0.785$ ).

### Discussion

CSDH generally occurs in elderly people by minor head trauma<sup>(4,7)</sup>. It originates in dural border cell layer, placed between dura mater and arachnoid membrane. The dissection of these cell layers makes a

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subdural cavity which is accumulated by bleeding<sup>(17)</sup>. Brain is reduced by approximately 200g in elderly people due to extensive brain atrophy, which in turn increases the extracerebral volume of up to 11%<sup>(1,17,18)</sup>. This results in CSDH and extra volume can be occupied by the hematoma before a considerable rise in intracranial pressure occurs<sup>(1,3)</sup>. Surgical evacuation should be needed in CSDH with related symptoms such as headache, hemiparesis, gait problem, memory disturbance and abnormal behaviour. Various surgical treatments of CSDH have been used such as twist drill, burr hole, craniotomy with or without irrigation and /or closed drainage system<sup>(2,6,8,10,12,19)</sup>. Among these procedures burr-hole drainage is the commonest surgical procedure<sup>(2,7)</sup>. Study is overloaded with retrospective analysis of patient with chronic subdural hematoma management. Though there are some randomized controlled trials in chronic subdural hematomas which discuss the issue of burr hole irrigation with or without drainage<sup>(5,14)</sup>, twist drill drainage for 48 vs,72 hrs<sup>(4)</sup>. We put asubdural drain in all the patients in view of the low recurrence rates as proved by a previous randomized trial<sup>(14)</sup>. The overall recurrence rate in our present series was low (6.52%), as compared to others<sup>(7)</sup>. This low recurrence rate is possibly because of the strict use of

subdural drains in all the patients. The explanation given in the literature for high incidence of postoperative recurrence in such subdural collections is the hyperfibrinolytic activity and tendency to re-bleed from the membrane of multilocular collections<sup>(15)</sup>. Kansal<sup>(6)</sup> in his observational study of 267 cases in which he has excluded patients with bilateral collections, coagulopathy, and significant brain atrophy also found no statistically significant difference between recurrence rates after single or double burr hole drainage. However our study is a randomized trial and we have included patients with bilateral subdural collections and coagulopathy. We observed that these factors have no bearing on the recurrence of the hematoma whether these receive a single or a double-burr hole drainage

#### Conclusion

In our study we conclude that in patients with chronic subdural hematoma, a single burr-hole is as good as a double-burr-hole in terms of recurrence. Single burr hole drainage is considered safe and effective treatment method because of lower recurrence rate and short hospitalisation. We hence stress the use of single-burr hole for subdural collections (except multilocular collections) as it is less invasive.

**Table I:** Factors Have No Bearing on the Recurrence of the Hematoma Whether These Receive a Single or a Double-Burr Hole Drainage

Parameter	Single Burr Hole (n=94)	Double Burr Hole (n=90)	P Value
Age (mean)	63.01 yrs	63.27 yrs	0.879 (NS)
Gender	M=54, F=40	M=50, F=40	0.273 (NS)
Bilaterality	15	9	0.201 (NS)
Coagulopathy	14	10	0.794 (NS)
Recurrence	7 (7.44%)	5 (5.55%)	0.785 (NS)

NS= not significant.

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