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Case Report

Bilateral Sub-acute Subdural Hematoma of the Posterior Fossa As a Complication of Anti-coagulation Therapy: A Case Report and Literature Review

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Abstract

Background: Subdural hematomas are one of the commonest neurosurgical pathologies faced in practice and it is rarely located in the posterior fossa. Posterior fossa subdural hematomas are challenging because of the difficulty in their diagnosis and management.

Case Presentation: A case of bilateral sub-acute subdural hematoma of the posterior fossa in a 65-year-old female presented with a complaint of headache and vomiting for three weeks followed by a decreased level of consciousness two days prior to admission. The patient is a known cardiac patient on long-term anti-coagulant, her condition was intensively investigated and the diagnosis of posterior fossa sub-acute hematoma was reached, following which the patient was treated surgically and improved in the postoperative period.

Conclusion: Subdural hematomas located in posterior fossa are considered very rare. Most of the reported cases are due to anti-coagulant use, with minor number of cases due to trauma. Literature denoted difficulty reaching diagnosis using only computed tomography and advice to be aided by magnetic resonance imaging as in our case. In most occasions, surgical management is the best choice for the management of such a case, regardless of surgical technique, and will result in excellent outcome.

Keywords: posterior fossa, sub-acute subdural hematoma, anticoagulation therapy complications

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1. Introduction

Subdural hematoma is a common neurosurgical issue with well-known methods of treatment. The posterior fossa is an uncommon site of spontaneous sub-acute subdural hematoma [1, 6].

There are scarce literature review resources and no guidelines for the management of posterior fossa subdural hematoma making it challenging and difficult to diagnose and treat. Posterior fossa subdural hematoma is more frequent in trauma and in children and newborns. Only about 20 cases as we know have been reported in literature

of which 6 are anti-coagulant-induced hematomas such as in our case [1, 6, 7]. We report a case of spontaneous bilateral sub-acute subdural hematoma of the posterior fossa presented by headache and vomiting preceded by gradual decrease in the level of consciousness diagnosed by brain magnetic resonance imaging after inconclusive computed tomography and treated surgically with excellent functional outcome.

2. Case Presentation

A 65-year-old female – a known case of hypertension, congestive cardiac failure and atrial fibrillation, with a past history of atrial septal defect repaired 16 years ago and on warfarin, anti-hypertensive, and anti-heart failure agents – presented with headache and vomiting for three weeks followed by decreased level of consciousness two days prior to her hospital admission. No other presenting symptoms and the systemic review were unremarkable. On initial examination, patient looked ill, GCS 12/15 Pupils equally reactive to light bilaterally and was generally weak. Other system examinations were unremarkable. CT brain showed dilated ventricular system with no obvious lesion. MRI showed posterior fossa sub-acute subdural hematoma compressing the cerebellar hemisphere and consequently compression of the fourth ventricle complicated by hydrocephalus (Figure **1**). After optimization, the patient underwent a 4× 4 cm sub-occipital decompressive craniectomy, hematoma was sub-acute with multiple clots and emerged under high tension; complete evacuation of the hematoma was achieved. The patient's neurological condition improved immediately post-operatively. The patient stayed in hospital for four days during which a follow-up CT brain was obtained which showed complete evacuation of the hematoma (Figure **2**). The patient was then discharged in good condition, fully conscious with no neurological deficit. The patient came for follow-up six weeks later and showed good postoperative recovery with no complaint.

3. Discussion

Subdural hematoma is a well-known neurosurgical disease, with an annual incidence of 1–2 per 100,000 individuals. Alcoholism, epilepsy, or coagulopathies are major risk factors that might cause subdural hematoma [1]. Chronic subdural hematoma are more common among senior inhabitant patients as brain weight is known to decrease with age – by 150–200 gr which makes for nearly 11% rise in extra-cerebral volume [2].

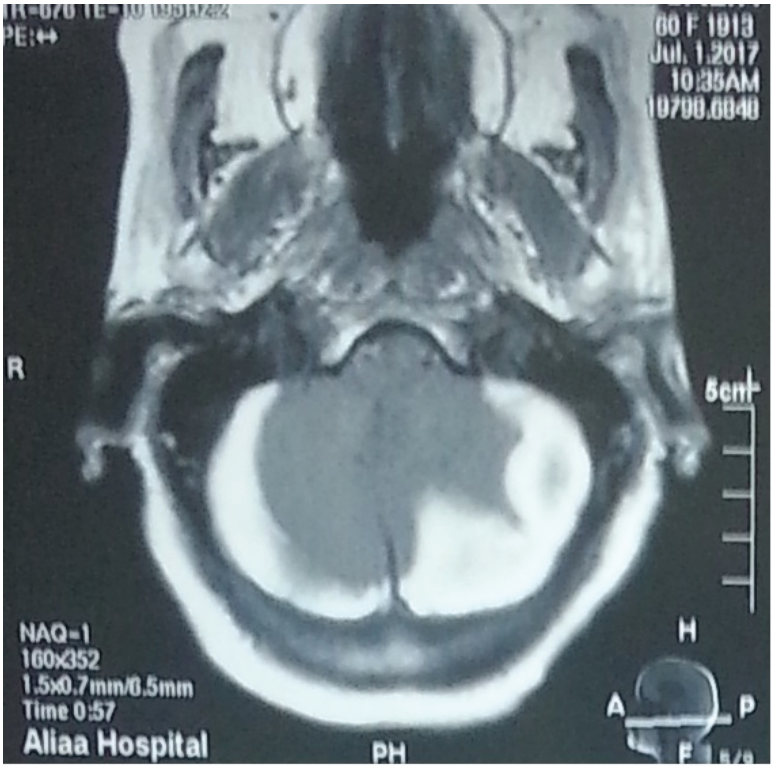

Figure 1: T1WI axial cut brain MRI taken at the level of posterior fossa showed hyperintense subdural collection consistent with bilateral sub-acute subdural hematoma with effacement of the fourth ventricle.

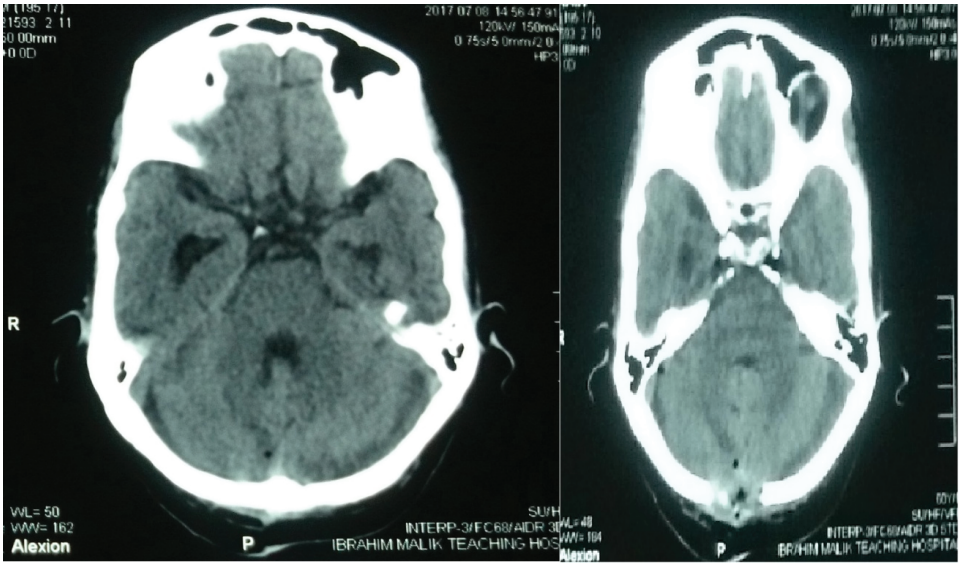

Figure 2: Postoperative CT brain showing complete evacuation of the hematoma with normal-size unaffected fourth ventricle.

The pathogenesis of SDHs is considered to be dynamic; in 1932, Gardner proposed that the progression of chronic subdural hematoma size is a result of the hyperosmotic gradient effect [3].

Subdural hematomas, specifically the chronic type, are surrounded by visceral and parietal membranes formed by dural cell layer forming a cavity in which the hematoma lies in.

The parietal membrane vascularity is more than that of visceral membrane because it contains more sinusoidal vessels which might cause recurrent bleeding [4].

Theoretically, failure of chronic hematomas to coagulate is attributed to immoderate activation of coagulation and fibrinolytic systems or raised level of expression of tissue-type plasminogen activator [5]. Nevertheless, subdural hematomas occasionally arise in the posterior fossa. Ciembroniewicz and colleagues found only 3 cases out of 535 intracranial subdural hematomas that were occupying posterior fossa [6].

Chronic subdural hematomas are very rare in posterior intracranial fossa. Reviewing the literature showed that only 20 cases of spontaneous chronic subdural hematomas of the posterior fossa were reported in adults patients, 6 of which associated with usage of anticoagulants [7].

Difficulty of diagnosis of chronic subdural hematomas in posterior fossa is attributed to nonspecific symptoms on patient presentation. Almost in all cases published before the presence of the new medical diagnostic imaging-like computed tomography, the diagnosis was established only during surgery or at autopsy [6, 7].

TABLE 1: Cases of chronic subdural hematoma of the posterior fossa in adults using anti-coagulants without a history of trauma reported in the literature.

Author	Age	Sex	Duration of symptoms	Cerebellar signs
Zenteno-Alanis et al. (1968) [15]	49	Male	2 months	Yes
Capistrant et al. (1971) [12]	50	Male	1 day	Yes
Kanter et al. (1984) [13]	59	Female	Acute	Yes
Ashkenazi et al. (1994) [1]	56	Female	18 months	Yes
Lagares et al. (1998) [14]	65	Female	Acute	No
Stendel et al. (2001) [11]	70	Female	8 weeks	Yes
Ahmed et al. (2020)	65	Female	2–3 weeks	No

Trauma is the most common cause of subdural hematoma. About half of the patients developing subdural hematomas report minor form of head trauma [1]. Other causes like post-traumatic cerebellar contusions are also rare causes of posterior fossa subdural hematoma [8]. Low number of bridging veins present in the posterior fossa justify the rare occurrence of chronic subdural hematomas in the posterior fossa [9]. Poor visualization of the posterior fossa subacute subdural hematoma in CT brain may impair the ability to diagnose such lesions especially the small hematomas which might

resolve spontaneously [7]. Patient using anticoagulation therapy are generally at risk to developing subdural hematomas especially when they have history of head injury [1].

Subdural hematomas form the most common complication of anticoagulation therapy with an incidence of 12–38% [10]. To the best of our knowledge, only six cases of posterior fossa subdural hematoma which are associated with anticoagulation usage have been reported so far in the literature [11–15] (Table 1).

The predominant manifestations of posterior fossa subdural hematoma are headaches, vomiting, cerebellar symptoms, and cranial nerve dysfunction. While rare cases of adult chronic infra-tentorial subdural hematomas have reported nystagmus and vertigo as the main presenting symptoms in only three patients [1, 6, 7].

In many occasions, surgical management would be the most appropriate choice for treating such cases. Kota *et al.* suggest unilateral or bilateral burr hole evacuation of posterior fossa chronic hematoma [16]. The same method of treatment is suggested by Takemoto *et al.* [17]. Moreover, Stendel *et al.* suggest that there is no difference in the management approach between infra-tentorial and supra-tentorial chronic subdural hematomas [7].

4. Conclusion

In conclusion, there is no enough data in literature and no guidelines for diagnosis and management of spontaneous sub-acute subdural hematoma, we infer that anti-coagulation therapy and hence coagulopathies is the predisposing factor, in such patient one should bear in mind the possibility of posterior fossa subdural hematoma, specifically those with symptoms and signs of raised intracranial pressure, vertigo, and decreased level of consciousness. In our case, MRI was the diagnostic imaging technique. We performed a sub-occipital craniectomy with patient in prone position and under general anesthesia. Surgical evacuation in our opinion offered a safe and fast recovery of the patient.

Acknowledgements

None.

Ethical Considerations

The study protocol was approved by the ethical committee of Aliaa Specialist Hospital. Written informed consent was obtained from the patient for publication of this case report and accompanying images which is available for review by editors of this journal.

Competing Interests

The authors declare that they have no competing interests.

Availability of Data and Material

All relevant data of this study are available to any interested researchers upon reasonable request to the corresponding author.

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