

# Appendicitis within an umbilical hernia sac: previously unreported complication in children

## Umbilikal fitik kesesi içinde apandisit: Çocuklarda daha önce bildirilmemiş bir komplikasyon

Cüneyt ATABEK, İlhami SÜRER, Hasan DELİAĞA, Bahadır ÇALIŞKAN,  
Abdülkerim TEMİZ, Suzi DEMİRBAĞ, Haluk ÖZTÜRK

Umbilical hernia is one of the most common congenital pathologies of the anterior abdominal wall in children. Umbilical hernia in children has a high tendency for spontaneous closure. Surgical treatment is performed only for rarely occurring complications. Appendicitis within an umbilical hernia sac is a previously unreported complication for umbilical hernias. We report here the first case in the current English language literature.

**Key Words:** Appendicitis; children; complications; hernia, umbilical/surgery; infant.

Umbilikal fitik, çocuklarda karın ön duvarının sık karşılaşılan doğumsal patolojilerinden biridir. Çocuklarda görülen umbilikal herni, yüksek sıklıkla kendiliğinden kapanma eğilimindedir. Cerrahi tedavi ancak seyrek görülen komplikasyonlar geliştiğinde gereklidir. Umbilikal fitik kesesi içerisinde gelişen bir apandisit olgusu, daha önce bildirilmemiştir. Bu olgu, İngilizce literatürde bir ilktir.

**Anahtar Sözcükler:** Apandisit; çocuk; komplikasyon; umbilikal fitik/cerrahi; yenidoğan.

Umbilical hernia is one of the most common congenital pathologies of the anterior abdominal wall in children. Since there is a tendency for spontaneous closure in the majority of the cases during the early years of life, the real incidence is controversial, but the estimated incidence is about 15-32%.<sup>[1-7]</sup> It is particularly seen in premature or small for gestational age infants. Although there is no genetic predisposition, there is a higher incidence for Afro Caribbean origin infants. It is also detected as an associated anomaly in Beckwith-Wiedemann syndrome, trisomy-21 and congenital hypothyroidism.<sup>[7]</sup> Conservative management is recommended since complications, which include incarceration, strangulation and recurrent abdominal pain, occur rarely.<sup>[1-7]</sup>

## CASE REPORT

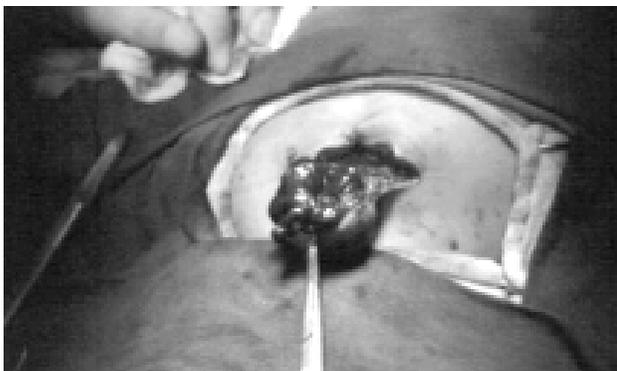
A 25-day-old male infant was operated because of bilateral inguinal hernia and taken under follow-up for an umbilical hernia with an internal diameter of 1.5 cm. On the 25th day of the follow-up, he presented to our clinic with fever and bilious vomiting. On physical examination, there was abdominal distention, erythematic area around the umbilicus and a palpable but not reducible soft tissue mass within the umbilical defect. He underwent emergency operation with the provisional diagnosis of strangulation. In the operation, appendicitis in the umbilical hernia sac was detected (Fig. 1). Appendectomy and primary closure of the umbilical defect were performed. The postoperative period was uneventful.

## DISCUSSION

Although surgical treatment for umbilical hernias may be performed for hernias of more than 2 cm in diameter, which have not closed spontaneously by 4 years of age and cause parental anxiety, the only real surgical indication for umbilical hernias are incarceration and strangulation.<sup>[1]</sup> On the other hand, the 6% mortality reported by Haller for the emergent surgical operations of umbilical hernias in adults suggests seriously determining the relative indications for children.<sup>[1]</sup> The postoperative period in our case was uneventful and no morbidity occurred during the follow-up.

Incarceration and strangulation generally occur in infants less than 6 months of age and in medium-sized defects according to Lassaletta classification (Table 1), with an incidence of 0.07-0.3%.<sup>[2-6]</sup> Small intestines, especially the terminal ileum, are the most often involved contents within the hernia sac, but cecum, appendix and ascending colon may also be involved. Omentum is thought to be the incarcerated organ in patients with recurrent abdominal pain. Ascites, bezoars, undigested food, foreign bodies, *Ascaris lumbricoides*, obesity and invagination are all reported causes of incarceration and strangulation.<sup>[1-3,6]</sup> The two-month-old boy reported here is the first patient who presented with appendicitis in a medium-sized umbilical hernia sac caused due to incarceration of the appendix, cecum and the terminal ileum.

Appendicitis within other hernia sacs is not a rare entity and has been termed as Amyand's hernia for inguinal hernias and De Garengeot hernia for femoral hernias. The reported incidence of appendicitis within the hernia sac is 1.6% for adults, but



**Fig. 1.** Intraoperative view of appendicitis within the umbilical defect.

**Table 1.** Lassaletta classification for umbilical hernias

Diameter of fascial defect	Size
<0.5 cm	Small
0.5-1.5 cm	Medium
>1.5 cm	Large

there is no such incidence for children.<sup>[7-10]</sup> To the best of our knowledge, there is no case of appendicitis within the umbilical hernia sac in the current English language literature.

The possible hypothesis of why appendicitis occurs within the hernia sacs is ischemia caused by the compression at the neck of the sac and recurrent trauma causing adhesions, inflammation and bacterial overgrowth.<sup>[10]</sup> Since the patient was under follow-up when the event occurred acutely, the first hypothesis seems more feasible for this case.

In view of this previously unreported complication of umbilical hernia in a child, it should be kept in mind that the strangulated abdominal content might be the appendix.

## REFERENCES

1. Meier DE, OlaOlorun DA, Omodele RA, Nkor SK, Tarpley JL. Incidence of umbilical hernia in African children: redefinition of "normal" and reevaluation of indications for repair. *World J Surg* 2001;25:645-8.
2. Fall I, Sanou A, Ngom G, Dieng M, Sankalé AA, Ndoye M. Strangulated umbilical hernias in children. *Pediatr Surg Int* 2006;22:233-5.
3. Papagrorgoriadis S, Browse DJ, Howard ER. Incarceration of umbilical hernias in children: a rare but important complication. *Pediatr Surg Int* 1998;14:231-2.
4. Keshtgar AS, Griffiths M. Incarceration of umbilical hernia in children: is the trend increasing? *Eur J Pediatr Surg* 2003;13:40-3.
5. Okada T, Yoshida H, Iwai J, Matsunaga T, Ohtsuka Y, Kouchi K, et al. Strangulated umbilical hernia in a child: report of a case. *Surg Today* 2001;31:546-9.
6. Ameh EA, Chirdan LB, Nmadu PT, Yusufu LM. Complicated umbilical hernias in children. *Pediatr Surg Int* 2003;19:280-2.
7. Garcia VF. Umbilical and other abdominal wall hernias. In: Ashcraft KW, editor. *Pediatric surgery*. Philadelphia, Pennsylvania: W.B. Saunders Company; 2000. p. 651-3.
8. Yazici M, Etensel B, Gürsoy H, Ozkisacik S, Erkus M, Aydin ON. Infantile Amyand's hernia. *Pediatr Int* 2003;45:595-6.
9. Akopian G, Alexander M. De Garengeot hernia: appendicitis within a femoral hernia. *Am Surg* 2005;71:526-7.
10. Al-Qahtani HH, Al-Qahtani TZ. Perforated appendicitis within paraumbilical hernia. *Saudi Med J* 2003;24:1133-4.