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ETIOLOGY AND SURGICAL OUTCOME OF CHRONIC SUBDURAL HEMATOMA AT TERTIARY CARE HOSPITAL.

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ABSTRACT… Objectives: To determine etiology and management outcome among patients presenting with chronic subdural hematoma at tertiary care Hospital. **Study Design:** Cross Sectional. **Setting:** Department of neurosurgery, Liaquat University Hospital, Hyderabad/ Jamshoro. **Period:** One year from 2015 to 2016. **Material & Methods:** All the patients with diagnosis of unilateral chronic subdural hematoma, and both male and female gender were included in this study. CT scan and other relevant laboratory investigations were done. All the patients underwent treatment of burr hole evacuation after taken informed consent. Antibiotics were given to all the patients pre- and post-operatively. All the subjects underwent CT scan for the evaluation of hematoma cavity. Patients were discharged generally following 1-week and were followed at outpatients department for 1-month, 3-months and 3-months, respectively. All the patients were assessed according to Glasgow Outcome Scale. **Results:** Over a period of one year; total thirty patients were selected, most of them were in the 6th and 7th decades of their lives and males were in majority 25(83%). Sixteen patients had a history of minor head injury, eleven patients had no obvious cause and one patient had chronic subdural hematoma secondary to over shunting. According to complications; intracerebral bleed was among 2(6%) cases and Pneumocephalus was in 2(6%) cases, followed by subdural empyema, acute subdural hematoma, extra dural hematoma, penetration into brain via drain catheter, C.S.F leakage and dysphasia were found in one patient, in each case, respectively. Almost every patient recovered and survival rate was 28(93%), while only two patients died. **Conclusion:** It was concluded that patients showed best outcome (93% survival rate) according to Glasgow Outcome Scale, after burr hole evacuation management. Head injury due to road traffic accident was the most common etiology and burr hole evacuation was the best treatment option for chronic subdural hematoma.

Key words: Burr Hole Evacuation, Chronic Subdural Hematoma, Etiology.

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INTRODUCTION

Subdural space is a capillary gap amid the arachnoid mater and dura mater and comprises a little amount of serous fluid that moisturizes smooth opposite surfaces. Bleeding between arachnoid and dura results in subdural hematoma. Conventionally, subdural hematoma may be categorized as sub-acute, acute and the chronic subdural hematoma, purely in terms of time which they take to produce symptoms. Clinically during 72 hours of trauma are usually considered acute.[1] Post traumatic acute subdural hematoma is one of the unexplained challenges in neurotraumatology. In spite of major development in outcome of the head injuries in current years, those with subdural hematoma persistently represent 50.0% to 74.0% rate of mortality. Related to the lesion incidence, the first computed topography scan associates with poorer outcomes.[2,3] If symptoms of hematoma emerge within three weeks, it is termed as sub-acute.[4] In the chronic subdural hematoma (CSDH), symptoms emerge following three weeks of injury. Instead of using a temporal difference between chronic and acute subdural hematoma, a few surgeons explain CSDH as liquid hematoma; and explain acute-subdural hematoma as clotted-hematoma.[1,4] In the subjects admitted with chronic subdural hematoma (CSDH); a general interval between the diagnosis

and a known trauma was 4.0-5.0 weeks.[1,5] CSDH is a frequent challenging condition in adults with head injury; even in trivial trauma overlooked by the subject.[6-9] CSDH is a collection of nearly always dark colored transformed liquid blood associated with a neomembrane located amid arachnoid mater and dura mater. CSDH is an eminent curable disorder among the elderly subjects.[5] The disease is further frequent in older age because of anatomical causes. The surgery is required in majority of the subjects and outcome is quite good. Chronic subdural hematomas (CSDHs) are in 11.0% to 35.0% of patients. In early surgery it becomes evident that removal of only 1 of the 2 hematomas will precipitate expansion of the contra lateral untreated hematoma. If bilateral hematomas exist, they must be treated simultaneously.

The most frequent factor of CSDH is minor head injury which can possibly be overlooked by the subject. Trauma is a significant factor of CSDH. Patients generally become symptomatic several days or week after a minor head injury.[6,10] Almost 50% of chronic traumatic subdural collection results into subdural hematoms. Though 40.0-50.0% of subjects do not have any trauma history[11] and other 50% can possibly be considered such as anticoagulant medication, coagulopathy[12], acetylsalicylic acid[13], dural sarcomas, metastatic cancers meningiomas, arachnoid cyst and vascular malformations. Chronic subdural hematoma (CSDH) can manifest with different neurological signs and symptoms including seizures, hemiparesis and confusion.

The commonly found symptoms are headache among 81.0%, weakness in 22.0%, vomiting in 30.0%, confusion in 38.0%, variation in consciousness 47.0%, seizures in 9.0% and visual symptom among 13.0%. Signs can possibly be memory loss among 27.0%, motor weakness among 41.0%, dysphasia in 11.0%, pupalary inequality in 21.0%.[14] CT scan is very convenient technique for diagnosis of CSDH. Though; 76.0% of CSDHs are hypodense on computerized tomography scan. The lesion can possibly also be in mixed density or isodense. MRI is superior to computerized tomography scan for imaging subdural collections. 4th generation computerized tomography scan cam possibly miss CSDH.[14] Treatment for CSDH is controversial ranging from craniotomy to burr hole irrigation without or with closed drainage system. Decisive treatment of CSDH is surgical removal of clot, however occasionally when clot is minor it can be treated medically by hydration, Mannitol, steroids and rest.[14] Majority of patients with CSDH are effectively treated with external drainage and simple burr hole evacuation.[6,7] Studies showed controversial findings regarding etiology and treatment outcome. Therefore this study was conducted to determine the etiology and management outcome among patients presenting with chronic subdural hematoma. This study will provide the knowledge regarding etiology and updated treatment outcome.

MATERIAL AND METHODS

This study was performed at the department of neurosurgery of Liaquat University Hospital, Hyderabad/Jamshoro. Over a period of one year from May 2014 to 2015. All the patients with diagnosis of chronic subdural hematoma, and both male and female gender were included in this study and patients with bilateral haematoma were excluded. CT scan and other relevant laboratory investigations were done. All the patients underwent treatment of burr hole evacuation after an informed consent. All the patients were informed regarding complication of treatment before the surgery. One liter of 5% D/Water, I/V fluid before and one liter during the operation is supposed to assist in expanding the brain following elimination of the clot. These subjects were mostly operated under general anesthesia. Following general anesthesia practice; patient was suitably placed in supine position on operating table with the head tilted to one side. Site to be operated was always placed upwards.

A vertical incision of 2.5 to 3 cm was given on affected area where maximum thickness of clot was noted according to CT scan. It was closed after taking the burr hole dura and then a vertical incision was done in the dura, and from this site of incision dark brown fluid rushed out with

pressure. The first flow was controlled by taking cotton paty at the incision site and the suction of the fluid of clot to avoid the sudden emptying of cavity, which can cause the fresh bleeding from the brain. After that incision size was increased and cruciate incision was made for making the opening of the dura large to flow the clot. After the fluid's flow stopped, irrigation of the cavity was started with the normal saline via burr hole by the disposable 50ml syringe. Normal saline mixed in the residual clot stated coming out the cavity, and on coming of pure colour normal saline from burr hole irrigation was stopped. A subdural nelaton catheter number 10 was then inserted through a particular incision in the scalp. An edge of the burr hole was nipped to avoid kinking of the subdural drain. Drain was connected with a closed drainage bag. Dura was not closed. Muscle and scalp were stitched in layer over the burr holes. Head sides of the patients were kept 20 degree down for 24-48 hours post-operatively. This helped to drain the residual clot in the drain bag and to expand the brain. Patients were kept well hydrated by giving large quantities of oral and I/V fluids. All the patients were given antibiotics pre and post-operatively for 7 days. All the patients underwent CT scan to assess the cavity of hematoma and on stable condition patients were discharged. All the cases were followed by OPD 30 days, 3rd month and 6th month. Outcome of the patients was assessed according to GLASGOW OUTCOME SCALE as showed in table below.

Classification	Description
Grade 5	Good recovery, resumption of normal life.
Grade 4	Moderate disability, disable but independent.
Grade 3	Severe disability, dependent for daily support.
Grade 2	Vegetative state, unresponsive and speechless.
Grade 1	Death
Glasgow outcome scale	

RESULTS

Over a period of one year total thirty patients were selected with chronic subdural hematoma (CSDH). 51-60 years and 61-70 years of age groups were most common 11(36%) and 12(40%) respectively, followed by 40-50 years were 4(13%) and more than 70 years patients were only 3. There were 25 (83%) males and 5 (17%) females. Few cases were from Hyderabad city and mostly were from rural areas of Sindh. Most of the cases presented with Hemiparesis, headache and speech disorders. (Table-I)

According to the etiology 16(53.3%) cases had history of the minor head injury caused by road traffic accident and trivial injuries, such as the fall. Eleven patients were noted without any actual causes. No any case was found with Alcohol abuse history, while evidence of bleeding disorder was in 2 cases. 1 case had CSDH secondary to over shunting. (Table-II)

Postoperatively, no patients complained of headache, so we achieved 100% result, Hemiparesis improved in all patients within a week except one patient who was an extensor response preoperatively, become unconscious and died due to RTI. Out of 9 patients having dysphasia 6 patients improved completely and their speech became normal. Dysphasia was improved in 2 patients but not 100% and one patient did not show any improvement post-operatively. CT scan showed ischemia that might be a reason of dysphasia. Dysphasia improved in 2% cases. One patient who had seizures preoperatively did not become seizures free until a period of six month follow-ups though frequency of seizures was decreased. One patient developed dysphasia post-operatively. One patient was worsening and become unconscious postoperatively and immediately underwent CT scan which showed penetration of drain catheter in brain matter, and large subdural clot was developed, therefore craniotomy was done to evacuate the clot and patient was improved.

Among two cases pneumocephalus developed, but effect of the mass was not enough, for deterioration so patients were recovered. Total two cases expired, one died after 4th postoperative day due to critical condition of chest at admission and other patients died due to CSF leakage on subdural drain removal and subdural empyema

development and did not recover even with antibiotics and died on 4th day, surgery was planned but died before start the surgery. Among 10 cases; residual hematoma was developed according to CT scan, but recovered without reopen, because they had no any neurological deficit. Complications can be avoided on careful management. Finally good recovery was observed in 28 patients according to GLASGOW OUTCOME SCALE and they left for home with satisfactory condition. (Table-III and IV)

Variables	Frequency (%)
Gender	
Male	25(83%)
Female	5(17%)
Total	30(100.0%)
Age groups	
40-50	4(13%)
51-60	12(40%)
61-70	11(36%)
71-80	2(6%)
81-90	1(3%)
Total	30(100.0%)

Table-I. Demographic characteristics of patients (n=30)

Etiology	No of Patients
Minor Head Injury	16(53.3%)
Coagulopathy	2(6.7%)
Post V. P shunt	1(3.3%)
Unknown	11(36.7%)
Total	30(100.0%)

Table-II. Etiology of chronic subdural hematoma (n = 30)

Complications	No of Patients
Subdural Empyema	1(3%)
Penetration of brain by drain catheter	1(3%)
Intracerebral Bleed	2(6%)
Acute subdural hematoma	1(3%)
Pneumocephalus	2(6%)
Extra dural hematoma	1(3%)
Dysphasia	1(3%)
C.S.F leakage	1(3%)

Table-III. Cases distribution according to complication n=30

Outcome	No of Patients
Good Recovery	28(93%)
Moderate Disability	00
Serve Disability	00
Vegetative State	00
Death	2(6%)

Table-IV. Surgical outcome Glasgow outcome scale n=30

DISCUSSION

This study, regarding the etiology and surgical out come in patients of chronic subdural hematoma (CSDH) through single burr hole drain placement technique, was carried out over a period of one year. During this period thirty cases were operated for CSDH. In this study most of the patients presented with 6th or 7th decades of their lives and twenty five patients 25(83%) were aged more than 50 years. This is a perfect match with the international study of Miranda LB et al[15] conducted at united state. And another study of Kitya D et al[16] reported that males were in majority 72.8%. Similarly a national study of Vash Dev et al[17] also found comparable results regarding age. In our study male to female ratio was 6:1 and the ratio also correlated nearly with a large study conducted by Vash Dev et al[17], in which males were 63.6%. In another study conducted in department of Neurosurgery, Hayatabad, Peshawar; male to female ratio was 4:1, through there was a difference which could be due to over small sample size.[18] Bankole OB et al[19] also found similar findings regarding gender as 46 males (83.64%) and 9 females (16.36%).

In our study out of 30 patients 17 (56.6%) had history of head trauma due to RTA. In contrast to our study, Bankole OB et al[19] reported that 71 (41.82%) cases had history of road traffic accident. Huang et al.[20] conducted study in Taiwan and found traumatic brain injury in 73 (74.49%) of 98 patients. Rovlias et al.[21] in Brazil found TBI in 503 (51.01%) out of 986 patients. In these studies traumatic brain injury rate was higher as compare to this study, and this may be due to small sample size of our study. In our study 36.7% cases had unknown cause, which was similar to the study of Bankole OB et al[19], as 22% cases were presented with unknown causes. The patients with unknown etiology were probably from trivial trauma as none of them was on anticoagulant, antiplatelet aggregation or had coagulopathy.[19] Some other national and international studies conducted by Mekaj AY et al[22] and Kazmi AM et al[23], also found comparable findings. In this study according to complications; one case showed subdural Empyema, intracerebral Bleed occurred in 2 cases, Pneumocephalus was among 2 patients,

extra dural hematoma developed in one case, acute subdural hematoma in one case, C.S.F leakage was found in one case and dysphasia was also found in one case, while overall complication rate was 30%, which is near to the recent study of Rovlias A et al[24] which reported a postoperative complications rate of 22.7%. Kitya D et al[16] reported that wound infection developed in four patients, subdural empyema developed in only one patient, and infection rate was 2.4%. Lee L et al[25] showed that surgical complication rate was 11.4%.

In this study surgical outcome was addressed according to Glasgow Outcome Scale, almost all patients recovered and survival rate was 94%, while mortality rate was 6%. In contrast to this study ACHAKZAI NU et al[26] reported that 129 (89%) patients had favorable outcome while 16 (11%) patients had unfavorable outcome. Bankole OB et al[19] reported that favorable outcome was 94.54% and it was significantly affected by GCS prior to surgery. Silva et al[27] in Brazil found favorable outcome of 82.4% and their outcome was also affected by GCS. Mulligan P et al[28] reported that 3(7%) died in the postoperative period. So looking at the rates of complication, it appears high but it may be because of the small sample size and may be because overlooking of minor things pre-operatively. Common complications that we encountered were pneumocephalus, acute subdural hematoma, and subdural emphyema and these can be due to avoiding and correcting the coagulopathy or carefully insertion of catheter and proper post-operative care.

CONCLUSION

It was concluded that chronic subdural hematoma (CSDH) is a benign lesion, mostly found in the elderly people. Patients showed best outcome of 93% survival rate according to Glasgow outcome Scale, after burr hole evacuation management. Head injury due to road traffic accident was the most common etiology and burr hole evacuation was the best treatment option for chronic subdural hematoma. CT scan is the best diagnostic choice for chronic subdural hematoma (CSDH). Early diagnostic of CSDH is essential for best outcome with deteriorating the neurological status outcome may become poor.

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