









EVALUATION OF BILATERAL CHRONIC SUBDURAL HEMATOMAS IN PATIENTS UNDER 50 YEARS OF AGE

50 YAŞ ALTINDAKİ BİLATERAL KRONİK SUBDURAL HEMATOMU TANILI HASTALARIN İNCELENMESİ

İlyas DOLAŞ¹ , Tugrul Cem ÜNAL¹ , Sefa ÖZTÜRK¹ , Cafer İkbal GÜLSEVER¹ , Duran ŞAHİN¹ , Mustafa Selim ŞAHİN¹ , Mehmetzeki YILDIZ¹ , Pulat Akın SABANCI¹ , Yavuz ARAS¹ , Altay SENCER¹ , Aydın AYDOSELİ¹ 

¹Istanbul University, Istanbul Faculty of Medicine, Department of Neurosurgery Istanbul, Türkiye

ORCID IDs of the authors: İ.D. 0000-0002-3425-3220; T.C.Ü. 0000-0001-6228-1379; S.Ö. 0000-0001-5583-0384; C.İ.G. 0000-0002-9246-1378; D.Ş. 0000-0003-2703-5687; M.S.Ş. 0000-0002-3626-8637; M.Y. 0000-0002-8430-775X; P.A.S. 0000-0002-0283-0927; Y.A. 0000-0001-8418-2291; A.S. 0000-0001-9925-5422; A.A. 0000-0002-4695-8295

Cite this article as: Dolas I, Unal TC, Ozturk S, Gulsever CI, Sahin D, Sahin MS, et al. Bilateral chronic subdural hematomas in patients under 50 years of age. J Ist Faculty Med 2023;86(4):307-311. doi: 10.26650/IUITFD.1219255

ABSTRACT

Objective: Chronic subdural hematoma (CSDH) is typically seen in elderly people with unilateral hemorrhages. The aim of this study was to examine the clinical outcomes of patients under the age of 50 who were treated at our clinic for bilateral CSDHs.

Material and Method: This retrospective study included 20 patients under the age of 50 who had been diagnosed with bilateral CSDHs and treated with burr-hole drainage between 2000 and 2022 at Istanbul Faculty of Medicine, Department of Neurosurgery, Istanbul University. The patients' demographic information, clinical data, and radiological images were obtained retrospectively from the hospital system. The data were subjected to descriptive statistical analysis using the IBM SPSS statistics 28.0.0 program.

Result: There were 14 (70%) males and 6 (30%) females in our study, with a mean age of 20.5 years. The most common complaints among the patients were headaches in nine patients (45%), newly developed paresis in five patients (25%), and seizures in four patients (20%). It was discovered that 17 patients (85%) had no history of head trauma. CSDH was evacuated by bilateral burr-holes in 14 patients (70%). Three (21.4%) of 14 patients with bilateral burr-holes, and 3 (50%) of the remaining six patients were reoperated due to recurrent bleeding in the follow-up period.

Conclusion: In our study, trauma history and use of antiaggregants and anticoagulants were low. More comprehensive studies on the etiology of bilateral CSDH in patients under 50 years of age are required.

Keywords: Burr-hole, chronic subdural hematomas, intracranial hematoma

ÖZET

Amaç: Kronik subdural hematoma (KSDH) genelde yaşlı popülasyonda ve unilateral olarak izlenir. Bu çalışmada 50 yaşın altında tanı almış bilateral KSDH hastalarının klinik özelliklerinin incelenmesi planlandı.

Gereç ve Yöntem: Bu çalışmaya İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Beyin ve Sinir Cerrahisi anabilim dalında 50 yaşın altında bilateral KSDH tanısı almış ve "burr-hole" drenajı ile tedavi edilmiş olan 20 hasta dahil edildi. Hastaların demografik, klinik, radyolojik bilgilerine hastane sisteminden retrospektif olarak ulaşıldı. Tüm veriler IBM SPSS 28.0.0 programı kullanılarak istatistiksel olarak değerlendirildi.

Bulgular: Çalışmaya, 14 (%70) erkek ve altı (%30) kadın hasta dahil edildi. Ortalama yaşın 20,5 olduğu görüldü. En sık hastaneye başvurma semptomları incelendiğinde dokuz (%45) hastada baş ağrısı, beş (%25) hastada yeni gelişen parezi ve dört (%20) hastada nöbet geçirme olduğu görüldü. On yedi (%85) hastada kafa travması öyküsünün olmadığı saptandı. KSDH 14 hastada bilateral "burr-hole" ile boşaltıldı. Bu 14 hastanın takiplerinde üçünün (%21,4) ve geri kalan altı hastanın üçünün (%50) rekürren kanama nedeniyle tekrar opere edildiği saptandı.

Sonuç: Çalışmamızda, genç bilateral KSDH tanılı hastalarda travma öyküsünün, antiagregan ve antikoagülan kullanımının az olduğu görüldü. Elli yaş altında karşılaşılan bilateral KSDH etiolojisini aydınlatmak için daha geniş çaplı çalışmalara ihtiyaç bulunmaktadır.

Anahtar Kelimeler: Burr-hole, kronik subdural hematoma, intrakranial hematoma

Corresponding author/İletişim kurulacak yazar: Cafer İkbal GÜLSEVER – cafer.gulsever@gmail.com

Submitted/Başvuru: 22.01.2023 • **Revision Requested/Revizyon Talebi:** 25.01.2023 •

Last Revision Received/Son Revizyon: 18.02.2023 • **Accepted/Kabul:** 10.05.2023 • **Published Online/Online Yayın:** 11.10.2023



Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

INTRODUCTION

One of the most common types of intracranial hemorrhage is chronic subdural hematoma (CSDH) with an incidence of approximately 5.3–13.5/100,000/yr (1). The incidence rate of CSDH increases with age (2). Bilateral CSDH has a high recurrence rate and variable clinical features. The most frequent factor in the etiology of CSDH is head trauma. Other etiological factors are alcoholism, liver cirrhosis, chronic renal failure, history of anti-aggregant or anticoagulant drug use, and hematological diseases (1). However, recent studies show that the etiological factors are not limited to these. Many factors contribute to the development of CSDH, including age-related changes in patients' physiological immune responses and angiogenic pathways, genomic instability, epigenetic defects, dysregulation of metabolic pathways, increased cell aging, impaired cell regeneration, increased reactive oxygen species in mitochondria, and loss of proteostasis (3). Young-onset CSDHs are often associated with predisposing factors, such as arachnoid cysts (AC), coagulation disorders, and ventriculoperitoneal (V/P) shunts (4). CSDH can occur in young people without any underlying predisposing factor (5). Bilateral subdural hematomas are characterized by severe symptoms, rapid progression, and clinical deterioration, and they should be treated as soon as possible. Various surgical techniques, such as burr-hole drainage, craniotomy, twist-drill craniostomy drainage, and subdural-peritoneal shunt, are used in the surgical treatment (1,6). Middle meningeal artery embolization is an alternative treatment for CSDH (7). Our study aims to present a cohort of young patients diagnosed with CSDH, focusing on presentation, surgical treatment, and outcome, and emphasizing the differences between them and the elderly group.

MATERIAL and METHODS

Patients with bilateral CSDHs were reviewed retrospectively between January 2000 and June 2022 at Istanbul Faculty of Medicine, Department of Neurosurgery, Istanbul University. This study was approved by the institutional ethics review committee at the Istanbul Faculty of Medicine (Date: 11.11.2022, No: 20). Patients over the age of 50, patients with subdural hematomas with acute or subacute components, patients with CSDHs who had been followed up with a conservative approach, and patients who had had craniotomy or twist-drill craniotomy as surgical treatment were excluded from the study. The radiological images of the patients were accessed from the hospital ventriculoperitoneal (V/P). The study included 20 patients whose diagnosis of bilateral CSDHs was confirmed by preoperative radiological imaging and who underwent burr-hole drainage. Age, gender, admission complaint, use of anticoagulant or antiaggregant drugs, comorbid disease, admission Glasgow Coma Scale

(GCS), preferred surgical method, and reoperation needs were evaluated retrospectively. The outpatient clinic application notes were used to evaluate follow-up times. The results were subjected to descriptive statistical analysis using the SPSS ver.28.0 (IBM Corporation, Armonk, NY, USA). Univariate analyses were performed using the Mann-Whitney U test for non-normally distributed scale parameters. Median and range calculations were used for the description of scale parameters. All analyses were performed with a 95% confidence interval and a significance level of 0.05.

RESULTS

The study included fourteen (70%) males and 6 (30%) females. The mean age was 20.5 years. At the same time, the mean age for men was 22.9 and 14.8 for women. The most common complaint seen in nine patients (45%) was a headache, followed by newly developed paresis in five patients (25%) and seizures in four patients (20%) (Table 1). In 17 patients (85%), no previous head trauma was discovered. While no patients were found to be using anticoagulant or antiaggregant drugs, eight patients (40%) had at least one disease that could cause comorbidity. Three patients (15%) had V/P shunts. While the GCS at admission was 15 in 18 patients (90%), one patient (5%) presented with a GCS of 14 (E4M6V4), and one patient (5%) presented with a GCS of 10 (E4M3V3). An examination of the preoperative cranial imaging of the patients included in the study revealed no midline shift. Drainage was provided with a total of four burr-holes, two on the right side and two on the left, in 14 patients (70%). A unilateral subduraperitoneal shunt was inserted after drainage in one patient with one burr-hole, and a bilateral subduraperitoneal shunt was inserted after drainage in one patient with two biparietal burr-holes. In the first operation, 18 patients (90%) had bilateral burr-hole drainage (Table 2). No postoperative complications were observed in the patients, except for rebleeding. Six patients (30%) were reoperated due to rebleeding within the first three months after the first operation. Due to rebleeding, 3 (21.4%) of 14 patients with bilateral four burr-holes and 3 (50%) of six patients with less than four burr-holes were reoperated.

DISCUSSION

Chronic subdural hematomas are hemorrhages caused by the rupture of the parasagittal bridging veins which become stretched due to cerebral atrophy. CSDH is typically characterized by unilateral bleeding in the elderly. Although the pathophysiology of bilateral CSDH is unknown, traumatic injury to the bridging veins is believed to be the cause (8).

In a meta-analysis comparing young and old patients with CSDH, Bartek et al. stated that they considered 50

Table 1: Clinical features of chronic subdural hematomas

Results	Male	Female
Number of patients	14 (70%)	6 (30%)
Average age (years)	22.9	14.8
Complaints		
Headache	3 (15%)	6 (30%)
Newly developing paresis	5 (25%)	0 (0%)
Seizure	2 (10%)	2 (10%)
Trauma	2 (10%)	1 (5%)
Co-morbid diseases		
V/P shunt	2 (10%)	1 (5%)
Arachnoid cyst	2 (10%)	0 (0%)
Hypertension	1 (5%)	0 (0%)
Thrombotic thrombocytopenic purpura	0 (0%)	1 (5%)
Urinary system pathology	1 (5%)	2 (10%)
Surgical treatment/recurrent bleeding		
One-sided burr-hole	2/1	1/1
1 burr-hole in total on one side	1/0	0/0
2 burr-hole in total on one side	1/1	1/1
Bilateral burr-hole	12/3	5/1
Bilateral total 2 burr-holes	2/0	0/0
Bilateral total 3 burr-holes	1/1	0/0
Bilateral total 4 burr-holes	9/2	5/1

Table 2: Recurrent bleeding in young patients with bilateral chronic subdural hematoma

Variable	Recurrent bleeding (n=6)	No recurrent bleeding (n=14)	P value (p<0.05)
Gender			0.904
Male	4 (67.6%)	10 (71.4%)	
Female	2 (33.3%)	4 (28.5%)	
V/P shunt			0.019*
Patient with V/P shunt	3 (50%)	0 (0%)	
Patient without V/P shunt	3 (50%)	14 (100%)	
Arachnoid cyst			0.516
Patient with arachnoid cyst	0 (0%)	2 (14.3%)	
Patient without arachnoid cyst	6 (100%)	12 (85.7%)	
Bilateral/unilateral drainage			0.258
One-sided burr-hole	2 (33.3%)	1 (0.07%)	
Bilateral burr-hole	4 (66.7%)	13 (92.8%)	

* Statistically significant, V/P: Ventriculoperitoneal

years of age to be the limit because, in their study, brain atrophy began to increase after the age of 50 (4). In our study, we selected a younger age group and investigated the clinical outcomes of patients with bilateral CSDHs who were all under the age of 50.

Previous studies demonstrated that CSDH manifests with symptoms of increased intracranial pressure more frequently in younger patients under the age of 50, while it manifests with neurological deficits more frequently in elderly patients. This is because there is no significant age-related atrophy in the human brain until the age of 50. Bleeding in the subdural space causes an increase in intracranial pressure and has a mass effect. Therefore, symptoms appear earlier and, in most cases, before the onset of neurological deficits (4). This information is supported by our study, which found that headache, nausea, and vomiting were the presenting complaints of 18 patients (90%). In comparison, only five patients (20%) experienced new weakness in any extremity.

Various risk factors for bilateral CSDH were identified in a previous study, including age (>75 years), coagulopathy, use of antiaggregant or anticoagulant medication, and hemodialysis (9). However, no patients in our study received antiaggregant or anticoagulant therapy, and only one patient received peritoneal dialysis due to chronic renal failure caused by thrombotic thrombocytopenic purpura. Most of the risk factors for bilateral CSDH were absent in the young patients with bilateral CSDH included in our study. Bilateral CSDH seen at a young age is caused by other risk factors. To determine these, more research on young-age bilateral CSDH is required.

CSDH is one of the complications of arachnoid cysts, and CSDHs associated with arachnoid cysts are more common in the elderly and infants (10). Approximately 2%-4% of patients with arachnoid cysts are found to have CSDH. Men are three times more likely than women to suffer CSDH caused by arachnoid cysts (11). ACs were discovered in preoperative cranial computed tomography (CT) images of two male patients aged 3 and 30. According to Benek et al., the presence of arachnoid cysts in young adults is a predisposing factor for developing CSDH (12). In a study on young patients with CSDHs conducted by Ou et al., it was discovered that when patients with arachnoid cyst (AC) or V/P were compared with patients without AC or V/P shunt, the history of head trauma was statistically significantly higher in the group with AC or V/P shunt (5). There were five patients in our study who had AC or V/P shunts, three who had V/P shunts, and two who had arachnoid cysts. There was no history of head trauma in any of these patients. In our study, head trauma history was not significant in the group with AC and V/P ($p=0.553$). In the same study, no significant difference in recurrence rates was found between the two groups.

Six patients were reoperated for rebleeding in our study, and three of the reoperated patients had V/P shunts. Our results showed that rebleeding was significantly higher in patients with a history of V/P shunts ($p=0.019$) (Figure 1).

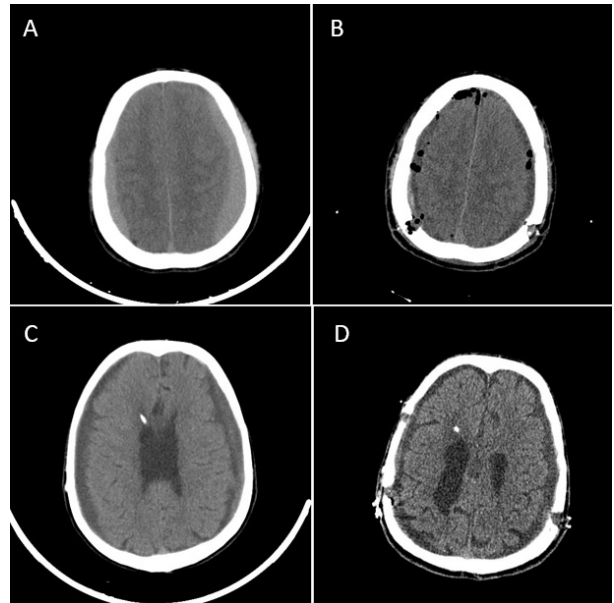


Figure 1: Pre-operative axial CT scan of bilateral chronic subdural hematoma is seen (A). CT scan after bilateral burr-hole drainage (B). Another patient with VP shunt and bilateral chronic subdural hematoma is shown (C). Post-operative image after burr-hole drainage is appreciated (D). (CT. Computed tomography, VP. Ventriculoperitoneal)

Compression of the bilateral cerebral hemispheres provides a relatively buffering effect in bilateral CSDH, and hematoma leading to midline shift is less common in these patients (13). This was confirmed in our study where there was no midline shift in the preoperative CT images of the patients.

Andersen-Ranberg et al. discovered that evacuation of unilateral hematoma in treating bilateral CSDHs increased the rate of ipsilateral or contralateral reoperation (13). In our study, 18 patients had bilateral burr-hole drainage, and two had unilateral burr-hole drainage. One of the two patients who had unilateral burr-hole drainage had to be reoperated due to an increase in the size of the hematoma on the opposite side. Only five of 18 patients who had bilateral burr-hole drainage had to be reoperated. In terms of rebleeding, our results showed that there was no significant difference between unilateral and bilateral drainages ($p=0.258$).

The limitations of our study include retrospective data collection, the small number of patients diagnosed with bilateral CSDHs under the age of 50, and the exclusion of surgical treatments other than burr-hole drainage.

CONCLUSIONS

In our study, patients under the age of 50 with CSDHs had a low trauma and antiaggregants and anticoagulants usage history. The factors involved in the etiology of young patients with bilateral CSDHs differ from those seen in the elderly. A conclusion of our study is that more comprehensive studies on the etiology of bilateral CSDH in patients under 50 years of age are required.

Ethics Committee Approval: This study was approved by Istanbul Faculty of Medicine Clinical Research Ethics Committee (Date: 11.11.2022, No: 20).

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- İ.D., T. C.Ü., S.Ö., C.İ.G.; Data Acquisition- S.Ö., C.İ.G.; Data Analysis/ Interpretation- S.Ö., C.İ.G., D.Ş.; Drafting Manuscript- C.İ.G., M.Y., M.S.Ş.; Critical Revision of Manuscript- P.A.S., A.A., Y.A., A.S.; Final Approval and Accountability- P.A.S., A.A., Y.A., A.S.; Supervision- A.S.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Uckun OM, Divanlıoğlu D, Dağlıoğlu E, Alagöz F, Dalgıç A, Belen AD. Kronik subdural hematom hastalarında klinik özellikler: travma ve antikoagülan/antiagregan ilaç kullanımı, clinical features in chronic subdural hematoma patients: trauma and anticoagulant / antiagregan drug used. Ankara Eğitim ve Araştırma Hastanesi Tıp Dergisi 2018;51(3):196:200.
2. Wei Q, Fan G, Li Z, Wang Q, Li K, Wang C, et al. Middle meningeal artery embolization for the treatment of bilateral chronic subdural hematoma. Front Neurol 2021;12:651362. [CrossRef]
3. Weigel R, Schilling L, Krauss JK. The pathophysiology of chronic subdural hematoma revisited: emphasis on aging processes as key factor. Geroscience 2022;44(3):1353-71. [CrossRef]
4. Bartek J, Sjøvik K, Dhawan S, Sagberg LM, Kristiansson H, Ståhl F, et al. Clinical course in chronic subdural hematoma patients aged 18-49 compared to patients 50 years and above: a multicenter study and meta-analysis. Front Neurol 2019;10:311 [CrossRef]
5. Ou Y, Dong, J, Wu L, Xu L, Wang L, Liu B, et al. The clinical characteristics, treatment, and outcomes of chronic subdural hematoma in young patients. World Neurosurg 2019;125:1241-6. [CrossRef]
6. Mohamed T, Swed S, Al-Mouakeh A, Sawaf B. Nontraumatic bilateral subdural hematoma: Case report. Ann Med Surg (Lond) 2021;71:102907. [CrossRef]
7. Désir LL, D'Amico R, Link T, Silva D, Ellis JA, Doron O, et al. Middle meningeal artery embolization and the treatment of a chronic subdural hematoma. Cureus 2021;13(10):e18868. [CrossRef]
8. Huang YH, Yang KY, Lee TC, Liao CC. Bilateral chronic subdural hematoma: what is the clinical significance? Int J Surg 2013;11(7):544-8. [CrossRef]
9. Oyama H, Ikeda A, Inoue S, Shibuya M. The relationship between coagulation time and bilateral occurrence in chronic subdural hematoma. No To Shinkei 1999;51(4):325-30.
10. Kaya M, Ceylan D, Kaçıra T, Tarihi G. Araknoid kistler ile ilişkili subdural hematomlar: iki olgu sunumu. Sakarya Tıp Dergisi 2021;11(3):669-74. [CrossRef]
11. Wu X, Li G, Zhao J, Zhu X, Zhang Y, Hou K. Arachnoid cyst-associated chronic subdural hematoma: report of 14 cases and a systematic literature review. World Neurosurg 2018;109:e118-30. [CrossRef]
12. Benek HB, Akcay E. Concomitant chronic subdural hematomas and arachnoid cysts in young adults. F1000Res 2021;10:421 [CrossRef]
13. Andersen-Ranberg NC, Poulsen FR, Bergholt B, Hundsholt T, Fugleholm K. Bilateral chronic subdural hematoma: unilateral or bilateral drainage? J Neurosurg 2017;126(6):1905-11. [CrossRef]