Journal of Neurological Sciences [Turkish] **32:(1)**# 43; 154-160, 2015
http://www.jns.dergisi.org/text.php3?id=857
Research Article

The Effects of Membranous Abnormalities on Mortality and Morbidity in Chronic Subdural Hematomas

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Summary

Objective: Our aim was to evaluate the effects of membranous abnormalities on morbidity and mortality in chronic subdural hematomas (CSDH).
Methodology: This retrospective study included 116 patients operated in three different hospitals during last three years. Patients were analyzed for the presence of trauma, operation type, recurrence, complication/s, presence of membranous abnormalities like thick outer membrane and septa formation, and mortality.
Results: The mean age of the patients 62,06±11.4 ranging between 42 and 87. 78 (67.2%) of them were male and 38 (32.8%) were female The most common predisposing factor was the trauma especially in male gender. The presence of membranous abnormalities played significant effects on recurrence and complication rates. However, it didn't have significant effect on mortality.
Conclusion: Trauma is still the most common etiological factor in chronic subdural hematomas. The presence of membranous abnormality in CSDH increases the recurrence and complication rates.

Key words: Chronic subdural hematoma, trauma, septa, recurrence, complication, burr hole, craniotomy

Kronik Subdural Hematomlarda Membranöz Abnormalitelerin Mortalite ve Morbiditeye Etkisi

Özet

Amaç: Bu çalışmada amacımız kronik subdural hematomlarda (KSDH) membranöz abnormalitelerin morbidite ve mortaliteye etkilerini değerlendirmektir.
Metod: Bu retrosepktif çalışmaya son üç yıl içinde üç farklı hastanede ameliyat edilen 116 olgu dahil edildi. Hastalar travma varlığına, ameliyat tipine göre, nüks olup olmadığına göre, komplikasyonlar görülüp görülmediğine göre, hematomda membranöz abnormalite varlığınıa göre ve mortalite yönünden hastalar değerlendirildi. Membranöz abnormaliteler hematomun kalın membrana sahip olması ve hematomun septalı olup olmadığını içerdi.
Bulgular: Hastaların yaşı 42 ila 87 arasında değişmekte olup ortalama yaş 62,06±11.4 idi. Hastaların 78 (%67,2)'si erkek, 38 (%32,8)'I ise kadındı. En önemli predispozan faktörün özellikle erkek hasta grubunda travma olduğu tespit edildi. Membranöz abnormalite varlığının nüks oranları ve komplikasyon gelişimi üzerinde önemli etkiler gösterdiği belirlendi. Bununla birlikte, mortalite üzerinde etkisi olmadığı görüldü.
Sonuç: Travma KSDH'larda halen en yaygın etyolojik faktördür. Membranöz abnormalite varlığı nüks ve komplikasyon gelişimini artırır.

Anahtar Kelimeler: Kronik subdural hematoma, travma, septa, nüks, komplikasyon, burr-hole, kraniotomi

INTRODUCTION

Chronic subdural hematoma (CSDH) located between the dura mater and arachnoid membrane and usually results from tearing of bridging veins. It is usually caused by minor trauma, and its risk factors like atrophy and coagulopathy[2,7,12]. It is one of the most common pathology encountered in daily neurosurgical practice. Its incidence increases with aging[3,8,12]. There are two forms of encapsulated chronic subdural hematoma. These are septated and nonseptated forms. Although the treatment of nonseptated form is relatively easy, the treatment of septated form is a therapeutical problem[4].

The main management of CSDH is based on surgical options including twist-drill and spontaneous hematoma efflux, twist-drill craniotomy and catheter drainage, small craniotomy and endoscopic removal, subduro-peritoneal shunt as an alternative for infants and elderly patients, large craniotomy, hematoma removal and membranectomy, or burr-hole craniotomy without or with continuous closed-system drainage[3]. All of these different techniques have own advantages and disadvantages.

In the present study, we aimed to present the surgical outcomes, recurrence rate, and the effect of membranous abnormality of our 116 cases with CSDH.

MATERIAL AND METHODS

A total of 116 patients were treated surgically at the Bitlis State Hospital, Bozok University Training and Research Hospital, Yüzüncü Yıl University Training and Research Hospital from 2010 to 2013. Information was obtained from patients folders. 25 patients with incomplete medical records were excluded from the study. Data about septated form and nonseptated form were gathered from radiological findings or operation notes from patients' folders.

RESULTS

The mean age of the patients 62,06±11.4 ranging between 42 and 87. 78 (67,2%) of them were male and 38 (32,8%) were female. There was a presence of trauma in 73 (62,9%) of all patients. Only 5 (6,4%) of male patients didn't mention the history of trauma. However, only 6 (15,8%) of female patients mentioned presence of trauma. There was a statistically significant relationship between trauma presence and development of SDH (p=0,001).

We observed that 81 (69,8%) of patients underwent operation under general anesthesia and others operated under local anesthesia. In 10 (8,6%) of all patients, hematoma was evacuated with craniotomy, however, in 91,4% of patients hematoma was evacuated with two or three burr-holes according to the extension of the hematoma. In 8 (6,9%) patients in burr hole group revision surgery was needed. We detected that revision surgery had not been performed in craniotomy group. However, any statistical difference was not observed between two groups (p=0,06) (Graphic I). Also, there was not any statistically significant between type of operation and mortality (p=0,7).

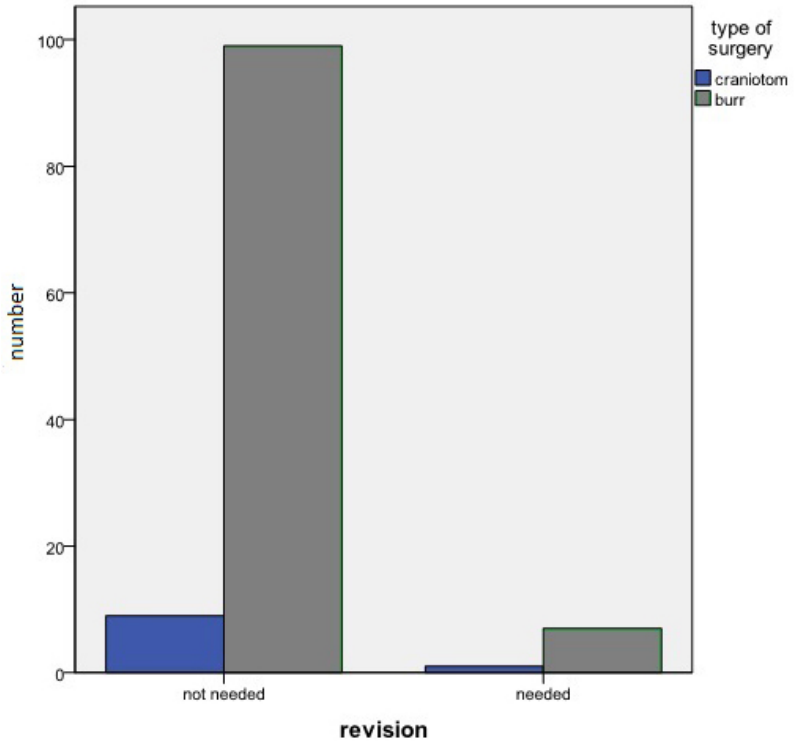
Hematoma was right sided in 55 (47,4%) patients , left sided in 46 (39,7%) patients, and bilateral in 15 (12,9%) in patients. Membranous abnormality (thick membrane and septa formation) was observed in 55 (47,4%) patients. Postoperative complication development was observed in 5 (4,3%) patients. These complications were pneumocephalus, Broca's aphasia, subarachnoid hemorrhage, contra-lateral acute subdural hematoma, and epilepsy in

each case. Complication development was only observed in patients operated with burr-hole. However, there was not any statistically important difference between the type of surgery and development of complication (p=0,6) (Graphic II).

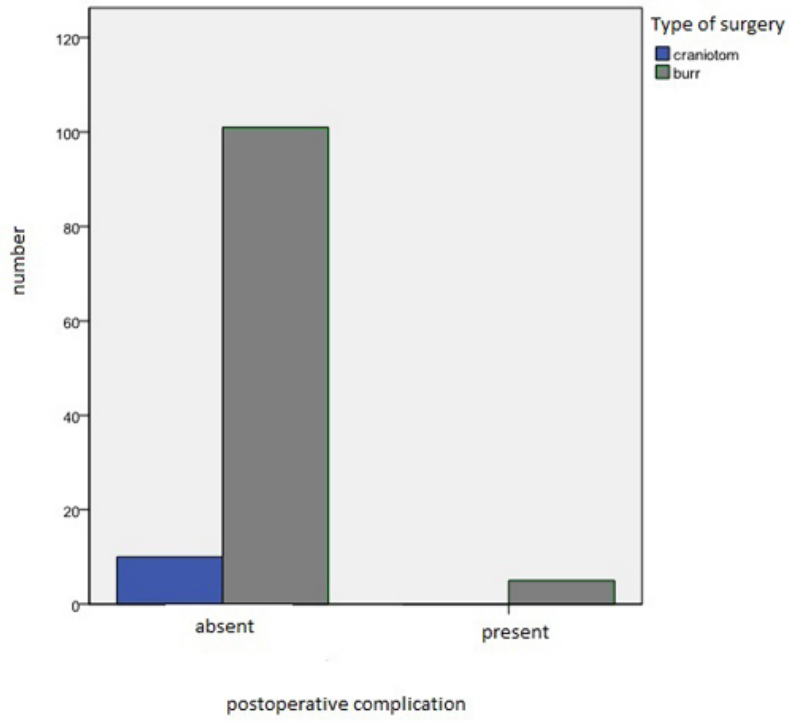
We observed statistically significant difference the presence of membranous abnormality and development of complication (p=0,03). Similarly, we found statistically significant difference between the presence of membranous abnormality and the need of revision surgery (p=0,002) (Graphic III). However, there was not any statistically significant difference between the presence of membranous abnormality and mortality (p=0,07) (Graphic IV). Although the localization of bleeding classified roughly we didn't was observe statistically significant difference between mortality and the hematoma location (p=0,056).

Statistical Analysis

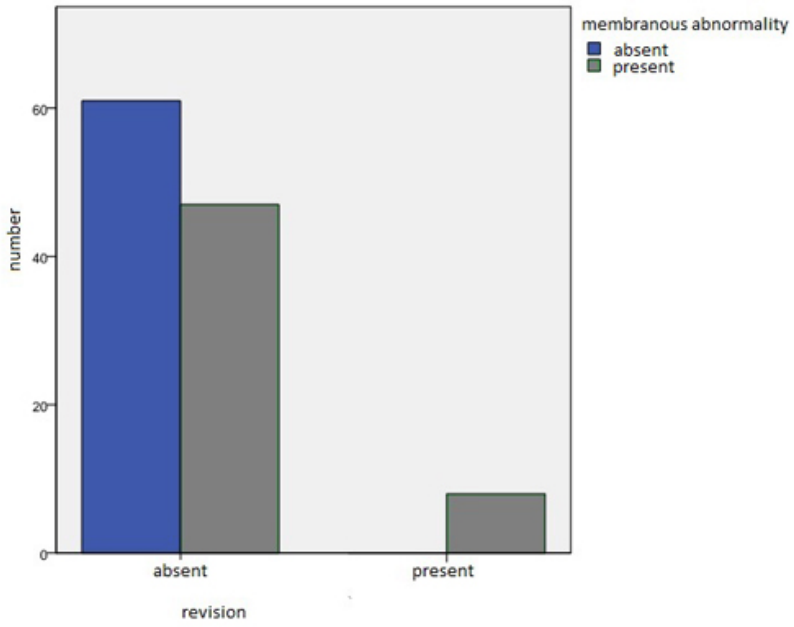
The statistical analyses were performed using software (SPSS 18.0). Parametric values were given as mean±standard deviation, and non-parametric values were given as a percentage. To compare parametric continuous variables, Student's t-test or analysis of variance was used; to compare nonparametric continuous variables, the Mann–Whitney U-test or the Kruskall–Wallis test was used. Categorical data were compared by Chi-square distribution. Two-tailed P-values of less than 0.05 were considered to indicate statistical significance.



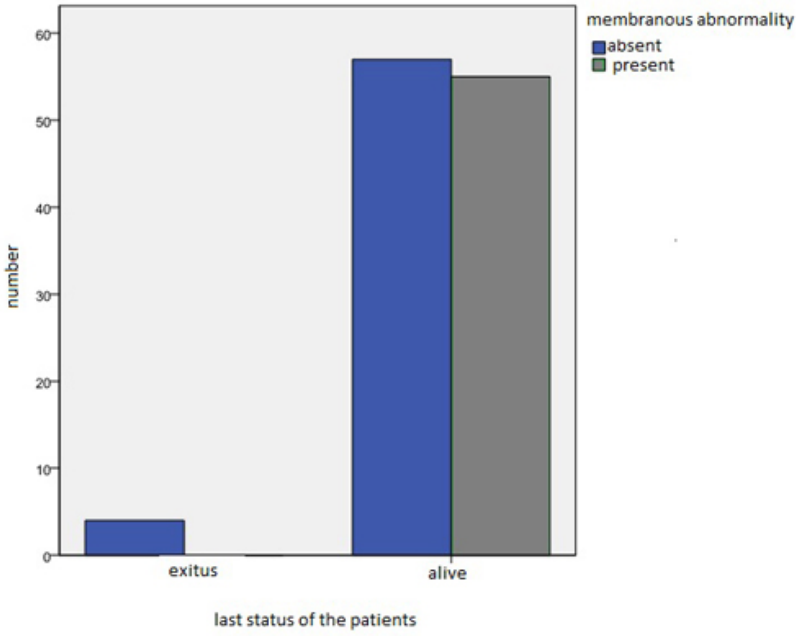
Graphic I: *Shows the relationship between the type of the surgery and need of revision.*



Graphic II: *Shows the relationship between the type of the surgery and the development of complication.*



Graphic III: *Shows the relationship between the presence of membranous abnormality and the need of revision surgery.*



Graphic IV: *Shows the relationship between the presence of membranous abnormality and last status of the patients.*

DISCUSSION

CSDH is one of the most common pathology encountered in daily neurosurgical practice[8,12]. Its estimated incidence is approximately 3.4 per 100,000 in patients younger than 65 years of age to 8–58 per 100,000 in those older than 65 years[2,3,12]. In treatment, the accepted method is the surgery. Different surgical approaches have been reported in the literature and each of them have own advantages[3]. Surgical options may be encountered as burr-hole drainage, twist drill drainage, and craniotomy. As an alternative approach a small craniectomy has also been advocated[10].

The most common used approach is the burr-hole evacuation of the hematoma. The number and size o the burr-holes depends on the localization and the size of the hematoma[10]. Kansal et al. compared single burr-hole with double burr hole in the management of CSDH and reported that the number of burr holes didn't affect the postoperative recurrence rate[5]. In burr-hole operations drainage or irrigation may be used. In a study, Okada et all compared the results of burr hole drainage and burr hole irrigation in chronic subdural hematoma[9]. They concluded that burr-hole drainage resulted in less frequent recurrence and shorter hospitalization than burr-hole irrigation in the treatment of CSDH[9]. In a recent study, Ahmed et al. compared the burr hole drainage with continuous closed drainage and concluded that closed drainage no advantage[1].

In twist drill craniostomy (TDC), skull opening usually less than 5 mm is performed. It was reported that this procedure is a safe and effective method for CSDH in elderly and could be used as the first and only option in these people[11]. However, irrigation through such a small opening may be difficult[10].

When there are substantial solid components, burr-hole may be converted to craniotomy[10]. Although craniotomy is more invasive procedure and leads to more blood loss, it has advantages of fluid evacuation and partial removal of the

hematoma membrane especially in patients with recurrent, persistent hematoma[7].

In a meta-analysis comparing twist drill craniostomy, burr hole craniostomy, and craniotomy, it was reported that twist drill craniostomy and burr hole craniostomy were the safest method and should be the first line approach. They found that burr hole craniostomy had the best cure to complication ratio and was superior than TDC in the treatment of recurrences. They also reported that craniotomy and burr hole craniostomy had the lowest recurrence rates. However, in the mortality rates, these three different techniques had not showed significant difference[13].

In 2012, Latini reported that minimally invasive treatment with trans-marrow puncture was an acceptable procedure with low mortality rate. They also reported that with this method hospitalization days was shorter[6].

In our study, trauma was the most prominent etiological factor especially in male patents as in previous studies[1]. We performed burr hole craniostomy with closed drainage and craniotomy. Only in 10 patients craniotomy was performed. We observed complication in 5 patients and recurrence in 8 patients and all of these patients were in burr-hole group. Recurrence or complications were not observed in patients operated with craniotomy. We may suggest that craniotomy is superior than burr hole craniostomy with closed drainage in the form recurrence rate and complication development. However, we didn't determine any statistical difference between two groups. This may be due to small number of our patients in the study group, especially in the craniotomy group.

An important feature of our study was to evaluate the relationship between the presence of membrane abnormalities and postoperative complication, recurrence, and mortality. Membrane abnormalities included the thick outer membrane and the presence of septa. Septated CSDH is still a displeasing problem in modern neurosurgery because of frequent recurrence and incomplete drainage and it require extended intervention[4]. In our study we observed membraneous abnormality in 55 (47,4%) patients. The presence of membranous abnormality played a significant role in recurrence and complication development. However, it had no effect on mortality.

In conclusion the presence of membranous abnormality in CSDH increases the recurrence and complication rates. Fortunately, it has no effect on mortality.

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Received by: 28 December 2013
Revised by: 06 November 2014
Accepted: 10 December 2014

The Online Journal of Neurological Sciences (Turkish) 1984-2015
This e-journal is run by Ege University Faculty of Medicine,
Dept. of Neurological Surgery, Bornova, Izmir-35100TR
as part of the Ege Neurological Surgery World Wide Web service.
Comments and feedback:
E-mail: editor@jns.dergisi.org
URL: http://www.jns.dergisi.org
Journal of Neurological Sciences (Turkish)
Abbr: J. Neurol. Sci.[Turk]
ISSNe 1302-1664

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