Uncommon Complication of Paediatric Umbilical Hernia: Spontaneous Evisceration. Case Report and Literature Review

Abstract
The umbilical hernia is common in children. Most of the cases have a spontaneous regression around the age of 3 years. Complications are very rare and thus surgery is not routinely indicated before the age of 3 years. We report an exceptional case of spontaneous rupture of an umbilical hernia with emphasis on the management of this rare complication and a literature review of similar cases.

Keywords: Umbilical hernia; children; Spontaneous evisceration

Introduction
An umbilical hernia is not exceptional in first years of life. It is estimated that one out of six children has an umbilical hernia.

Most of the cases resolve without any treatment if they are asymptomatic, and do not enlarge by the age of 2-3 years [1]. When the defect is small (<1 or 2 cm), 90% of all umbilical hernias close spontaneously within three years. In some reports, spontaneous closure occurs in 85% of the cases regardless of the size of the abdominal defect [2]. Complications of an umbilical hernia that require immediate surgical interventions are incarceration or strangulation and in extremely rare cases rupture, when the skin over the hernia breaks open.

Case Presentation
A 3 years old girl came to the department of pediatric surgery at Armand Trousseau Hospital with a ruptured umbilical hernia. This child was born prematurely at 27 weeks of gestation. She was handled and treated for persisting arterial duct by a medical prescription of ibuprofen with uneventful follow-up. She was known carrying a medullar malformation (syringomyelia between the 5th cervical and the 7th thoracic vertebrae) without any neurological impact. Few days before the accident, the patient had progressive constipation. Rupture of the umbilical hernia occurred in our case during a defecation effort. The skin over the hernia broke open, exposing the tissue inside the hernia sac. The infant was transferred to our institution by a medically assisted transfer. The delay between the occurring of the evisceration and the arrival to the hospital was three hours. Clinically the skin over the hernia breaks open.

The rest of the viscera looked healthy, the size of the fascial defect was approximately 1.5 cm. The hernia sac and overlying skin were excised. Closure of the defect was performed with an interrupted transverse suture; the umbilicus was then tacked to the fascia and the skin closed. Postoperative follow-up was uneventful. Oral supply was started the day after surgery, and the patient was discharged three days after surgery. Two years on follow-up, the child has remained healthy.

Figure 1: Spontaneous Rupture of Umbilical Hernia containing the momentum.
Discussion

All neonates have a small umbilical defect at birth through which the umbilical vessels pass. Typically the umbilical ring closes in the early days to weeks of infancy. However, in 10% to 30% of children, the defect fails to close and is apparent on physical examination. The incidence of an umbilical hernia is associated with race, birth weight, and certain syndromes. Sub-Saharan African infants, such in our case, are 6 to 10 times more likely than Caucasian children to have an umbilical hernia [2].

Likewise, infants born weighing less than 1200 g are nearly four times more likely to have an umbilical defect than their counterparts weighing greater than 2500 g [3].

There is both an embryological and anatomical basis for the development of an umbilical hernia. Embryologically, it is thought to be attributed to the failure of the recti to approximate in the midline following the return of the midgut into the peritoneal cavity leaving a midline defect in the linea alba. Anatomically, the umbilical ring consists of the umbilical scar, round ligament, and umbilical fascia. Usually, the round ligament passes over the superior margin of the umbilical ring and attaches to the inferior margin. However, if it only attaches to the superior margin of the ring, so that the floor of the umbilical ring is formed only by the umbilical fascia and peritoneum, this will create a weakness and hence predispose to an umbilical hernia [4].

Incarceration of the pediatric umbilical hernia is considered uncommon. However, several studies report the cause for repair to be incarceration in up to 5% of cases [5].

Spontaneous rupture of an umbilical hernia remains exceptional. B. Zendejas and al [5] reported only one case in a study including 489 children managed in their department for 53 years. Since 1956 and the first report of spontaneous rupture of an umbilical hernia, 19 similar cases were published in the medical literature. The average age of the patients was 12.3 months ranging from 2 weeks to 11 years (Table 1).

Table 1: Summary of similar published cases.

| Year | Authors | Country | Sex | Age | Predisposing Cause | Fascial Defect | Contents Eviscerated | Outcome |
|------|---------|---------|-----|-----|--------------------|---------------|----------------------|---------|
| 1956 | Strange [1] | England | M   | 3 M | Unknown            | NM            | Bowel                | Died    |
| 1965 | Harding-Jones and Robson [2] | England | F   | 11 W | Penny strapping causing ulceration | 1.3 cm | Caecum, appendix and terminal ileum | Alive |
| 1972 | Metcalff and Price [3] | Wales | F   | 7 W | Possible umbilical sepsis | NM | Small bowel | Alive |
| 1972 | Chatterjee [4] | India | NM  | 6 W | Umbilical sepsis | 2 cm | Small bowel | Died |
| 1977 | Chochinov [5] | Canada | F   | 1 M | Umbilical sepsis | 2.5 cm | Caecum, small bowel and ascending colon | Alive |
| 1982 | Holme and Gundersen [6] | Norway | M   | 3 W | Intussusception, crying | NM | Ileum | Alive |
| 1994 | Bain and Bishop [7] | England | F   | 9 M | Coughing, bronchiolitis, | NM | Caecum, small bowel | Alive |
| 1998 | Ahmed et al. [8] | Nigeria | F   | 2 M | Crying | >1.5 cm | NM | Alive |
| 2003 | Ameh et al. [9] | Nigeria | M   | 3 M | Crying, Previous umbilical sepsis | >1.5 cm | NM | Alive |
|      |         |         | F   | 10 M | Large ulcerated hernia | >1.5 cm | NM | Alive |
|      |         |         | F   | 3 M | Intestinal obstruction | >1.5 cm | NM | Alive |
|      |         |         | F   | 6 W | Unknown | >1.5 cm | NM | Alive |
| 2000 | Singh et al. [10] | India | F   | 8 M | Recurrent umbilical sepsis | 2 cm | Bowel | Alive |

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There are several factors which are thought to precipitate rupture including the age, the defect size, umbilical sepsis or ulceration and any condition which raises intra abdominal pressure (crying, coughing, pneumonia, positive pressure ventilation, ascites or intra-abdominal pathology).

In this case, the infant was suffering from constipation which is known to be a predictive factor since it raises intra-abdominal pressure. Umbilical sepsis was noted in 38% of the reported cases of the spontaneous evisceration. Foreign body impactions have been known to precipitate incarceration and, therefore, can be advocated as a predictive factor for umbilical sepsis. In the 13 cases where it was reported, the parietal defect was at least 1.5 cm. It suggests that the large hernias are more likely to present a spontaneous rupture. These reported cases are spread worldwide between developed and developing countries, making it difficult to determine any geographical significance.

We report the 20th case of this rare complication. The mortality rate is low, two cases of death were reported, In both cases, there was a delayed presentation to hospital with concomitant dehydration and sepsis in one case.

Conclusion

Rupture of an umbilical hernia is exceedingly rare in paediatric population; such case report should alert physicians to the potential risk factors for spontaneous rupture and in these patients expedite surgical repair.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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