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Management of Chronic Subdural Hematoma: A Rural Institutional Experience of 98 Patients

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ABSTRACT

BACKGROUND: *Chronic subdural hematoma is a well known traumatic head injury in elderly patients. It has good prognosis if treated surgically in time. There are many operative interventional techniques for the treatment of CSDH. Burr hole craniostomy is the method of choice for evacuation of CSDH. It is the simplest and safest method with low morbidity and mortality, although it has a recurrence rate from 9.2% to 26.5%. The aim of this study is to see the effectiveness of single burr hole craniostomy without using any subdural drain.*

METHODS: *98 patients of CSDH admitted during a period from August 2011 to November 2014 were included in the study. Clinical assessment was done by GCS and radiological assessment was done by CT scan. All patients were operated by making a single burr hole at maximum thickness of CSDH. Thorough saline irrigation was done until returning fluid became clear. Multiple membranes were opened up widely by using bipolar coagulation. Subdural cavity was refilled with saline and wound closed without any drain.*

RESULTS: *Only 2% patients had recurrence of CSDH. They were re-operated by using same burr hole. Both were improved after re-operation. Four patients readmitted with in 2 month of discharge with headache and hemi paresis. CSDH was diagnosed on CT. Two of them having history of repeated falls due to drug addiction and rest of two were on antiplatelets medication with deranged coagulation profile.*

CONCLUSION: *In many studies use of close suction drain was recommended in CSDH for reducing the recurrence. Closed suction drain was not used in this study and recurrence rate was only 2%. So the results were in favour of making single burr hole craniostomy without any drain for the management of CSDH.*

Key words *- Chronic subdural hematoma, single burr hole, subdural drain*

INTRODUCTION

Chronic subdural hematoma is a common in elderly patients with the history of minor trauma to head. (1-3). Its incidence is about 5/100000 in general population and 58/100000 in elderly population (>70 yrs) (4). It is treated with surgical evacuation. Though surgical method is widely accepted but optimal method has not been obtain yet (5-8). Burr hole, craniectomy & craniotomy is the surgical options. Burr hole evacuation is the best and simplest method for CSDH but it has the recurrence rate from 9.2% to 26.5 % depending on the vascularity of the neomembrane in CSDH (2,5,9,10-13). There is not common opinion regarding the use of drain after surgical evacuation. There are many factors that are associated with recurrence of CSDH after surgery (3,5,7). These risk factors depend on thickness, multiple membrane and trabeculation in hematoma,type of surgical procedure (with/without drain, with/without irrigation), post operative subdural air collection (14) . In this study usefulness of the single burr hole craniostomy at the site of maximum collection with saline irrigation is analysed. Closed suction drain was not used in this study.

MATERIAL AND METHOD

In this study 98 patients were retrospectively analysed. They were admitted in neurosurgery department during a period from august 2011 to November 2014. All patients under gone surgical intervention with only single burr hole craniostomy. CSDH was diagnosed by CT scan. Patients were neurologically assessed by GCS. This study was done with the collaboration with cardio-vascular and thoracic department of the Institute.

Exclusion criteria- Patients who had multiple compartments in CSDH, as seen on CT scan that needed more than one burr hole or wide craniotomy were excluded from the study.

Surgical technique- Written informed consent was taken from all patients prior to surgery. All patients operated under local anaesthesia. Single burr hole was made at the maximum depth of CSDH. Any bony bleeding was stopped with the use of bone wax. Dura along with outer membrane of CSDH was opened with cross shaped incision and coagulated properly. Fluid material was drained out and irrigation was done with warm normal saline with the use of infant feeding tube. All the collected blood was removed by changing the direction of infant feeding tube. Irrigation was done until returning fluid became clear and brain surface clearly seen from burr hole. If there was multiple membrane than a wide window is made in these membrane with the help of bipolar coagulation and saline irrigation was done. After that subdural space is filled with normal saline and skin is closed in two layers without putting any drain.

Any co-morbid condition (table-1) like hypertension and diabetes were managed accordingly with the consultation with physician. Antibiotics were given as per guide line of Centre for Disease, Control and Prevention (15). Both clinical and radiological criteria were used to see the progress of patient. Patients were discharged on 7th day.

RESULTS

This study include 98 patients, 80 men (87%) with mean age was 61 yrs and 16 women (13%) with mean age of 65 yrs. GCS was ranging from 5 to 15. The most common presentation was headache 40%(40 patients), hemeparesis 31%(30 patients), incontinence 15%(15 patients), dementia 10%(10 patients) and seizure in 4%(3 patients). 80 patients (82%) had unilateral and 18 patients (18) had bilateral CSDH. The mean midline shift on CT scan was 9.2 mm. All operated patients were improved and had 15 GCS after 1 to 12 hours of operation. 2 patients (2%) were improved initially but they became sick after 2 days. Repeat CT scan was showed re-collection and re-operation was done using the same burr hole. Both were improved after re-operation. Four patients were readmitted within 2 months of discharge and CT scan showed new development of CSDH on the opposite site of operation in one and on same side in three patients. Two of these patients were having history of drug addiction and repeated falls. Rest of the two patients were on anti-platelets drugs with deranged coagulation profile. So this was not considered as recurrence of CSDH as all four patients were having definite reason of development of new CSDH. Ninety patients were discharged on 7th day and eight patients were discharged on 10th day because of delayed wound healing.

Table-1 Co-morbidity in patients with CSDH

Minor Trauma	Antiplatelet Drugs	Narcotic Addiction	Brain Atrophy	Hypertension	Diabetes	CAD
50	12	8	14	26	20	4

DISCUSSION

CSDH usually occurred in elderly patients with history of minor trauma three or more weeks before (16). Most head injuries leading to CSDH are trivial and are easily forgotten by the patients. In present study 52% patients had history of head injury. Similar were the observation in the study done by Baechli et al (17). The number of CSDH patients is gradually increasing as older patients are increasing with the help of better medical facilities (10,18). CSDH can be managed by both surgically as well as conservatively depending on the clinical status and amount of CSDH on CT scan. Currently conservative management is opted only in asymptomatic patients or in those who have high risk of complication due to co morbid conditions. Most of the researches are now in favour of surgical management of CSDH. Burr hole craniostomy is widely accepted as simplest and safest method for the treatment of CSDH with recurrence rate 9.2 to 26.5% (2, 5, 9-13).

Some investigators found that subdural space is actually a continuum of cells between the dura and arachnoid layer. A cleavage in the weakest layer of this continuum by blood can form CSDH. This cleaved layer formed the inner layer and outer layer of the CSDH is formed by outer zone of the dura-arachnoid interface. Outer membrane contains blood vessels. Repeated bleeding from these vessels results in CSDH formation. This is

also responsible for recurrence of hematoma after evacuation. It is postulated that eosinophils in the outer membrane may contribute to the development of hyperfibrinolysis and recurrent subdural bleeding; possibly by the liberation of eosinophilic granule (19, 20).

Some studies showed gap junctions in the endothelial layer of outer membrane that can cause leakage of blood. The basement membrane of these capillaries is thin and fragile and can easily bleed. These gap junctions remain open by the hydrostatic pressure of CSDH. After drainage of CSDH, this pressure was removed and the separation of endothelial cells became reduced resulting in decreased membrane permeability. This may be the possible cause of non-expansion of CSDH after evacuation in most of the cases (21). Craniotomy being more invasive as compared with burr hole and does not provide extra benefit in term of recurrence of CSDH (2,18). It may be useful in case of multiple compartments in the CSDH or with multiple recurrences. Now most of the studies support the use of burr hole craniostomy as the 1st method of choice for CSDH drainage. It has equal results as compared with the craniotomy and had least morbidity and mortality with shorter postoperative hospital stay (7,22).

CONCLUSION

Complete evacuation by burr hole craniostomy in CSDH leads to significantly reduction in intracavitary pressure leading to decrease in gap junction in endothelium and secession of bleeding from outer membrane. Thorough saline wash needed for removal of semisolid component of blood and other fibrinolytic agents. Refilling of the residual subdural cavity by normal saline prevents entry of air that may be a cause of non-expansion of brain in post operative period. Although this study is small and based on single institution, it's conclusions were also in favour that single burr hole craniostomy is the simplest and effective surgical method of the management of CSDH.

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