Case Report

Endoscopic Assisted Evacuation of Chronic Subdural Hematoma

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Abstract

Background: Chronic subdural hematoma (CSDH) is a common neurosurgical condition, typically managed with burr-hole evacuation. Although widely used, this method carries a higher recurrence risk compared to craniotomy. Endoscopic-assisted evacuation has recently emerged as a minimally invasive technique that provides better visualization and may reduce recurrence.

Case Presentation: We report a 72-year-old Bangladeshi male with a history of head trauma 20 days prior, presenting with altered consciousness and right-sided hemiparesis for 10 days. He was a known diabetic, hypertensive, and post-CABG patient with left ventricular failure. On admission, his Glasgow Coma Scale (GCS) was 7/15 with anisocoria. CT scan revealed a chronic subdural hematoma with an estimated volume of 50 ml.The patient underwent left parietal burr-hole evacuation under endoscopic guidance using the YKD-9101 system. Pseudo-membrane disruption and clot evacuation were achieved, followed by subdural drain placement. Postoperative CT showed significant reduction of hematoma volume (50 ml 15 ml). Clinically, GCS improved from 7/15 to 13/15, and right-sided muscle power improved from 2/5 to 4/5.

Conclusion: Endoscopic-assisted burr-hole evacuation provides superior visualization of hematoma membranes and cortical vessels, facilitating effective evacuation and potentially lowering recurrence risk. This case highlights its safety and efficacy in the management of CSDH in elderly patients with multiple comorbidities.

Keywords: Chronic subdural hematoma, Endoscopic evacuation, Burr-hole surgery

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Introduction

Chronic subdural hematoma is a common surgically treated intracranial emergency. Chronic subdural hematomas (CSDH) are characterized by the formation of a blood envelope between the dura mater and arachnoid mater (subdural space). It is a benign, slow-growing intracranial hemorrhage that contains a mixture of fluid and clotted blood.1 A projection made with original and reviewed data suggests that the incidence may increase by 53 % by the year 20403. One of the main reasons for this increase is populational aging, as age is the most important risk factor for CSDH.3 The most common history findings were history of trauma (69.9 %), motor deficit (68.4 %) and cognitive deficit (26.3 %). The average hematoma size was similar on both sides, and showed an increasing trend with aging. The size of CSDH was also greater in those who presented motor deficits.

Compression of the brain parenchyma and intracranial hypertension can be caused by incremental hematoma, which may result in clinical symptoms such as motor disturbance, gait abnormality, headache, cognitive disturbance, and aphasia. The first choice of management in these patients is a large craniotomy or burr-hole evacuation.

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Burr-hole evacuation is the most widely used technique, as it is both minimally invasive and relatively quick1. However, the recurrence rate of burr-hole evacuation is slightly higher than that of osteoplastic craniotomy due to limited exposure or involuntary injury[1].

Recently, endoscopic evacuation has been reported to a be a feasible method for evacuation in acute, subacute and chronic SDH patients in different age groups with favourable outcome 1–3. It is also reported that hematoma clots, trabecular structures, and stretching of the cortical vessels, which could be found only under neuro-endoscopy, were significant risk factors for CSDH recurrence[1].

Here we report our experience on a typical case on chronic subdural hematoma and its evacuation with the assistance of endoscope.

Case presentation:

A 72-year-old Bangladeshi male, hailing from Meherpur, presented in MICARE health with complaints of history of accidental fall with head trauma 20 days back, altered consciousness for 10 days and right sided hemiparesis for same duration.

The patient is diabetic, hypertensive and a diagnosed case of LVF. He had a history of undergone CABG surgery in 2016 with no significant post-operative complications. On physical examination, his BP- 160/110 mm Hg, Pulse 98 bpm, SPO2 98%, Temperature normal. Clinical examination revealed GCS E2M4V1 (7/15) and anisocoria with a sluggishly reacting left pupil. After completing examinations and investigations, decision was taken for operative measures for definitive treatment for the patient.

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Per operative findings:

A Parietal burr hole made on Left side on parietal eminence. Burr hole diameter 2 cm for easy maneuverability of endoscope. "YKD-9101 Full Endoscope System" with 3 mm Telescope used for this surgery. 'X'-shaped durotomy done, cauterized for widening Dural window. Then endoscope inserted keeping the telescope at air media. An angled 2 mm zero sucker used for suction-evacuation of Subdural haemorrhage. Sucker also used for disrupting pseudo membrane of Subdural Haematoma. Pseudo membrane disruption helped trapped haemorrhage to come out easily. (Fig: 1) After evacuation Brain pulsation seen. A Subdural drain inserted under Endoscopic guidance. A haemostatic Gel foam kept on burr hole site beside the drain tube. Skin closed in single layer. Drain tube removed on 3rd post-operative day

To objectively assess the patient's condition before and after surgery, several clinical parameters were recorded (Table: 1)

Parameter	Preoperative	Postoperative
CT Scan Volume of Hematoma	50 ml	15 ml
Glasgow Coma Scale (GCS)	7/15	13/15
Muscle Power (Right Side)	2/5	4/5

Table 1: Clinical parameters before and after evacuation of Chronic subdural hematoma

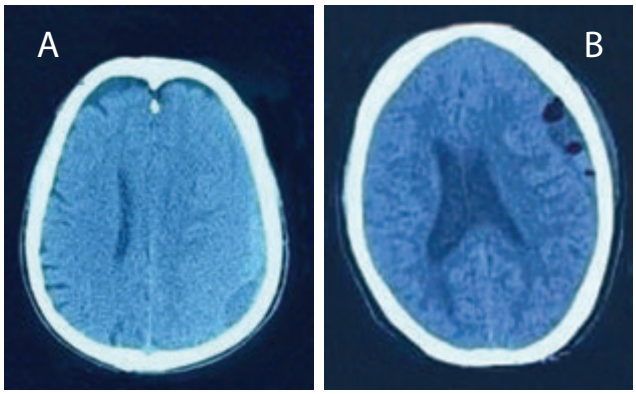

Fig: Preoperative (A) and post-operative (B) CT scan image

Discussion

Chronic subdural hematoma (CSDH) is a common neurosurgical condition, particularly prevalent among the elderly population. The gradual accumulation of blood in the subdural space, often following minor or unrecognized trauma, can result in significant neurological deficits due to cortical compression and increased intracranial pressure. Age-related cerebral atrophy, anticoagulant use, and comorbidities such as hypertension and diabetes are recognized predisposing factors[2,3].

In this case, the patient was a 72-year-old male with a history of hypertension, diabetes mellitus, and previous coronary artery bypass grafting (CABG). He presented with neurological deficits following a fall, and radiological imaging revealed a sizable chronic subdural hematoma. The patient underwent endoscopic-assisted evacuation using neuroendoscopes, which enabled complete visualization and removal of the hematoma components.

Traditionally, burr-hole drainage has been the most commonly employed surgical approach for CSDH due to its minimally invasive nature and relative simplicity. However, recurrence rates following burr-hole procedures remain a concern, with contributing factors including residual hematoma clots, septations, and insufficient cortical expansion post-surgery[1,3]. Craniotomy offers better visualization but is more invasive and not always ideal for elderly or comorbid patients.

Endoscopic evacuation presents a compelling alternative, as it allows direct visualization of the subdural space, enabling the identification and removal of septations, organized clots, and stretching of cortical vessels—features that are often missed during conventional surgery[1]. In the current case, postoperative improvement was significant: hematoma volume reduced from 50 ml to 15 ml, Glasgow Coma Scale (GCS) improved from 7/15 to 13/15, and motor power on the affected side increased from 2/5 to 4/5.

Our findings are consistent with those of Mokbul et al., who demonstrated the efficacy of both rigid and flexible endoscopic evacuation of CSDH in preventing recurrence and promoting faster neurological recovery[1]. Similarly, Zhu et al. highlighted that detailed intraoperative visualization and complete removal of hematoma membranes and clots are key factors associated with lower recurrence rates [3]. Additionally, Karam et al. emphasized the growing incidence of CSDH with age and the need for optimized surgical strategies tailored to geriatric patients[2].

The endoscopic technique also offers other advantages: smaller craniotomy size, reduced operative time, and suitability under local or general anesthesia—all beneficial for high-risk patients[1]. While the availability of neuroendoscopic expertise and equipment may limit its widespread use, its role is expected to expand as surgical experience and technology improve.

This case underscores the potential benefits of endoscopic-assisted evacuation in managing chronic subdural hematomas, particularly in older adults with comorbidities. Further comparative studies and long-term follow-up data will be essential to establish standardized guidelines for endoscopic management in CSDH.

References

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