

# A Dangerous Game; Trampoline and Subdural Hematoma in a Child: Case Report

## Tehlikeli Bir Oyun; Trambolin ve Bir Çocukta Subdural Hematom

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Geliş Tarihi/Received: 26.06.2012

Kabul Tarihi/Accepted: 05.01.2013

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**ABSTRACT** Trampoline is popular game in childhood. However, trampoline associated injuries have been increasing gradually. Most of these injuries were related to bone and soft tissues. Less frequently may be spinal cord injury even though causes death. There were no reports about trampoline related subdural hematoma in children. Eight years old male boy was admitted to the pediatric emergency department with impairment of speech, severe headache, numbness in the right arm, and loss of balance since six days. There was no history of previous head injury or predisposing factor of intracranial hemorrhage. Cranial Magnetic Resonance Imaging showed a chronic left-sided subdural hematoma. The hematoma was drained with burr hole, and the patient was discharged after a week with no neurological sign or symptoms. We present a first pediatric patient with trampoline related subdural hematoma in this study.

**Key Words:** Hematoma, subdural, intracranial; child

**ÖZET** Trambolin herkesçe bilinen, daha çok çocukluk döneminde rağbet gören bir oyundur. Ancak, tramboline eşlik eden yaralanmalar, giderek artmaktadır. Bu yaralanmaların çoğu kemik ve yumuşak dokular ile ilgilidir. Seyrek olarak görülen spinal kord travmaları bazen ölümlerle sonlanabilir. Çocuklarda trambolin ile ilişkili subdural hematom daha önce bildirilmemiştir. Sekiz yaşında erkek hasta, altı gün önce başlayan konuşma bozukluğu, şiddetli baş ağrısı, sağ kolda uyuşma ve denge kaybı ile çocuk acil servisine başvurdu. Kafa içi kanamaya neden olabilecek travması veya kanamaya eğilim öyküsü yoktu. Beyin manyetik rezonans görüntülemesinde süregelen subdural hematom görüldü. Hasta, hematom "burr hole" ile drenajını takiben, hiçbir nörolojik belirti ve bulgu olmadan 1 hafta sonra taburcu edildi. Biz bu yazıda trambolin ilişkili ilk pediatrik subdural hematom olgusunu bildiriyoruz.

**Anahtar Kelimeler:** Hematom, subdural, intrakraniyal; çocuk

**Türkiye Klinikleri J Pediatr 2013;22(2):83-5**

Trampoline is a popular game in many countries. However, the frequency of injuries associated with trampoline was increased with the popularity in pediatric population.<sup>1</sup> Approximately 52,000 trampoline related injuries in 1995 have been reported in children younger than 15 years in USA.<sup>2</sup> By 2005, these injuries had risen to 210,000 in pediatric population.<sup>3</sup> Most of trampoline related injuries were falls from the trampoline to the ground surface, sprain and dislocation of extremities, fractures, collision with another jumper, and soft tissue injuries.<sup>4</sup> However, fatal and neurologic injuries related to this activity are very rare in children. Causes of fatal trampoline injuries included "falling from," "jumping on," "doing

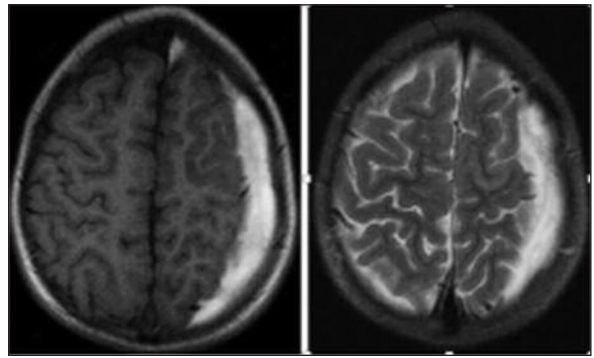
flips,” and “hanging from a spring by a necklace”.<sup>4</sup> Our knowledge, there were no reports about trampoline related subdural hematoma in children in the literature. We present a first pediatric patient with trampoline related subdural hematoma in this study.

## CASE REPORT

A previously healthy 8-year-old male was admitted to the pediatric emergency department with impairment of speech, severe headache, numbness in the right arm, and loss of balance since six days. There was no history of previous head injury. All complaints had begun 6 days ago after bounce on a trampoline to be learned. His body temperature, pulse, respiration, and blood pressure were 36.5°C, 76 beats/min, 24 breaths/min, and 110/70 mm Hg, respectively. His Glasgow Coma Scale score was 15. Neurologic evaluation revealed abnormal finger to nose and heel to toe maneuvers, and dysmetria of the right upper extremity. An upper limb motor strength exam in the right extremity revealed weakness (4/5). Deep-tendon reflexes were hyperactive on both upper and lower extremities, and there were no pathologic reflexes. Cranial nerves were intact. The medical history was negative for anticoagulant therapy, vascular abnormality, and bleeding disorders. Hematologic parameters including platelet count, prothrombin time, partial thromboplastin time, bleeding and clotting time, levels of coagulation factors and biochemical tests were normal. Cranial Magnetic Resonance Imaging (MRI) on admission showed a chronic left-sided subdural hematoma (Figure 1a, 1b). He was for this reason sent to our neurosurgical department for surgical intervention. After exclusion of coagulopathy, drainage with burr hole was performed, and a good surgical result was noted. He was discharged after a week with no neurological symptoms or signs.

## DISCUSSION

Trampoline has become popular game in recent years. However, trampoline related injuries have been increasing gradually. These injuries represented around 3% of all injuries in emergency de-



**FIGURE 1a,b:** T1 and T2-weighted MR imaging was showed hyperintensity consistent with late subacute subdural hemorrhage on the left frontoparietal region.

partments.<sup>4</sup> The most common cause of trampoline injuries are awkward landing on the trampoline, fall off the trampoline, collision with another person, performing a somersault.<sup>4</sup> The distribution of body regions injured on trampolines are lower extremity (38-41%), upper extremity (29-33%), face (9-11%), trunk (7-8%), head (5-6%), neck (5-6%), and other (1%).<sup>5</sup>

Cervical spine injuries are the leading cause of devastating complication associated with trampolines. Eight to 12% of trampoline related injuries result in spinal cord injuries, and approximately 0.5% of all injuries result in permanent neurologic damage.<sup>6</sup> These injuries represents paraplegia, quadriplegia and rarely death. The mechanism of cervical spine injuries commonly occur with hyperflexion or hyperextension injuries.<sup>6</sup>

Subdural hematoma (SDH) is a collection of blood between the arachnoid and dura mater due to disruption of surface vessels, usually bridging veins.<sup>7</sup> The mechanism of bleeding surface vessels is caused by acceleration-deceleration injury.<sup>7</sup> In children, the most common causes of SDH are trauma and child abuse especially shaken baby syndrome.<sup>8</sup> Non-traumatic causes including coagulation disorders, meningitis, convulsion, post-neurosurgery, sinus or cortical vein thrombosis, vascular malformations, tumors and metabolic diseases are very rare.<sup>9</sup> There was no report trampoline related SDH in the literature. In our patient, there was no predisposing factor for SDH such as evidence of child abuse, trauma or coagulopathy.

The probably mechanism of SDH in our patient was tearing of bridge veins due to sudden hyperflexion or hyperextension.

The common clinical findings of SDH are vomiting, nausea, headache, speaking disturbances, hemiparesis, sensory deficits, gait problems, and disturbances in consciousness.<sup>10,11</sup> In infants, clinical findings may include tense fontanel, macrocephaly, convulsion, vomiting, irritability, and focal neurological signs.<sup>7</sup> For some patients with SDH, the mass effect of the accumulating SDH is the primary cause of neurologic sign. Many pa-

tients of SDH, however, are related with cerebral contusion, brain ischemia, and diffuse brain swelling.<sup>12</sup> Even though clinical findings of SDH are shown within hours after the trauma, occasional clinical findings of chronic SDH are diagnosed days or even weeks after the trauma such as our patient.

In conclusion, trampolines can be dangerous especially for inexperienced small players. In this study, we wish to alert the physicians in the presence of neurologic abnormality of unknown etiology in children should consider trampoline.

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