

## Primary Omental Infarction: A Rare Cause of Acute Abdominal Pain

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### Abstract

Omental infarction is an uncommon but important cause of acute abdominal pain, which frequently mimics other surgical presentations. The current series describes five cases of idiopathic omental torsion and infarction and provides a review of the literature. We discuss the diagnosis of primary omental infarction as well as the role of conservative and surgical management.

**Keywords:** Omentum, omental, epiploic, infarction, acute abdomen, abdominal pain, omentectomy, intra-peritoneal focal fat infarction, torsion, laparoscopy

### Introduction of Cases

This case series includes five patients who presented to one hospital over a three year period (April 2009 – April 2012) with sudden onset sharp right sided abdominal pain (See Table 1). There were no associated symptoms of nausea, vomiting, change in bowel or urinary habit or fevers in any of these cases. On examination, each of our patients were afebrile at presentation with stable vital signs. Abdominal examination revealed right

sided tenderness without signs of peritonitis. Acute appendicitis was suspected initially based on history, clinical findings and primary investigations in four cases (Case 1,2,3,4). Acute cholecystitis was the working diagnosis in Case 5.

Abdominal ultrasonography and computerized tomography (CT) was performed pre-operatively in all but one case (Case 4). A CT study from Case 3 (Figure 1) demonstrates reticular inflammatory fat stranding involving omental fat on the right greater omentum. . Laparoscopy was ultimately performed in four of our cases, three for diagnostic purposes (Case 1, 2, 4) and one following failure of conservative management with persistent localized abdominal pain (Case 3).

The diagnosis of primary omental infarction was confirmed histologically following laparoscopic omental resection in each of the cases managed surgically. There were no postoperative complications with complete resolution of symptoms at follow up (three months to 1 year). No definitive aetiology was ascertained in any of our five cases regarding past medical and surgical history. In particular, there was no previous abdominal surgery, herniation, inflammation (e.g.: secondary to diverticulitis/appendicitis /cholecystitis) or recorded coagulopathy in any of our cases. Two patients were noted to have an elevated body mass index.

## **Discussion**

Omental infarction is an infrequent but important cause of acute abdominal pain. Cases of omental infarction were first reported in the literature over 100 years ago<sup>1,2</sup>. Infarction of the greater omentum occurs at a rate of 0.1% of all laparotomies performed for acute abdomen<sup>3</sup> and is estimated to have an incidence of 0.0016-0.37%<sup>4</sup>. A diagnosis of omental torsion with infarction was confirmed intraoperatively and histologically in the four cases managed surgically. Omental infarction may be classified as primary where there is no identifiable aetiology, or secondary in the presence of other intra-abdominal pathologies such as adhesions from previous intra-abdominal surgery, hernia, tumour, cyst or localised inflammation.

Right sided abdominal pain was the primary presenting complaint in all five cases. The right side of the omentum is more commonly involved in omental infarction than the left due to increased length and mobility<sup>5</sup> which leaves it more prone to tort upon itself along its long axis causing vascular compromise. One study reports that 90% of omental infarction involves the right side of the omentum<sup>6</sup>. A retrospective study of 35 children showed that omental infarction was associated with less nausea and fever, a significantly lower WBC count and CRP level, and in particular a lower neutrophil percentage than acute appendicitis<sup>7</sup>.

Obesity has been suggested as a precipitating factor for primary or secondary omental infarction as well as adult age (most frequently occurring at age 40-50 with only 15% of cases reported occurring in paediatric populations), male sex, heavy exertion and sudden changes in body position<sup>8,9,10</sup>. The exact aetio-pathogenesis of primary or idiopathic omental infarction is unknown. Redundant omentum, vascular congestion, increased intra-abdominal pressure and hyper-peristalsis due to over-eating are mechanisms which have been postulated in the literature to account for omental torsion and infarction<sup>11</sup>.

As the present series demonstrates, omental infarction often mimics more common surgical causes of acute abdominal pain and therefore it is frequently diagnosed at laparoscopy<sup>12</sup>. The importance of accurate radiological diagnosis of this condition has been highlighted by recent studies, as conservative non-surgical management is frequently successful in management with spontaneous resolution of symptoms<sup>13,14</sup>. Follow-up imaging studies of patients managed conservatively show a decrease in the size of the infarcted omentum<sup>10,15</sup>.

Unnecessary surgery may be safely avoided in selected cases where primary omental infarction is diagnosed confidently on ultrasonography or CT, provided that patients remain clinically stable with complete resolution of symptoms. However, in cases of inconclusive radiological findings, laparoscopy is often necessary to establish a definitive diagnosis. Ultrasonography findings of omental torsion and infarction include a hyperechoic, noncompressible, ovoid mass. Characteristic CT findings include a streaking or “whirling” pattern of inflammatory fatty tissue with a fluid cavity<sup>16</sup> (**Figure 1**).

Due to the rarity of this condition and non-specific clinical presentation, pre-operative diagnosis is often difficult. Only 0.6% to 4.8% of cases of omental infarction are reportedly diagnosed non-operatively or pre-operatively, although this data predates modern radiological advances and is likely an underestimation<sup>4</sup>. Surgical management of omental torsion and infarction involves omentectomy (**Figure 2**), generally by a laparoscopic approach which allows visualization of other intra-abdominal organs for a causative or associated pathology. It has been suggested<sup>17</sup> that surgical treatment of omental infarction should be limited to those with complications such as omental abscess, bowel obstruction or adhesion formation after failure of conservative management, or in cases of diagnostic uncertainty<sup>4</sup>. Physicians should therefore remain vigilant to persistent or worsening symptoms of abdominal pain when managing omental infarction conservatively.

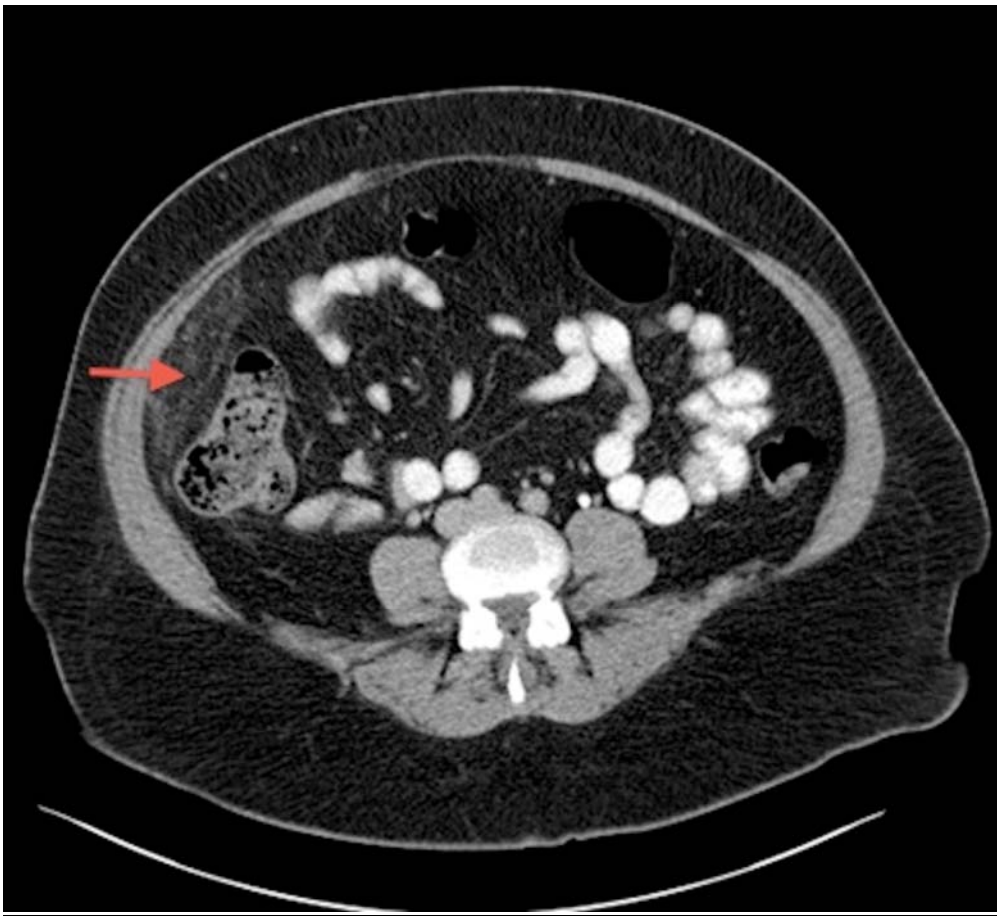
## **Conclusion**

Omental infarction should be considered as a differential diagnosis in the presentation of acute abdominal pain. The exact aetio-pathogenesis of omental torsion and infarction is still unknown. Increased awareness of this condition, combined with the use of ultrasonography or CT may reduce unnecessary surgery. However, due to an overlap in the symptoms and signs of omental infarction with other surgical causes of abdominal pain, such as acute appendicitis, intraoperative diagnosis has been reported to be more frequent than pre-operative or non-operative diagnosis. No trials have been performed to date to elucidate the epidemiology, aetiology and appropriateness of conservative versus operative (i.e. laparoscopic) management.

## **References**

- [1] P. Bush, A case of haemorrhage into the greater omentum, *The Lancet*, 1896;147(3779):286.
- [2] G. Eittel, Rare omental torsion, *NY Med Rec*, 1899;55:715-6.
- [3] F.C. Abente, P. Ferraina, J.M. Lardies, A. Napolitano, L. Sarotto, Primary segmental infarction of the greater omentum: a rare cause of RLQ syndrome: laparoscopic resection, *Surg Laparosc Endosc Percutan Tech [Case Reports]*, 2001 Feb;11(1):60-2.
- [4] J. Khersonsky, E. Itenberg, J. Mariadason, M. Wallack, Modern management of omental torsion and omental infarction: a surgeon's perspective, *Journal of Surgical Education [Case Reports]*, 2010 Jan-Feb;67(1):44-7.
- [5] M.E. Lutolf, A.M. Steinauer-Gebauer, J. Yee, Torsion of the greater omentum with infarction: the vascular pedicle sign, *Clinical Radiology [Case Reports Review]*, 2001 Dec;56(12):999-1002.
- [6] D. Crofoot, Spontaneous segmental infarction of the greater omentum, *The American Journal of Surgery*, 1980;139(2):262-4.
- [7] F.C. Huang, Y.H. Huang, S.Y. Lee, T. Mao-Meng, K.S. Tang, Y.L. Yang, Comparison of Clinical Characteristics and Neutrophil Values in Omental Infarction and Acute Appendicitis in Children, *Pediatr Neonatol* 2010;51(3):155–159

- [8] S. Khanna, N. Patle, P.K. Sasmal, O. Tantia, Omental torsion and infarction: a diagnostic dilemma and its laparoscopic management, *Journal of Laparoendoscopic & Advanced Surgical Techniques*, 2010 Apr;Part A. 20(3):225-9.
- [9] E. Chatzianni, A.J. Karayiannakis, Primary torsion of the greater omentum: Report of a case, *Surg Today*, 2002;32:913-5.
- [10] J.B. Puylaert, Right-sided segmental infarction of the omentum: clinical, US, and CT findings, *October 1992 Radiology*, 185, 169-172.
- [11] C.L. Fernandez-Rey, Primary omental infarction as cause of non-surgical acute abdomen: imaging diagnosis, *Revista Espanola de Enfermedades Digestivas [Case Reports]*, 2010 Jul 2010;102(8):498-9.
- [12] M.C. Haddad, N.S. Shabb, L.N. Naffaa, CT findings of omental torsion and infarction: case report and review of the literature, *Clinical Imaging [Case Reports Review]*, 2003 Mar-Apr;27(2):116-8.
- [13] B. Coulier, Contribution of US and CT for diagnosis of intraperitoneal focal fat infarction (IFFI): a pictorial review, *Jbr-Btr: Organe de la Societe Royale Belge de Radiologie. [Review]*, 2010 Jul-Aug;93(4):171-85.
- [14] J.A. Albasini, M.F. Arenas, V.S. Aledo, E.G. Baena, M.C. Arenas, J.A. Jimenez, M.J. Perello, B.F. Pastor, [Omental torsion: imaging techniques can prevent unnecessary surgical interventions], *Gastroenterologia y Hepatologia [English Abstract Review]*, 2002 Oct;25(8):493-6.
- [15] D.A. Gervais, P. Lee, A.K. Singh et al., Omental infarct: CT imaging features. *Abdom Imaging* 2006;31:549 –54.
- [16] E.K. Abdennasser, D. Abdellatif, B. Driss, A. Mehci, B. Mohamed, C. Souad, Omental torsion and infarction: CT appearance. *Internal Medicine. [Case Reports]*, 2008;47(1):73-4.
- [17] E.J. Balthazar, R.A. Lefkowitz, Left-sided omental infarction with associated omental abscess: CT diagnosis, *J Comput Assist Tomogr*, 1993;17:379-81.

**Figure 1**

Selective axial image from an IV and oral contrast enhanced CT of the abdomen at the level of the caecum demonstrating reticular inflammatory fat stranding (red arrow) involving omental fat on the right anterolateral aspect of the greater omentum (Case 3).

**Figure 2**



Intra-operative photograph of resected specimen demonstrating omental torsion and infarction. No identifiable aetiology on thorough inspection of specimen (Case 3).

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