Perforation of large and small intestines by impalement in a 13-year-old boy

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Anal impalement is a rarely reported entity. As far as children are concerned, it is often an accidental injury that is exceptionally associated with intra-abdominal injuries. We herein report a case of impalement with intestinal perforation in a 13-year-old boy. He jumped down from a wall and fell upon a picket of wood which directly penetrated his anus. He felt the end of the picket in the abdomen near his umbilicus. After removal of the picket, he developed peritonitis. However, there was no injury at the anal margin. The anuscopy showed a superficial and linear detachment of the rectal mucous membrane. The surgical exploration of abdomen showed perforations of sigmoid colon and small intestine. We performed a primary repair of intestinal injuries (excision — suture of the sigmoid colon perforation, resection and end to end anastomosis of the ileum perforation), associated with a left transverse colostomy. The colostomy was closed 5 weeks later. The postoperative periods were uneventful. With a follow-up of 2 years, there were no complications.

With children, anorectal traumas are rare event [1–3], whereas impalements with intra-abdominal injuries are exceptional [4,5]. Anal impalement is associated with anorectal, genitor-urinary or intra-abdominal injuries [1,4,6,7]. Their management often requires a colostomy, according to the grade of Black et al. [2].

We herein report a case of impalement with intestinal perforation in a 13-year-old boy.

1. Case report

A 13-year-old boy was admitted to the surgical emergency department of Sylvanus Olympio Teaching Hospital of Lomé on April, 27, 2012 for peritonitis.

Eight hours earlier, he jumped from a wall that was 2 m high onto a picket of wood. The picket directly penetrated his anus, and he felt its extremity in the abdomen near his umbilicus. He was removed from the picket, and was brought to the local hospital and transferred 80 km to Sylvanus Olympio Teaching Hospital. His past medical history was unremarkable. On arrival, he appeared well and was hemodynamically stable. He had no fever; his blood pressure and pulse rate were normal. He urinated normally without hematuria. He had peritonitis signs, his anal margin was normal with blood at the opening (Fig. 1). The rectal exam was painful without a palpable perforation. The anuscopy showed blood coming far from the colon, and a superficial and linear separation of peritoneum on the anti-mesenteric side of ileum (Fig. 5), and plant debris in the abdomen.

Those findings permitted us to classify this trauma grade V of Black et al.

The treatment consisted in primary repair of the colon and the ileum: excision — suture of the sigmoid colon perforation, closure of the colostomy.

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the wound of ileal mesentery, resection and an end to end anastomosis of the ileal perforation, closure of the ileal peritoneum separation. A left transverse colostomy was performed to protect the sigmoid colon repair. The antibiotics included ceftriaxone and metronidazole for a full 7 day course. The postoperative period was uneventful. He was discharged after two weeks, and had an uneventful colostomy closure 5 weeks after the injury. At 2 year follow-up, he had normal bowel function.

2. Discussion

Impalement is an exceptional etiology of anorectal trauma [6,7]. Most of publications are case reports on one or few cases [1,4–7]. Beiler et al. [5], and Vincent et al. [7] encountered respectively 10 and 14 cases over 11 years. It often occurs when the child falls upon offending objects [6]. Those offending objects can be pickets of wood [1] as in our case. But it can also be various objects: metallic spikes [7], animal horns [1] or some other objects in bathroom [4,6]. Sexual assault had also been reported [7].

Whatever is the etiology of the impalement, the precise diagnosis of the associated injuries is not easy. As in our case, the
absence of a wound or a superficial external wound of the anal margin don’t reflect the seriousness of the injury. The notion of penetrating trauma must force the surgeon to perform a methodical and meticulous examination of the child. Associated injuries in pelvis or in the abdomen are frequent and can be potentially life threatening and surgically challenging [4]. Not only does the extent of the injury not only depend on the size, the force, the direction of the impaling object [4], but also on the consistence, the regular or non regular aspect of the object, the penetrating length, and the presence or absence of clothes before the impalement. After general status and abdominal examination, the perineal examination must include proctoscopy along with cystoscopy (if hematuria or anterior rectal wall injury) and vaginoscopy in girls (if vaginal bleeding) [7]. The anorectal injury can be associated with lesions of vagina (in girls), urethra [1,5], bladder [8] or intra-peritoneal organs as in our case. Plain radiograph of abdomen can help determine if there is intestinal perforation; but in our case, there were two intestinal perforations without free air in abdomen on the radiograph.

The management depends on the type of anorectal injury and the time spent before admission. The very question is to know whether a colostomy is necessary or not. In our case, there was no serious anorectal wound. However, due to the perforation of the sigmoid colon and the peritonitis, we decided to perform a left transverse colostomy and the postoperative course was uneventful. In case of rectal perforation, or serious peri-anal soft tissue damage, the repair without colostomy can lead to severe infection of the wound and insufficiency of anal sphincter; this situation will require a compulsory and quick fecal diversion [5]. In addition, a long delay to treatment with potential infection of anorectal wound also requires fecal diversion. In case of suspicion of associated injury of intra-peritoneal organs, the abdominal exploration and repair of a possible lesion can be done with laparoscopy [9]. A broad-spectrum antibiotic treatment is essential. In our case, we administered ceftriaxone with metronidazole as did also Beiler et al. [5]. Rectal stump irrigation and presacral drainage are proposed [10]. In a schematic way, the management of impalement is based on the classification of anorectal injuries by Black et al. [2]. In early admitted injuries, primary repair without colostomy is proposed to grade I (superficial injury of anal canal or rectal mucous membrane) and grade II injuries (full-thickness injury below internal and/or external anal sphincter) [1,2]. The colostomy is necessary in injuries of grade III (Full-thickness injury above internal anal sphincter without peritoneal involvement), IV (peritoneal involvement but no injury to other intra-peritoneal organs) and V (associated injury to other intra-peritoneal organs). With a methodical diagnosis and well adapted treatment, there is often good outcome [5]. Nevertheless, missed diagnosis of intra-peritoneal injuries can lead to complications and death [1].

3. Conclusion

Intraperitoneal injuries by impalement without anorectal wound are rare in children. The mechanism of trauma may help the surgeon determine all possible related injuries. A low threshold for a diverting colostomy must be maintained.

Conflict of interest

We declare that there is no conflict of interest.

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