Complicated umbilical hernia in childhood

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Summary
Umbilical hernias occur frequently in children but complications are rarely reported. This study assessed the incidence of complicated umbilical hernias in our patients, evaluated data for risk factors and reviewed our management in the light of these findings.

We conducted a prospective study of all children needing umbilical hernia repair for complications over a period of 15 years. Patients with para-umbilical and other ventral wall hernias were excluded. In total, 389 children had umbilical hernias repaired during this period (average age 6 years); 28 (7%) of these had complicated hernias. Symptoms included umbilical pain (100%), vomiting (71%) and constipation (28%). The average age of the complicated group was 3 years. All cases had a painful irreducible umbilical mass. Eleven of the 19 children who had an abdominal radiograph showed radiological evidence of small-bowel obstruction and in 5 children there was radiological evidence of pica. Two patients had ischaemic omentum that required resection. Patients who present with localised abdominal pain or an irreducible umbilical mass should be operated on promptly.

An umbilical hernia is a common childhood defect that occurs at the site of the cicatrised umbilical ring which closes concomitantly with the atrophy and obliteration of the umbilical vessels. The vast majority resolve spontaneously. Complications such as irreducibility, obstruction and strangulation are rarely reported. Possible predisposing factors for complications include pica, where sand may accumulate intraluminally and form an enterolith which cannot be reduced through the neck of the hernia because of its size, and ascarids, which may become entrapped and produce a similar clinical effect on the hernia.

The aim of this study was to determine the incidence of complicated umbilical hernia in our patients, to evaluate the data for risk factors, and to review our management in the light of the findings and the literature.

Materials and methods
Red Cross War Memorial Children’s Hospital admits children up to the age of 13 years and has a catchment population of 2 million. A prospective review was done of all children who underwent complicated umbilical hernia repair at the hospital over a 15-year period (1991 - 2005). Patients with para-umbilical hernias and other ventral abdominal wall defects were excluded. Details were recorded of gender, age, race, weight, previous history, and symptoms and signs of complication. Note was also taken of gestational age, coexistent conditions, and radiological and operative findings. Complications were defined as irreducibility, bowel obstruction, or strangulation.

Results
Between 1991 and 2005, 389 children underwent umbilical hernia repair, of whom 28 (7.21%) had complicated hernias. These 28 children were black children and 6 were coloured.

Fourteen of the 28 children were female. The average age of the complicated group was 3 years. All cases had a painful irreducible umbilical mass. Eleven of the 19 children who had an abdominal radiograph showed radiological evidence of small-bowel obstruction and in 5 children there was radiological evidence of pica. Two patients had ischaemic omentum that required resection. Patients who present with localised abdominal pain or an irreducible umbilical mass should be operated on promptly.
tive repair during the same admission. The size of the umbilical defect was recorded in 14 cases and ranged from 0.3 to 5 cm (mean 2.24 cm). The hernia contents were omentum (N = 6) and small bowel (N = 3). The small bowel was viable in all cases. In 2 children the omentum was necrotic and required resection. Children with pica and worms were treated for these conditions postoperatively. One child developed a superficial wound infection, and another an umbilical abscess that required incision and drainage.

Discussion

The quoted incidence of umbilical hernia in childhood varies widely. Several authors believe that the incidence is higher in black than white children, although others have shown no significant differences. Spontaneous closure of the defect has been described by Blumberg as being similar to a sphincter. Elastic fibres that reinforce the umbilical ring in infants coupled with proliferation of the lateral connective tissue plates originally from the cord are responsible for this. This is aided by the obliteration of umbilical vessels and fibrosis.

A recent review of the literature could only identify 45 cases of complicated umbilical hernia in the world literature. Although not all published reports were included, the relative number of complications is surprisingly small considering the ubiquity of the condition. Irreducibility is the main complication, with strangulation occurring less frequently.

In our study, 28 umbilical herniotomies were performed for initial irreducibility, with only 2 children having obstruction and strangulated omentum that required resection. The majority of complications (82%) occurred in children younger than 4 years, with an average age of 3 years. The average size of the fascial defect in cases where it was measured was 2.2 cm in our series and size did not seem to be related to the incidence of complications.

Complications were heralded by umbilical pain in every case. The majority complained of pain for about 24 hours before presentation. Often this was accompanied by vomiting, constipation, or both. Five children had sought medical attention for umbilical pain in the 6 months before their definitive operation. Despite the contention that umbilical hernias do not cause symptoms, it is acknowledged that pain may occur at the site; intermittent omental entrapment as the hernia gets progressively smaller is proposed as a possible mechanism.

The plain abdominal film was often helpful, confirming those patients with small-bowel obstruction in whom immediate resuscitation and appropriate surgical management was indicated, as well as identifying children with worm infestation and pica.

Seven per cent of all our patients with umbilical hernias required emergency repair for complications. Conservative management of these hernias must therefore be tempered with this knowledge. Complications are more common in black children, which may reflect their increased incidence of umbilical hernia.

Defect size has been proposed as a predictive factor for complications, but small defects (i.e. < 1.5 cm) may be more likely to complicate. In our series the average defect size was 2.24 cm. Average age at surgery was 3 years, suggesting that children with smaller defects at a younger age are more at risk for complications. Umbilical hernias can close up to the age of 14 years without complications. The only constant indication of potential complication was a history of localised umbilical pain or an intermittent mass at the site of the hernia. Because of our documented incidence of complications (7% in this series), we advocate that surgery should be performed around the age of 5 years if there is still a persistent defect > 2 cm, or immediately if there is a preceding history of localised umbilical tenderness or a mass at the site. However if there is significant protrusion of abdominal contents closure may be advanced to prevent rupture and for cosmetic reasons.

Vrsansky and Bourdelat and Ameh et al. have emphasised the potential for umbilical hernias to complicate in what has been believed to be a benign surgical condition. Haller et al. reported a 6% mortality rate and 9-day hospitalisation for adults undergoing emergency surgery for an ‘incarcerated’ umbilical hernia. Our series supports their plea for increased vigilance of umbilical hernias in children. Certainly expectant conservative management can continue; however it should be replaced by surgery in the case of children with a history of local tenderness or an intermittent mass at the site of the umbilical hernia. Parents of young children with umbilical hernial defects should also be alerted about the signs (mass) and symptoms (tenderness) of potential complications of the hernia.

REFERENCES