ORIGINAL RESEARCH

A Study of Surgical Treatment of Chronic Subdural Hematoma in the Elderly Patients in Muscat, Oman

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ABSTRACT

Introduction: Chronic subdural hematoma (CSDH) is an encapsulated collection of blood between the brain and its surrounding dura, The underlying cause of CSDH is usually traumatic tearing of the bridging veins which connect the brain surface with the dura mater. This study is aimed at analysing the clinical outcome of surgically treated 46 patients over a period of one year.

Material and Methods: The clinical records collected 46 consecutive patients treated surgically from September 2014 to August 2015. Age, sex, the size and location of the hematoma, pre-operative midline shifting, density, Glasgow Coma Score (GCS), post-operative brain expansion, post-operative pneumocephalus and clinical outcomes were evaluated.

Results: Of the 46 patients, there were 37 (80%) males and 9 (20%) females with the mean age of 61 years (21 - 92 years). On admission 36 patient was having GCS 13-15, while 9 patients admitted on GCS 8-12, and one patient in deep coma. Among 46 patients, 30 patients (65%) were in the favourable outcome group (GOS 4-5) while 10 (22%) patients demonstrated a poor outcome. 6(13%) patients died.

Conclusion: Chronic subdural hematoma is a relatively common neurosurgical condition, affects mainly elderly patients. Treatment of chronic subdural hematoma is usually by surgical evacuation. Early diagnosis and prompt surgical treatment is essential for the success of the management of chronic subdural hematoma.

Keywords: Chronic Subdural Hematoma, Blood, CSDH

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INTRODUCTION

Chronic subdural hematoma (CSDH) is an encapsulated collection of blood between the dura mater (which adheres to the skull), and the arachnoid mater (which envelops the brain). It most commonly occurs in the older age groups (80% of patients are older than 40 years).[1]

It was first described by Virchow in 1857 as "pachymeningitis haemorrhagica interna" recognizing its inflammatory and hemorrhagic elements.[2] Later Trotter put forward the theory of trauma to the bridging veins as a cause of what he named "subdural haemorrhagic cyst". Since then trauma has been recognised as an important factor in the development of CSDH.[3]

Patients with CSDH can be asymptomatic, have very mild symptoms such as headache, nausea, vomiting, vertigo, fatigue, confusion, gait disturbance, mental deterioration, limb weakness, incontinence, dysphasia, or present with acute and grave symptoms such as hemiplegia, seizures, or coma. Computed tomography (CT) is the most important imaging method in the initial evaluation of CSDH.[5] The best diagnostic signal is a crescent-shaped iso- to hypodens extra-axial collection on CT.

The treatment option of CSDH is influenced by both the clinical presentation of the patient and the radiographic appearance of the lesion. The paucity of quality data from well-designed studies makes it difficult to identify the most effective surgical approach for CSDH. While surgical drainage is well recognised as an effective treatment of CSDH,[6] multiple standard surgical techniques exist. These include burr hole drainage (BHD), twist drill craniostomy (TDC) and craniotomy. Various factors like coagulopathy, pre-operative neurologic condition, patient's age, post-operative pneumocephalus, and brain expansion were known as related with prognosis.[4]

The present retrospective study analyzed the results of CSDH treated by one dependant or multiple burr holes craniostomies.

MATERIAL AND METHOD

The clinical records collected 46 consecutive patients treated surgically from September 2014 to August 2015 at a tertiary

referral hospital in Muscat Oman (Department Neurosurgery, Khoula hospital, Ministry of health).The data were collected from the admission notes, operation theatre records, hospital discharge summaries and out patients department notes.Diagnosis was confirmed by cranial computed tomography (CT) scan or by magnetic resonance imaging (MRI).
Age, sex, focal deficits, pre-operative midline shifting, density and the location of the hematoma, Glasgow Coma Score (GCS), post- operative brain expansion, post-operative pneumocephalus and clinical outcomes were evaluated. All patients were operated under general anaesthesia (GA) except those who had high risk of GA, Surgery done under Monitoring local anaesthesia. According to the size and location of hematoma it was drained by a single dependant burr hole or by multiple burr holes. In case of recurrence standard craniotomy and evacuation obtained.
Outcome was assessed in terms of post op GCS, Glasgow Outcome Score (GOS) at 3-4 weeks follow up, and the patients in category 4 or 5 were defined as having favourable outcome. Immediate CT scan was repeated only in those who either did not recover or deteriorated, remaining all patients follow up CT scan was done at 3-4 weeks.

RESULTS

Of the 46 patients, there were 37 (80%) males and 9 (20%) females with the mean age of 61 years (21 - 92 years). 32 (70%) patients present with the history of trauma. The mean duration between trauma and the diagnosis was 21.3 days (range from 6 to 70 days). iso- to hypodens extra-axial According to location 38 patients operated for two burr holes craniostomies, 5 patients for bilateral four burr holes craniostomies and 3 patients for single burgle craniostomy.
Out of 46, 33 (72%) patients immediate post op either improved by GCS, while 13 (28) patients either drop GCS or remains same GCS. 27 (59%) patient who had focal deficits, 26 (57%) patient showed immediate post op recovery. Regarding 3-4weeks follow up CT scan, 33(72%) patient scan showed good evacuation, while 10 (22%) patients CT scan showed partial evacuation with pneumocephalus. 3 CT scan showed no interval changes. All these 3 patients underwent for craniotomy and evacuation of hematoma.
Among 46 patients, 30 patients (65%) were in the favourable outcome group (GOS 4-5) while 10 (22%) patients demonstrated a poor outcome. 6 (13%) patients died, All of them age wise above 60 years and GCS at admission below 10/15 (Table.1).

DISCUSSION

CSDH is one of the commonest neurosurgical condition and the effects of the hematoma is mainly mechanical due to its space occupying effect and brain shift. Focal cortical compression, raised intracranial pressure, and cerebral ischaemia contribute to the symptomatology. Figure 1.

Trauma is an important factor in the development of CSDH. However, a history of head injury (direct trauma) is absent in about 30% to 50% of the cases. Indirect trauma seems to be more important. About half the patients have a history of fall but without hitting their head on the ground.[5-7] In many situations the trauma is so trivial that it is forgotten. Other predisposing factors include anticoagulation, alcoholism, epilepsy, bleeding diathesis, low intracranial pressure secondary to dehydration or after the removal of cerebrospinal fluid, and receiving renal dialysis, presumably due to platelet dysfunction.[8] The current study showed that in 14 cases the history of head injury was absent.

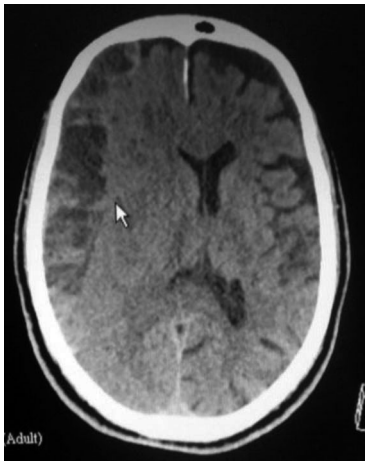

Figure-1: CT scan brain showing iso- to hypodens extra-axial chronic subdural hematoma with significant mass effect and midline shift.

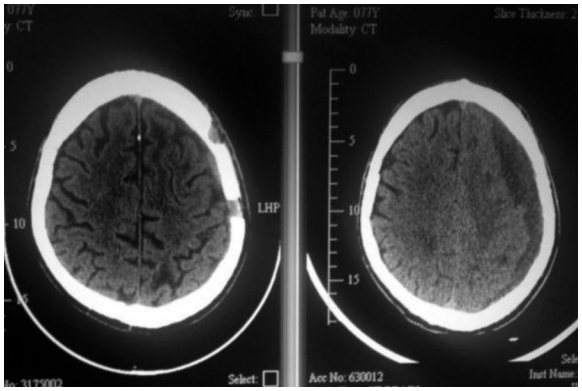

Figure-2: Pre and post op scan, Showing good evacuation of hematoma.

Factors	Favourable Outcome	Poor Outcome	Deaths
GCS			
13 to 15	24	0	0
8 to 12	6	9	5
7 and below	0	1	1
Age			
60 years and above	18	6	6
30 to 60 years	7	4	0
Below 30 years	5	0	0

Table-1: Variable factors and clinical outcomes

CSDH is known to be prevalent in two age groups, infants and the elderly, especially those over 75 years old, but can occur in any age group.[9] In this study the mean age of 61 years (21 - 92 years), Its supported that CSDH affects mainly elderly patients because brain atrophy causes enlargement of subarachnoid space and stretching of the bridging veins, and these pre-existing conditions facilitate tearing of the arachnoid membrane leakage of bloody cerebrospinal fluid(CSF).[10]

In this study patient's neurological conditions on admission are measured by GCS. Rozzelle et al.[11] reported that patients with CSDH especially with GCS under 7 had high mortality rates. Weisse et al.[12] also recommended early diagnosis and treatment for CSDH because of poor prognosis of patients with GCS under 8. Our study supported this results that on admission 36 patient was having GCS 13-15, while 9 patients admitted on GCS 8-12, and one patient in deep coma. 33 patients immediate post op either improved by GCS, while 13 patients either drop GCS or remains same GCS. (Table.1)

The spectrum of surgery extends from twist drill craniostomy to a more aggressive craniotomy and membranectomy. Burr hole drainage (BHD) craniostomy appears to occupy the position in between.[13] BHD has been the standard treatment since McKissock et al published a large series in 1960.[14] This is a simple and widely practiced technique and has the best cure to complication ratio. In the present series 46 patients had burrhole evacuation as the treatment of choice. Out of 46 patients, Post op scan of 33 showed good evacuation, while 10 patients CT scan showed partial evacuation with pneumocephalus. 3 CT scan showed no interval changes. All these 3 patients underwent for craniotomy and evacuation of hematoma.

In our series 30 (65%) patients in the favourable Out come, It shows that surgical treatment burr hole drainage appears sufficient in majority of patients and the outcome is favourable even in the elderly. Only few patients required further drainage by craniotomy.

CONCLUSIONS

Chronic subdural hematoma is a relatively common neurosurgical condition, affects mainly elderly patients. Treatment of chronic subdural hematoma is usually by surgical evacuation. Burr hole drainage is a simple and widely practiced technique and has the best cure ratio. Early diagnosis and prompt surgical treatment is essential for the success of the management of chronic subdural hematoma.

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