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Original Research

Surgical Evacuation of Chronic Subdural Hematoma- An Institutional Experience

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ABSTRACT

Background: A chronic subdural hematoma is among the most frequent neurosurgical conditions that neurosurgeons encounter. Chronic subdural hematomas are becoming more common with rise in population of elderly people. In this work, we have attempted to shed light on the factors that contribute to the formation of chronic subdural hematomas and the prognosis associated with them.

Methods: This is a prospective study of all operated cases of unilateral CSDH (Chronic subdural hematoma) for a duration of 3 yrs. Demographic variables, CT brain imaging and clinical features were evaluated to determine the outcome and recurrence in operated cases of CSDH.

Results: The study included 50 patients. There were 16 females and 24 males. The average age was 61 yrs. In eight cases, recurrence was observed. Male recurrence was 25%, but female recurrence was 12.5%. Mixed density hematomas recur more whereas Antiplatelet and anticoagulant usage had no significant association with recurrence.

Conclusions: Chronic subdural hematomas can produce highly satisfying outcomes if they are managed carefully and appropriately. Mixed density or loculated hematomas are known to recur. Use of Antiplatelet and anticoagulant can hinder the surgical outcomes. Given the aging population, preoperative patient evaluation and postoperative management become crucial.

Keywords: Chronic Subdural Hematoma, Craniotomy, Recurrence.

INTRODUCTION

Chronic Subdural Hematoma, a disease mainly of the elderly, manifests with varied clinical signs and symptoms. Trivial trauma and routine use of antiplatelet or anti coagulant drugs form majority of risk factors. Hematoma evacuation is routinely performed neurosurgical procedure. Though multiple options ranging from twist drill, single or double burr hole craniostomy, craniotomy, middle meningeal artery embolisation, endoscopic evacuation are utilised, none is preferred as a sole surgical choice.[1,2,3,4,5]Recurrence rate is not uncommon ranging from 2%-37%.[6]The study aims to examine the clinical picture, radiological findings, different surgical approaches, outcome and recurrence in CSDH patients at tertiary care center.

MATERIALS &METHODS

This prospective observational study involved 50 patients diagnosed with chronic subdural hematoma who were admitted to the neurosurgery department of Mysore Medical College and Research Institute from January 2022 to December 2024 for a period of 3 years. Clinical presentation, demographic profile, and baseline blood and radiological tests were recorded for these 50 individuals. Bilateral CSDHs were not included in this study.

CSH was evaluated using CT brain to check for density of blood, the presence of membranes or loculations, mass effect, and midline shift. Imaging characteristics and patients GCS (Glasgow coma scale) were considered in making surgical decisions. The clinical outcome was assessed at discharge and three months following surgery. Recurrence was considered when patient underwent revision surgery within 3 months of discharge due to neurological

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deterioration. SPSS software for Microsoft Windows was used for all data analysis.

RESULTS

68% of the 50 patients in our study were men (n=34). Our study group's average age was 61 years. A history of trauma was reported by 30% of the patients (n=15). The most frequent presenting symptoms were headache and giddiness (54%), motor weakness (24%), and altered sensorium (18%). The least frequent presenting symptom (4%)was seizures. Comorbidities include CAD (10%),diabetes (20%), and hypertension (40%). There was no statistically significant correlation between these comorbidities and outcome or recurrence.

Four (8%) and one (2%) of the 50 patients were on anti-platelet and anticoagulant medications, respectively. Antiplatelets and anticoagulants were withheld for 5 days prior to surgery and none of them received transfusion of platelet or fresh frozen plasma before the surgical procedure. The result and recurrence rate were unaffected by the medications.

70% (n=35)of the patients had a GCS between 13 and 15 at admission. Ten patients had GCS between 9 and 12, whereas five patients had GCSs less than 8.

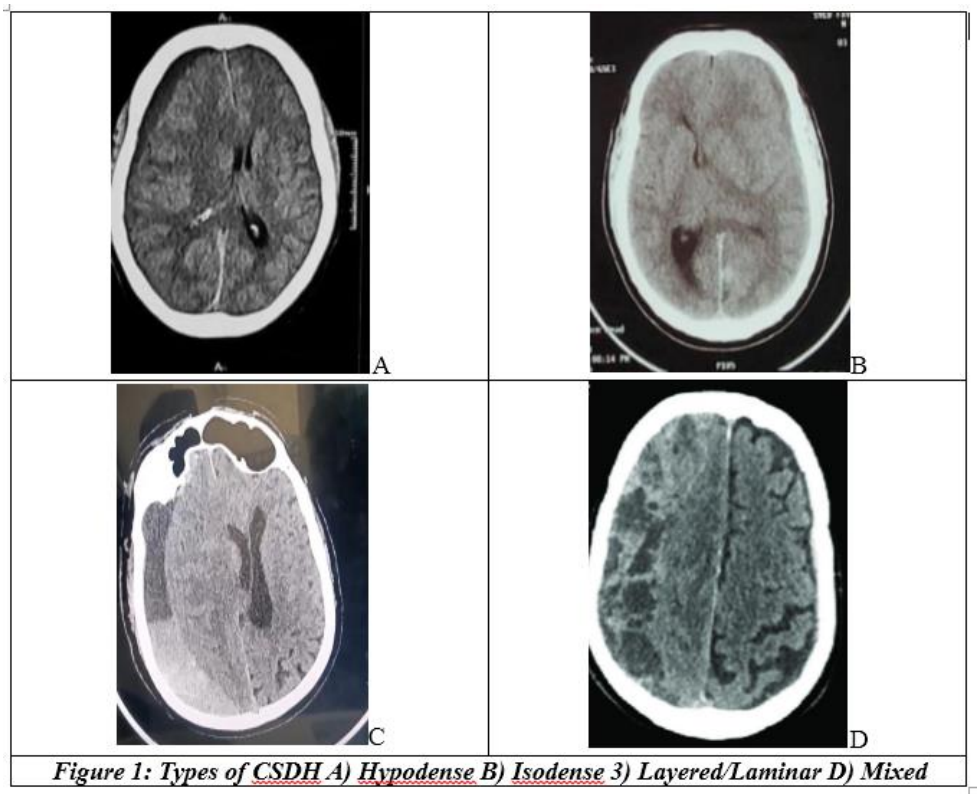

Figure 1: Types of CSDH A) Hypodense B) Isodense 3) Layered/Laminar D) Mixed

Fifteen patients (30%) had a isodense CT scan pattern, whereas eleven patients (22%), had a mixed density pattern followed by hypodense 20% (n=10) and 8% layering (n=4). On axial imaging, the average thickness was 16 mm, and the average midline shift was 9.5 mm. The relationship between recurrence and radiological type was statistically significant.

The patients' GCS and the type of CSDH were taken into consideration when choosing the surgical technique. 10% of patients had a single burr-hole evacuation (n = 5), 76% had two burr-hole evacuations (n = 38), and 14% had a mini-craniotomy (n = 7). No subdural drains were placed in any of the procedures.

Six out of the seven patients who had minicraniotomy had mixed and layered types of CSDH. The choice to perform a minicraniotomy on these patients was influenced by the presence of a membrane and loculations on CT imaging. Patients undergoing minicraniotomies were 68 years old on average. Eight patients (16%) developed symptomatic recurrence in this group of 50 patients who underwent surgery for CSDH. Six of them were males and two females. Five of them displayed mixed CSDH, two patients had isodense CSDH, and one patient had hypodense CSDH with a P-value of 0.06.

Mini craniotomy patients had no recurrence. However, we weren't able to establish a statistically significant association between types of surgical options chosen and the recurrence rates. Each of the eight patients who developed recurrence underwent minicraniotomy to remove the membranes and hematoma that were observed in all of them. In this study, there were no fatalities. 44 patients showed signs of improvement at discharge and were functioning on their own at the time of follow-up. 90% of the patients with motor symptoms showed good recovery. Two patients developed stroke, a four

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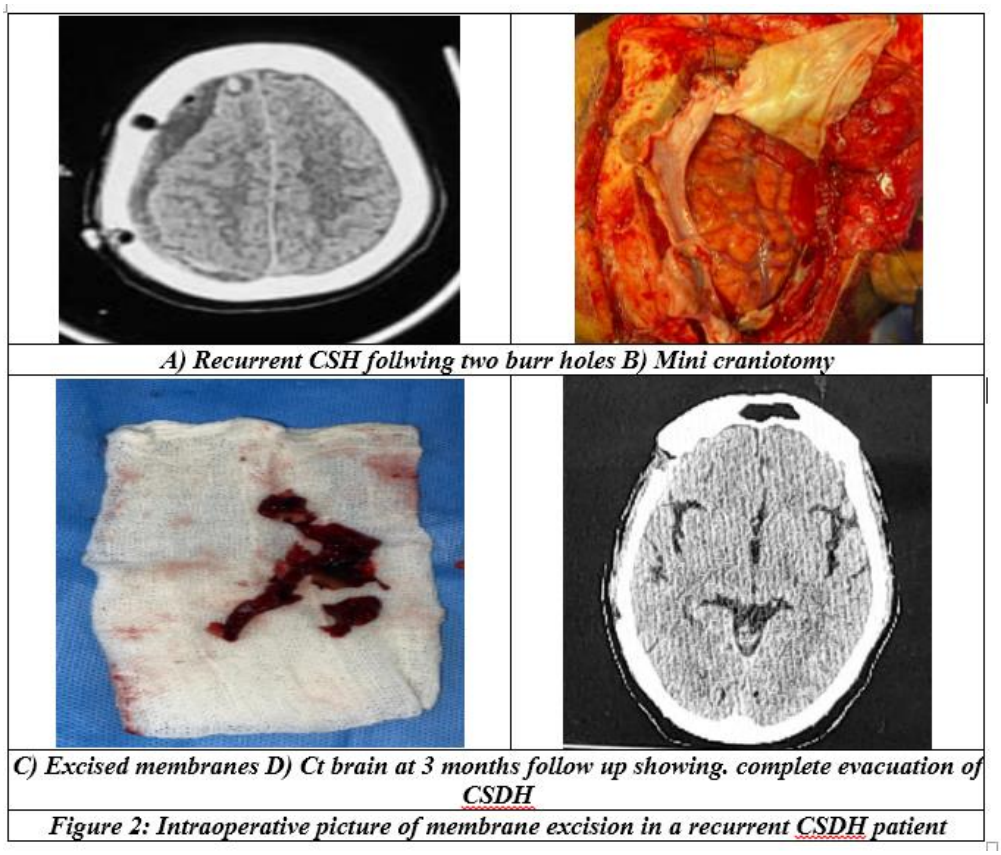
others need assistance in order to perform their everyday tasks.



A) Recurrent CSH follwing two burr holes B) Mini craniotomy

C) Excised membranes D) Ct brain at 3 months follow up showing. complete evacuation of CSDH

Figure 2: Intraoperative picture of membrane excision in a recurrent CSDH patient

DISCUSSION

Chronic subdural hematoma, a disease of the aging brain, forms following significant reduction in the brain volume. As a result, elderly brain forms wide subdural space causing tension on the intervening bridging veins leading to their fragility. Trivial trauma results in rupture of these veins and eventually subdural hematoma. The incidence is higher among males than females in our group which correlates well with other studies.[1,2,3,4,5]Because men are more likely to sustain head injuries, CHDs are more common in men. Oestrogen is also known to promote angiogenesis and vascular healing, which may contribute to its protective effects in females.[3,7]

Consistent with prior studies, a considerable proportion of our patients had a history of trivial trauma.[7,8,9,10]

Small subdural clots form as a result of this insignificant trauma, which then induces membranes and chronic subdural hematomas. Although there are numerous theories, the most widely accepted ones center on membrane angiogenesis and their ongoing secretory activity. Although the incidence of chronic subdural hematoma is not directly proportional to the history of trivial trauma, it is a key factor in the development of chronic subdural hematoma since many patients also have a tendency to forget their history of trivial trauma. Headache, motor impairments, and mental changes are common symptoms, however they differ from patient to patient. Similar to previous studies, symptoms does not correspond with recurrence in our study as well.[3,6,11]

Although Comorbidities like hypertension, diabetes have no significant corelation with development of CSDH or its recurrence but intake antiplatelet and anticoagulant medications are significant risk factors Isodense, layered and mixed hematomas are more likely to reoccur than hypodense hematomas. The likelihood of complete draining of hypodense hematomas and a lower probability of thick membrane formation are the likely causes of this. Additionally, vascular endothelial growth factor and transforming growth factor beta have been linked to increased recurrence in CSDHs with hyperdense components, according to chemical analysis of hematomas.[3,7]

Thick subdural membranes are indicative of increased vascularity and recurrence, while the space between the dura and the brain surface shows the degree of brain atrophy. The likelihood of recurrence increases with brain atrophy.[9]

CONCLUSIONS

Despite their propensity for recurrence, chronic subdural hematomas are surgically treatable and frequently yield favorable results, especially in older patients with comorbidities. Imaging provides an indication as to which types of bleeding-the layered and mixed types-are susceptible to recurrence, which

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could help the surgeon select the most suitable surgical treatment. Mini Craniotomies have the benefit of reducing recurrence, and our study found no appreciable increase in the probability of unfavorable outcomes.

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