



UMBILICAL HERNIA, SIGNIFICANCE IN PAEDIATRICS -CASE SERIES WITH REVIEW OF LITERATURE

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<p>Article Info <i>Received 15/01/2015</i> <i>Revised 27/02/2015</i> <i>Accepted 22/03/2015</i></p> <p>Key words: Umbilical hernia, umbilical ring, incarcerated umbilical hernia, umbilicoplasty.</p>	<p>ABSTRACT Umbilical hernia (UH) is an abnormality in the abdominal wall and results when there is persistence of a patent umbilical ring. In paediatric anterior wall defects, UH is one of the most commonly encountered abnormalities in the early months of infancy. Literature review reported that it is seen in about 10 -20% of all children. Only a few children have a hernia that persists beyond four or five years of age as most of these UH close spontaneously. Surgical repair is required only in about 30% of the cases. This case series report UH in two children and highlight the significance of UH with a review of literature.</p>
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INTRODUCTION

Umbilical hernia is a common disorder of the anterior abdominal wall in children and is usually recognized in the early weeks of life after the cord falls off. UH is seen in about 10 -20% of all children. The incidence of UH at age 1 year ranges from 2-15% and the incidence is increased in infants of African origin (85%)[1]. The frequency is higher in premature and small for gestational age neonates. Low birth weight is a risk factor seen in the development of an UH. Children with congenital hypothyroidism, Down syndrome (trisomy 21), trisomy 13, trisomy 18 and Beckwith-Wiedemann syndrome have an associated UH. In children undergoing peritoneal dialysis also an UH can be seen. There is no sex predilection for the prevalence of UH [2]. Understanding the embryology and anatomy of the umbilical ring (UR) and looking for clues of associated congenital anomalies and syndromes in the presence of a UH is of value. Further, knowledge about the current treatment modalities for UH is important in every infant or children to achieve better outcome and to prevent its complications [3]. This article reports a case of UH in two children.

CASE REPORT

Case 1

A 2- year- old male child presented in the outpatient with an UH. The parents complained of the child having pain over the abdominal wall swelling since 1 week and had non projectile vomiting of 2 days duration. Parents were non-consanguineously married. Birth history revealed that he was born fullterm, weighing 3.9 kg and his newborn period was normal. He had normal milestones of development and was immunised to date. The UH was present since birth. He was under periodical follow up by the local Paediatrician, in anticipation of spontaneous closure of the defect. The UH was increasing in size and was advised Paediatric Surgeon management, but the family could not seek consultation due to personal reasons. On general physical examination, child was alert but had pain over the UH. He was afebrile, heart rate 72/minute , respiratory rate 36/minute. Per abdomen examination a soft swelling, irreducible was seen over the umbilicus. There was tenderness on palpation of the swelling and no rise of temperature over the swelling was noted. There was also



no dysmorphism, evidence of any congenital anomalies or syndromic features in the child. Other systemic examinations were normal. His ultrasonography (USG) of abdomen done 3 months back showed a 15 mm defect seen in the anterior abdominal wall in umbilicus with herniation of omentum. The impression was of an UH with rest of abdomen and pelvis being normal (Figure 1A). After admission, USG abdomen showed a 16X17 mm umbilical hernia defect noted through which bowel loop was protruding out. There were features of obstruction in the bowel loop such as no peristalsis in the bowel loop and minimal free fluid in the hernia sac (Figure 1B). The parents were informed about the need for surgery. Hemogram showed Hb (10.9 g/dl), PCV (33.7%), total count (11000/ μ l), neutrophils (47%), lymphocytes (48%), eosinophils (3.3%), monocytes (1.5%), basophils (0.2%), ESR (31mm/hr), and platelets count (210000/ μ l) were all found to be normal. Past thyroid function tests done were normal. During surgery under general anaesthesia, omentum was found firmly adhered to the hernia sac which had to be dissected in order to be reduced into the peritoneal cavity. The umbilical opening was closed and the patient had an uneventful recovery.

Case 2

A 6- month- old male child presented in the outpatient with an UH (Figure 2 A). Parents were non-consanguineously married and the parents are very much worried about the increasing size of the UH especially when he is crying and being very much playful (Figure 2 B). Birth history revealed that he was born to a 24 year old mother at 38 weeks gestation via spontaneous vaginal delivery weighing 2.7 kg and his newborn period was normal. He is developing normally. The UH was present since birth. He is under regular periodical follow up in our outpatient. The UH is increasing in size but is reducible. On general physical examination, child was alert and playful and is well nourished on breastfeeding and weaning feeds. There is no evidence of any dysmorphism, congenital anomalies or syndromic features in this child. All systemic examinations are normal. His USG of abdomen done now showed the reducible UH with abdomen and pelvis being normal (Figure 2C). Past thyroid function tests done were normal. The parents were reassured, explained about possibility of spontaneous closure and advised follow up.

Figure 1. (A) Ultrasonogram of abdomen done 3 months back showed a 15mm defect seen in the anterior abdominal wall in umbilicus with herniation of omentum and (B) Ultrasonogram of abdomen done after admission showed a 16X17 mm umbilical hernia defect noted through which bowel loop was protruding out. There were features of obstruction in the bowel loop such as no peristalsis in the bowel loop and minimal free fluid in the hernia sac.

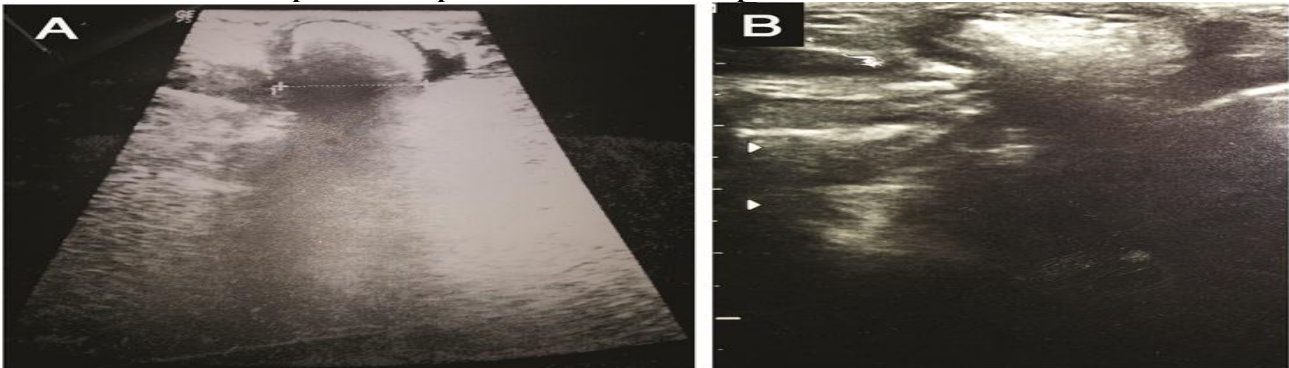
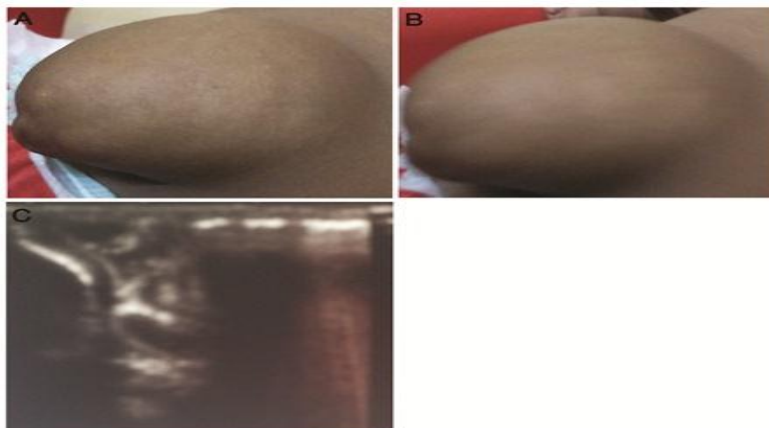


Figure 2. (A) Umbilical hernia (UH) causing concern to the parents; (B) UH increasing in size on crying and also when child is playful and (C) Ultrasonogram of abdomen done now showed the reducible UH with abdomen and pelvis being normal.



DISCUSSION

The daily routine practice of a Paediatrician will meet with many children with umbilical disorders and UH is common. The parents are worried because the swelling is present since birth and is increasing in size, especially when the child cries or coughs. One of the reasons to refer an infant or a child to the Paediatric Surgeon is because of an UH. UH is defined as protrusion of intra-abdominal contents through the UR due to the incomplete closure of the fascia of the UR [4]. Literature review has not identified any common etiological factor responsible for occurrence of UH in the majority of these neonates, infants and children. Low birth weight and premature infants are more likely to have an UH. Boys and girls are equally affected. Preterm babies with a birth weight 1-1.5 kg are more prone to have a UH than in those weighing 2-2.5 kg at birth [5].

A small opening is left in the abdominal wall after birth when the end of the umbilical cord with the structures such as umbilical vein, umbilical arteries, and urachal remnant, dry up. A failure of the abdominal muscles to close around this opening results in an UH. The area of the UR is covered by skin and this distinguishes an UH from an omphalocele [2,4]. As the skin over the UH is intact and the size of the opening is relatively small this is the mildest form of abdominal wall defect [5]. The UR has important anatomical attachments and is supported inferiorly by the attachments of the median umbilical ligament (the obliterated urachus) and the paired medial umbilical ligaments (the obliterated umbilical arteries) and the round ligament (the obliterated umbilical vein) is present superiorly. Richet fascia that is originating from the transversalis fascia is covering the UR and the innermost portion of the UR is covered by the peritoneum. The abnormalities in the attachment of these ligaments and the covering by Richet fascia is a predisposing factor children to develop UH [6]. The opening usually is noticed within a few weeks after separation of the umbilical cord. Marked stretching of the skin and a proboscis appearance of the abdominal wall can be seen even in a small umbilical defect due to the the pressure exerted on the umbilical skin and causes much concern [7].

The UH is most prominent when the infant or child is crying, straining or on sitting up. This is well evident in case 2 presented here. The UH may be flat when the infant lies on the back and is quiet. An UH is usually painless and can have a diameter from less than 1 cm to more than 5 cm. UH can be diagnosed by a careful physical examination by the treating physician and usually does not require costly investigations. There is a strong association of UH in congenital dysmorphic syndromes such as Down syndrome, Beckwith-Wiedemann syndrome and in the trisomy 13, 18 as well [1-3,6,7]. In the cases presented, both children did not have any of the dysmorphic syndromes. Presently no medical therapy to hasten the process of closure of the UH is recognized. UH in many children undergo spontaneous closure in the first

few years of life ie by 3-4 years. The diameter of the UR defect can to an extent prognosticate spontaneous closure, whereas the length of the protruding skin of the UH does not have any significance. UH with ring diameters less than 1 cm are more likely to spontaneously close than those with ring diameters more than 1.5 cm. If the UR defect is small the child can be followed up till age 4-5 years so as to allow spontaneous closure. If closure does not occur by this time, surgical repair is usually advised [7,8]. The child in case one had initially an UH but was asymptomatic and was followed-up and required surgery later. UH repair is one of the most common surgical procedures performed by Paediatric Surgeons worldwide.

In the past strapping the UH in infants by coin or any other object was practised but is cumbersome and is not beneficial apart from allaying the anxiety of the parents for a short period [2-4].

UH are of two types a direct, congenital type and an oblique indirect, acquired type. Regardless of its size the congenital type will disappear by the age of three years. On the contrary, the indirect UH progresses and becomes larger mostly requiring surgical repair. By clinical examination, it is rarely possible to identify the two types of UH, unless the hernia is quite large [9]. The persistence of UH after three years favors the oblique type along with the marked downward displacement of the umbilicus [8,10].

Surgery is indicated for all symptomatic UH or if the fascial defect fails to decrease in size over time and do not spontaneously close. UH with larger UR defects (ie, >1.5 cm) are unlikely to close spontaneously, surgery is recommended to be performed at an earlier age [8,10]. When the intestines get trapped within the UH, the condition is known as an incarcerated hernia [11]. In this situation the child usually has severe pain and the UH may be firm and red. So, in any UH during the physical examination it is pertinent to determine if there are any abdominal contents in the UH sac. In case one, USG of abdomen showed the UH defect through which bowel loop was protruding out with features of obstruction such as no peristalsis in the bowel loop and the child was symptomatic also. In the case two of the report, the UH is increasing in size but is reducible and does not have any features of obstruction and the child is under follow-up. Incarceration, strangulation, skin erosion, and bowel perforation are indications for immediate surgery [11,12].

UH rarely cause abdominal pain so children with UH with pain should be thoroughly evaluated for other causes of abdominal pain. Adults with UH have high risk of developing incarceration of UH than in the paediatric age group [11]. Radiography helps to rule out incarceration and is not routinely done if UH is asymptomatic. Unexpected detection of an UH have been observed during Barium meal study of the upper gastrointestinal tract and a small bowel follow through [6,9,10]. The various steps in the surgery of UH includes identification of all anatomical structures of the umbilicus, surgical excision of urachal



and omphalomesenteric remnants, closure of the UR and preservation of the natural aesthetic appearance of the umbilicus [7-12].

UHs are approached through an incision in the infraumbilical or supraumbilical crease. Utmost care is taken to avoid injury to contents within the hernia sac (which is reduced initially) and to the umbilical skin. To avoid injury to the bowel, opening the anterior surface of the sac is advocated. The sac is resected down to the level of the fascia. The umbilical fascia is closed with interrupted or running absorbable sutures. For large or recurrent hernias, a non-absorbable suture is used and strict aseptic precautions and hemostasis maintained. In huge UH, which are voluminous, umbilicoplasty using skin flaps provide better aesthetic results [7]. The complications

after a UH surgery include intraoperative or postoperative bleeding, infection of the incision and post operative ileus. Recurrent umbilical hernias are very rare but is mentioned [13]. UH repair also increases the incidence of functional gastrointestinal disorders, especially in children [14]. This case series conclude that awareness of UH among the Paediatricians and treating Physicians is very important in preventing unnecessary worries and also not missing serious life saving conditions associated with it.

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