

Internal Herniation Due to Appendix Vermiformis Rotation: A Rare Case of an Acute Abdomen

Mehmet Erikoğlu, Mehmet Aykut Yıldırım



ABSTRACT

Internal herniation is a rare occurrence that appears in about 0.2-0.9% of autopsy cases. An 84-year-old female patient presented to our clinic with severely distended the abdomen .Abdominal examination revealed tenderness and rebound mainly in the right side of the abdomen. Following the laparotomy it was observed that the appendix vermiformis was about 12 cm in length and was adhered to the cecum having rotated around itself at 360 degrees. It was also seen that a terminal ileum loop of about 30 cm. had penetrated into the appendix forming a circle having rotated around itself and that this segment was ischemic and a portion was perforated for a length of 1 cm. Further, this rotation had also affected the cecum which showed ischemic changes. A right hemilectomy and segmenter small bowel resection were performed. There were no problems during the follow-ups the patient was discharged on the tenth postoperative day. Although there are several reports detailing various kinds of internal herniation published in literature.

Key words: Internal herniation, appendix rotation, acute abdomen

Apendiks Vermiformis rotasyonu Nedeniyle Gelişen İnternal Herniyasyon: Nadir Akut Abdomen Nedeni

ÖZET

İnternal herniasyon otopsi olgularının %0.2-0.9 da ortaya çıkan nadir bir durumdur. 84 yaşında kadın hasta karında ileri derecede distansiyon ile kliniğimize başvurdu. Karın muayenesinde sağ tarafta daha belirgin olmak üzere yaygın hassasiyet, rebound ve defans mevcuttu. Akut karının etyolojisinin belirlenmesi amacıyla hasta acil olarak operasyona alındı. Laparotomi sonrası gözlemlenilen apendiks vermiformisin yaklaşık 12 cm uzunluğunda olduğu ve kendi etrafında 360 derece rotasyon yaparak çekuma yapıştığı gözlemlendi. Rotasyon yaparak bir çember oluşturan apendiksin içine yaklaşık 30 cm lik bir terminal ileum ansının girdiği ve bu segmentin iskemik olduğu ve 1 cm lik kısımdan perfore olduğu tespit edildi. Ayrıca bu rotasyondan çekumun da etkilendiği ve çekumda da iskemik değişiklikler gözlemlendi. Hastaya sağ hemikolektomi, segmenter ince barsak rezeksiyonu yapıldı. Takiplerinde sorun olmayan hasta postoperatif 10. günde taburcu edildi. Literatürde çok çeşitli internal herniasyon vakaları yayınlanmasına rağmen, benzerine rastlamadığımız apendiks rotasyonu sonucu internal herniasyon gelişen bir vakayı sunmayı amaçladık.

Anahtar kelimeler: İnternal herniasyon, apendiks rotasyonu, akut karın

INTRODUCTION

Internal herniation is a rare clinical event that emerges in 0.2-0.9% of autopsy cases. Preoperative diagnosis of internal herniation cases is very difficult and patients generally present with the clinical symptoms of small bowel obstruction. Acute abdomen is always seen with ischemia and is often related to malnutrition and late cases of perforation. During the preoperative period the most helpful

radiological method is the CT scan. The decision of surgery for these patients is generally made according to the physical examination results (1,2).

CASE

An 84-year-old female patient presented to our Emergency clinic with complaints of abdominal pain,

Necmettin Erbakan University Meram Medical Faculty, General Surgery, Konya, Turkey

Correspondence: Mehmet Erikoğlu, Necmettin Erbakan University Meram Medical Faculty, General Surgery, Konya, Turkey

Received: 26.01.2012, Accepted: 25.05.2012

nausea, vomiting, and unable to excrete gas-stool for the previous three days. There was no abdominal surgery reported in the patient's history. She was on anti-hypertensive medication because of hypertension. A physical examination revealed that her general condition was not stable: she was inclined to somnia, her arterial blood pressure was 90/50 mm/Hg and her pulse was 100/min. The patient's abdomen was severely distended and showed extensive sensitivity and rebound, defense being clearer on the right side. A digital rectal examination revealed no pathological features. Routine blood test showed that her leukocyte level was 22000 K/uL; creatinine level, 4.6 mg/dl; urea, 60 mg/dl; CRP was 100 mg/dl; and procalcitonine, 4.5 ng/L. Direct abdomen graphy revealed small intestinal levels. When ultrasonography was performed abdominal free fluid and dilatation were seen in the small intestinal loops. Since the patient's renal functions were failing, no abdominal CT scan was performed before the operation and she was taken into emergency surgery with a pre-diagnosis of ileus based on the clinical and examination results. Following the laparotomy it was observed that the appendix vermiformis was about 12 cm in length and was adhered to the cecum having rotated around itself at 360 degrees. It was also seen that a terminal ileum loop of about 30 cm. had penetrated into the appendix forming a circle having rotated around itself and that this segment was ischemic and a portion was perforated for a length of 1 cm. Further, this rotation had also affected the cecum which showed ischemic changes (Figure 1). A right hemilectomy and segmenter small bowel resection were performed. Because of the patient's age and additional diseases, end-to-end anastomosis was not considered. The colon remaining in the distal was closed and left in the abdomen and end ileostomy was performed. The patient was taken into the intensive care unit following the operation where she received fluid electrolyte and supportive care. On the third postoperative day she was moved to the ward since her general condition and biochemical parameters had improved. Tests showed the urea-creatinine levels were within normal limits. Her CRP level was 63 mg/L and procalcitonine level was 1.4 ng/L. As there were no problems during the follow-ups the patient was discharged on the tenth postoperative day.

DISCUSSION

Internal hernias develop because the intestines are herniated due to peritoneal or mesenteric defects. This condi-



Figure 2. The appearance of the appendix and ischemic changes of the ileum.

tion may be congenital or acquired. Previous surgeries, trauma or inflammation are among the most prominent causes of acquired internal hernias while congenital hernias originate from anomalies during the rotation of the intestines in the embryonic period. Internal hernias are classified according to their location as paraduodenal (50-55%), pericecal (10-15%), foramen Winslow (8%), transmesenteric and transmesocolic (8%), pelvic and paravesical (6%), sigmoid (6%), and transomental (1-4%) (1-3).

The most frequently herniated organ in internal herniation is the small bowel and patients generally present with the symptoms of small bowel obstruction. The clinical symptoms may range from mild abdominal pain to acute abdomen. The fact that the symptoms are generally non-specific during the period up to the formation of the strangulation increases the possibility of ischemia in the intestines and since delays in early diagnosis bring about ischemia due to strangulation, mortality and morbidity rates increase (2,4,5). The patient in our case had herniated small bowel and the symptoms of small bowel obstruction and we performed intestinal resection because of strangulation.

The safest method in diagnosing internal hernias is computed tomography (CT), a highly valuable tool in the early diagnosis and planning of surgical treatment of these patients because of the increase in mortality and morbidity caused by delays in diagnosis (1,6). In this case we did not suggested a CT scan before surgery since the patient not only presented with surgical acute abdomen symptoms but renal dysfunction also.

While internal obstruction caused by internal hernias are rare, they certainly need to be taken into consideration within the framework of differential diagnosis especially when there is a history of abdominal surgery or trauma. Intestinal ischemia generally develops in these cases, sometimes because an accurate diagnosis before surgery is difficult, or sometimes because of delays in patients' presentation to the hospital (1). We have seen that the appendix vermiformis was attached to the cecum having rotated around itself at 360 degrees and the small bowel loop got into this circle and became strangulated. Although we have researched this phenomenon, we have not come across any examples in the literature that resemble this particular case.

The literature on the subject reports paracecal hernias as rare causes of internal hernias stating that these are frequently formed as a result of the changes in the normal process of intestinal rotation during embryological development (6). Meyers et al. classify paracecal hernias into 6 groups: paracecal sulcus, cecal fossa, cecal recess, superior iliacal recess, inferior iliocecal recess, and retrocecal recess. Although our case may be described as a paracecal hernia group due to its location, it was not possible for us to classify it wholly as such since the appendix formed an opening having been attached to the cecum as a result of its rotation forming a circle. We think that the attachment of the appendix to the cecum forming a circle is more easily detected than cases where patients have had previous abdominal surgery or abdominal infection.

In conclusion, internal herniation is among the rare surgical pathologies and is often difficult to arrive at an accurate diagnosis before surgery because of the uncertainty of the clinical symptoms. Delays in diagnosis may lead to morbidity and mortality. In the literature examining internal herniation we have not found any cases where this is due to the rotation of the appendix vermiformis around itself. Therefore, we believe that this presentation contributes to the current literature.

REFERENCES

1. Takeyama N, Gokan T, Ohgiya Y, et al. CT of internal hernias. *Radiographics* 2005; 25(4):997-1015
2. Rajeswaran G, Selvakumar S, King C. Internal herniation of the caecum into the lesser sac: an unusual cause of an acute abdomen. *Eur Radiol* 2010;20:249-52
3. Meyers M. Internal abdominal hernias. In: Meyers MA (ed) *Dynamic radiology of the abdomen: normal and pathologic anatomy*, 5th eds. Springer, New York, 2000; pp 711-748
4. Ghiassi S, Nguyen SQ, Divino CM, Byrn JC, Schlager A. Internal hernias: clinical findings, management, and outcomes in 49 nonbariatric cases. *J Gastrointest Surg* 2007;11(3):291-5
5. Zarvan NP, Lee FT Jr, Yandow DR, Unger JS. Abdominal hernias: CT findings. *AJR Am J Roentgenol* 1995;164(6):1391-5.
6. Jang EJ, Cho SH, Kim DD. A Case of Small Bowel Obstruction Due to a Paracecal Hernia *J Korean Soc Coloproctol* 2011;27(1);41-3.