

Genital Injuries in Prepubertal Girls From Inline Skating Accidents

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ABSTRACT. We report 2 cases where accidents from inline skating resulted in significant genital injury to female children. When genital trauma occurs in children, it frequently raises the concern that sexual abuse might have caused the injury. Historical information provided by the child and others must be compared with the injuries to understand whether an injury may be the result of abuse. We characterize the nature of the genital injuries of our cases as being caused by an accidental "rapid-splits" type mechanism while children were using inline skates. We conclude that the reported accidental mechanism caused the identified injuries. Distinguishing accidental from abusive causes of genital trauma is critical. We report these cases, as there are no reports in the literature regarding this accidental mechanism of injury. *Pediatrics* 2002;110(2). URL: <http://www.pediatrics.org/cgi/content/full/110/2/e16>; *child sexual abuse, differential diagnosis, inline skating injuries, children.*

Genital trauma in prepubertal children, especially when it involves the hymen, is often considered to be an important physical indicator of child sexual abuse. A limited number of reports of accidental injuries to the anogenital area in children describe the mechanisms of trauma in relation to the identified injuries. These studies stress the importance of clear, consistent, and credible historical information.¹⁻⁸ There have been no reports identifying inline skating accidents as resulting in significant genital trauma so far. Both cases we report were witnessed events. The historical information that was provided to the health care providers was clear and consistent, both by the patient as well as by the observers.

CASE REPORTS

Case 1

While using inline skates, an unsupervised 8-year-old girl fell in a manner where her legs rapidly abducted in a "splits-type" mechanism. She was not able to recall whether there had been any object on the paved street onto which she fell. The accident was witnessed by a 6-year-old sister and a 7-year-old cousin. The girl noticed immediate pain and bleeding. Application of a clean cloth with gentle pressure (by the child's grandmother) and bed rest stopped the bleeding, so no medical care was initially sought. The girl was on a weekend visit to her grandmother at the time of the event. When she returned to her mother's care the next day, the

bleeding recurred and the anogenital area remained uncomfortable; urination was moderately painful. The mother brought the child to a pediatric hospital emergency department ~24 hours after the event.

Examination revealed a deep midline splitting injury from the anal verge to the perineum and an extensive hematoma from the perineum to the right lower labia majora and into the fossa navicularis. The hematoma reached the hymen, causing a few petechiae on the hymenal membrane. The hymen itself was not further injured (Fig 1). The girl underwent surgical repair of the injury. The intraoperative inspection of the anal sphincter and the vagina were unremarkable. Because of the severity of the genital injury, sexual abuse was initially considered as a possible differential diagnosis. Therefore, testing for sperm and sexually transmitted diseases was performed. No sperm was detected on the vaginal, anal, perigenital swabs, or on the underpants. Testing for gonorrhea, chlamydia, and syphilis was negative.

The child herself gave a clear and consistent history of the inline skating accidental event. She denied any sexual abuse. Per the child's mother, the children who witnessed the event provided histories identical to the one provided by the patient. Neither the child's mother nor any other involved person had any suspicion of



Fig 1. Case 1: Midline splitting injury from inline skating accident—8-year-old girl.

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sexual abuse. Additional questioning by a specialized psychological referral center was unsuspecting. The grandmother was not available for interviewing. The girl was seen for follow-up twice within 4 weeks and showed healing without complications.

Case 2

While using inline skates, an 8-year-old girl fell in a manner where her legs rapidly abducted in a "splits-type" mechanism. The patient stated that she did not fall on to any object, other than the paved street. The accident was witnessed by an adolescent female cousin. The girl noticed immediate pain and bleeding. The child was taken back home, where the family sought immediate medical care.

Patient was examined in the operating room because of obvious bleeding from the genitals. The girl was unable to cooperate with an examination while awake because of anxiety. Examination under anesthesia revealed a midline splitting injury from the posterior fourchette through to the posterior commissure. Small hematomas were noted lateral to the tear. The hymen was crescentic with smooth margins; no injury to the hymen was noted. The injuries did not require surgical correction and healed without sequelae. Testing for gonorrhea and chlamydia was negative.

The child gave a clear and consistent history of the inline skating accidental event. She denied any sexual abuse. The caretakers did not raise concern for sexual abuse. The other witness provided a history identical to the one provided by the patient.

DISCUSSION

The children in this series provided clear, consistent, and detailed histories about the nature of the mechanism of trauma that caused their injuries. These events were witnessed by multiple individuals. The type of injury that has been identified involves splitting of the midline tissues as a result of rapid abduction. We conclude that inline skating accidents with a fall involving rapid abduction of the legs can cause "splits-type" genital injury in children. None of the children from this series was noted to have any significant injuries to the hymen. This type of serious injury seems to be a rare event.

Inline skating accidents are characterized by potentially occurring at high speeds. Speeds of 12 to 18 mph (~20–30 km/hour) can be obtained even by inexperienced skaters. Experienced skaters reach 30 mph (nearly 50 km/hour); anecdotal reports describe speeds of up to 70 mph (112 km/hour). These speeds result in significant kinetic energy; a fact that is also supported by research on similar activities like roller skating and ice skating.^{9–12}

Fifty percent to 86% of all inline skating injuries (abrasions, lacerations, fractures, etc) comprise the upper extremities. Approximately 45% of all injuries are fractures. Seventy percent to 93% of the fractures involve the upper extremities. A minority of injuries involve the lower extremities, pelvis, or pubic area.^{9–11,13} Reports of pelvic fractures¹⁴ indicate that considerable forces can be directed to this area. Few reports specifically examine children; those that do indicate similar injury patterns as seen in adults.^{15–18}

Published reports regarding accidental genital injuries describe them to be mostly minor and superficial. The injuries tend to be anterior, external, and unilateral. All reports stress the overwhelming importance of the history.^{2–5} In most cases of accidental injury, the hymen is not involved. Exceptions are rare cases of accidental penetrating injuries.²⁰ Bond et al³ reported 56 accidental genital injuries in girls. One of them sustained a fall in a "splits-type" mech-

anism with sudden abduction of her legs, resulting in a pinpoint abrasion of the hymen. Bays and Jenny¹⁹ stated that a "sudden, accidental violent abduction of the legs may cause splitting injuries of the midline genital structures," although until then the only reported case was caused by sudden violent abduction during sexual abuse. Lynch et al⁶ described 22 girls with "blunt urogenital trauma" without signs of sexual abuse. One case was caused by a witnessed skateboard accident with extension of the injury to the posterior fourchette and posterior vagina. Pokorny⁴ reported 25 accidental cases with a series of 32 acute genital injuries. Three of the accidental cases had a hymenal transection: 1 by jumping on a pool toy, 1 by sliding on a protruding stump, and 1 was iatrogenic by a physician's finger during an examination. Dowd's² series of 100 straddle injuries included 2 hymenal injuries, a hematoma by straddling a bicycle bar, and a "plunger injury." Boos²⁰ reported a case of a 7-year-old sliding onto a toy horse in a bathtub causing a transection of the hymen. As that accident was unwitnessed, his report stressed the characteristics and importance of the history for differentiating this rare type of accidental injury from sexual abuse trauma. Kunkel²¹ reported a case of posterior vaginal laceration near the hymen by a waterslide accident.

CONCLUSION

Inline skating accidents with a fall involving rapid abduction of the legs may cause significant blunt soft tissue trauma to the genital area in girls. Although child sexual abuse should always be considered when genital injury is identified, the children of the reported cases sustained their genital injuries in an accidental manner. These cases reinforce the importance of obtaining a clear history when genital trauma is identified, to clarify whether the trauma was attributable to an accident or abuse. Although genital trauma may be the result of child sexual abuse, accidental events can occur, and their possibility must be considered if suggested by the history. As there are no reports in the literature that describe this type of accidental mechanism, we suggest that it be included in the differential diagnosis of abusive genital trauma.

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