Dear Sir,
The association of penetrating umbilical injury through an umbilical hernia is worthy of note; because though this hernia is a frequent pathology of the anterior abdominal wall in children,¹ such injury is rarely reported. Due to the inherent fascial defect in umbilical hernia, trivial injuries directed against it could lead to breach of the skin and peritoneum with evisceration of loops of intestine. These case reports emphasize the need for prophylactic repair of umbilical hernias if they fail to close spontaneously after the age of 4 years even if they remain asymptomatic and for carefully storing away of harmful objects from children.

A 5-year-old boy was admitted to the Children Emergency Unit of the University of Calabar Teaching Hospital with a 24-hour history of evisceration of loops of intestine through the umbilicus. He was said to have fallen on a sharp wooden object in the home premises while playing with his peers. Suddenly loops of intestine eviscerated through his umbilicus, with associated recurrent bilious vomiting an hour later. Preceding the fall, the patient had an asymptomatic umbilical hernia with a ring diameter of about 2.0 cm. He was treated at home with bandaging for 24 hours before seeking medical treatment.

On arrival at the Children Emergency Unit, the child was examined and found to be very dehydrated. The vital signs were blood pressure (BP)- 85/60 mm Hg, heart rate- 160 beats/min, respiratory rate- 46 cycles/min and temperature (rectal)- 37.0°C. There was a 2.0-cm opening in the umbilical cicatrix through which loops of non-viable small bowel eviscerated. The patient was adequately resuscitated and given anti-tetanus prophylaxis. Under a general anesthetic, a laparotomy was done, during which the gangrenous bowel was prevented from slipping back into the peritoneal cavity. About 30-cm length of the non-viable ileal segment was resected, followed by an end-to-end ileo-ileostomy. Injury to other intra-abdominal viscera was excluded by careful exploration. The abdominal wound and fascial defect were repaired with nylon suture and umbilicoplasty was done. The wound healed primarily, and he was discharged home on the eighth post-operative day. The patient was reviewed in the outpatient clinic 8 weeks after discharge, when he was found to be doing well.

A 10-year-old boy presented to the Children Emergency Unit of the University of Calabar Teaching Hospital with a 24-hour history of a protrusion of a fleshy tissue through the umbilicus. He was playing at home when he fell on a piece of iron rod. He failed to tell his parents for fear of being beaten until when he developed persistent severe abdominal pain. There were no associated gastro-intestinal symptoms. Prior to the fall, the patient also had an asymptomatic umbilical hernia with a ring diameter of about 1 cm.

On examination in the Children Emergency Unit, he was found to be in painful distress. The vital signs were blood pressure (BP)- 100/65 mm Hg, pulse rate- 80 beats/min, respiratory rate- 28 cycles/min and temperature (rectal) 37.2°C. There was a 1.0-cm defect in the umbilical cicatrix through which a tongue of viable omentum protruded.

The abdomen was full and moderately tender. He was resuscitated and given anti-tetanus prophylaxis. Under a general anesthetic, a laparotomy was done, during which the tongue of omentum was prevented from slipping back into the peritoneal cavity. There was hemoperitoneum of about 30 mL without any visceral injury. The exteriorized omentum was ligated and excised. The abdominal wound and fascial defect were repaired with nylon suture and umbilicoplasty was done.

The wound healed primarily, and he was discharged home on the seventh post-operative day. He was reviewed in the outpatient clinic 8 weeks after discharge and found to be doing well.

Penetrating umbilical injury with evisceration through the umbilicus in a child has been reported,² but the report did not mention whether there was an associated hernia. It is however very rare that penetrating injury involves the umbilicus and leads to evisceration of loops of intestine as the...
intact umbilicus is not naturally a weak point in the anterior abdominal wall.

The anatomy of the umbilicus is probably responsible for the rarity of penetrating injuries through it. In the normal umbilicus, there is a single layer of fused fibrous tissue consisting of the superficial fascia, the rectus sheath and linea alba, as well as the fascia transversalis with the peritoneum adherent to the deep aspect of this. Therefore, though the umbilicus is actually the thinnest area of the anterior abdominal wall, it is very tough and unyielding.

This is however not the case when an umbilical hernia exists irrespective of size. The herniation is through the linea alba, and the ring is formed by the fusion of all the layers of the anterior abdominal wall. This leaves a defect covered only by skin, fat and peritoneum that could yield readily during abdominal wall.

Our two cases are peculiar in that both patients had untreated umbilical hernias prior to the penetrating umbilical trauma, and so the force required to breach the peritoneum when directed against the umbilical hernia was far less than that required when directed against an intact umbilicus. It is worthy of note that the objects culpable in these injuries are those found commonly in the environment in which these children grow up. Firearms are noted to cause similar injuries in developed countries.

Common causes of penetrating abdominal trauma in children in our environment are falls onto sharp objects, sporting injuries and, rarely, road traffic accidents and violence. The gores of domestic animals like cows, goats and rams sometimes cause abdominal trauma which results in intestinal evisceration. Pieces of broken glass have also been reported to cause penetrating injury with intestinal evisceration and omentocele. The umbilicus alone could be the site of this injury, especially when there is a co-existing hernia.

The diagnosis of penetrating injury aims to establish peritonitis consequent on violation of the peritoneum and hemodynamic instability. While a limited number of diagnostic modalities may be applied, clinical examination remains the primary tool to decide which patient requires operation.

The traditionally recommended management when an injury violates the peritoneum with evisceration of the intestine or omentum is exploratory laparotomy. Currently, selective management of children with such penetrating injury is adopted because of the concern about the high number of unnecessary laparotomies in adults with penetrating injuries. This is so because much of the information on nonoperative management has been derived from adult experiences. Because the decision as to who should have selective non-operative management is difficult, several diagnostic methods, including ultra-sound scan (USS), computerized tomography (CT), diagnostic peritoneal lavage (DPL) and diagnostic laparoscopy, may be used in some carefully selected patients. This form of management requires supervision and frequent observation of the patients.

Our two patients were subjected to laparotomy, though the second case could have been suitable for selective management while repairing only the umbilical hernia. With the availability of some of these diagnostic modalities in most of our health institutions now, non-operative treatment of penetrating abdominal trauma in carefully selected children should be possible and needs be considered.

On the whole, these injuries are preventable. Parents should monitor and store away all potentially harmful objects from their children. Because an umbilical hernia remains a weak site for penetrating umbilical injury, any hernia that has failed to close spontaneously after 4 years of age should be prophylactically repaired even if it remains asymptomatic.

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References

Prevalence and correlates of serious injury among students of classes 7 and 8 in Kenya

Dear Sir,

Injuries are a major public health problem. A household injury survey in Kenya reported 300,000 injuries per 100,000 people per year,[1] while young adults, i.e., 15-44 years old, were reported as “most affected” in a rural health center–based study in western Kenya.[2] A prospective hospital-based survey reported 71% of injuries in males and 29% in females out of a total of 1304 casualties in Eldoret town in Kenya.[3] In United States, injuries are responsible for more deaths in adolescents than all other diseases combined, and about 15,000 adolescents (10-19 years old) die each year as a result of injuries.[4]

To investigate prevalence and correlates of injury in relation to gender, class, having missed classes/school without permission, sexual experience, use of illicit drugs and involvement in physical fight with self-reported serious injury in the past 12 months in students of classes 7 and 8 in Kenya, we used data from the Global School-based Student Health Survey for Kenya (GSHS-Kenya) conducted in 2003 by the Kenyan Ministry of Health in collaboration with the World Health Organization and the Centers for Disease Control and Prevention, United States.[5] We selected all the respondents from classes 7 and 8, who responded to the question “During the past 12 months, how many times were you seriously injured?” Students responding affirmatively to this question with one or more serious injuries were identified as having suffered serious injury in the past 12 months. A two-stage cluster sample design was adopted for the GSHS-Kenya to produce nationally representative estimates for 13-15 years old students. Design-based analysis with SUDAAN 9.01 was done using logistic regression. Odds ratios (ORs) were computed for the association of self-reported serious injury in the past 12 months with gender, class and various risk-taking attributes.

Serious injury was defined as one that makes a person miss at least one full day of usual activities, like school, or necessitates treatment by either a doctor or a nurse. The overall prevalence of serious injury in the past 12 months among the students of classes 7 and 8 was 76%, and 95% confidence interval (CI) was 72%-80% (n = 2993). In male students, prevalence of “seriously considering suicide attempt” was 76%, with 95% CI being 71%-81%; and in female students, 75%, with 95% CI being 71%-79%. No statistically significant association was found between gender and serious injury in the past 12 months in terms of ORs. Compared to students from class 7, students from class 8 were less

Letters to Editor