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Surgical Outcome of Chronic Subdural Hematoma (C.D.S.H.) after Burr Bole and Catheter Drainage

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Abstract **Original Research Article**

Background*:** Chronic Subdural Hematoma (C.S.D.H.) is familiar with the collection of blood on the brain's surface, and in everyday neurological practices, it is the most ordinary clinical entity. This leads to the commendatory prognosis of infection. Surgical therapy is linked with numerous complications because of patients' medical problems and advanced generations. C.S.D.H. is commonly not being out symptoms, but it requisite surgical approaches when it occurs. C.S.D.H. has very well diagnosis and treatment approaches that are most effective, but some essential factors that lead to this disease are still unknown. This study is to know about the surgical outcome. ***Method: Out of 80 C.S.D.H. Patients between 60 to 70 years were selected.50 male and 30 female C.S.D.H. patients were treated with one burr hole and catheter drainage. The study was conducted at the neurosurgery unit of MartbaChuhan Medical College and Mardan Medical Complex from April 2018 to March 2021. A total of 80 patients were included in this study. Burhhole and Cather Drainage were performed for all patients. These patients were reviewed after 2, 5, and 6 weeks at O.P.D. ***Results:*** Mostly the patients, 94% show a good recovery, and 4% represent no recovery. However, only 2% show the complications against this approach. As for the burr hole and catheter drainage, there was a remarkable reduction of the C.S.D.H. However, 5% of the sample patients show the repetition of Hematoma after the 1 week of operation. In contrast, 2% suffered from some operative complications. ***Conclusion:*** Burr hole and Catheter drainage is an affected way of treatment for the patients suffering from C.D.S.H.

Keywords: C.D.H., clinical, burr hole, catheter drainage, Hematoma, chronic Subdural hematoma.

INTRODUCTION

Chronic Subdural Hematoma (C.S.D.H.) is the condition associated with the collection of blood or the blood clotting at the brain's surface (Pudenz and Shelden *et al*., 2018). This assemblage is sometimes on the outermost covering of the brain or mostly on the top region. Blood breakdown products and blood clots on the outermost covering enhance the pressure on the brain. C.D.S.H. causes severe headaches, seizures, apathy, vision problems, and many brain disorders. This is usually among chronic alcoholics, older patients, and head injury patients. Burr hole drainage and catheter drainage surgery are performed with the drill of the small holes in the skull. The Skull location for drainage is selected according to the diseased patient. In dura, the opening removes the excess fluid from the brain (Kolias, Edlmann, and Hutchinson *et al*., 2017). However, this approach is very effective as it avoids blood clotting and blood blockage in the brain. C.S.D.H. is known as the most usual clinical practice used by the surgeon in neurological cases. This disease mostly appears in older people or people who suffer from a head injury (Rovlias, Theodoropoulos, and Papoutsakis *et al.*, 2015). It needs clinical and therapeutic approaches to maintain the patient's condition. The incidence of the C.S.D.H. per year fluctuates from 1.8 to 21 per 10000 of the total population. The number of C.S.D.H. patients enhanced as time passed from 1995 to 2021 (Rauhala *et al*., 2021). It is essential to control the recurrences with time. This will control both costs and complications among disease people. The major risk of C.S.D.H. was observed in older people just because of their brain atrophy. This is because of bridging veins stretchering

and subarachnoid spaces enlargement. After the mild head injury, the risk of C.S.D.H. in elder patients is more because of leakage of the bloody CSF into the subdural space. Once the pathophysiology is understood with in-depth considerations, the improvement will be achieved. For this approach, neuroimaging was accessible (Rauhala *et al*., 2021). The surgery indications show neurological deficit with the GC5-15 for the symptomatic patient, hematoma thickness >15mm, the volume of Hematoma> 25cc, and the mid-line shift >5 mm. After that, the in situ drain bag was closed. This method was very significant in minimizing chronic Hematoma and avoiding its risk after the surgeries. Burr hole evacuation gains a good surgical prognosis of more than 97%, and very few recurrences occur in less than 3% (Weigel *et al*., 2003). The basic purpose of this article is to evaluate the surgical consequences after the drainage of the burr hole in the C.S.D.H. patients. This approach is unique as it avoids the clotting and assembling blood, reduces the pressure make on the empty spaces by this blood clotting, and removes excess fluid from the brain in C.S.D.H. patients.

METHODOLOGY

Out of 80 patients, 50 males and 30 females. For the C.S.D.H. treatment, firstly, the data was collected in which some of the risk factors were analyzed that are correlated with this disease. Causes and symptoms were asked of the patients. The ratio of other diseases is also evaluated to avoid complications.

C.S.D.H. patients were the target of this research. 80 consecutive patients were used for this purpose. These patients were suffering from C.S.D.H. They were treated with the burr hole and catheter drainage to remove their skull's blood breakdown and blood clots. This research was performed at the Department of Neurosurgery. The research time frame was from April 2018 to March 2021. The targeted population was 80 patients, of which 350 men and 50 women were from the age group of 35 to 85 years. Symptoms and causes of C.S.D.H. were evaluated in the diseased patients.

With anesthetic drugs, one or two burr holes and catheter drainage was performed along with the deep sedation. For this, in the scalp of the C.S.D.H. patient incision was made. Surgeon drills were utilized to make two small holes in the skull. Unnecessarily fluids were drained to reduce the pressure on the patient's skulls. Once the Subdural Hematoma was drained out, the cavity which was burr holed was rinsed with the usual saline. After the operation, closure of subdural drainage was pursued 1 for days. C.T. scan was performed to compare the preoperative and preoperative brain conditions. The ratio of coexisting diseases was evaluated, and patients having no complications were discharged after the 7 P.O.D. The effectiveness of this approach was analyzed. In contrast, the complications ratio was also evaluated among these patients.

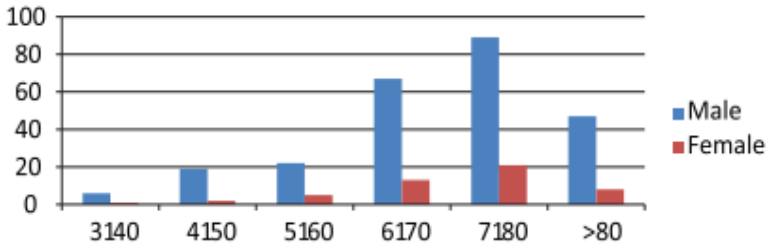

Figure 1: C.S.D.H. patient's age distribution. Blue colors represent the men, and red colors represent the women.

RESULTS

This study shows that there is a major increase in diseased patients in each decade. To confirm the diagnosis computed tomography (C.T.) scan was done.

Table 1: Clinical features of the 80 patients with C.S.D.H. This includes data from the 350 male patients and 50 female patients. The age of these patients is in between 60 to 70 years

80 Patients: Male: 50. Female: 30. Age: 60-70 Location of Hematoma:	
Right	24 (30%)
Left	41.6 (52%)
Bilateral	14.4 (18%)
The thickness of Hematoma: n-(80) 100%	
Right side	15-24 mm.
Left side	15-25 mm.
Bilateral.	20-39 mm.
The volume of Hematoma:	

Right side	25-70 cc.
Left side	25-75 cc.
Bilateral.	40-130 cc.
The density of Hematoma on the C.T. scan:	
Isodensity	40%
Hypodensity	45%
Hyperdensity	15%

We analyze that the C.S.D.H. location in the patients was 52% on the left side, 18% on the bilateral, and 30% on the right side. Also, the C.T. scan demonstrated that the isodensity of C.S.D.H. was 40%, hyper-density was 15%, and hypodensity was 45%. In contrast, the volume of the C.S.D.H. is from 15-25 mm to 25-40 mm, respectively.

Table 2: Ratio of Coexisting Diseases after the burr hole drainage in the C.S.D.H.

Coexisting Disease.	Several affected Patients.
Diabetes.	05
Hypertension	25
Cerebral infraction	4
C.L.D.	15
Anti-coagulant	4

This table represents the diseases that were present among the C.S.D.H. patients. As 25 patients, data shows that they were also suffering from hypertension. 05 patients had diabetes. 15 patients had C.L.D., and 4 patients were suffering from cerebral infarction.

Table 3: Causes of C.S.D.H.

Cause	No Patients. (80)
Anti Coagulant	4%
Head Injury	60%
Alcohol	6%
Unknown	30%
Total	100%

The range of causes is present that lead to the C.S.D.H. But we analyze some of the specific causes and evaluate their percentage in the C.S.D.H. patients. Data shows that head injury is the cause of this disease, and the ratio that leads to a head injury to C.S.D.H. was 60%. 4% of patients suffer from this disease because of the alcohol, and 6% due to the anti coagulant. However, 30% of patients developed C.D.S.H. because of an unknown cause.

Table 4: Symptoms appear due to Chronic Subdural Hematoma

Symptoms	Patients affected.
Headache	20
Gait Disturbance.	25
Hemiparesis.	20
Dementia.	4
Convulsion	2
Motor aphasia	2
Vomiting	2
Consciousness disturbance	5

This table presents the symptoms of C.S.D.H. affected people. 80 people have faced the disturbance in their walking style. And 4 people have convulsion problems. 04 people have dementia-associated problems. In contrast, the rest of the people faces motor aphasia, vomiting, consciousness disturbance, and many other problems. Well, these symptoms are evaluated before the treatment. Some of them remained after the treatment.

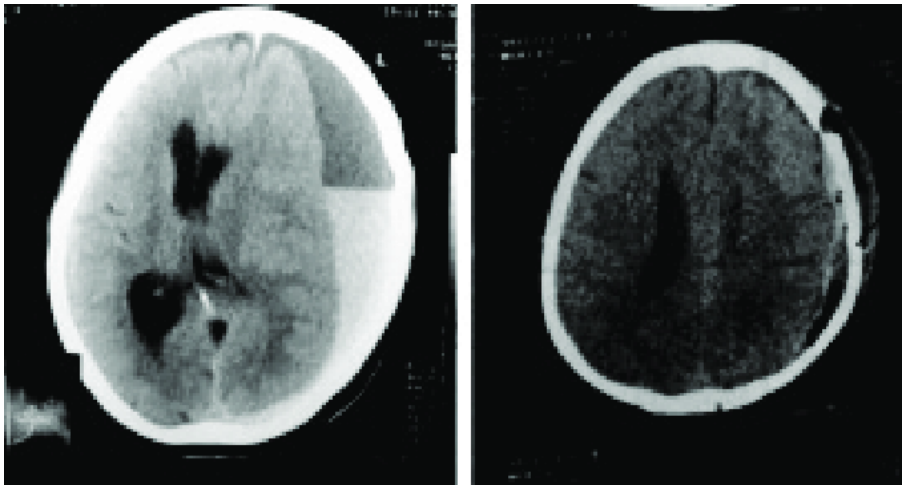

Figure 2: Pre and Postoperative Ct Scan of C.D.S.H. patients

This figure clearly shows that blood clotting and blood breakdowns are present before the burr hole and catheter drainage of the C.S.D.H. patient. After the drainage, there is no pressure between the spaces of the brain. Thus this drainage approach is quite useful in getting rid of excessive blood material.

Below the flow chart presents the effectiveness of burr hole and catheter approaches among diseased patients.

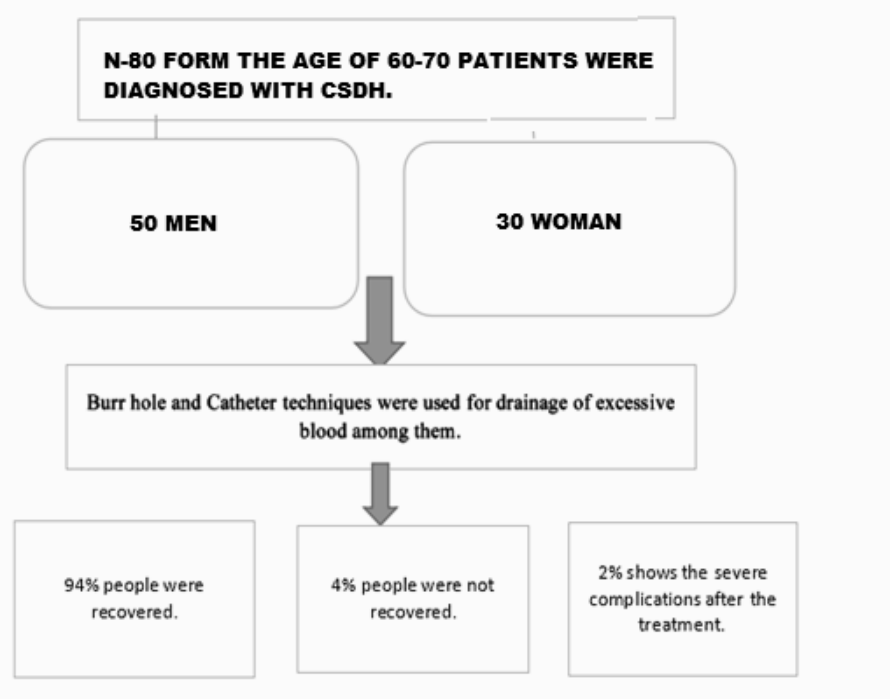

Figure 3: The effectivity of these techniques is 94% among the C.S.D.H. patients

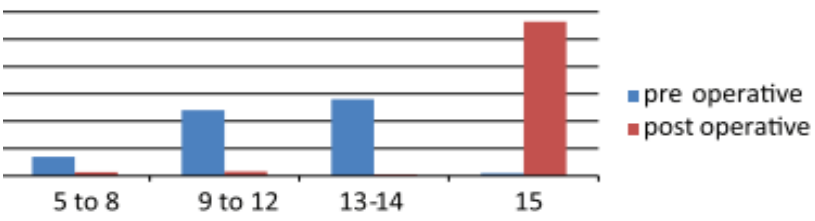

Figure 4: Pre and Postoperative outcome of G.C.S. scale

Table 5: Percentage of severe complications among patients

Complications	Patients affected
Acute Subdural Hematoma	8
Tension pneumocephalus	4
Stroke and cerebral infractions	4

16 patients show that they have severe complications after this treatment.

DISCUSSION

As the C.S.D.H. etiology is not understood completely. There is still a major gap as severe complications are presented. Previous literature represents that chronic subdural is present in old age, and there is no effective approach to treat them Rovlias, Theodoropoulos, and Papoutsakis *et al*., 2015). However, this article will be very useful in treating C.S.D.H. patients. These symptoms and causes will also help to understand the disease. For the initial stage, burr hole and catheter should be the method of choice. In this article, the age range was between 60 to 70 years. In this study, the ratio between men and women was 350:1 (5:1). In this study, the most common symptom was gait disturbance. This affects the 50 patients. However, it was demonstrated that the headache was most common if the C.S.D.H. appeared in the young individual. In recent studies, the ratio was 75%, but the effectivity ratio is 94% in our study. In the previous studies, the unknown disease cause was 40%, whereas it is 30% in our study. In previous studies, severe complications after the treatment were 15% (Kolias, Edlmann, and Hutchinson *et al*., 2017). In the present study, the ratio of severe complications among individuals is only 4%.

CONCLUSION

C.H.S.D.H. is common in old people

Bur hole and catheter drainage is an effective method for surgical management of chronic subdural Hematoma.

Future perspectives and Recommendations

As the C.S.D.H. is common in old age so, at this time, there is a need for techniques to deal with the disease. When blood clots affect the brain spaces, it causes serious complications. These complications and other diseases will be avoided using the burr hole and catheter techniques. Here are some recommendations for these techniques.

- Local anesthesia should be used to ignore the effects of hazards of general anesthesia.
- For the complete evacuation of hematoma purposes, a double burr hole should be preferred.
- Gel foam should be used to avoid Subdural Hematoma.

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