OPTIMUM MANAGEMNT OF CHRONIC SUBDURAL HEMATOMA:EVALUATION OF VARIOUS SURGICAL OPTIONS FOR THE TREATMENT OF CHRONIC SUBDURAL HEMATOMA

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ABSTRACT

Objective: To evaluate the various surgical treatment options and find out the best possible treament for chronic subdural hematoma(CSDH).

Methodology: This descriptive study was conducted in the Department of Neurosurgery, Hayatabad Medical Complex, Peshawar from February 2009 to 30th January 20112. CSDH was diagnosed on CT scan brain. Patients below sixteen years of age were excluded from the study. Surgical techniques used were two burr holes aspiration, craniectomy and in recurrent cases craniotomies. Patients were evaluated for improvement in neurological status and development of any complications. Data was analyzed in SPSS 16.

Results: Total 161 patients were operated for CSDH during this study period. 125(77.64.0%) males and 36 (21.36%) females with the mean age of 61$\pm$ 2.23 years (22-74 years) .Causes of CSDH was fall in 65 (40.37%) and road traffic accidents in 49 (30.43%) patients. Forty eight (29.81%) patients did not remember any head trauma. Most common presentations include headache in 105(65.21 %),Hemiparesis in 64(39.75%)patients, altered sensorium in 52 (32.75%),amnesia in 23(14.28%)patients, fits in 21(13.04%) patients, dysphasia in 14(8.70%) patients and facial palsy in 10(6.21%) patients. CSDH was unilateral in 133(82.61%) patients and bilateral in 28 (17.39%) patients. Two burr-hole aspirations were performed in 98 patients (Group 1). And in 52 patients enlarged craniectomy, with a diameter of about 30 mm (Group 2) was performed. Complications included recollection in 8(12.88%),intracerebral bleed in 5(8.05%),seizures in 4(6.66%),pneumocephalous in 3(4.83%),wound infection in 6(9.66%) and subdural empyema in 2(3.22%) patients. Two patients (3.22%) died in postoperative period. Twenty six patients needed re-exploration for recurrences. Craniotomy was performed in 11 patients after two recurrences.

Conclusion: In properly indicated cases of chronic subdural hematoma, surgical treatment has good outcome .For the initial treatment of chronic subdural hematoma, better option is two burr-hole drainage with irrigation of the hematoma cavity .Craniectomy has relatively higher re accumulation rate. In recurrent cases craniotomy and membranectomy is appropriate treatment option.

Key Words: Chronic subdural hematoma, Two burr holes evacuation, Craniectomy, Craniotomy, Outcome.

Abreviations: CSDH: Chronic subdural hematoma

INTRODUCTION

Chronic subdural hematoma (CSDH) represents one of the most common intracranial Hemorrhages in a neurosurgical practice. Surgery on these patients is not straight forward because of the coexisting medical problems in these patients. Various treatment options have been described[1,2,3 ,4,5,6,7,8,9]. However, unanimous treatment option for CSDH does still not exist and several important aspects of clinical management remain controversial[10,11,2,12,13,14,6,8,15,16,17].

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The extent of surgical treatment ranges from simple burr-hole evacuation and irrigation of the subdural hematoma cavity in simple CSDH to craniotomy and partial membranectomy. The recurrence rate ranges between 2.7 and 37%[2,12,13,18,4,5,6,8,15].

Wide craniectomy and extended craniotomy have also been described as surgical treatment option for CSDH by some others[19,5,8,16].

In the present study, various surgical approaches which were performed in our unit were evaluated i.e. two burr holes drainage without membranectomy (Group 1); enlarged craniectomy with a diameter of about 30 mm and partial membranectomy (Group 2); and in recurrent cases larger craniotomy with a gross membranectomy. The purpose of the study is to find out the best possible surgical treatment option for the chronic subdural hematoma.

PATIENTS AND METHODS

It was a descriptive study which was conducted in the Department of Neurosurgery at Hayatabad Medical Complex, Peshawar from 1st February 2009 to 30th January 20112. One hundred and sixty one patients of CSDH were included in this study.

History was taken and examination performed by the time of admission. CSDH was diagnosed on CT scan brain and defined as a moon shaped hypodense lesion between dura and brain. Separate performa was used for date collection.

Diagnosed cases of CSDH from both genders were included in this study. Pediatric patients were excluded from this study. Surgery was performed either under general anesthesia or local anesthesia as considered appropriate. In fresh CSDH patients either two bur holes evacuation or single craniotomy were performed while craniotomy and membranectomy was done after two recurrences. Much irrigation was done via each burr holes in two burr-hole technique until the irrigation fluid would become clear. Drain was placed if required. All the patients were assessed for improvement in neurological status post operatively and development of complications. The patients were discharged by third to seventh day after surgery. Patients were then subsequently followed in outpatient department at two weeks intervals after operation for one month. Glasgow outcome scale was used to assess the patients on follow up.

The collected information were entered into our ward computer database and analyzed in statistical package of social sciences (SPSS) version 16.Frequency and percentage were calculated for variables like age, sex, mechanism of trauma, clinical features, CT scan findings, complications and postoperative outcome.

RESULTS

Total 161 patients were operated for chronic subdural hematoma during this study period. There were 125(77.64.0%) males and 36 (21.36%) females patients with the mean age of 61$\pm$ 2.23 years (22-74 years).

Predominant cause of CSDH was fall 65 (40.37%) and 49 (30.43%) had a history of road traffic accident. Forty eight (29.81%) patients did not remember any trauma to the head when asked after recovery. These patients had various medical causes like hypertension and coagulopathies apart from minor trauma.

Most common presenting features were headache and motor weaknesses in various parts of the body. Various presentation of chronic subdural hematoma in our patients are given in table no 1.

CT scan of 133(82.61%) patients showed unilateral hematoma while 28 (17.39%) showed bilateral chronic subdural hematoma .

Table 1: Presentation Of Chronic Subdural Hematoma

No	Clinical features	No of patients	Percentage
1	Headache	105	65.21 %
2	Hemiparesis	64	39.75%
3	Altered sensorium	52	32.2%
4	Memory loss	23	14.28%
5	Fits	21	13.04%
6	Dysphasia	14	8.70%
7	Facial palsy	10	6.21%

Table 2: Post operative complications

No	Post operative complication	No of patients	Percentage
1	No complication	138	85.71%
2	Significant Recollection	8	12.88%
3	Intracerebral bleed	5	8.05%
4	Seizures	4	6.44%
5	Pneumocephalous	3	4.83 %
6	Wound Infection	6	9.66 %
7	Subdural empyema	2	3.22%
8	Death	2	3.22%

Table 3: Surgical procedure and rate of reoperation

Group	Procedure	No of patients	No of Reoperation	Percentage
1	Two burr holes aspiration	98	9	9.18%
2	Enlarge craniectomy	52	6	11.54%

Two burr-hole craniotomy (diameter 12 mm), one of which was anterior to the coronal suture and the other one on the posterior portion of the CSDH, was performed in 98 patients (Group 1). Membranectomy was not performed in these patients. There were 52 patients treated by enlarged craniectomy, with a diameter of about 30 mm (Group 2). In 11 patients extended craniotomy was performed after two recurrences. Closed-system drainage was put into the hematoma cavity if required for an average of 2 days.

Neurologic status improved after the surgical treatment in most cases. The general outcome was good with no or mild neurologic deficits post operatively. Various post operative complications are listed in table 2.

Operative mortality was defined as death within 30 days after operation. However these deaths in our study were related to accompanying diseases and not due to cerebral decompensation.

Amongst 161 patient, total 26 patients were re-operated. Number and rate of reoperation are shown in table no 3.

Eleven among these 26 were operated for the third time and craniotomy and membranectomy was performed this time. Indications for reoperation were increase in the volume of residual subdural fluid within the hematoma cavity, rebleeding, subdural empyema and one case of pneumocephalous.

DISCUSSION

Chronic subdural hematoma is well known as a curable disease primarily of elderly population. However timely and appropriate treatment is essential. In the previous years, various surgical treatments of CSDH have been reported[1,19,3,4,5,6,9]. The extent of surgical therapy is still controversial and difference of opinions still exist as to which procedure is better than others[10,11,12,13,14,6,8,15,16,6].

In our department we operate patients via two burr-hole drainage without membranectomy (Group 1). However craniectomy (group 2) is also not uncommon in our department.

Putnam and Cushing and the others advocated extended craniotomy because of the better exposure it provides for treatment of the solid components of the SDH [4,5,8,16]. Therefore, in 11 cases in this study a larger craniotomy with gross excision of thickened space occupying hematoma membrane was performed, in whom two recurrences occurred with the previous two modalities of treatment.

Irrespective of surgical method, in majority of our patients, the neurologic status improved after the surgical treatment. However Post-operative complications like recurrence of hematoma, pneumocephalus ,seizures and intracerebral hemorrhage may occur in some patients .

The general outcome of the surgical treatment for CSDH has been good in the present study. In 138 patients (85.71%) there has been uneventful recovery of the patients. Only few complications were observed postoperatively and treated accordingly. Two patients in the present study died in post operative period but these patients had other co morbid conditions as well and cerebral decompensatin was not the cause of their mortality. According to previous studies, the rate of various complications varies in different ranges. Mortality ranges from 0-8% depending on the preoperative clinical condition. Subdural empyema occurs in 2% of patients, especially when the drain is left in place for more than 3 days. In most of the series, long-term epilepsy is a rare complication and patients do not require antiepileptic drugs. We kept all of our patients on antiepileptic drugs for two weeks if there were no preoperative history of fits. However six months antiepileptic drugs were given if there were preoperative or post operative seizures had occurred. The lack of cortical re-expansion, postoperative intracerebral hematoma and tension hydrocephalus are among other complications occurring after surgery. In our series two factors that can't be ignored and has got an influence on the outcome are pneumonia and hypertension. These conditions were aggressively treated during the post operative period.

There are some patients which require reoperations. This is due to residual thick hematoma membranes followed by re-accumulation of subdural fluid or re-bleed. In our patients there were 8 (12.88%) patients who had reaccumulation. The rate of reoperation varies between 2.7 and 30%[13,18,4,6,8,15].In some studies the rate of reoperation rate was ranging between 16 and 23%, depending partly on the surgical method[2,12,13,18,4,5,6,8,15]. In our study in whom two burr-hole drainage without membranectomy (Group-1) were performed ,the rate of reoperation 9/98 (9.18%) was lower than in Group-2 i.e. 6/52(11.54%) which had craniectomy & partial membranectomy. Hence we think craniectomy is no better than two burr holes drainage in terms of reoperation rate.

It has been realized that the development and enlargement of a CSDH is a result of both local

hyperfibrinolysis and continuous micro hemorrhages from the sinusoidal vessels of the parietal

membrane[23,3,24]. Therefore, for the initial treatment of CSDHs, adequate drainage and rinsing of the hematoma cavity, is better option than partial resection of membrane. Patients in whom recurrence occurred more than twice ,wide craniotomy and excision of membrane was done as recommended in previous studies as well[4,5,8,16].

CONCLUSIONS

In properly indicated cases of chronic subdural hematoma ,surgical treatment has good outcome .For the initial treatment of chronic subdural hematoma, two burr-hole drainage with irrigation of the hematoma cavity. It is safe and timesaving option and has got less chances of reaccumolation. Craniectomy has relatively higher re accumulation rate. In recurrent cases craniotomy and membranectomy is appropriate treatment option.

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