RISK FACTORS OF CHRONIC SUBDURAL HEMATOMA RECURRENCE AFTER BURR HOLE SURGERY

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ABSTRACT

Background: Chronic subdural hematoma (CSDH), a common type of intracranial hemorrhage and one of the most common clinical entities encountered in daily neurosurgical practice tends to occur in elderly patients. **Objective:** To determine the frequency and risk factors of chronic subdural hematoma recurrence after burr holes surgery. **Patients and Methods:** This descriptive cross sectional study was conducted in neurosurgery department Nishtar Hospital Multan from 1st January 2013 to 31st December 2013. All the patients diagnosed as CSDH, confirmed on computed tomography (CT) and treated by hematoma evacuation and drainage through cranial bur hole during the study duration were included in the study. Routine computed tomography (CT) was performed in all the patients, the day after the surgery, one week after the surgery, two months after the surgery and all the patients were followed up to three months after the surgery. Preoperative and postoperative CT findings were compared to calculate the recurrence rate. Data was entered and analyzed by using SPSS version 17. P value = 0.05 was considered significant. **Results:** There were 72.64% male and 27.36% female patients. 78.31% patients were = 70 years age and 21.69% below 70 years. CT demonstrated CSDH as hypo dense to cerebral parenchyma in 49.05%, isodense in 29.24% and hyperdense in 21.71%. Recurrence of chronic subdural hematoma after the bur holes craniotomy was observed in 10.8% (12) patients. Major risk factors identified for recurrence were age = 70 years and re-expansion of the brain after the surgery. **Conclusion:** It is concluded that recurrence of chronic subdural hematoma after burr holes evacuation is directly related with age and re-expansion of the brain after surgery.

Key Words: Recurrence, Chronic Subdural Hematoma, Burr Hole

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INTRODUCTION

Chronic subdural hematoma (CSDH), a common type of intracranial hemorrhage and one of the most common clinical entities encountered in daily neurosurgical practice tends to occur in elderly patients with reported recurrence rate of 2.3 to 33%.[1,2] In up to 50% cases head trauma has been identified as a risk factor for chronic subdural hematoma and other risk factors identified are coagulopathy, use of anticoagulant drugs, seizures, alcoholism and patients at risk of falls.[3] For the treatment of chronic subdural hematoma there is no uniform agreement on the best method. Different treatment options available for CSDH are single large bur hole, two bur holes with or without subdural drain and formal craniotomy with excision of subdural membrane.[4] Traditionally CSDH is managed by placing two bur holes one in frontal, other in parietal region with irrigation of subdual space with normal saline and placement of subdural drain for one or two days.[5] Recurrence of subdural hematoma after the surgery is related with different factors like age, anticoagulant treatment, recurrent traumas and re-expansion of the brain after the surgery. Decompression of CSDH by burr holes surgery offers a dramatic improvement of symptoms and procedure is relatively noninvasive and safe with satisfactory postoperative outcome in majority of patients.[6] This study was planned to observe the frequency and risk factors of chronic subdural hematoma recurrence after burr hole surgery in patients admitted in neurosurgery department Nishtar Hospital Multan.

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PATIENTS AND METHODS

This descriptive cross sectional study was conducted in Nishtar Hospital Multan from 1st January 2013 to 31st December 2013 to analyze the frequency and risk factors for recurrence of chronic subdural hematoma (CSDH) after burr holes surgery. All the patients diagnosed as CSDH, confirmed on computerized tomography (CT) and treated by hematoma evacuation and drainage through cranial bur holes in the department of neurosurgery during the study duration were included in the study. Patients with

previous history of surgery for CSDH and not willing to be included were excluded. All the patients undergoing surgery were interviewed after taking verbal consent by using preformed questionnaire. Under aseptic conditions hematomas were evacuated and irrigated with normal saline through two bur holes and closed system subdural drainage was continued for two days after the operation.

Routine computerized tomography (CT) was performed in all the patients, the day after the surgery, one week after the surgery, two months after the surgery and all the patients were followed up for at least three months after the surgery in the outdoor. Preoperative and postoperative CT findings regarding re-expansion of the brain, subdural air accumulation and density of the hematoma were recorded and compared to find out the association between risk factors and recurrence. The recurrence was labeled if hematoma developed after day two to up to 3 months after the bur holes craniotomy. Data was entered and analyzed by using SPSS version 17. Fishers exact test was applied to see any statistical difference in risk factors between two groups i.e. with recurrence and without recurrence. P value<0.05 was considered significant.

Accumulation of blood between dura matter and cerebral parenchyma after burr holes surgery after day two to up to three months on CT scan was labeled as recurrence. The space between dura matter and brain parenchyma on CT scan filled two third or more after evacuation of hematoma was labeled as re-expansion of the brain. Presence of jet black spots on CT scan between cerebral parenchyma and dura matter after evacuation of hematoma was labeled as subdural air accumulation.

RESULTS

Total 109 patients were included in the study. Three patients died within 24 hours after the surgery. The data of remaining 106 patients was analyzed. There were 72.64% male and 27.36% female patients. 78.31% patients were > 70 years age and 21.69% below 70 years.

Computed tomographic (CT) studies showed that in 51.88% cases CSDH was on the left side, in 34.98% cases on right side and bilateral in 13.14% cases. CT demonstrated CSDH as hypo dense to cerebral parenchyma in 49.05%, isodense in 29.24% andhyperdense in 21.71% as shown in Table I.

Table I:Characteristics of patients with chronic subdural hematoma.

Variable	Frequency	Percentage
Gender		
Male	77	72.64%
Female	29	27.36%
Age groups		
< 70 years	23	21.69%
> 70 years	83	78.31%
Hematoma location		
Left	55	51.88%
Right	33	34.98%
Bilateral	18	13.14%
Hematoma density on CT		
Low	52	49.05%
Iso	31	29.24%
High	23	21.71%

Table II: Factors related to recurrence in patients with chronic subdural hematoma.

Factor	Recurrence (12)		No recurrence (94)		P value
Sex	**Frequency**	**%age**	**Frequency**	**%age**	
Male	10	83.33%	95	98.95%	0.9989
Female	02	16.67%	01	01.05%	
Age					
< 70 years	03	25%	04	4.16%	0.0289
> 70 years	09	75%	92	95.84%	
Re-expansion of the brain to its actual place	03	25%	92	95.84%	0.0381
Subdural air accumulation after operation	5	41.66%	17	17.70%	0.0657
Causes of CSDH					
Head injury	5	41.68%	70	72.91%	
Neurosurgery	3	25.00%	17	17.70%	NS*
Alcoholism	2	16.66%	04	04.16%	
Anticoagulant drugs	2	16.66%	05	05.23%	
CT findings					
Low density	4	33.33%	72	75.00%	
Iso dense	5	41.67%	09	09.37%	NS*
Hyperdense	3	25.00%	15	1563%	

*NS= Not Significant

Recurrence of chronic subdural hematoma after the bur holes craniotomy was observed in 10.8% (12) patients. In our study the participants in which chronic subdural hematoma recurred after burr hole surgery were 83.33% male, 16.67% females, 25%

less than 70 years and 75% were more or equal to 70 years and in participants in which CSDH didn't recurred after surgery 98.95% were male, 01.05% females, 4.16% less than 70 years and 95.84% were >70 years age. Re-expansion of the brain to its actual place in patients in which hematoma recurred after the surgery was in 25% and 95.84% in which hematoma didn't recurred. Subdural air accumulation after operation with recurred CSDH was in 41.66% patients and 17.70% in which there was no recurrence. Causes of CSDH in patients with recurrence was head injury in 41.68%, neurosurgery in 25%, alcoholism, 16.66%, anticoagulant drugs in 16.66% and in patients with no recurrence causes were head injury in 72.91%, neurosurgery in 17.70%,alcoholism, 04.16% and anticoagulant drugs in 05.23% patients.

DISCUSSION

Generally CSDH known as a curable condition and usually it requires repeated surgical treatment; frequencies varying from 2.7-33%.[2] There is no consensus about the surgical treatment method and from last twenty years, the most frequently used surgical techniqueused is burr-hole drainage, irrigation and closed drainage.

In our study majority of the patients about 72% were male patients and 78.31% patients were >70 years of age. Computed tomographic (CT) studies showed that in nearly half patients CSDH was on the left side and bilateral in only 13.14% cases. CSDH was hypo dense to cerebral parenchyma in 49.05%, iso-dense in 29.24% and hyperdense in 21.71%. Our study results revealed that the recurrence rate of chronic subdural hematoma after burr holes surgery was 10.8%. These results are comparable with the study conducted by Mellergard P et al and with many other studies.[6,7,8]

Our study found significant association between recurrence after bur holes surgery and age of the patients (p= 0.0289), similarly re-expansion of the brain after the surgery was statistically associated with recurrence of hematoma (p= 0.0381). These findings are consistent with the study conducted by Mori K et al.[1]

In our study no significant association was found between recurrence of CSDH after surgery and gender, subdural air accumulation after surgery, cause of CSDH and density of CSDH on CT as compared to cerebral parenchyma. These findings are consistent with the study conducted by Tugcu B et al.[9] Our study results are also comparable with the study conducted by Kong W et al.[10]

Our study imposes certain limitations and is potentially subject to diverse biases and variations. Further analysis with larger sample size would be necessary to clarify the definite risk factors for recurrence of chronic subdural hematoma after burr holes evacuation.

CONCLUSION

It is concluded that recurrence of chronic subdural hematoma after burr holes evacuation is directly related with age and re-expansion of the brain after surgery.

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