

Outcome of Double burr-hole Craniotomy in patients with Chronic Subdural Haematoma

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Abstract:

Background: Chronic subdural haematoma (CSDH) is a common condition in late stages of life. Most of the patients are subjected to minor trivial trauma which will end up with a collection of altered blood in the subdural space. This necessitates immediate surgical drainage, with the aim to reduce the mass effect on the brain to alleviate the symptoms and to reverse the condition.

Objective: To report the experience and outcome of double burr-holes craniotomy in treatment of chronic subdural haematoma.

Patients and Methods: This study was conducted on 70 patients with CSDHs managed at Omdurman Teaching Hospital Sudan, during the period from November 2004 to November 2006. All patients after clinical assessment and CT scan of the brain proved to have CSDH. The haematoma was removed surgically by double burr-holes craniotomy, irrigation and close system drainage.

Results: The study included 70 patients, 50 males and 20 females. The mean age was 69 years. Computed tomography scan, showed unilateral collection in 60% of patients and bilateral in 40%, only 1.8% showed coning of the brain. Unilateral double burr-hole craniotomy was performed in 60% of the patients, while bilateral was done in 35.7%. In the postoperative follow up 87.1% of the patients showed uneventful recovery. Seven patients developed complications in the form of pneumocephallus or postoperative recurrence. The mortality rate was 2.9%.

Conclusion: burr holes craniotomy, irrigation and close system drainage, is effective and favor rapid regression of residual subdural collection and associated with fewer recurrences.

Key Words: Chronic subdural haematoma, burr holes, craniotomy, CT scan, pneumocephallus

Introduction

Many authors have defined chronic subdural haematoma (CSDH) in patients with the classical picture two to three weeks after trauma¹. CSDH is one of most common problems in neurosurgery observed in elderly patients. Several surgical techniques were used for its treatment including simple burr-hole drainage with or without close system drainage with variable results. The main problem after surgery is the intracranial accumulation of air^{2,3,4}.

This study was done with objectives of reporting the experience of burr hole craniotomy in treating patients with CSDH and to evaluate the outcome.

Patients and Methods

In this prospective study, seventy consecutive patients were studied at Omdurman Teaching Hospital. All clinically suspected patients underwent brain CT scan. Those proved to have subdural collection were included in this study.

Operative technique

Informed consent was obtained from all patients. Surgery was performed after admission

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and careful clinical and radiological evaluation. In all cases two burr holes one frontal and the second in the parietal region were done and washing out the collection with iso-osmotic saline solution and insertion of thin drainage tube size 8 F in the parietal burr hole, connected to close drainage system were performed. The catheter tip was inserted in the subdural space, exteriorized through a separate scalp incision in the retroauricular region. This manoeuvre was done on both sides in patients with bilateral lesions. The catheters were removed after twenty four hours or less. The obtained data were analyzed using SPSS version 14.

Results

The study included 70 patients, 50 (71.4%) were males. Their age ranged between 55 to 105 years, with a mean of 69 years.

The common presenting symptoms and signs were depicted in table 1.

Table (1) Presenting symptoms and signs in patients with CSDH

Symptoms	No of patients	signs	No of patients
Headache	56(80%)	Spasticity	56(80%)
Disturbed consciousness	42(60%)	Reflex changes	56(80%)
Visual changes	21(30%)	Pupillary changes	44(70%)
Vomiting	14(20%)		
Paresis	44(70%)		

The computed tomography [CT] scan, which was done to all patients, showed a unilateral collection in 42 (60%) of patients and bilateral in 28 (40%). Midline shift was noted in 90% of patients. Only 1.8% showed conning of the brain. Most of the subdural haematomas were seen in the frontal region (in 43.5%), while in the parietal and fronto-parietal regions were 31.5 and 25% respectively.

Unilateral double burr-hole craniotomy [DBHC] was performed in 42(60%), while bilateral DBHC was done in 25 (35.7%) of the patients.

In the postoperative follow up, 61 (87.1%) patients showed uneventful recovery. Seven patients developed complications in the form of peumocephallus [n=5] or postoperative recurrence [n=2] for whom second surgery was done. Other medical complications were chest infection in three, urinary tract infection in two patients. The mortality rate was 2.9%.

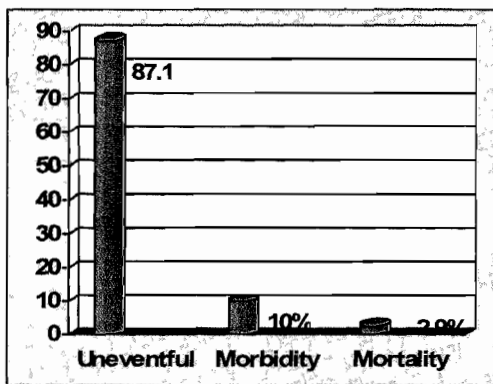


Figure 1. showing outcome of surgery

Discussion

Chronic subdural haematoma is one of the most common clinical entities in daily neurosurgical practice⁵, yet optimal treatment is not well defined and research for efficient surgical solution continues⁶. The patients were mostly men^{7,8,9} ranging in age between the fifth and eighth decade of life and the incidence increases with age^{6,7,8} due brain atrophy, vascular malformation, trivial trauma¹⁰, use of anti-coagulants, alcohol, and chronic medical diseases^{11,12,13}. The patients in our studies show similar age preponderance and gender distribution.

CT scan showed the presence of bilateral CSDHs in 40% of cases which was higher than the 9.7% observed by Gelabert⁵. Midline shift was evident in 90% and this indicates the volume of accumulating blood.

Two patients in our study died constituting a mortality rate of 2.9% and this in keeping with a mortality rate of 1.3% to 5% obtained by other researchers^{5, 7, 14, 15}. The first case presented with coma, flaccidity and respiratory irregularity due to conning and bilateral CSDH. The second patient was a known case of ischemic diseases (heart and brain) taking oral anti-coagulant drugs, left with moderately severe disability before death after three days in the intensive care unit. Poor prognosis was related to patients age >70 years, associated illnesses like cardiac and renal failure⁷.

Two patients 2.9% developed postoperative recurrent collection that necessitated re-do surgery. The first case is 92 years old male with Glasgow coma scale 10 at presentation. The second case sustained head trauma on day five post-operatively.

The recurrence of subdural haematoma after burr-hole craniotomy and irrigation was reported to be 17%¹⁶, while in Okada study 25% recurrence was found from his 20 patients. In cases where burr-hole craniotomy was supplemented with drainage a reduction in recurrence rate was reported to be 2%-5.1%^{8, 14, 15,17} while others demonstrated no difference between the irrigation and drainage groups¹⁸. In our study both techniques were combined and using double burr-hole craniotomy, the results were similar to the drainage group.

In a new therapeutic method for the treatment of CSDH without irrigation but replacement of the haematoma with oxygen resulted in a recurrence of 10%¹⁹.

Many factors contribute to recurrence as the presence of thick subdural membrane visualized during surgery, separated type, frontal base type, midline displacement >5mm, volume of haematoma >70 ml and long standing residual air after surgery^{7,20,21}.

Patients with parietal or occipital drainage had much more subdural air than those with frontal drainage²². this explain the presences of pneumocephalus in five cases in our study, where we placed the tip of the drainage catheter in the parietal region. Postoperative hyperperfusion syndrome manifested by temporary acute agitated delirium, was not seen in our study, although had been reported by others²³. Subdural empyema though reported in the literature, was not noticed in our study.

Conclusion

These preliminary results indicate that double burr holes craniotomy, isotonic saline irrigation and close system drainage, is equally

effective and favor rapid regression of residual subdural collection, which seem to be associated with fewer recurrences.

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