



Chronic Subdural Hematomas: A Review of 94 Cases

Kronik Subdural Hematomlar: 94 Vakanın Derlenmesi

Murat Yılmaz¹, Alaattin Yurt², İdiris Altun³, Hakan Yılmaz², Bilal Kılıçarslan¹, Nuri M. Arda¹

¹Dokuz Eylül University Medical Faculty, Department of Neurosurgery. İZMİR

²Bozyaka Education Hospital, Department of Neurosurgery. İZMİR

³Sütçü İmam University Medical Faculty, Department of Neurosurgery, KAHRAMANMARAŞ

Cukurova Medical Journal 2015;40(1):22-27.

ABSTRACT

Purpose: To investigate risk factors, preoperative findings, treatment, complications and prognosis of patients with chronic subdural hematoma treated in our university.

Material and Methods: Consecutive patients operated with a diagnosis of chronic subdural hematoma between January 2003 and December 2012 were reviewed retrospectively. Etiology and medical status of the patients at the time of admission were noted. Exact localization of the chronic subdural hematoma was detected by computed tomography scans and follow-up was maintained with magnetic resonance imaging. The outcome of the patients was evaluated one month after injury, by assessing activities of daily living.

Results: Ninety-four consecutive patients met the eligibility criteria for the study. The mean age was 65 (range 45 to 85) years. In 74 (78.7%) patients, head injury was the supposed origin. In 20 (21.3%) patients, no trauma was evident. Most common symptom reported at the time of admission was headache (100%), and the most common neurological finding was confusion (87.2%). The majority of the patients had a mild neurological deficit with a Glasgow Coma Scale score over eight. In general, 90.4% of cases were sufficiently treated by a single operation, while 9.6% needed a second procedure. During the follow-up, 91.5% of the patients returned to daily living activities on the first month kontrol.

Conclusion: Surgical treatment of chronic subdural haematoma can give a high rate of complete recovery to normal life.

Key words: Burr-hole craniostomy; complications; head injury; chronic subdural hematoma.

ÖZET

Amaç: Kliniğimizde kronik subdural hematoma nedeniyle tedavi edilen hastaların risk faktörlerini, preoperatif bulgularını, komplikasyonları ve prognozlarını araştırmak.

Materyal ve Metod: Ocak 2003 ve Aralık 2012 arasında kronik subdural hematoma nedeniyle cerrahi olarak tedavi edilen hastalar retrospektif olarak incelendi. Hastaların ilk kabulü esnasındaki durumları ve etyolojileri not edildi. Kronik subdural hematomun kesin lokalizasyonu bilgisayarlı tomografi ile tespit edilip takipleri manyetik rezonans görüntüleme ile yapıldı. Sonuçlar bir ay sonra günlük hayat aktivite ölçümü ile değerlendirildi.

Bulgular: Çalışmaya 94 hasta dahil edildi. Ortalama yaş 65 (45-85) idi. 74 dastada (%78.7) kafa travması orijini vardı. 20 hastada (%21.3) travma bugusu yoktu. Kabul sırasında en sık rastlanan semptom başağrısı (%100) ve en sık rastlanan bulgu konfüzyondu (%87.2). Hastaların çoğunluğunda hafif bir başağrısı mevcuttu ve Glasgow Koma Skalası skoru sekizin üzerindeydi. %90.4 vaka tek bir ameliyatla tedavi edildi. %9.6 vakada ikinci bir işlem gerekti. Birinci ay kontrolde %91.5 hasta günlük hayat aktivitesine geri döndü.

Sonuç: Kronik subdural hematomların cerrahi tedavisi yüksek oranda normal hayata dönüşü sağlayabilir

Anahtar kelimeler: Burr-hole kraniostomi; komplikasyon; kafa travması, kronik subdural hematoma.

INTRODUCTION

The chronic subdural hematoma (CSDH) is a common condition that occurs particularly among elderly patients in neurosurgical practice. Its treatment is not standardised and varies widely, from craniotomy to enlarged burr holes, twist drill craniostomy with or without closed-system drainage and single-needle trephination.¹ It was often observed at post mortems and the first clear account of CSDH was reported in 1817 by Houssard.²

Head trauma is determined in less than 50%, and sometimes quite insignificant trauma can create these lesions. Other risk factors are alcohol taking, seizures, ventricular shunts, coagulopathies. CSDH annual incidence ratio is approximately 0.001%-0.002%.³ After anticoagulant treatment, CSDH occurrence probability at least 42.5% increases.³ Significant recurrence rate from 9.2% up to 26.5% has been reported.⁴ A variety of different surgical treatments exist, including twist drill craniostomy, single or multiple burrhole drainage (with or without a subdural drain), minicraniectomy and craniotomy. Santarius *et al.* published class 1 evidence for the use of subdural drains in treating this condition.⁵ Weigel *et al.* published a meta-analysis, concluding that burrhole drainage was more effective in draining a CSDH than twist drill craniostomy, and was associated with fewer complications than craniotomy.⁶

The aim of this study was to investigate risk factors, preoperative findings, treatment, complications and prognosis of patients with CSDH treated in our department between January 2003 and December 2012.

MATERIAL and METHODS

This study was approved by Izmir Bozyaka Training and Research Hospital Ethic Committee review board. Patients admitted to the Department

of Neurosurgery of our university and operated with a diagnosis of CSDH, between January 2003 and December 2012, constituted the study group.

Etiology and medical status of the patients at the time of admission were noted. Glasgow Coma Scale (GCS) was used to determine neurological status. Exact localization of the CSDH was detected by computed tomography (CT) scans and magnetic resonance imaging (MRI) in all cases. Associated intra or extraparenchymal brain lesion detected by CT scan was also noted. Angiographic examination was not performed in any patients. The amount of blood loss, control of hemorrhage, and the amount of transfused blood were noted. The outcome of the patients was evaluated one month after injury, by assessing activities of daily living.

For every patient, neurological examination and CT scans were performed every 3 weeks postoperatively, until CSDH had completely dissolved. In special cases, follow-up was individually adjusted with MRI and neurological examination.

RESULTS

Ninety-four consecutive patients met the eligibility criteria for the study. Of the 94 patients (77 males, 17 females) whose charts were reviewed, the mean age was 65 (range 45 to 85) years. In 74 (78.7%) patients, head injury due to a fall or direct hit was the supposed origin. In 20 (21.3%) patients, no trauma was evident. Initial symptoms reported at the time of admission were headache in 94 (100%), nausea and vomiting in 68 (72.3%), speech difficulties in 44 (46.8%), loss of power in 38 (40.4%), seizure in 21 (22.3%), and comatose state in 6 (6.4%) patients (Table 1). The neurological findings were confusion in 82 (87.2%), loss of consciousness in 60 (63.8%), hemiparesis in 38 (40.4%), and papilledema in 26 (27.7%) patients. The GCS score was between 13 and 15 in 43 (45.7%), between 8 and 12 in 44 (46.8%), and between 3 and 7 in 7 (7.4%) patients. The majority

of the patients had a mild neurological deficit with a GCS score over eight. The most common CT scan results were hypodense hematoma in 72 (76.6%) patients (Table 2). Hematoma was located over the right hemisphere in 41 (43.6%) of cases, over the left in 42 (44.7%), and bilateral in 11 (11.7%). CSDH was diagnosed by preoperative CT (Figure 1a and 1b) and MRI (Figure 2a and 2b) in all patients, while the follow-up was performed by MRI.

All patients underwent surgery within 24 hours after admission. Eighty-six (91.5%) of the patients were operated by using burr-craniostomy with

closed system drainage and 8 (8.5%) were operated by craniotomy. A single operation was sufficient in 85 (90.4%) patients, while a revision surgery was necessary in 9 (9.6%) patients.

Detected postoperative complications were residual collection in 8 (8.5%), CSDH recurrence in 5 (5.3%), intracerebral hematoma in 3 (3.2%), exitus in 3 (3.2%), meningitis in 2 (2.1%), pneumocephalus in 2 (2.1%), postoperative epilepsy in 2 (2.1%) patients (Table 3). During the follow-up, 86 (91.5%) patients returned to daily living activities on the first month control.

Table1. Detected symptoms at the time of admission.

| | n (%) |
|---------------------|------------|
| Headache | 94 (100%) |
| Nausea, vomiting | 68 (72.3%) |
| Speech difficulties | 44 (46.8%) |
| Loss of power | 38 (40.4%) |
| Seizure | 21 (22.3%) |
| Comatose state | 6 (6.4%) |

Table 2. Preoperative computed tomography results.

| | n (%) |
|-------------------------------|------------|
| Hypodense haematoma | 72 (76.6%) |
| Haematomas in various density | 13 (13.8%) |
| Isodense haematoma | 5 (5.3%) |
| Hyper dense haematoma | 4 (4.2%) |

Table 3. Complications detected in the study group.

| | n (%) |
|---------------------------------------|----------|
| Residual collection | 8 (8.7%) |
| Chronic subdural haematoma recurrence | 5 (5.3%) |
| Intracerebral haematoma | 3 (3.2%) |
| Exitus | 3 (3.2%) |
| Meningitis | 2 (2.1%) |
| Pneumocephalus | 2 (2.1%) |
| Postoperative epilepsy | 2 (2.1%) |



Figure 1a. Hypodense chronic subdural hematoma (white arrow) is seen in the left fronto-parietal area on axial CT image.



Figure 1b. Hypodense chronic subdural hematoma (white arrow) is seen in the left fronto-parietal area on coronal CT image.

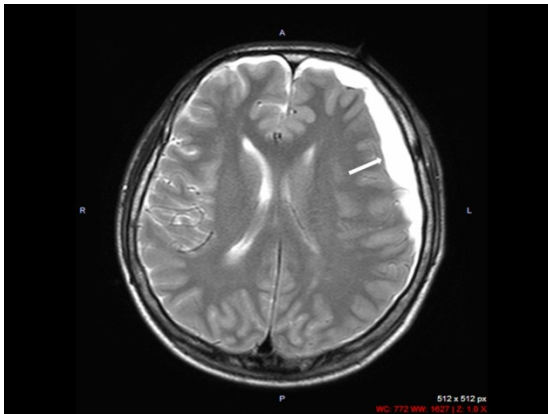


Figure 2a. Hyperintense chronic subdural hematoma (white arrow) is seen in the left fronto-parietal area on T2-weighted axial MRI.



Figure 2b. Hypointense chronic subdural hematoma (white arrow) is seen in the left fronto-parietal area on T1-weighted coronal MRI.

DISCUSSION

In the present study, the CSDH group were predominantly male and had a mean age of 65 years, which is in keeping with CSDH occurring more often in the elderly. The incidence of CSDH is 1.72 per 100,000 for the overall population⁷. Lind et al. have shown an incidence of 4.6 per 100,000⁸. The incidence of CSDH in the age group 70–79 years is, however, 7.35 per 100,000 per year.

The age distribution of patients between the three CSDH groups is relevant in terms of presenting symptoms and signs. Liliang et al.

reviewed the presentation of CSDH in an older group (>75 years) and a younger group (<40 years) of patients⁹. The presenting symptoms and signs in both groups differed where the younger patients usually presented with headache and vomiting, whereas the older patients were more likely to present with symptoms and signs that included focal neurological deficits⁹. In the present study, the most common symptom reported at the time of admission was headache (100%), and the most common neurological finding was confusion (87.2%).

Head trauma is determined in less than 50%, and sometimes quite insignificant trauma can create these lesions⁷⁻⁹. Other risk factors are alcohol taking, seizures, ventricular shunts, coagulopathies and the patients the risk of falling down. In the present study, head injury was the supposed origin in 78.7%, while no trauma was evident in the rest of the study group.

A large retrospective study by Gelabert et al. on 1000 CSDH cases showed that they comprised 471 on the left and 432 on the right (47.1% vs. 43.2%)¹⁰. A review by Mori and Maeda on 500 CSDH cases reported 260 on the left and 152 on the right (52.0% vs. 30.4%)¹¹. We have shown that left CSDHs were more common than right CSDHs (44.7% left vs. 43.6% right).

The treatment of CSDH has two different goals. On the one hand, the space-occupying, continuously expanding and potentially life-threatening hematoma has to be reduced. On the other hand, recurrence and surgery-related complications have to be avoided. Many different treatment options, such as craniotomy, burr-hole craniostomy, twist-drill craniostomy or needle trephination are able to decompress the hematoma¹². Thus, selecting the most suitable treatment must focus on reducing complications and minimising recurrence. In the present study, all patients in the study group underwent surgery within 24 hrs after admission. 91.5% of the patients were operated by using burr-craniostomy with closed system drainage and the rest were operated by craniotomy. A single operation was sufficient in 90.4% patients, while a revision surgery was necessary in 9.6%.

In the postoperative period, the most important problem is recurrent hematoma and existence of clot hematoma because of not enough drainage with burr hole and twist drill. The most important reason of recurrent hemorrhage is failure of brain re-expansion after drainage of hematoma. After Burr-hole and twist drill techniques together with closed system drainage treatment, recurrent CSDH incidence changes between 0%-31.6%¹⁰.

Known risk factors for recurrence are low socio-economic status, cerebral atrophy, large hematoma, alcohol addiction, anticoagulation usage, kidney malfunction, liver dysfunction, multiple membrane or septum in hematoma cavity, high density and mixed density haematoma in CT scan, and meningeal dissemination of malignant tumours¹⁰. In the present study, early postoperative complications are intracerebral hematoma in 3 (3.2%), meningitis in 2 (2.2%) patients, while 3 (3.2%) patients died because of cerebral oedema. Postoperative epilepsy was diagnosed in 2 (2.2%), recurrence in 5 (5.3%), and pneumocephaly in 2 (2.2%) patients.

CONCLUSIONS

In conclusion, CSDH can be successfully treated in most of the cases with prompt preoperative planning and preparation. If the patient's condition is suitable for emergency CT scan and MRI, it may be helpful for operative planning.

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

Acknowledgement: None

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Yazışma Adresi / Address for Correspondence:

Dr. Murat Yılmaz
Dokuz Eylul University Medical Faculty
Department of Neurosurgery,
İZMİR
E-mail: muratran@yahoo.com

Geliş tarihi/Received on : 08.06.2014

Kabul tarihi/Accepted on: 21.07.2014