

# Laparoscopic Management of Pediatric Omental Infarction

GREGORY T. BANEVER, MD, MICHAEL E. GANEY, MD,  
KEVIN P. MORIARTY, MD, FACS, FAAP,  
and RICHARD A. COURTNEY, MD, FACS, FAAP

## ABSTRACT

**Objective:** Primary segmental infarction of the omentum is an infrequent cause of acute abdominal pain in children. We describe our experience with seven children.

**Methods:** A retrospective chart review was performed at a tertiary referral center for 2001.

**Results:** Seven patients, five boys and two girls, presented at the age of 4 to 13 years (average age, 8.7 years). Four patients were above the 95th percentile, with all above the 70th percentile, for weight. All experienced right lower quadrant pain of 18 to 96 hours' duration. White blood cell counts were 7800 to 16,200/mm<sup>3</sup>, and one child had fever. Two ultrasonograms were performed for appendicitis, with one false positive and one nonvisualized appendix. In one case, computed tomography revealed nonmesenteric intra-abdominal fat streaking, suggesting omental infarction. Six of seven patients' preoperative diagnoses were acute appendicitis. All underwent partial omentectomy and incidental appendectomy. Four cases were laparoscopic and two open, and one was converted to open because of concern for bowel injury. Pathology revealed normal appendices and acute hemorrhagic omental infarction. Two cases of umbilical port site cellulitis resolved with antibiotics. Patients were discharged home on the first or second post-operative day and were doing well at final follow-up.

**Conclusions:** Primary omental infarction is a rare cause of acute abdominal pain in children that is often misdiagnosed as acute appendicitis. Laparoscopy is an excellent diagnostic and therapeutic approach for these often overweight patients.

## INTRODUCTION

PRIMARY SEGMENTAL INFARCTION of the greater omentum, first described by Bush in 1896,<sup>1</sup> has remained a rare cause of acute abdominal pain. In both children and adults, the condition presents with findings often consistent with acute appendicitis. The actual etiology of the abdominal pain is most often identified only at operation, and the diseased portion of the omentum is resected.

We describe our experience with seven children who were found to have omental infarction, and its successful treatment with laparoscopy in four of them.

---

Division of Pediatric Surgery, Baystate Medical Center Children's Hospital, Tufts University School of Medicine, Springfield, Massachusetts.

## PATIENTS AND METHODS

A retrospective chart review at a tertiary referral center was conducted, with a search for all cases of omental infarction in patients younger than 18 years of age during the year 2001. Seven cases were identified, and the inpatient and outpatient records were obtained for review.

Five boys and two girls presented at the age of 4 to 13 years (average, 8.7 years). All patients presented with right lower quadrant abdominal pain lasting between 18 and 96 hours, and white blood cell counts ranged from 7800 to 16,200/mm<sup>3</sup> (average, 12,200/mm<sup>3</sup>). Only one child had fever at presentation. All children were above the 70th percentile for weight based on age, with four patients above the 95th percentile.

Two ultrasonograms were performed, of which one was read as suggestive of acute appendicitis and the other as a nonvisualized appendix. A computed tomographic scan obtained in one overweight child with persistent symptoms after 96 hours revealed nonmesenteric intraabdominal fat streaking (Fig. 1). This patient was taken to the operating room with a presumed diagnosis of omental infarction, whereas acute appendicitis was the working diagnosis in the remaining six children.

## RESULTS

Because of a concern for ruptured appendicitis, two children underwent open procedures. The other five cases were initiated laparoscopically. One case was converted to open because of concern about involvement of the right side of the colon. Only one appendix appeared to have mild serosal inflammation; the others were grossly normal. A combination of endoscopic GIA staplers and Harmonic scalpel was used to excise the diseased omentum. In one instance, torsion of an omental projection appeared to be the cause; the others seemed to be primary in nature (Fig. 2). In all cases, the appendix was removed. All seven patients were discharged home on the first or second postoperative day. Two cases of umbilical port site cellulitis occurred and were successfully treated with antibiotics. At a follow-up of 1 to 3 weeks, all patients were doing well. At more than 5 months after the surgery, none had developed bowel obstruction.

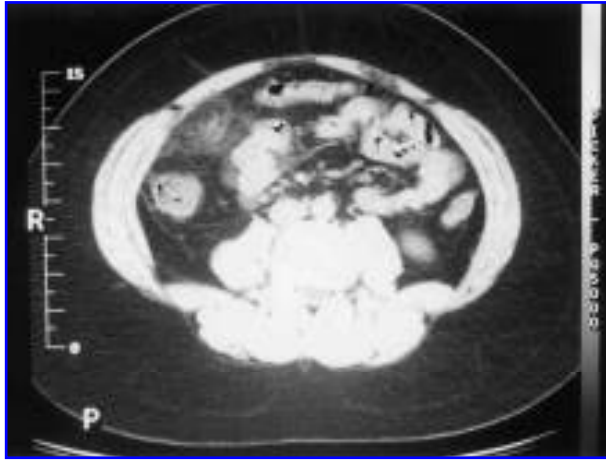
The pathologic investigation of the specimens revealed hemorrhagic omental infarction, which was mostly evidenced by vascular congestion, acute inflammation, and hemorrhage. Fibrinous exudate was observed in two of the specimens. All appendices were histologically normal.

## DISCUSSION

Primary idiopathic infarction of the omentum is an uncommon condition that most often presents with abdominal pain suggestive of acute appendicitis or cholecystitis. In pediatric patients, this pain is most frequently attributed to appendicitis, and prompt surgical exploration is performed.

Omental infarction has been classified as primary or secondary. Primary cases may be either idiopathic or secondary to torsion. Although these two have been described separately in the literature, there appears to be no difference in their presentation, clinical management, or outcome.<sup>2</sup> The torsion variant involves rotation of what has been described as a tongue-like projection of omental fat, typically located on the right side, that causes vascular congestion, ischemia, and then infarction.<sup>3</sup> The idiopathic type has been defined as spontaneous segmental omental infarction, not resulting from disease in other organs, and possessing gross and pathologic findings that exclude other causes, particularly torsion.<sup>4</sup> The seven cases we are presenting represent both the idiopathic and secondary-to-torsion types. Secondary cases arise from a known intra-abdominal or systemic disorder.

Multiple hypotheses have been proposed to explain the cause of idiopathic omental infarction. As summarized in a review by Quinn and Jothi,<sup>5</sup> these include venous injury secondary to gravitational stretching, developmentally or acquired inadequate blood supply, and postprandial engorgement followed by vascular



**FIG. 1.** Computed tomographic scan revealing nonmesenteric fat streaking in the right side of the abdomen.

injury from minor trauma. Several of these theories involve an increased risk in obese patients because of the excessive omental fat content. A definite propensity toward obesity was seen in our patient group, and this has been observed by other authors.<sup>6,7</sup>

Regardless of the cause, the incidence of omental infarction appears to be increasing. With the documented earlier return to usual activities after laparoscopic appendectomy, the threshold to perform laparoscopic exploration in children with abdominal pain may be lower than that traditionally used for open appendectomy. Some of these additional procedures may be revealing those patients with omental infarction whose symptoms would have resolved spontaneously in the past. In our series for the year 2001, one case of omental infarction was found for every 11 cases of acute appendicitis, a ratio that is much higher than the 1:185 to 1:800 rates reported in the literature.<sup>6,8,9</sup> It should be noted that the previous reviews spanned time periods from 6 to 30 years, and the vast majority of these intervals were before the introduction of laparoscopy. An additional factor that may be increasing the incidence of omental infarction is the growing prevalence of obesity in children.



**FIG. 2.** Infarcted omentum adherent to the lateral abdominal wall.

Nonoperative therapy has been proposed as a management option for omental infarction. Puylaert<sup>10</sup> reported seven patients who were managed nonoperatively for radiologically documented omental infarction. None of these patients experienced significant morbidity; however, three experienced nagging sensations that persisted for several months before resolving completely. However, serious complications have been reported, including death secondary to sepsis in a patient with omental infarction.<sup>11</sup> Also, an adult female patient required partial left colectomy with colostomy,<sup>12</sup> and another patient developed an associated abscess.<sup>13</sup> Two of our patients did develop umbilical port site erythema and were treated empirically for cellulitis, but all were discharged home soon after resection of their diseased omentum without any other complications. Laparoscopic resection appears to be a definitive and favorable management strategy, as substantiated by similar studies.<sup>3,14,15</sup>

## CONCLUSION

Primary omental infarction should be included in the differential diagnosis of the pediatric patient who presents with acute abdominal pain. We have demonstrated that omental infarction can be successfully managed laparoscopically, with the expected early return to usual activities that is seen with laparoscopic appendectomy. We have also observed, as described in the literature, an association between omental infarction and overweight in children.

## REFERENCES

1. Bush P. A case of hemorrhage into the greater omentum. *Lancet* 1896;1:286.
2. Barcia PJ, Nelson TG. Primary segmental infarction of the omentum with and without torsion. *Am J Surg* 1973;126:328-331.
3. Steyaert H, Valla JS. Laparoscopic approach to primary infarction of the greater omentum. *Surg Laparosc Endosc* 1997;7:97-98.
4. Wrzesinski JT, Firestone SD, Walske BR. Primary idiopathic segmental infarction of the omentum: A report of 2 cases. *Surgery* 1956;39:663-668.
5. Quinn AD, Jothi RK. Idiopathic segmental infarction of the greater omentum. Report of a case mimicking appendicitis. *Postgrad Med* 1986;79:133-134, 139-140.
6. Rich RH, Filler RM. Segmental infarction of the greater omentum: A cause of acute abdomen in childhood. *Can J Surg* 1983;26:241-243.
7. Crofoot DD. Spontaneous segmental infarction of the greater omentum. *Am J Surg* 1980;139:262-264.
8. Kimber CP, Westmore P, Hutson JM, Kelly JH. Primary omental torsion in children. *J Paediatr Child Health* 1996;32:22-24.
9. Knight PJ, Vassy LE. Specific diseases mimicking appendicitis in childhood. *Arch Surg* 1981;116:744-746.
10. Puylaert JB. Right-sided segmental infarction of the omentum: Clinical, US, and CT findings. *Radiology* 1992;185:169-172.
11. Patchell RD. A fatal case of idiopathic omental infarction. *W V Med J* 1977;73:29-30.
12. Vertuno LL, Dan JR, Wood W. Segmental infarction of the omentum: A cause of the semi-acute abdomen. *Am J Gastroenterol* 1980;74:443-446.
13. Balthazar EJ, Lefkowitz RA. Left-sided omental infarction with associated omental abscess: CT diagnosis. *J Comput Assist Tomogr* 1993;17:379-381.
14. Helmroth MA, Dorfman SR, Minifee PK, Bloss RS, Brandt ML, DeBakey ME. Right lower quadrant pain in children caused by omental infarction. *Am J Surg* 2001;182:729-732.

## LAPAROSCOPIC MANAGEMENT OF PEDIATRIC OMENTAL INFARCTION

15. Danikas D, Theodorou S, Espinel J, Schneider C. Laparoscopic treatment of two patients with omental infarction mimicking acute appendicitis. *JSL* 2001;5:73-75.

Address reprint requests to:  
*Kevin P. Moriarty, M.D., FACS, FAAP*  
*Pediatric Surgery Services*  
*125 Liberty Street*  
*Springfield, MA 01103*

*E-mail: kpmort@charter.net*