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Chronic Subdural Hematoma Prognostic Factors for Recurrence

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Abstract

Background: Chronic Subdural Hematoma (CSDH) is a common neurologic disease in elderly. It is not always a benign condition because high recurrence rate had been reported. Independent risk factors for CSDH recurrence, especially the surgical and post-operative factors, had not been sufficiently investigated.

Aim of Study: To evaluate the outcome of CSDH after burr hole craniostomy and irrigation with closed system drainage, and to analyze the potential risk factors, emphasizing surgical and post-operative ones, for CSDH recurrence and comparing the results to others mentioned in literature.

Methods: We retrospectively analysed data of 82 CSDH patients treated by burr hole(s) craniostomy and irrigation with close system drainage CSDH in Assuit University Hospital from July 2015 to July 2016.

Results: Of these CSDH patients, the main age was 58.9 years and 85.4% were males. The CSDH recurrence rate after burr-hole craniostomy was 7.3% in our hospital. CSDH recurrence was significantly associated with diabetes mellitus (p=0.027), hypertension (p=0.021) and prolonged PT (p= 0.025). Moreover an increased CSDH recurrence rate was observed in the patient group that had a mixed type (p=0.047), separated (p=0.044), trabecular (p=0.025) and hematoma thickness more than 20mm (p=0.34) of the CSDH in the preoperative diagnostic imaging .Also there were increased recurrence rate in patients group that had postoperative residual hematoma (p<0.001).

Conclusion: We found diabetes mellitus, hypertension, prolonged PT, mixed type hematoma, separated, trabecular internal architecture of hematoma, thickness of hematoma 20mm and post-operative residual hematoma independently predict recurrence of CSDH after burr hole(s) craniostomy. The patients with these risk factors may need closer surveillance post-operatively.

Key Words: *Chronic subdural hematoma – Recurrence – Risk factor – Burrhole – Craniostomy.*

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Introduction

CHRONIC Subdural Hematoma (CSDH) represents an abnormal collection of liquefied blood degradation underneath the dura matter and usually forms in for approximately 3 weeks **[1,2]**. CSDH is one of the most frequent types of intracranial hemorrhage that is still associated with significant morbidity **[3,4]**. The CSDH is a common disease in elderly patients, and its incidence is highest in persons older than 70 years of age **[4]**.

Three principal techniques have been used for evacuation of CSDH: Burr hole with or without irrigation and with or without a closed drainage system, twist drill trephination and craniotomy. Burr-hole craniostomy with drainage appears to be the most effective treatments when considering morbidity, mortality and recurrence rate, burr hole drainage is relatively less invasive with high cure rate even for older or high risk patients **[4-8]**. However, some patients suffer from the recurrence after surgery, with an incidence as variable as 3.7 to 30% **[1,4,9-12]**.

Numerous factors influencing recurrence have been reported in the literature, but controversial findings are not uncommon. The recurrent rate has been showed to be influenced by multifactors such as pre-operative patient demographics, radiological type, thickness of hematoma and different surgical approach. Although numerous studies investigate these risk factors for CSDH the results have not been always consistent. So there are no established criteria of recurrence. Most studies focused on the pre-operative factors, but few concerned the surgical or post-operative factors, such as burr-hole numbers, use of drainage, duration and volume of drainage. This subject has not been studied sufficiently yet.

Patients and Methods

This study is prospective randomizing hospital-based clinical trial study included 82 patients whose diagnosed clinically and radiologically as CSDH and then underwent one or two burr holes procedure and irrigation with close system drainage at Neurosurgical Department of Assuit University Hospital from July 2015 to July 2016. This study included patients whose age were more than 18 years old and treated surgically. We were excluded patients who are treated conservatively or age less than 18 years old. The patient evaluated pre-operatively by detailed history, clinical examination, and laboratory investigations. Computerized Tomogram (CT) is the stander investigation where the thickness of hematoma was measured, also the type and internal architecture of the hematoma according to Nakaguchi et al., [13] ; that is homogenous, laminar, separated or trabecular was determined.

Under general endotracheal anesthesia. The patient positioned in supine position with the head slightly elevated (15º) and tilted to healthy side.

After scalp incision and burr hole/holes craniostomy was/were done the outer layer of dura cauterized by bipolar diathermy then we opened the dura in criss-cross manner with gradual evacuation of hematoma, then the margin of opened dura cauterized until shrunken completely to avoid bleeding from the opened dura to the subdural space, after that genital irrigation of hematoma by normal saline until complete evacuation of hematoma and the wash comes out clear then close system drainage with negative pressure was applied, subdurally or subgaleally. Finally the wound closed in layers. Patient admitted into the intensive care unit for 24 hours before referred to ward unless the patient deteriorated. The patient was given I.V antibiotic (usually fourth generation of cephalosporin like cefobid), antiepileptic and analgesic, in addition the patient was encouraged for fluid intake and I.V fluid for 24 hours. The patient was kept flat in bed without pillow 24 hours and allowed sitting and walking the next day. The drainage system was removed when drainage stopped mostly within 2-3 days. The patient discharged from hospital after 3-4 days and scalp stiches were removed 10 days post-operation. A recurrence of CSDH was defined as a subsequent increase in hematoma volume with fresh bleeding in the ipsilateral subdural space for which reoperation was performed, as described by Torihashi et al., [9] . The reoperation was performed to the patients having subsequent radiological increasing hematoma with re-neurological deficits or no improvement of deficit.

Outcomes assessment:

1- Clinical and radiological assessment:

The Glasgow Coma Scale (GCS) and motor power were used to assist patient outcome. Also post-operative CT image was asked or requested within 24 hours if patient clinically deteriorated otherwise CT image was done within 48 to 72 hours post-operatively to detect any residual hematoma. Once the patient clinically and radiologically improved, discharged and followed-up in an outpatient clinic bases.

The patients were followed-up clinically and CT image at one month then clinically only at 3 and 6 months later.

2- Prognostic factors that will be studied for recurrence:

• *Pre-operative prognostic factors:*

- Age of patient.

- Associated chronic diseases like hypertension, diabetes mellitus, liver diseases and renal impairment.

- Laboratory investigation like Hb, platlate count, PC, and PT.

- Pre-oprative radiological parameters:

A- Hematoma thickness: Less than 10mm, from 10mm to 20mm or more than 20mm.

B- Density of hematoma: Hypodense, hyperdense, isodense or mixed.

C- Internal architecture of CSDH according to Nakaguchi et al.

• *Operative prognostic factors:*

- Number of burr hole: One or two burr holes.

- Position of drain: Subgaleal or subdural.

• *Post-operative risk factors:*

- *Duration of drainage:* Equal or less (<2), and (3-5) days.

- Amount of drainage: <100, (100-200), (200-300), and 300<.

- Present of post-operative residual hematoma.

Statistical analysis:

The data were tested for normality using the Anderson-Darling test and for homogeneity vari-

ances prior to further statistical analysis. Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (mean, SD). Chi-square test and fisher exact test used to compare between categorical variables. Multiple logistic regression analysis used to assess the predictors of recurrence. A two-tailed $p<0.05$ was considered statistically significant. All analyses were performed with the IBM SPSS 20.0 software.

Results

This study included 82 patients, 70 patients (85.4%) were males and 12 patients (24.6%) were females. The mean age was 58.9 years (range 34-93 years). Among all patients about 20 patients (24.4%) had diabetes mellitus, 28 patients (34.1%) had hypertension and 4 patients (4.9%) had chronic liver disease. Thirty patients were presented with disturbed conscious level (GCS range of the patient was **[9-14]**). Regarding motor power about 30 patients had full motor power and the others had some sort of motor weakness. Six patients (7.3%) had Prothrombin Time (PT) more than 14 seconds (control value 11.5-12 seconds) while the Prothrombin Concentration (PC) was less than 70% in 6 patients (7.3%), also Hb level was less than 10mg/dl in 6 patients (7.3%). Pre-operative CT scan evaluation of patient's hematoma density demonstrated that 14 patients (17.1%) had hypodense, 38 patients (46.3%) had isodense, 4 patients (4.9%) had hyperdense and 26 patients (3 1.7%) had mixed type. Regarding radiological internal architecture of hematoma, 42 patients (51.2%) had homogenous hematoma, 14 patients (17.1%) had laminar hematoma, 10 patients (12.2%) had separated hematoma and 16 patients (19.5%) had trabecular hematoma. Fourteen patients (17.1%) had hematoma thickness between (10-20mm) while 68 patients (82.9%) had hematoma thickness more than 20mm. Out of all patients who operated, 10 patients (12.2%) underwent one burr hole while 72 of patients (87.8%) underwent two burr holes. The drain was placed subglial (Sg) in 62 patients (75.6%) while drain was placed subdural (Sd) in 20 patients (24.4%). The amount of drainage that accumulated post-operative in the drainage system was less than 100ml in 2 patients (2.4%), (100-200ml) in 36 patients (43.9%), (200-300ml) in 32 patients (39%), and more than 300ml in 12 patients (14.6%). Also the drain maintained or kept in situ less than 3days in 28 patients (34. 1%) and (3-5) days in 54 patients (65.9%). Follow-up brain CT within 48 hours post-operatively demonstrated that 12 patients (14.6%) had residual hematoma. These patients managed conservatively and not needed to early re-evacuation. During the early follow-up, that's one month after surgery; six patients presented with recurrence of CSDH as follow: One patient (16.7%) within the first week, two patients (33.3%) within the second week, two patients (33.3%) within the third week, and the last one (16.7%) between the fourth and fifth week. All these patients underwent re-evacuation with good outcome. The recurrence rate in all our study was 7.3 % as shown in (Table 1).

All patients with recurrence of CSDH were above 60 years old but they are not statistically significant ($p=0.246$). Diabetes and hypertension were statistically significant factors regarding recurrence of CSDH; 4 out of 6 recurrent patients were diabetic (66.7%) with ($p=0.027$) while 6 out of 6 recurrent patients were hypertensive (100%) with ($p=0.021$) as shown in (Table 2). There is no relationship between recurrent CSDH and patients had chronic liver disease ($p=0.889$). Among recurrence patient, about 2 patients (33.3%) had prothrombin time more than 14 seconds (control 11.5-12 second) with significant correlation with recurrence ($p=0.025$), while prothrombin concentration more than 70% is protective factor of recurrence CSDH ($p=0.029$) as shown in (Table 3). The recurrence occurred in 4 patients (66.7%) with mixed type of hematoma which was statistically significant ($p=0.047$) while others types were statistically insignificant for recurrence. The statistically significant recurrence occurred in 2 patients (33.3%) and 4 patients (66.7%) with both separated and trabecular hematoma respectively with the p-value was ($p=0.044$) and ($p=0.025$) respectively while there were no recurrence among others. All six patients displayed recurrence had radiological hematoma thickness more than 20mm and was statistically significant ($p=0.034$) (Table 4). The recurrence of CSDH occurred exclusively among patients underwent two burr holes n=6 (100%) and also recurrence was more among patients with subgalial (Sg) drain n=4 out of 6 (66.7%) in comparison with patients with subdural (Sd) drain but that was statistically insignificant where p-value was ($p=0.633$) and ($p=0.599$) respectively. Although recurrence was exclusively among patients in whom the drain maintained 3 days or more but it is statistically insignificant ($p=0.52$). Also there were no correlation between recurrence and amount of drainage ($p>0.596$). Out of all patients of recurrence about 4 patients (66.7%) had post-operative residual hematoma and was statistically significant ($p<0.001$) (Table 5).

Table (1): Frequency distribution of studied patient's risk factors.

	No.	%
Age:		
<40	4	4.9
40-50	8	9.8
50-60	20	24.4
>60	50	61.0
Range	34-93	
Mean ± SD	58.9± 12.4	
Kidney disease:		
Absent	82	100.0
DM:		
Present	20	24.4
Absent	62	75.6
HTN:		
Present	28	34.1
Absent	54	DM
Liver disease:		
Present	4	4.9
Absent	78	95.1
GCS:		
Range	9-15	
Mean ± SD	14.3± 1.3	
Power:		
5	30	36.6
4	30	36.6
3	10	12.2
1	2	2.4
0	10	12.2
Sensation:		
Intact	82	100.0
Hb:		
<10	6	7.3
>10	76	92.7
LFT:		
Normal	82	100.0
KFT:		
Normal	80	97.6
Abnormal	2	2.4
PT:		
10-12	34	41.5
>12-14	42	51.2
>14-16	4	4.9
>16	2	2.4
PC:		
<70%	6	7.3
>70%	76	92.7
Platlate:		
100-150	4	4.9
>150	78	95.1
Hematoma radiological type:		
Hypodense	14	17.1
Isodense	38	46.3
Hyperdense	4	4.9
Mixed	26	31.7
Hematoma architecture:		
Homogenous	42	51.2
Laminar	14	17.1
Separated	10	12.2
Trabecular	16	19.5
Thickness of hematoma:		
1-2cm	14	17.1
>2cm	68	82.9
No. of burrhole:		
One	10	12.2
Two	72	87.8
Position of drain:		
Sg	62	75.6
Sd	20	24.4
Duration of drain:		
Less than 3 days	28	34.1
3 days and more	54	65.9
Amount of draining:		
<100	2	2.4
100-<200	36	43.9
200-<300	32	39.0
300-400	12	14.6
Post-operative residual hematoma:		
Present	12	14.6
Absent	70	85.4
Recurrence:		
Yes	6	7.3
No	76	92.7

Table (2): Multivariate analysis to determine the most historical risk factors of recurrence.

	Recurrence				*p*-value
	Yes		No		
	No.	%	No.	%	
Age:					
<40	0	0.0	2	5.3	0.558
40-50	0	0.0	4	10.5	
50-60	0	0.0	10	26.3	
>60	3	100.0	22	57.9	
DM:					
Yes	2	66.7	8	21.1	0.077
No	1	33.3	30	78.9	
HTN:					
Yes	3	100.0	11	28.9	0.012*
No	0	0.0	27	71.1	
Liver disease:					
Yes	0	0.0	2	5.3	0.684
No	3	100.0	36	94.7	

Table (3): Multivariate analysis to determine the most laboratory risk factors of recurrence.

	Recurrence				Odds (95%CI)	*p*-value
	Yes		No			
	No.	%	No.	%		
HB:						
<10	6	7.9	0	0.0	1 (reference)	
>10	70	92.1	6	100.0	1.2 (0.1-23.7)	0.905
KFT:						
Normal	74	97.4	6	100.0	1 (reference)	
Abnormal	2	2.6	0	0.0	2.3 (0.1-52.9)	0.605
PT:						
10–	32	42.1	2	33.3	1 (reference)	
12–	40	52.6	2	33.3	0.8 (0.1-6.0)	0.828
14–	2	2.6	2	33.3	16 (1.4-180.9)	0.025*
16–	2	2.6	0	0.0	2.6 (0.1-70.3)	0.570
PC:						
<70%	4	5.3	2	33.3	1 (reference)	
>70%	72	94.7	4	66.7	0.11 (0.02-0.79)	0.029*
Platelet:						
100-150	4	5.3	0	0.0	1 (reference)	
>150	72	94.7	6	100.0	0.8 (0.04-16.7)	0.889

Table (4): Multivariate analysis to determine the most radiological risk factors of recurrence.

	Recurrence				Odds (95%CI)	*p*-value
	No		Yes			
	No.	%	No.	%		
Type of hematoma:						
Hypodense	14	18.4	0	0.0	1 (reference)	0.461
Isodense	36	47.4	2	33.3	2 (0.1-3.2)	0.664
Hyperdense	4	5.3	0	0.0	–	
Mixed	22	28.9	4	66.7	5.8 (1.1-28.8)	0.047*
Radiological architecture:						
Homogenous	42	55.3	0	0.0	1 (reference)	0.069
Laminar	14	18.4	0	0.0	–	
Separated	8	10.5	2	33.3	5 (1.2-9.8)	0.044*
Trabecular	12	15.8	4	66.7	7.2 (1.5-15.3)	0.025*
Thickness of hematoma:						
10-20mm	14	18.4	0	0.0	1 (reference)	
>20mm	62	81.6	6	100.0	3 (1.2-56.2)	0.034*

Table (5): Multivariate analysis to determine the most operative and post-operative risk factors of recurrence.

	Recurrence				Odds (95%CI)	*p*-value
	No		Yes			
	No.	%	No.	%		
No. of burrhole:						
• One	10	13.2	0	0.0	1 (reference)	
• Two	66	86.8	6	100.0	2.1 (0.2-39.2)	0.633
Position ofdrain:						
• SC	58	76.3	4	66.7	1 (reference)	
• SD	18	23.7	2	33.3	1.6 (0.3-9.5)	0.599
Duration of drain:						
• Less than 3 days	28	36.8	0	0.0	1 (reference)	0.022*
• 3 days and more	48	63.2	6	100.0	7.6 (1.4-14.7)	
Amount of draining:						
• <100	2	2.6	0	0.0	1 (reference)	
• 100-200	32	42.1	4	66.7	0.7 (0.03-16.8)	0.821
• 200-300	30	39.5	2	33.3	0.4 (0.02-11.1)	0.596
• 300-400	12	15.8	0	0.0		–
Post-operative residual hematoma:						
• Present	68	89.5	2	33.3	1 (reference)	<0.001**
• Absent	8	10.5	4	66.7	17 (2.7-10.3)	

Discussion

CSDH is a common disease in neurosurgical practice and the incidence is increasing [14], usually it does require repeated surgical treatment. There is not a standard consensus about the surgical treatment method. For the last twenty years, the most frequently used surgical techniques have been burr-hole drainage, irrigation and closed drainage. However it has been reported that recurrence rate range from 3.7 to 30% [1,4,9-12]. This study showed a recurrence rate of 7.3%.

The etiology of recurrence of CSDH has not been completely understood until now [15], but several risk factors for recurrence of CSDH have been reported, including advanced age, brain atrophy, bilateral CSDH, hematoma density, seizures, diabetes mellitus, bleeding tendency, alcohol abuse, and post-operative posture [9,13,16-19]. However, the definitive risk factors have not been defined until now. The purpose of this study was to evaluate and identify the risk factors for recurrence of CSDH whether pre-operative like age, liver disease, diabetes mellitus, hypertension, prothrombin time, radiological density, internal architecture and thickness of hematoma, operative like number of burr hole and position of drain and post-operative ones like amount of drainage, duration of drain and residual hematoma.

The literature states that the risk of CSDH recurrence increases with age. This may be correlated to brain atrophy and decayed of cerebral veins. In our study, no significant difference was observed between the average ages of the patients and the incidence of recurrence and non-recurrent. These results are consistent with those of Lee et al. [8], Nordmann et al., [20], Stanistic et al., [21], Abouzari et al., [22] and Weigel et al., [23].

In our study, no significant difference was observed between the incidence of recurrence of CSDH among patients with liver disease and those who had no liver disease, this may be explained that they had inactive chronic hepatitis and liver is not in cirrhotic stage. On the contrary patients in Gronbaek et al., [24], Kaul et al., [25] and MaCormick et al., [26] studies were in cirrhotic stage of liver disease and this was associated with increased risk of recurrence.

Also in this study prolonged prothrombin time was correlated with increase recurrence of CSDH due to deficiency of clotting factors (I, II, V, VII, and X) made by the liver.

In our study hypertension was a risk factor of recurrence, it may cause damage to blood vessels specially in elderly patients whose blood vessels were sclerotic and lost their elasticity so these vessels become more liable to rupture, in contrary to the study of Torihashi et al., [9] which showed that hypertension did not have any effect on recurrence.

Regarding diabetes Torihashi et al., [9]: Speculated that viscosity increases in diabetic patients, an osmotic pressure increase will trigger coagulation and decrease the risk of hematoma; however, they could not determine diabetes as an effective factor in their studies [9]. Tugcu et al., found there was no association between diabetes and CSDH recurrence [27]. In our study, diabetes was a significant risk factor of recurrence of CSDH, which may be correlated to capillary vasculopathy, particularly in patients with CSDH, where there is a sufficient capillary network on the outer membrane and the vasculopathy here may lead to a growth or recurrence of the hematoma.

Regarding CT hematoma density, Ko et al., and Kong et al.: Found that, the incidence of CSDH recurrence in the high-density and mixed-density groups was significantly higher than that in the low-density and iso-density groups [4,11] and this agreed with our study where the incidence of CSDH recurrence in the mixed-density group was significantly higher than other groups.

Regarding the internal architecture of CSDH: Separated stage of CSDH consider as a significant risk factor of CSDH in many reports [10,21,28-30] while others stated laminar stage of CSDH was risk factor of recurrence [1] and homogenous stage had a lowest recurrence rate in all previous reports. In this study we found both separated and trabecular hematomas were risk factors of recurrence, due to hyperfibrinolysis and the rebleeding from the neomembrane (the blood vessels of neomembrane is premature and friable) is high, so operation for evacuation of CSDH is preferable to do in homogenous stage to decrease incidence of recurrence unless sever symptom are present.

Many authors stated that hematoma thickness ›_20mm was significant risk factor of recurrence CSDH [1,5,11,21,31] the pathogenesis is unknown but it has been stated that any factor leading to a prolonged post-operative widening of the hematoma cavity (brain atrophy, residual hematoma, massive subdural air collection, excessive fluid drainage through subdurally placed drains) may cause an impaired adhesion between the inner and outer hematoma neomembranes and thus facilitate post-operative recurrence [29,32,33].

Few studies have been done to compare directly the use of one and two burr-hole techniques for the surgical management of chronic subdural hematoma. Despite this, both techniques are widely used by neurosurgeons [34], and no consensus has been reached whether one technique is superior to the other.

Han et al., [35], Kansal et al., [36], Belkhair et al., [37] reported no significant difference in recurrence rate observed between 2 BHC (two burr holes craniostomy) and 1 BHC (one burr hole craniostomy), but Taussky et al., [38]: Reported a significantly higher rate of recurrence was found for 1 BHC compared to 2 BHC. In our study, recurrence rate was more in patient underwent to 2 BHC but that was statistically insignificant.

We could not found studies investigated directly the comparison between subdural with subgaleal drainage and incidence of recurrence of CSDH. Although some reported that the recurrence rate has been low by using subdural (Sd) drainage [39-41], there is still disagreement on whether subdural drainage should be performed post-operatively [15,42-44]. Placement of a subgaleal (Sg) drain after a craniotomy has been reported with a low recurrence rate in the thesis of Gazzeri et al., and Mohamed et al., [45,46]. In this study although recurrence rate was more in patients with subgalial (Sg) drainage in comparing with patients with subdural (Sd) drainage but that was statistically insignificant.

Regarding the relationship between volume of drainage and recurrence rate: Kwon et al., [47], reported a correlation between postoperative drainage volume with the recurrence rate. When the total drainage volume was below 200ml, the recurrence rate increased from 0% to 6.4%, while Cheng et al., [1], found that larger drainage amount is independently associated with higher recurrence rate of CSDH. They suggested some explanations. First, some CSDH with large post-operative drainage amount may be transformed from subdural hygroma, notably it has been reported that persistent subdural hygroma is an important risk factor in the development of CSDH. Second, some elderly patients had severe cerebral atrophy and poor brain re-expansion, after hematoma evacuation, cerebrospinal fluid may pass through into the low-pressure subdural space. If there is large amount of subdural effusion, the bridge veins in the subdural space may tear gradually and bleeding from the inner membrane or more anti-thrombolytic factors produced made the CSDH recurrent. However, Stanisic et al., [21], reported there was no correlation between post-operative drainage volume with the recurrence rate, which correlate with our results where no relationship between recurrence rate and volume of drainage.

Stanisic et al., [21], reported that the appearance of acute subdural clots in cranial base CSDHs on CT scans obtained within four days postsurgery had a higher recurrence rate than that with absence

of these clots. Benzel et al., **[42]** suggested recurrence rate depends on the removal of the residual semisolid subdural hematoma component and the removal, dilution and inactivation of endogenous fibrinolytic agents and refilling the subdural cavity with saline prevent the influx of air into the subdural space and this reduce the recurrence rate of CSDH **[12]**.

In our study, the recurrence was significant in patients with post-operative residual hematoma following-up by brain CT 24 to 48 hours and within 3 weeks after surgery, so it is important to remove solid or semi-solid hematoma either by continuous irrigation or craniectomy.

Conclusion:

CSDH is common neurosurgical problems and a recurrent rate after surgical treatment is not uncommon. Certain risk factors influencing post-operative recurrence of CSDH were articulated in our study. Hypertension, DM, prolong PT, mixed density, separated and trabecular internal architecture of hematoma, and the thickness of hematoma more than 20mm in pre-operative CT and post-operative residual hematoma. However no correlation between age of patient, inactive chronic liver disease, number of burr hole, position of drain and amount of drainage with recurrence of CSDH.

This information might be helpful for determining patients with high incidence of recurrence for close follow-up and acts to reduce the recurrence such as evacuation of hematoma that is doing at homogenous stage and complete evacuation of hematoma may reduce the incidence of recurrence.

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دراسة العوامل التى تسهم فى إرتجاع التجمع الدموى تحت الآم الجافية

يعرف التجمع الدموى المزمن تحت الام الجافية بأنه تجمع غير طبيعى للدم السائل تحت الآم الجافية وغالبا يتكون خلال ثلاثة أسابيع.

إن معدل الإرتجاع للتجمع الدموى تحت الآم الجافية مازال مرتفع فى العديد من الآماكن مع تفاوت فى معدل الإرتجاع يتراوح بين ٣.٧٪، ٣٠٪ مع وجود إختلاف فى تجديد العوامل التى تسهم فى إرتجاع التجمع الدموى تحت الآم الجافية مع أن بعض الآبحاث قامت بدراسة العديد من العوامل لمعرفة ما إذا كانت من عوامل الخطورة التى تسهم فى إرتجاع التجمع الدموى تحت الآم الجافية مثل علاقة السن والجنس وخصائص التجمع الدموى الظاهر فى التصوير الطبقى للدماغ والتقنية الجراحية المستخدمة فى تفريغ التجمع الدموى وغيرها من العوامل التى تمت دراستها إلا أن الإتفاق عن إسهام هذه العوامل فى إرتجاع التجمع الدموى لازال محل خلاف.

تهدف هذه الدراسة إلى تقيم حالة المرضى الذين يعانون من تجمع دموى تحت الآم الجافية واللذين خضعوا لعملية تفريغ للتجمع الدموى بواسطة تقنية فغر القحف مع محاولة لتحديد ودراسة العوامل التى قد تسهم فى إرتجاع التجمع الدموى ومقارنتها مع دراسات أخرى أجريت لدراسة هذه العوامل وتحديد مدى التطابق أو الإختلاف بين هذه الدراسات والدراسات الآخرى.

لقد شملت هذ ه الدراسة ٨٢ مريض تم تشخيصهم سريريا وبالتصوير الطبقى للدماغ أنهم يعانون من تجمع دموى تحت الآم الجافية وتم تجديد العديد من العوامل التى درست لمعرفة مدى أسهامها فى إرتجاع التجمع الدموى تشمل هذه العوامل، عوامل قبل التفريغ للتجمع الدموى مثل عمر المريض والآمراض المرافقة كالضغط والسكر وعلاقة زمن البروثرمبين وخصائص التجمع الدموى الظاهرة فى التصوير الطبقى للدماغ مثل سمك التجمع الدموى ونوعه والخصائص الداخلية له وكذلك دراسة بعض العوامل المتعلقة بالتقنية الجراحية مثل عدد الفغور ومكان وضع قسطرة التصريف كما تم دراسة بعض العوامل المتعلقة بما بعد التفريغ مثل مدة ترك قسطرة التصريف وكمية السائل الذى تم تصريفه وعلاقة وجود بقايا تجمع دموى شبه صلب لم يتم تفريغه مع إرتجاع التجمع الدموى مرة أخرى.

بعد التحليل الإحصائى للنتائج التى تم الحصول عليها خلال فترة البحث تبين فى هذه الدراسة أن هناك العديد من العوامل التى قد تسهم فى إرتجاع التجمع الدموى تحت الآم الجافية، فقد وجدت الدراسة أن الضغط والسكر وطول زمن البروثرومبين والتجمع الدموى المختلط وكذلك التجمع الدموى فى الطور المنفصل والطور الحويجيزى وسماكه التجمع الدموى أكثر من٢٠ مليمتر وكذلك وجود بقايا شبه متخثره فى التجمع الدموى لم يتم تفريغها أثناء عملية التفريغ كل هذه العوامل تعتبر من عوامل الخطورة التى تسهم فى إرتجاع النزيف تحت الآم الجافية.