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OUTCOME OF CHRONIC SUBDURAL HEMATOMA CASES OPERATED IN CHITWAN MEDICAL COLLEGE

Ganesh Adhikari[1], Ajit Shrestha[1], Nimesh Paudel[2], Laxman Timilsina[2], Shisir Sharma[2]
[1,2]Department of Neurosurgery, Chitwan Medical College, Bharatpur-10, Chitwan, Nepal
Corresponding Author: Ganesh Adhikari, Department of Neurosurgery, Chitwan Medical College, Bharatpur-10, Chitwan, Nepal.
Email:adhikariganes@gmail.com

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Abstract:

Background: To determine whether there is any correlation between Glasgow coma scale and Age Group. Higher the age group with higher Glasgow coma scale has the best outcome.

Methods: Retrospective study which included cases presenting with chronic subdural hematoma in Chitwan Medical College Teaching Hospital (CMCTH) neurosurgery department from 5th November 2012 to 30th may 2021. 170 patients diagnosed with Chronic subdural Hematoma operated were only included in the study. Ct scan was used to conform the diagnosis. Glasgow outcome scale was employed to define outcome at 3 months as favourable (GOS 4 and 5) or unfavourable (GOS ≤ 3). Age, aetiology, risks factors, Glasgow coma scale at admission, location of hematoma, recurrence, were analysed for potential impact on final outcome.

Results: Among the 170 patients included in our study, majority of them were male (84.7%), Head injury was the most common cause (40%) of them had directly or indirectly related with trauma, and hypertensions (23%) were the predisposing factors for chronic subdural Hematoma. The Glasgow coma scale was favourable among >60 year group (94.1%) compared to that with 9 at presentation and unfavourable if Glasgow coma scale <9 with coagulopathy has possibility of recurrent.

Conclusion: Higher the age-group with higher the Glasgow coma scale has the best outcome. This study hints our advanced age group with coagulopathy has a higher possibility of recurrences.

***Keywords-*:** *Chronic Subdural Hematoma, Computed tomography, Burr Hole, Recurrent.*

I. INTRODUNCTION

cSDH, liquefied blood in the subdural space leads to slow but progressively deteriorating condition. The incidence increases with increasing age after 70 years of age.[1] Predisposing factors are head trauma, brain atrophy, anticoagulant, coagulopathy, HTN and DM, Seizure disorder.[2] Diagnosis of cSDH was computed tomography of the head. MRI further clarifies the exact thickness, density, and septum of the membrane. Surgery is preferred in thickness greater than 3mm or else can be managed conservatively.[3] Disregard overcomes with Calcification Empyema and even death. Various methods were preferred depending upon the experiences of the neurosurgeon including burr hole, and drainage, craniotomy with hematoma removable, craniotomy with membranectomy.[4-6]At Chitwan Medical College, we have been treating cSDH patients for a decade. Since Burr hole with the close system was followed. This study aimed to evaluate the outcome of the cSDH patients being intervened surgically in terms of age group, GCS and GOS.

II. METHODS:

Hundred and seventy patients diagnosed with cSDH and undergoing burr hole with closed system, from 5th November 2012 to 30th may 2021 were retrospectively evaluated. Demographical data and clinical details (Aetiology, location, risk factors, GCS, GOS and outcome after follow up upto 6 months) were collected and reviewed. Diagnosis of cSDH was based on computed tomography of head. All the patients diagnosed with cSDH and willing for surgical managements were included in the study. The data analysis was done using Statistical Package for Social Science (SPSS) 16 version Chicago, SPSS Inc. The continuous variables were expressed as mean ± SD and categorical variables as frequency and percentage. Chi square test were used for co-relation analysis. The confidence interval was set at 95% and p value<0.05 was taken as statistically significant.

The surgical procedure included burr hole craniotomy which was performed with scalp incision of 2cm applied anterior to the parietal region eminence deep to the periosteal level. A burr hole enlarged to 1.5cm was made with Hudson brace. The dura matter was opened with a cruciate incision and edges were sutured to peri-cranium. The subdural membrane was coagulated. Altered blood under pressure was thoroughly

washed with normal saline. Copious irrigation was done till the return was clear. The subdural space was filled with saline and the scalp layer was sutured in two-layer. Sterile dressing was applied and the patient shifted to recovery. Figure (1,2,3)

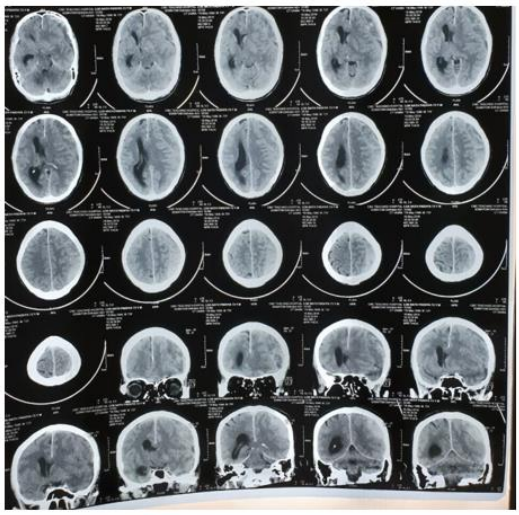

Figure 1.Left Sided cSDH with marked compression.

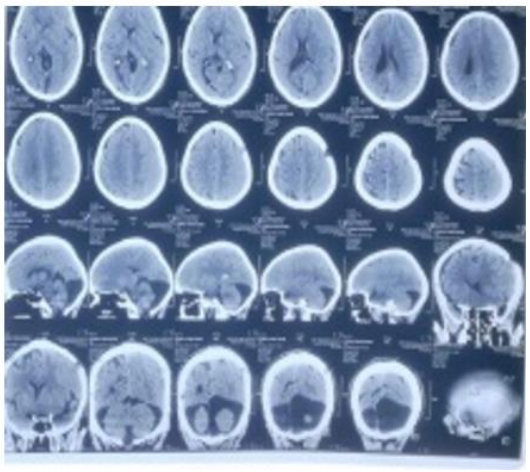

Figure 2.Post-Op recurrences with dandy walker Variant

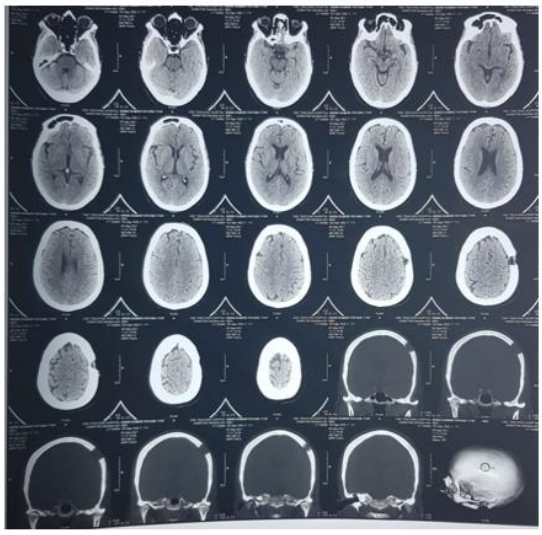

Figure3: Postop status with complete resolution after a month.

The outcome was evaluated by the Glasgow outcome scale (GOS) along with Glasgow coma Scale (GCS) during admission. Different variables were used such as age, sex aetiology, location, risk factors, sign and symptoms, etc. The outcome was evaluated using chi-square and kappa test access the relation between each parameter. A p-value <0.05 was considered statistically significant.

III. RESULTS:

200 patients with chronic SDH presented to CMCTH over the periods of 8 years of which 170 patients underwent surgical intervention.114 were male (81.7%), 26 were female (15.3%).Mean age of the presentation was 64.47 years with patients above 60 years of age being predominant (114 cases) and those below 60 years being less (56 cases).The demographical clinical manifestation were mentioned in Table 1, 2, 3.

Table 1.Demographic featurss of cSDH cases with surgical intervention.

sex	
Male	144 (84.7%)
Female	26 (15.3%)
Age	
≤60yrs	56 (32.9%)
≥60yrs	114 (67.1%)
GCS	
>9	160 (94.1%)
≤8	10 (5.9%)
Recurrence	
Normal	164 (96.5%)
Recurrent	6 (3.5%)
GOS	
>4	167 (98.2%)
<3	3 (1.8%)
Extra cranial complications	
Pneumonia	9 (5.3%)

Table 2.Associates risk factors of cSDH.

Hypertension	**40 (23.5%)**
Cirrhosis of liver	5 (2.9%)
Diabetes	17 (10%)
HTN and DM	30 (17.6%)
Alcohol withdrawal	9 (5.3%)
None	36 (21.2%)
BEP	3 (1.8%)
Gastritis	3 (1.8%)
Thrombocytopenia	10 (5.9%)
Cardiac disease	3 (1.8%)
AKI	5 (2.9%)

Table 1.Associated Etiological Factors of cSDH.

Aetiology	
Head Injury	68 (40%)
Unknown cause	40 (23.5%)
Coagulopathy	21 (12.4%)
Brain Atrophy	31 (18.2%)
Post Vp Shunt	1 (0.6%)
Parkinson	4 (2.4%)
Seizure	5 (2.9%)

Patient's neurological condition on admission and GOS were classified as suggested by Glasgow outcome Score.[7] The outcome was evaluated by the Glasgow Outcome Scale (GOS) along with GCS during admission. Different variables were used as age, sex aetiology, location, risk factors, sign and symptoms etc. The outcome was evaluated using Chis-square and kappa test access the relation between each parameter. A p-value <0.05 was considered statistically significant.

Results:

200 patients with chronic subdural hematoma presented to CMCTH over the period of 8 years of which 170 patients underwent surgical intervention.114 were Male (84.7%),26 were female (15.3%).Mean age of the presentation was 64.47 years with patients above 60 years of age being predominant (114 cases) and those below 60yrs being less (56 cases).The demographical clinical manifestation were mentioned in Table 1,2 and 3.

The chief complain presenting features of the patients were limb weakness (44.7%) followed by headache slurring of speech and urinary incontinence and seizure. Out of 170 recurrent hematoma was recorded in 3.5% and zero precents mortality among operated.

The GCS at presentation were evaluated and recorded. Majority of the cSDH patients (160 cases) had an admitting GCS ≥9 while only 10 cases had GCS≤8 at presentation.
Likewise the distribution of the cSDH had no predominance in terms of side as 70 cases were right sided, 77 cases were left sided and 23 cases of cSDH having both hypertension and diabetes (17.6%).

Recurrence was experienced in 6 cases of the 170 cases operated for cSDH. These cases were managed conservatively with aspiration and drainage of the recollected hematoma. There were (5.3%) of post-operative pneumonia which were conservatively managed.

The Aim of this study was to evaluate the outcome of the cSDH patients being intervened surgically. Overall 98.2% of the cases had favourable outcome in terms of GOS.
Comparing the age group and the outcome, patient with age >60 had favourable outcome (GOS≥4) in 94.1% and only 5.9% cases had adverse outcomes (GOS≤3) with significant level of outcome p-value (<0.001).
The patients with GCS>9 had better GOS (158 of 160 cases) compared to those with <9 which had poorer outcome. The outcome was statistically significant p<0.045.

IV. DISCUSSIONS:

Chronic Subdural Hematoma, First described by JJ Wepfer in 1656.[8] Virchow in 1857 reported cases under the name" pachymeningitis haemorrhagica interna.[9] Since then many authors have discussed the etilogy, pathophysiology and treatment .In1925 Putamen and Cushing draw 1st attention with three modes of presentation, hemiparesis, personality changes and features suggestive of raised ICP. In 1955 Robinson considered craniotomy and membranectomy.In 1964 Svien and Gelety proposed burr hole evacuation of the liquefie hematoma was superior was superior to any other.In 1977 Tabaddor and Shulman two surgical treatments with twist-drill craniotomy and closed system drainage in a total of 71 patients, and demonstrated the last methods to produce the best results while bed rest and mannitol therapy were advocated by Bender and Christoff in 1974 but was debated by Gjerris and Schmidt.[10]

Two theories have been suggested about the extent of Csdh the osmolality of the liquefied clot has increased protein content exerting an osmotic effect through increase oncotic pressure however the osmolality of the liquefied clot is actually the same as cerebrospinal fluid ad blood.[11] Bleeding occurs from abnormal and dilated blood vessels in the capsule that forms around the haematoma.[12]High concentrations of vascular endothelial growth factors have been demonstrated within the subdural fluid supporting the theory that ongoing angenesis and hyper permiabilities of capillaries contributes to hematoma expansion.[13]

However cSDH most often diagnosed delayed. Our study corresponds with other studied for similar symptoms hemiparesis, dis-orientation, headache and vomiting outcome of the patients depend on the clinical presentation, Admission GCS and associated risk factors. Burr hole of recurrent rate in our series was 3.5% which was better than Yamamoto analysed recurrence factors of cSDH with variables associated with presence of hematoma cavities on Ct scans, History of seizure, width of the hematoma and history of HTN, diabetes mellitus, coagulopathy. Another report by Nakaguchi emphasizes that the internal arthitecture of the hematoma is an important factor and that the recurrence rate is higher for separated types and cranial base hematomas.[14]
Amirijamshidi demonstrated in consecutive publications that lower admission GCS scores result in worse outcome as this is measured by GOS and higher mortality.[15]

Raf-Ingo Ernestus aslo analysed that headache is common complication in youngster and alcohol abuse, HTN and coagulopathy were more common in age group>60.This results supports our theory, age goup>60 with GCS >9 present with good outcome P value 0.006.In our series coagulopathy as well as brain atrophy is considered as the most common cause of recurrence of hematoma. Thus all above theories support and has no conflict with other consider that we have no mortality with very low recurrence rate.

V. CONCLUSION:

cSDH neurological problem in elderly, burr hole with the closer system is the only option for the best outcomes, Many risk factors play important role where HTN is the most common in age group>60,patients present with hemiparesis followed by loss of consciousness and slur speech. Headache

is common in adults. Bi-lateral burr hole had the best outcome without recurrence of hematoma. Higher the age group with higher the GCS has the best outcome, Thus cSDH was the safe procedure in elderly and possibility of recurrence in 6 out of hundred.

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ABBREVIATIONS
cSDH: Chronic Sub Dural Hematoma; CT: Computed Tomography; CMCTH: Chitwan Medical College Teaching Hospital; TBI: Traumatic Brain Injury GCS: Glasgow Coma Scale; GOS: Glasgow Outcome Score.

AUTHORS' CONTRIBUTIONS:
AG and SA carried out the main manuscript writing and both should be considered as first authors. PN, TL, SA and SS collected, analysed the data and assisted in drafting the manuscript and reviewed the article. All authors read and approved the final manuscript.

AVAILABILITY OF DATA AND MATERIALS :
The data that support the findings of this study are available from the corresponding author upon reasonable request.

COMPETING INTERESTS: The authors declare that they have no competing interests.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE:
Written consent was given by patients or immediate family member for the information to be stored in the hospital database and used for the research. This study was approved by our institutional review committee, Chitwan Medical College Teaching Hospital, Chitwan, Nepal.

CONSENT FOR PUBLICATION:
Written consent was given by the patients and their relatives to use their information in a research study and publish it.

REFERENCES:

[1] 1. Shapey J, Glancz LJ, Brennan PM: Chronic Subdural Haematoma in the Elderly: Is It Time for a New Paradigm in Management Curr Geriatr Rep. 2016; 5: 71-77. doi: 10.1007/s13670-016-0166-9

[2] 2. Smith MD, Kishikova L, Norris JM: Surgical management of chronic subdural haematoma: One hole or two. Int J Surg,2012;10(9):450-2.,doi: 10.1016/j.ijsu.2012.08.005

[3] 3.Song DH, Kim YS, Chun HJ, Yi HJ, Bak KH, Ko Y: The Predicting Factors for Recurrence of Chronic Subdural Hematoma Treated with Burr Hole and Drainage: Korean J Neurotrauma,2014 Oct;10(2):41-8. doi: 10.13004/kjnt.2014.10.2.41

[4] 4. Göksu E, Akyüz M, Uçar T, Kazan S: Spontaneous resolution of a large chronic subdural hematoma: A case report and review of the literature. Ulus Travma ve Acil Cerrahi Derg , J Korean Neurosurg Soc. 2015 Sep; 58(3): 301–303. doi: 10.3340/jkns.2015.58.3.301

[5] 5. Aleksandar Kostić, Ivo Kehayov, Nebojša Stojanović, Vesna Nikolov, Borislav Kitov, Predrag Milošević, Emina Kostić, Hristo Zhelyazkov: Spontaneous chronic subdural hematoma in elderly people, Arterial hypertension and other risk factors. ScienceDirect2018, 81:781–6, Doi: 10.1016/j.jcma.2018.03.010.

[6] 6. Yuan Liu, Jun-zhe Xia, An-hua Wu, Yun-jie Wang: Burr-hole craniotomy treating chronic subdural hematoma: a report of 398 cases. Chinese J Traumat , English Ed ,2010,13(5):265–9.

[7] 7. Klemenc-Ketis Z, Bacovnik-Jansa U, Ogorevc M, Kersnik J: Outcome predictors of Glasgow Outcome Scale score in patients with severe traumatic brain injury. Ulusal travma ve acil cerrahi dergisi = Turkish journal of trauma & emergency surgery: TJTES 17(6):509-15,DOI:10.5505/tjtes.2011.35336

[8] 8. Rabiu TB: Chronic subdural hematoma : A survey of neurosurgeons practices in Nigeria. J R Soc Med 2002 Jun;95(6):290-2. doi: 10.1258/jrsm.95.6.290.

[9] 9. Kazuyuki Noda, Nobutaka Hattori, Yasuyuki Okuma, Takuji Yamamoto: Chronic subdural haematoma presenting as freezing of gait BMJ Case Rep.2017 Sep 26. doi: 10.1136/bcr-2017-221469

[10] 10. Muhammad Asghar, Vedamurthy Adhiyaman, M W Greenway, Bhimal K Bhowmick, A Bates: Chronic subdural haematoma in the elderly - A North Wales experienceJ R Soc Med,2002 Jun;95(6):290-2. doi: 10.1258/jrsm.95.6.290.

[11] 11. Imaizumi S, Onuma T, Kameyama M, Naganuma H: Organized chronic subdural hematoma requiring craniotomy: Five case reports. Neurol Med Chir (Tokyo) 2001 Jan;41(1):19-24. doi: 10.2176/nmc.41.19.7.

[12] 12. Ko B-S, Lee J-K, Seo B-R, Moon S-J, Kim J-H, Kim S-H: Clinical Analysis of Risk Factors Related to Recurrent Chronic Subdural Hematoma. J Korean Neurosurg Soc,2008 Jan;43(1):11-5.doi: 10.3340/jkns.2008.43.1.11

[13] 13. De Araújo, Silva D, Matis G, Kitamura MP, De Carvalho Junior E, Silva MM, Pereira C: Chronic subdural hematomas and the elderly: Surgical results from a series of 125 cases: Old "horses" are not to be shot!,Surg Neurol Int.2012;3:150. doi: 10.4103/2152-7806.104744

[14] 14. Berghauser Pont LME, Dippel DWJ, Verweij BH, Dirven CMF, Dammers R: Ambivalence among neurologists and neurosurgeons on the treatment of chronic subdural hematoma: A national survey,2013 Acta Neurol Belg 113(1):55–9. doi: 10.1007/s13760-012-0130-1

[15] 15. Belkhair S, Pickett G. Belkhair: One versus double burr holes for cSDH. 2012; Can J Neurol Sci,2013 40(1):56-60.doi: 10.1017/s0317167100012956.