

Double burrholes for unilateral and bilateral Chronic subdural haematomas; experience and outcome

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Abstract:

Objective: The objective of this study is to determine; the age mostly affected with chronic subdural haematomas (CSDH), to evaluate potential risk factors (age, gender, falls and anti-coagulation/antithrombotic therapy) that could play an essential role in the development of CSDH, common and rare clinical presentations seen with subdural haematomas (SDH), and the complication rate after treatment with double burrholes, for unilateral and bilateral CSDH.

Study design: It was an interventional study.

Place and duration: This study enrolled 36 consecutive patients with CSDHs managed at Fauji Foundation Hospital Rawalpindi, Pakistan, for duration of two years from January 2012 to May 2014.

Methodology: Characteristics studied were, age, gender, associated risk factors, clinical presentation, CT scan brain findings, and its associated complications. Four potential risk factors were assessed: gender, age, trauma and anticoagulation/antithrombotic medication (warfarin, aspirin and its derivatives). Diagnosis was based on clinical assessment and confirmed with CT scan (with contrast) of the brain. The hematoma was removed surgically by double burr-holes, irrigation and close system drainage. All patients were followed up to one month, after discharge.

Results: The study included 36 patients, 26 males (72%) and 10 (26%) females. 86 % of the patients were aged between; 60-80 yrs. Risk factors associated with the formation of CSDH in our study was as follows: there was no history of trauma in 80% of the patients, 15% of patients had history of minor fall, RTA in 5% of the patients was present among these patients 10% were on aspirin and 5% had been taking warfarin. The remainder patients had spontaneously developed hematoma without known cause. Computed tomography of the brain, showed unilateral collection in 63.9% of patients and bilateral in 36.1% in which, Frontal CSDH as 61.1% and Fronto-Parietal CSDH were 38.9%. Patients presented with variable symptoms, but most commonly presenting with headache, hemiparesis, aphasia, impaired consciousness. Unilateral double burr-hole craniotomy was performed in 63.9% of the patients, while bilateral was done in 36.1%.

In the postoperative follow up 97.2% of the patients had an uneventful recovery (n=35/36). Two patients developed complications in the form of postoperative recurrence with a recurrence rate of 2 % (n=34/36) in our study. One patient died (n=1) with a mortality rate of 2.8% in our study.

Conclusion: Our study concluded that among the general population, men, in their 6th and 7th decade, using warfarin, aspirin /harboring a coagulation defect, were more likely to have an intracranial surgical lesion, such as a chronic subdural hematoma. The indication for these medications, especially in elderly patients at risk for falls, should be carefully evaluated and controlled. Our study also concluded that CSDH are effectively treated with double burr holes and closed drainage, whether the collection is unilateral or bilateral.

Keywords: Chronic subdural Hematoma, Burr holes, CT scan brain, Trauma, Anticoagulation / Antithrombotic therapy, ageing.

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Introduction:

Chronic subdural hematoma (CSDH) is a frequently encountered entity in neurosurgery.¹ The estimated incidence is 7.4 out of 1000000.²

A chronic subdural hematoma is an “old” collection of blood and blood breakdown products between the surface of the brain and its outermost covering (the dura). The chronic phase of a subdural hematoma begins several weeks after the first bleeding. A subdural hematoma develops when the tiny veins that run between the dura and surface of the brain (bridging veins) tear and leak blood. This is usually the result of a head injury. A collection of blood then forms over the surface of the brain. In a chronic subdural collection, blood leaks from the veins slowly over time, or a fast hemorrhage is left to clear up on its own.³

Misleading clinical presentations may delay the decision to perform a CT scan to assess the diagnosis. Symptoms of CSDH include headache, dizziness, vomiting, drowsiness, lethargy, progressive decrease in level of consciousness, confusion, anisocoria (unequal pupils), weakness in limbs, seizure, and slurred speech. Varying levels of confusion and dementia are not uncommon in the elderly, which makes the diagnosis more difficult, but the most common presenting symptoms are headache, progressive neurological deficit and confusion.⁴

Complications of surgery include incomplete drainage in patients with multiple hematoma cavities. Incomplete drainage, may be due to obstruction of the drainage tube due to a blood clot, or hemorrhage due to damage to cortical vessels by the drainage tube itself. CSDH is commonly treatable and in general, a cure is usually obtained. However, the possibility of recurrence can not be ruled out. The standard surgical therapy is carried out as single or double burr-hole irrigation and drainage.⁵⁻⁷

However the initial surgical management of chronic subdural hematoma (CSDH) is still controversial and a standard therapy does not exist. Because of the advanced age and multiple

medical problems of the patients, surgical therapy is frequently associated with complications. A high level of concern is indicated in older patients presenting with neurological deficits who have had repeated falls, head trauma (even minor), and in patients taking anticoagulant medication. Our study was conducted to derive a set of criteria that could be used to identify these patients presenting with misleading clinical features with CSDH, and validate double burr hole procedure with drainage for its efficacy.

Methodology:

A prospective interventional study was carried out at Fauji Foundation Hospital Rawalpindi, Pakistan. The data was collected over a period of 2 years and 5 months, from January 2012 to May 2014, with a total of 36 patients enrolled in our study. Patients included were of all ages and both genders, harboring a Chronic Subdural hematoma on CT scan brain. Patients were excluded if guardians and attendants did not give consent to participate in the study, patients with acute subdural hematomas, or ones treated with craniotomies, patients with minimal symptoms and no mass effect and hematoma thickness less than 1cm were also excluded from the study population.

After taking permission from the hospital ethical committee all the patients fulfilling the criteria were enrolled in the study. Written informed consent was taken from the relatives. All patients were admitted for indoor assessment and treatment. Clinical assessment included taking history to rule out any risk factors and examining the patient, for any neurological deficit according to the proforma. CT scan Brain plain was done and where necessary with contrast was done and findings recorded on the proforma. In all cases two burr holes were done one in the frontal and one in parietal area. Data was entered and analyzed, using SPSS18. Categorical variables included age group, gender, and clinical presentation, findings on CT scan brain and associated complications.

Results:

The study included 36 patients. There was a

significant male preponderance in men than in women, with 26 males (72%) and 10 (28%) females with CSDH. Majority of the patients (86 %) with CSDH were aged between 60-80 yrs.

Computed tomography scan of the brain, showed unilateral collection in 63.9% of patients and bilateral in 36.1%. The location of CSDH was Frontal in 61.1% and Fronto-Parietal in 38.9%.

Patients presented with various symptoms most commonly presenting with headache, hemiparesis, aphasia, impaired consciousness as shown on table 3. Risk factors associated with the formation of CSDH included 16.6% of patients having history of minor fall, RTA in 5.5% of the patients was present, among these patients 8.3% were on

aspirin and 5.5% had been taking warfarin. The remainder (63.8%) patients had spontaneously developed hematoma.

Unilateral double burr-hole craniotomy was performed in 63.9% of the patients, while bilateral was done in 36.1%. In the postoperative follow up, 97.2% of the patients showed uneventful recovery.

Two patients developed complication in the form of postoperative recurrence with a recurrence rate of 2%. The mortality rate was 2.8%.

Discussion:

CSDH tends to occur with a higher frequency in elderly patients. As seen in table 1, with 86 % of the patients, between the ages of, 60-80 yrs.

It usually accompanies a rupture in the cortical veins which may be traumatic and is likely to appear in patients who have cerebral atrophy, alcoholism or in patients taking anticoagulants. It is also a delayed complication of a trivial trauma and often goes unnoticed.¹ Also seen in our study, as the most common risk factor after spontaneous CSDH development, is minor falls, followed by aspirin intake (8.3 %) and warfarin usage (5.5%) (Table 2). A critical evaluation should be done in elderly patients before antithrombotic or anticoagulant therapy is initiated. Exact evaluation of coagulation parameters is mandatory before surgical undertaking. In patients with proved platelet dysfunction, surgical intervention in our clinic was postponed, until the coagulation parameters were stabilized after platelet transfusion.

CSDH occurs predominantly in males at 63%, according to Miranda et al.⁸, which is consistent with our study in which 72% were males. One reason for a high preponderance is that men are more exposed to trauma. In medical practice multi-morbidity in the elderly is found more frequently in men than in women.⁹

In a study, done by Cameron M M et al, hemiparesis was the most common abnormal neurological sign found in 40% of patients, followed by personality or intellectual change. Headache was

Table 1: Characteristics of the study population (n=36)

Study Population	N%
Age	
0-30 years	1(2.8)
31-60 years	4(11.1)
61-85 years	31(86.1)
Total	36

Table 2: Cause of head injury in the study group (n=36)

Risk Factors	N%
RTA	2(5.5)
Aspirin intake	3(8.3)
Warfarin intake	2(5.5)
Minor falls	6(16.6)
Spontaneous collection	23(63.8)
Total	36

Table 3: CT scan brain: Diagnosis in study group (n=36)

Site/ Location of hematoma on Ct scan	N (%)
frontal SDH	22(61.1)
fronto-parietal	14(38.9)
unilateral collection	23(63.9)
bilateral collection	13(36.1)
Total	36

Table 4: Complications after surgical drainage (n=36)

Complications	N (%)
Re accumulation	2(5.6)
Death	1(2.8)
Total	36

seen in 38% of the patients.⁶ In our study the most common clinical presentation was hemiparesis (77%), followed by headache (55%). Chronic subdural hematoma (CSDH) is a neurosurgical entity that has a highly treatable rate. Diagnosis is facilitated by brain computerized tomography (CT) and magnetic resonance (MR) imaging.¹⁰ In our study, Computed tomography of the brain, showed unilateral collection in 63.9% of patients and bilateral in 36.1% CT scan brain. Frontal SDH were 61.1% and Fronto-Parietal in 38.9%. (Table: 3) Excluding minimal subdural hematoma, therapy is commonly surgical, and a dramatic and rapid improvement in symptoms is frequently observed.¹¹ Many surgical interventions, including craniotomy, trephination, burr-hole craniectomy and twist-drill perforation, irrigation and non-irrigation drainage methods are applied in the treatment of CSDH.¹² For our study we used double burr-holes in the treatment of unilateral and bilateral CSDH along with post op drainage.

CSDH is commonly treated well and in a cure is usually obtained; however, the possibility of recurrence cannot be eliminated for sure. The recurrence rate after surgical intervention may vary between 3.7% and 22.2%.^{5, 13-17} In our study the total recurrence rate was approximately 5.6% (n=2) which is consistent with previous studies.

The brain sometimes fails to expand and recurrence plus consciousness disorders may occur. Factors that increase the risk of recurrence include advanced age, cerebral atrophy, alcoholism, renal failure, liver dysfunction, meningeal diffusion of malignant tumors and a large hematoma, septum formation in the hematoma, inadequate postoperative drainage, air collection in the hematoma cavity, and early surgical intervention of the capsule in an undeveloped hematoma.^{11,5,18}

CSDH usually develops after a rupture in parasagittal bridging veins due to an accelerative type of trauma. The presence of cerebral atrophy or intake of aspirin and warfarin, may facilitate the formation of hematomas.^{9,19} Suzuki

et al.²⁰ showed that avoiding an immediate fall in ICP may be an important operative measure to prevent further complications. Recurrence is mostly related to the surgical technique applied instead of pre-op features. However, recurrence may occur due to the formation of new tears at the bridging veins as a result of an immediate fall in ICP. Drainage helps avoid such problems. If infection can be avoided, a drainage period of three to four days is adequate. Prophylactic antibiotic agents are administered to patients during the drainage period. After the irrigation process, complications may include cerebral hemorrhage, brain edema, and convulsions due to immediate changes in the intracranial status.^{11,21} These complications include incomplete drainage in patients with a multiple hematoma cavity, patients with an incomplete drainage due to obstruction of the drainage tube originating from a blood clot, and patients with hemorrhages due to damage to cortical vessels by the drainage tube.

In one series of study, conducted by NK Khadka et al, five patients (1.4%) died.²² In our study the mortality rate was 2.8% (n=1) which is comparable to the above mentioned study.

Conclusion:

Chronic subdural hematoma is primarily a malady of the elderly. It typically follows an insignificant trauma. An account of direct trauma to the head is usually missing. It is a disease with many faces, if one keeps in mind the rare forms of presentation and the usual risk factors associated with it. It can not only be readily diagnosed but also treated effectively with minimal complications. The frequent manifestations, which may vary, are altered mental state and focal neurological deficit. The risk for surgically treated CSDH in the elderly population especially in men appears to be higher in patients with falls and anticoagulation/antithrombotic therapy. Therefore the indication for this medication should be carefully evaluated and controlled, especially in elderly patients with risk for falls. Further prospective studies are needed to quantify the real incidence of CSDH in combination with anticoagulation/antithrombotic medication

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