SINGLE BURR-HOLE EVACUATION OF CHRONIC SUBDURAL HAEMATOMA - USE OF DRAINS VERSUS NO DRAINS

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ABSTRACT

Objective: To compare the use of drain insertion into the subdural space with no drains after burr-hole drainage of chronic subdural haematoma (CSDH) in terms of recurrence and neurological outcomes and complications.

Study Design: Randomised controlled trial.

Place and Duration of Study: The study was of 2 years duration conducted at neurosurgical unit Combined Military Hospital (CMH) Rawalpindi from Nov 2009 to Sep 2011.

Material and Methods: A total of 72 patients were randomly assigned to two treatment groups, group 1 (n=36) were subjected to burr hole craniotomy with use of drains and group 2 (n=36) were subjected to no drains. The results were assessed at 3 months intervals in terms of recurrence and neurological outcomes and complications.

Results: In this study recurrence was 8.3% with the use of a drains and 28% with no drains ($p< 0.00$) after burr-hole drainage of chronic subdural hematoma. The results of the study showed that a drain significantly reduced the probability of recurrence. No other factor had a significant association with recurrence. There was not much difference in complications associated with surgical procedure.

Conclusion: The recurrence is significantly less with the use of a drains after burr-hole drainage of chronic subdural haematoma.

Keywords: Burr-hole drainage, Chronic subdural haematoma, Recurrence, Subdural drain.

INTRODUCTION

Chronic subdural hematoma (CSDH) is common in elderly people and is associated with substantial morbidity and mortality[1,2]. Incidence is about 5 per 100000 per year in the general population[3]. Because the proportion of people aged 65 years and older is expected to double worldwide between 2000 and 2030[4], a large rise in incidence is expected. Diagnosis can readily be facilitated by brain computed tomography (CT) and magnetic resonance imaging (MRI). Excluding minimal subdural hematoma, therapy is commonly surgical and a dramatic rapid improvement in symptoms is frequently observed. Postoperative recurrence rate of CSDH with the use of burr-hole approach has been reported to vary from 3% to 35% is the focus of research[5-7]. Area of concern is whether subdural drains should be used with burr-hole craniotomy as emerging evidence suggests that such drainage of the subdural space lowers recurrence rates[8-10]. However, further studies are required for this dilemma. This study was carried out with the aim to evaluate the results of treatment for chronic subdural hematoma, especially in terms of recurrence, following burr-hole drainage with and without use of subdural drain.

Our hypotheses are:

1. Proportion of the patients with recurrence is different between two groups.
2. Neurological outcome and Complication rate is different between two groups.

MATERIAL AND METHODS

This study, a randomized controlled trial was carried out in neurosurgical unit Combined

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Military Hospital Rawalpindi from Nov 2009 to Sep 2011 in which use of drain insertion into the subdural space was compared with no drains after burr-hole drainage of CSDH. A total of 72 patients were inducted in the study and divided in two groups. Group 1 (n=36) was subjected to use of drains and group 2 (n=36) was subjected to no drains. Informed written consent was taken.

Non-probability convenience sampling was used as sampling technique.

Patients of either gender between 18 to 70 years and chronic subdural haematoma based on CT/ MRI study of brain were include in the study. While patients who were operated once or more (i.e. recurrence) for CSDH, and patients in whom CSF diversion procedure was done and who subsequently developed CSDH, and patients of CSDH in whom surgery other than burr-hole evacuation was done, were not enrolled.

Patients were evaluated at the time of admission based on history, physical examination, blood investigation and imaging studies. Coagulation parameters - platelet count, prothrombin time (PT), activated partial thromboplastin time (APTT)- were checked. On

Table 1: Clinical presentation of patients with chronic subdural hematoma .

Clinical presentation	Group-1	Group-2
Headache	21(58%)	22(61%)
Gait disturbances and fall	20(55%)	24(67%)
Limb weakness	19(53%)	18(50%)
Memory disturbances	11(30%)	8(22%)
Altered sensorium	13(36%)	15(42%)
Speech impairment	9(27%)	6(17%)
Vomiting	7(18%)	7(18%)
Seizure	4(11%)	5 (14%)
Cranial nerve palsy	3(8%)	3(8%)
Visual disturbances	5(14%)	4 (11%)
Incontinence	3(8%)	3(8%)

Table-2: Complications of surgical procedures.

Post Op. Parameter	Group-1	Group-2	*p*-value
Cranial nerve palsy New onset	0	1 (2%)	0.321
Limb weakness Improved Deficit Same Deteriorated	14(70%) 4(20%) 1(6%)	9 (52% 5(29%) 3 (17%)	
Seizure New onset	01 (2%)	0	0.321
Acute SDH—	0	0 1 (2%)	0.321
Wound infection / dehiscence	1 (2%)	2 (4%)	0.562
Post operative fever	1 (2%)	1 (2%)	1.00
Meningitis	0 1 (2%)	0	0.321
Empyema	0 1 (2%)	0	0.321

Table-3: Outcome in both groups at discharge and 3 months.

	Group-1	Group-2	*p*-value
Recurrence	3 (8%)	10 (28%)	0.003
Mortality(At 3 months)	3 (8%)	6 (16%)	0.292
Gross focal neurological deficit At discharge At 03 months	 17 (47%) 9 (25%)	 23 (64%) 11 (30%)	 0.159 0.605
GCS -15 (2nd day)	29 (80%)	24 (66%)	0.186

GCS, Glasgow Coma Scale;

imaging, CSDH was analyzed as hypodense, isodense, hyperdense, or mixed, on the basis of the density of haematoma relative to brain tissue. Before surgery, written informed consent was obtained from the patient or was obtained from the next-of-kin of comatose patients or those otherwise unable to give consent. Out of 72 patients 64 (89%) were male and 8 (11%) female. Male to female ratio was 8:1; with age ranging from 17-70 years. Presenting complaints in both groups are shown in (table-1). History of minor head injury in the recent past was present in 76 % of the patients. Level of consciousness was assessed using Glasgow coma score (GCS); 93% of patients had GCS of 9-15, and 7% had GCS of 8 or less. Hospital stay ranged from 2 days to 24 days with mean stay of 3 ± 4 days. Patients with a gross neurological deficit at discharge had usually deficit at admission. Therefore, the variable for neurological deficit at admission was a very strong and important predictor of deficit at discharge.

Patients were reviewed at 3 months intervals and effectiveness of the entire treatment was measured by:

1. Recurrence
2. Neurological outcome and complications

Data was analyzed by using SPSS on computer. Relevant descriptive statistics; frequency, rate and percentage was computed for presentation of qualitative outcomes like recurrence and complications. Quantitative variables like age time etc. was presented as mean ± standard deviation. Hypothesis 1 and 2 were tested by applying chi-square test at $p<0.05$ level of significance.

RESULTS

Complications associated with both surgical procedures are shown in table-2 whereas recurrence, mortality and gross neurological deficits are shown in table-3 in both groups. The results of the study showed that a drain significantly reduced the probability of recurrence (table-3). No other factor had a significant association with recurrence. There was not much difference in complications associated with surgical procedure.

DISCUSSION

In the previous years, various surgical treatments of CSDH have been reported[12-15]. However, the extent of surgical therapy is still controversial, and a standard therapy does not exist. The most commonly used techniques are burr-hole craniotomy with or without drainage[11,16].

We have seen that patients with chronic subdural haematoma treated with burr-hole evacuation and placement of a subdural drain had a much less recurrence rate, a better functional outcome than that of those without drainage. Moreover there was no difference in postoperative complication in both groups. Installation of a drainage system helps brain expansion and accordingly decreases the chance of recurrence[13]. According to Santarius et al CSDH with burr-hole evacuation and postoperative drainage had a recurrence rate much less than of those without drainage. He reported recurrence rate of 9% and 24% for patients treated with drain and no drains respectively[17]. Our findings accord with results from two prospective studies.[18,19] Wakai and co-workers[19] reported recurrence rates of 5% for drain and 33% for no drains. Tsutsumi and co-workers[18] reported rates of 3.1% and 17%, respectively. We report recurrence rates very similar to those in the retrospective study by Lind and co-workers[20] who identified recurrence rates of 10% for drain and 19% for no drain, and that of Mori and Maeda[21] who showed a recurrence rate of 9.8% for use of drains. Ramachandranet al[22] in his cohort study found a recurrence rate of 4% and 30% with and without drains respectively. Gazzeri et al[23] and Yu et al[24] in their cohort studies reported a recurrence rate of 7.6% and 6.6% respectively for all patient of CSDH treated with drains after surgery. However another school of thought is against the use of subdural drains and it is a matter of debate. Major

argument against the use of drains include increased risk of damage to the brain with placement of subdural drain and increased risk of infection in leaving a drain in place. These concerns are however more or less anecdotal since recent evidence based studies have demonstrated the efficacy of leaving a subdural drain in place. Similar to other published accounts[18-20] we could not identify any difference in frequency of medical or surgical complications between drain and no drain groups. Taking all these studies into consideration and the results of our study we conclude that drain should be placed in subdural space after evacuation of CSDH and it should be kept for 48 hours. Placement of subgaleal drain may be a safer method but may not be equally as effective as subdural drain.

CONCLUSION

The recurrence is significantly lesser with use of a drain after burr-hole drainage of chronic subdural haematoma.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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