



# Toddler with repeated fall frequently visiting hospital presented with acute subdural hematoma on readmission with ultra-rapid evolution: surgical management strategy

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## ABSTRACT

Repetitive fall producing head injury in children may lead to development of intracranial hematoma. The course of evolution may be rapid in case of repeated fall due to induction of sub-clinical coagulopathy caused by repetitive cranial injury. The awareness of such possibility is highly desired among the pediatrician and neurosurgeon and emergency team and quick diagnosis and pertinent imaging study is of immense value and appropriate surgical management for prompt and expediting the evacuation of intracranial hematoma evacuation should be attempted to preserve good neurological outcome. Authors reports a case, who had rapid neurological worsening, managed surgically with good neurological outcome, further various surgical management options along with pertinent literature are briefly reviewed.

## INTRODUCTION

Traumatic brain injury is a global epidemic affecting all age group and producing cognitive, emotional, psychological, and economic burden and various disability and huge cost to society on care of acute phase of head injury extending to the rehabilitative phase. Author presents a case, who had repeated fall in house due to carelessness and previously also visited hospital for fall, at current admission had rapid neurological worsening due to acute subdural hematoma. He was managed successfully.

## CASE ILLUSTRATION

Author presents a case of two- year old male child with history of repeated falls. Patient had fall from first floor with loss of consciousness. Patient presented to trauma emergency, on evaluation GCS was E4V5M6 with no focal neurological deficit. Computed tomography head did not reveal presence of fracture or intracranial haematoma and discharged satisfactorily after observation. (Fig-1) However, due carelessness of parents, the child had again fell down and brought to emergency in unconscious state after three days after discharge from hospital following previous admission. On examination at current admission, vitals were stable with GCS was E3V3M5. His

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pupils were asymmetric, left pupil was dilated and not reacting to light. Urgent repeat computed tomography scan head was done, showed presence of acute subdural hematoma extending over the left frontotemporal with midline shift with subfalcine herniation. (Fig-2). Baby had further neurological deterioration while awaiting admission at emergency to E2V2M4 and hence taken up for emergency surgical evacuation of acute SDH under general anaesthesia. dura was tense and following

opening the dura, thick dark coloured blood clot was observed in the subdural space. Post operatively child was electively ventilated for two days and then extubated and continued to receive decongestant therapy, antibiotics and antiepileptic medication continued. Following emergency evacuation of acute subdural hematoma, pupil anomaly improved. At the time of discharge, child was E4V5M6, accepting orally and playing actively with mother.

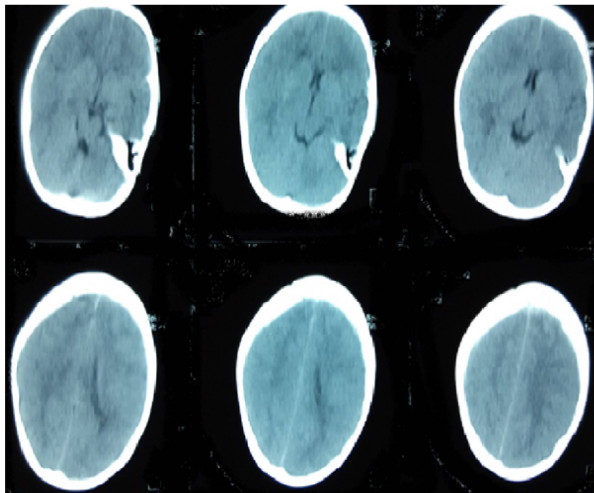


FIGURE 1. Cranial computed tomography scan following fall at previous admission showing no evidence of fracture or presence of extra-axial or intra-axial hematoma.

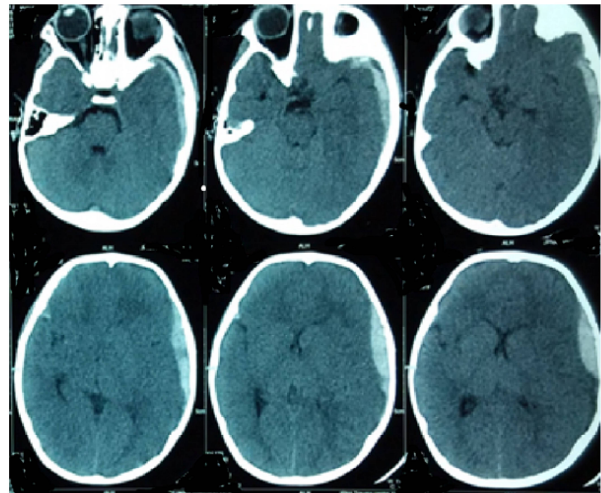


FIGURE 2. Computed tomography showing presence of large acute subdural hematoma over left fronto- temporal region with associated mass effect and subfalcine herniation, at current admission.

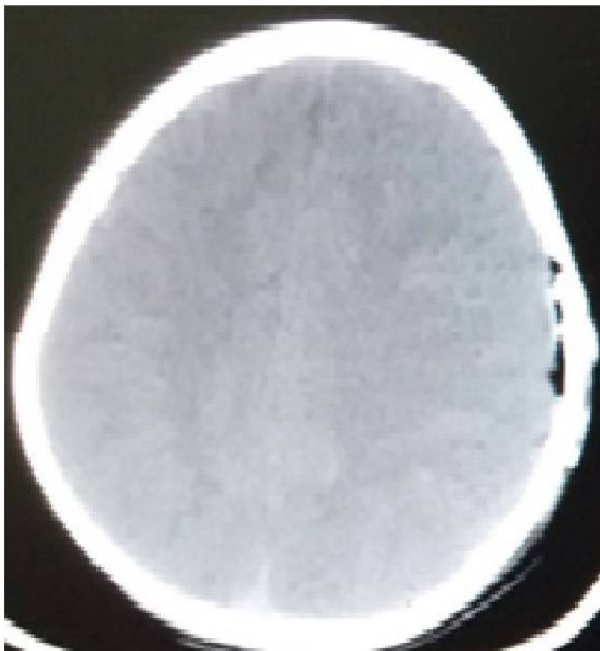


FIGURE 3. Non contrast computed tomography after six months following surgical evacuation of acute subdural hematoma.

**DISCUSSION**

Traumatic brain injury constitutes leading causes of acquired disability and death in the infants as well as children<sup>1</sup>. Subdural hematoma is most common intracranial pathology observed in neurosurgical practice following traumatic brain injury<sup>2,3</sup>.

Falls and motor vehicle accidents are common non-inflicted causes, while child abuse among infants and young children are unfortunate inflicted causes of traumatic brain injury<sup>2</sup>. The pathomechanism of fall from a short height in the very young children impart a predominantly linear force to the head. These forces can cause local deformity of skull or in cases forces being sufficient enough to produce skull fractures, and extradural hematomas. Subdural hematomas development commonly results from displacement of the brain relative to the dura, and may associated with rupture of the bridging veins courses from the brain's surface to the overlying larger draining venous sinuses<sup>4,5</sup>. However, extradural hematomas is commonly associated with

focal impact injuries, but subdural hematoma almost always results from angular head deceleration, in which the brain continues to rotate relative to the more stationary skull and dura, associated with diffuse parenchymal damage. Management of traumatic brain injury primary aims for limiting the progression of the primary brain injury and minimizing secondary brain injury<sup>6-11</sup>.

Surgical management is the mainstay of management of acute subdural hematoma with mass effect. However, in cases with rapid neurological deterioration, surgical decompression needs to be expedited and, in many resource, scarce centre, operation theatre may not be available, larger burr hole craniostomy with evacuation of subdural hematoma with subdural drain placement can offer an option with burr hole being placed at the site of thickest component<sup>9,11</sup>.

Satyarthee et al. reported burrhole evacuation of acute subdural haematoma is considered as a novel technique to reverse the worsening neurological state of patient<sup>7,8</sup>.

Other traditional approach include craniotomy with evacuation of subdural hematoma, decompressive craniectomy and management of associated intracerebral hematoma. Decompressive craniectomy or other major intracranial procedure for evacuation of acute subdural hematoma can be done if patient GCS and neurological status remains stable<sup>8-13</sup>.

## CONCLUSION

A child with repeated fall may develop larger haematoma, although previous cranial CT scan may not show presence of any intracranial hematoma, and depending on history, detailed clinical assessment, appropriate neuroimaging study is advocated and further early and rapid neurological deterioration, emergent surgical management is must. Awareness of rare but important pathology is highly recommended for pediatrician, neurologist, neurosurgeon and emergency care team.

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