Spontaneous Resolution of Acute Subdural Hematoma in a Patient with Thrombocytopenia: A Blessing in Disguise

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Abstract

Acute subdural hematoma (SDH) constitutes one of the most common emergencies in neurosurgery and its spontaneous resolution is an uncommon phenomenon. Several theories have been described to explain this phenomenon including redistribution of subdural blood, dilution by cerebrospinal fluid, and brain atrophy. Rapid resolution of acute SDH related to thrombocytopenia is a rare phenomenon. We report a case of a patient who showed rapid resolution of acute SDH with thrombocytopenia and also discuss such a rare case with speculation of the thrombocytopenia as a factor to promote this phenomenon.

Keywords

- subdural hematoma
- thrombocytopenia
- intracerebral hematoma
- hypocoagulable
- redistribution

Introduction

Acute subdural hematoma (ASDH) in majority of cases is related to a traumatic event. Rarely, they may occur spontaneously or after a minor trauma in patients receiving anticoagulant or antiplatelet therapy.[1] Considering the posttraumatic ASDH, two main types should be considered: (1) the ASDH related to contusion, laceration, and intracerebral hematoma—burst lobe syndrome and (2) the ASDH related to rupture of bridging vessel. The first one is usually related to significant primary brain injury, often with no lucid interval and may show delayed neurological deterioration. The second one is related to brain acceleration–deceleration during violent head motion, with less severe brain injury and the presence of lucid interval.

ASDH needs emergent neurosurgery or close observation because it is associated with a 60 to 80% mortality rate. Patients may be managed conservatively when they are neurologically intact or the hematoma is small. Rapid spontaneous resolution of ASDH has rarely been reported because it takes several weeks or months for spontaneous resolution without neurosurgical interventions.[1–3] The underlying pathophysiology is not well understood, but probably more than one mechanism is responsible for this phenomenon. Two possible mechanisms for spontaneous resolution of ASDH have been put forward to explain this phenomenon including redistribution of subdural blood and dilution by cerebrospinal fluid (CSF).[4]

Herein, we discuss a patient with thrombocytopenia who showed spontaneous rapid resolution of ASDH within 1 week after head injury and discuss the mechanism related to the thrombocytopenia contributing to the spontaneous resolution of the hematoma.

Case Report

A 26-year-old male presented with a/h/o road traffic accident to Apex Trauma Centre, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, UP, India. Patient was admitted and evaluated in detail as per Advanced Trauma Life Support protocol. Noncontrast computed tomography (NCCT) head was suggestive of left frontoparietal SDH with hemorrhagic contusions with mass effect with midline shift of 8.8 mm to the right side with effacement of basal cisterns (►**Fig. 1**). Patient was planned for decompressive craniectomy. But surgery could not be done due to thrombocytopenia (Platelet count—

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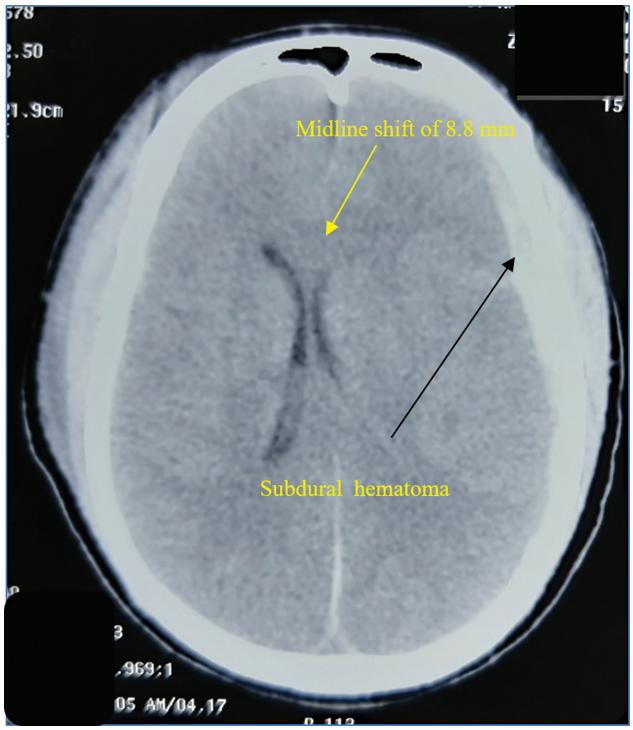

Fig. 1 Noncontrast computed tomography head at the day of admission.

40,000). Patient was then put on conservative treatment. Hematology consultation was done and multiple platelet transfusion were done. But thrombocytopenia still persisted (Platelet count—25,000). So, the patient was continued on conservative management. Repeat NCCT head done after 1 week showed significant resolution of the ASDH (►**Fig. 2**). Despite the presence of thrombocytopenia, patient showed significant resolution, which makes it a rare case to be reported.

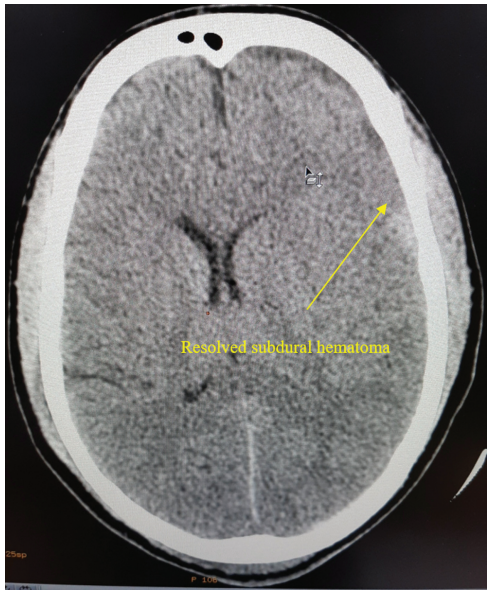

Fig. 2 Noncontrast computed tomography head after 1 week of admission.

Discussion

Most of these patients with ASDH undergo urgent hematoma evacuation except for those with poor general condition or with irreversible brain damage. The mechanism of the spontaneous resolution of ASDH has been attributed to intracranial redistribution of the hematoma.[3] Two possible mechanisms have been proposed. First, the hematoma may be diluted by flow of CSF through the arachnoid tear, followed by retrograde flow into the subarachnoid space. This process is explained by the presence of a low-density band between the SDH and inner table of the skull.[5] Second, brain swelling, caused by cerebral contusion, compresses the hematoma and may contribute to the redistribution of hematomas resulting in rapid resolution of SDHs.[5] In addition, the accompanying brain atrophy and fracture might facilitate the redistribution of the ASDH and improvement in the brain shift.

Additionally, the unique aspect of the case presented above is that the patient had thrombocytopenia with no skull bone fracture without brain atrophy. In the present case, we were concerned as to why spontaneous resolution of ASDH happened to this patient with thrombocytopenia. Healthy individuals possess adequate amounts of clotting factors, regulatory proteins, and platelets to achieve optimal clot formation, clot limitation, and dissolution. Patients with thrombocytopenia have a disturbed balance of procoagulant and anticoagulant factors, leading to disturbance in coagulation. There are two important factors to achieve hemostasis. One is a formation of a "platelet plug" that requires sufficient quantity of functional platelets working in an intact blood vessel. The other is a production of a "fibrin clot" that needs adequate and functional clotting factors. In this patient, as noted above, thrombocytopenia resulted in a hypocoagulable state. These conditions act like two sides of a coin for causing ASDH with trauma in this patient; they may have also concerned to redistribution of hematoma by preventing the well-organized hematoma formation. Hence, this coagulopathic status is more susceptible for hematoma to resolve or redistribute via the CSF dilution route. This case study supports hypocoagulable state as an important factor apart from brain atrophy, brain swelling, and skull fracture resulting in redistribution and thus resolution of hematoma.

Conclusion

Spontaneous resolution of ASDH is a rare phenomenon with only a few reported cases. The pathophysiology that leads to spontaneous resolution involves dilution by CSF and redistribution of the ASDH. In this case, thrombocytopenia, as a new factor, may contribute to the spontaneous resolution of the hematoma.

Note
This paper was presented as a poster at SGPGI Neurosurgery Update NEUROTRAUMA at SGPGIMS Lucknow, UP, India, on December 17, 2022.

Conflict of interest
None declared.

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