

## Contained Rupture of an Inflammatory Abdominal Aortic Aneurysm into the Iliopsoas Muscle: Report of a Case

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A 72-year-old man with a history of old myocardial infarction was admitted to our hospital for surgical treatment of a ruptured abdominal aortic aneurysm. His hemodynamics was stable. He had left lumbar pain on moving his left leg and constipation for ten days without abdominal pain and high fever. Elevation of fat density around the aneurysm and ureter involvement were noted on the computed tomography. These characteristic image findings indicated inflammatory aortic aneurysm. During operation, an infrarenal abdominal aortic aneurysm with an 8 cm maximum diameter was noted. This aneurysm was firm and thick and adhered to some organs due to inflammation. An 5 × 5 cm punched-out defect was found on the lateral wall of the aneurysm. We replaced the ruptured aneurysm with a Dacron graft. Histological examination showed that the aneurysm wall had an infiltrate of inflammatory cells, lymphoid follicles and thickened adventitia. From these findings, the diagnosis was inflammatory aortic aneurysm.

**Key words:** contained rupture, inflammatory abdominal aortic aneurysm, iliopsoas muscle

### Introduction

Inflammatory abdominal aortic aneurysm (AAA) is characterized by inflammatory thickening of the anterior wall of the aorta, thinness of the posterior wall of the aorta and periaortic fibrosis. Because of these characteristic findings, rupture of an inflammatory AAA is accompanied with bleeding from the posterior wall of the aorta. However, rupture of inflammatory AAA is more infrequent than that of AAA without inflammation.<sup>1–6)</sup>

It is generally said that rupture of an abdominal aortic

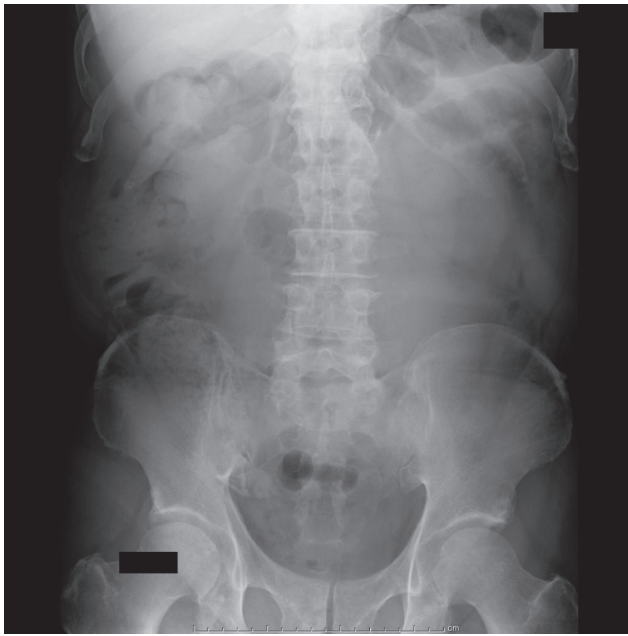
aneurysm is characterized by severe abdominal pain, unstable of hemodynamics or both and is diagnosed without difficulty by abdominal palpation, ultrasonography or computed tomography (CT). However, there have been some reports in patients with atypical symptoms. These cases are called contained rupture.<sup>7)</sup> We report a unique and rare case of contained rupture of an inflammatory AAA with iliopsoas muscle destruction without abdominal pain.

### Case Report

A 72-year-old man presented with left lumbar pain while moving his left leg and constipation for ten days. He had a history of an old myocardial infarction. His blood pressure was 120/68 mmHg; he was in sinus rhythm at 70 beats per minute and his hemodynamics was stable. His white blood cell count was 14,430/ $\mu$ l and his C-reactive protein was 18.97 mg/dl, indicating elevation of inflammatory reaction. The preoperative serum creatinine level was 1.95 mg/dl. Abdominal x-rays

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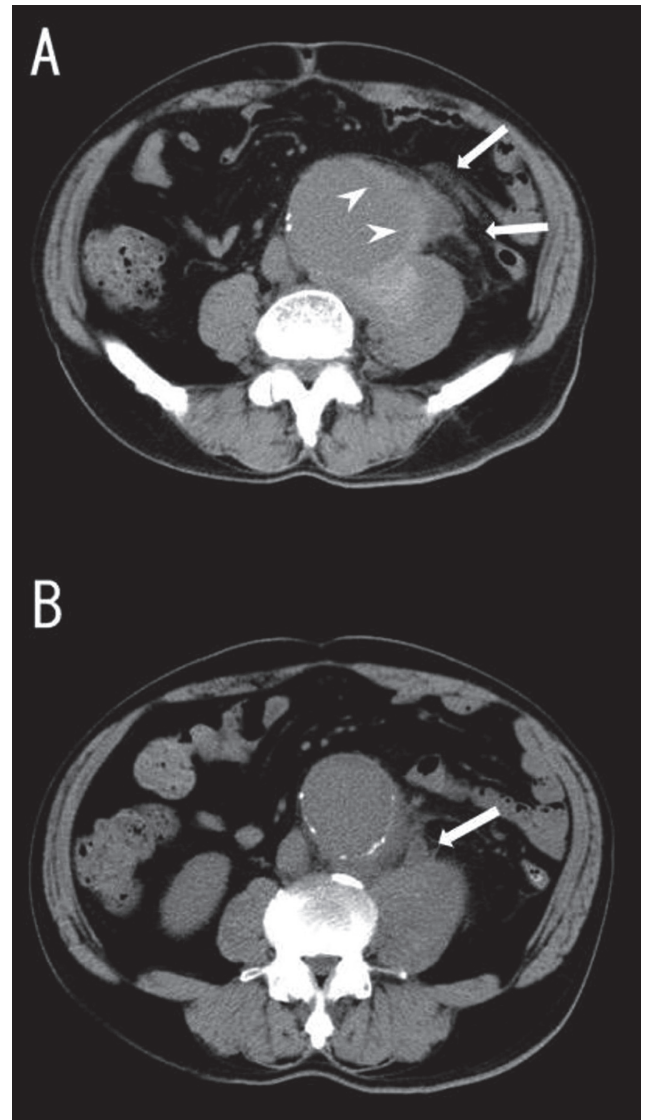
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**Fig. 1** Abdominal x-ray showing an indistinct shadow of the left iliopsoas muscle indicating intra-abdominal or retroperitoneal lesion.

showed an indistinct shadow of the left iliopsoas muscle (**Fig. 1**). Non-contrast CT revealed an infrarenal AAA with an 8 cm maximum diameter (**Fig. 2A**). The aneurysm had ruptured into the left iliopsoas muscle and there was left hydronephrosis, indicating ureteral stenosis (**Fig. 2B**). The AAA was easily palpated on examination, but had not been previously noticed. He was admitted to our hospital for treatment of rupture of an AAA. Urgent operation was undertaken on the same day as admission because of concerns about hemodynamic deterioration.

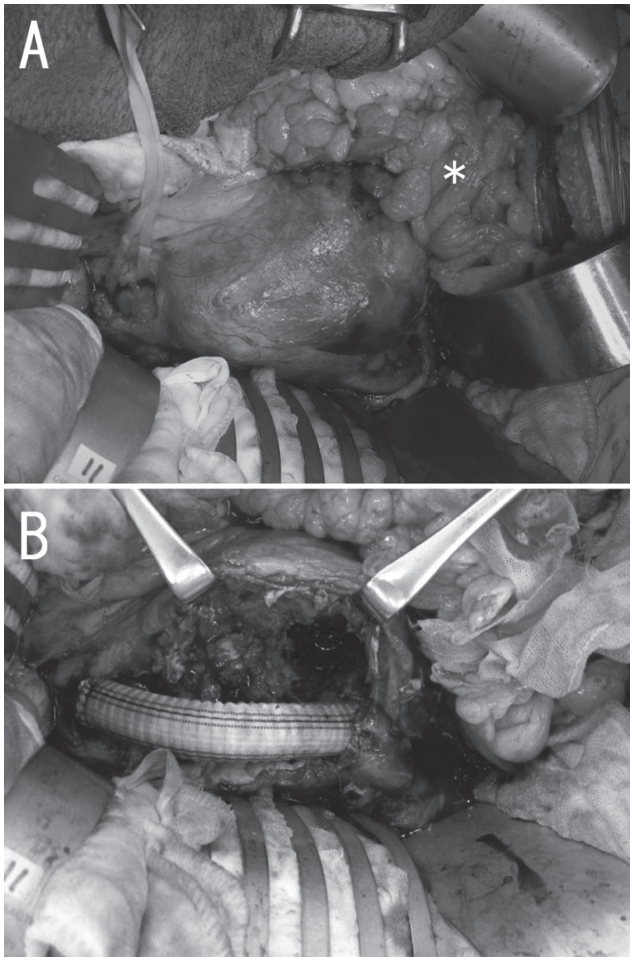
The aneurysm was approached through a transperitoneal incision. Adhesions were encountered in the duodenum of the fourth portion, ileum, sigmoid colon, mesentery, retroperitoneal and inferior vena cava. The aneurysm was a thick, shiny, whitish mass (**Fig. 3A**), and we did not find any significant stenosis in the iliac region. A 5 × 5 cm punched-out defect was found on the lateral wall of the aneurysm (**Fig. 3B**). An old hematoma was noted in left iliopsoas muscle without pus. We extirpated the hematoma and replaced the ruptured aneurysm with a Dacron graft. Culture of the hematoma resulted in growth of *Propionibacterium acnes* (*P. acnes*); however, infectious signs and symptom were not noted after surgery. Histopathologic examination of the aneurysm wall revealed an infiltrate of inflammatory cells, lymphoid follicles and thickened adventitia without calcification,



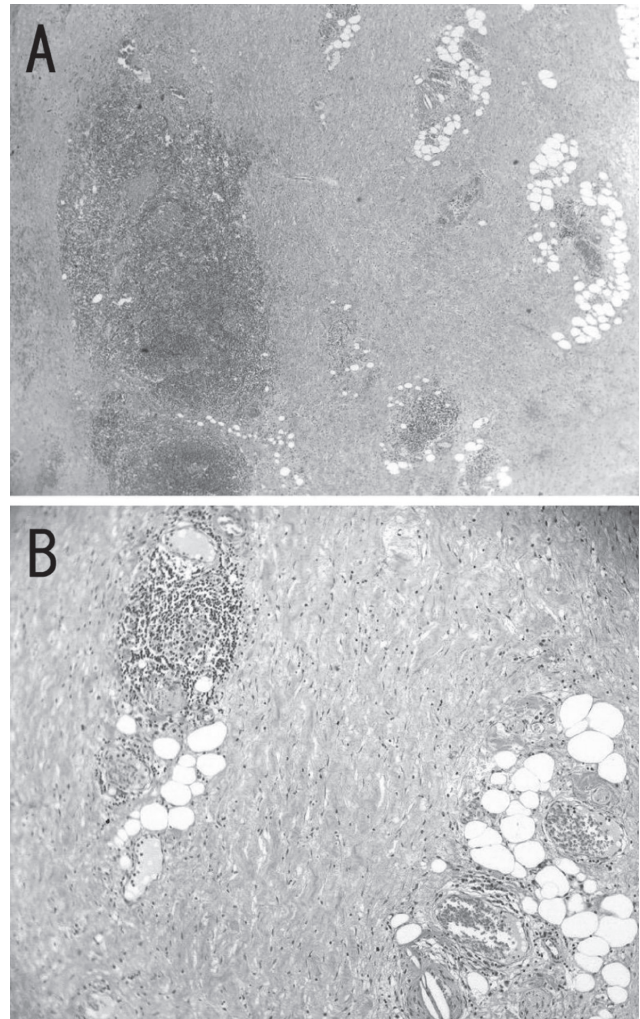
**Fig. 2** Unenhanced computed tomography image.  
**A:** A ruptured abdominal aortic aneurysm with a high-density area on the left side of the aneurysm wall (arrowhead) and elevation of fat density around the aneurysm wall (arrow).  
**B:** Expanded ureter between aneurysm and left iliopsoas muscle.

neoplasm or infection (**Fig. 4**). The histological diagnosis was inflammatory AAA. His postoperative course was uneventful and his symptoms were improved. He received 7 days of cefotiam with sensitivity to *P. acnes* intravenously after surgery. The postoperative serum creatinine level was 1.55 mg/dl. Abdominal CT on postoperative day 12 showed no evidence of worsening of hydronephrosis.

He has been doing well without complications, 9 months since the surgery.



**Fig. 3** Intraoperative pictures.  
**A:** The aneurysm was giant, firm and immovable. Bilateral common iliac arteries, veins and sigmoid colon (\*) strongly adhered to the aneurysm because of inflammation.  
**B:** The anterior aortic aneurysm wall was thickened markedly and firm, whereas the posterior wall was very thin.



**Fig. 4** Histopathologic examination of the excised aneurysm wall showed a comparatively thickened adventitia, entrapment of nerves and vessels or loss of smooth muscle cells and elastic fibers including an infiltrate of inflammatory cells. (**A:** Hematoxylin & eosin stain,  $\times 20$  original magnification, **B:** Hematoxylin & eosin stain,  $\times 100$  original magnification)

## Comment

We encountered a unique case of a contained rupture of an inflammatory abdominal aortic aneurysm into the iliopsoas muscle. In fact, inflammatory AAA is rare with an incidence ranging from 2.5%–10%.<sup>1–6)</sup> Moreover, the frequency of rupture of inflammatory AAA is smaller than that of AAA without inflammation. Hypothesis of inflammatory aneurysmal formation have been considered as an auto-immune reaction, an obstruction of lymphatic vessels, secondary inflammation or genetic predis-

position. However, the etiology of inflammatory AAA is still obscure and controversial.<sup>1–6)</sup> On the other hand, there are some reports suggesting that aortic aneurysm may be caused by bacteria. Culture of the hematoma found in this case was *P. acnes*. Marques da Silva and colleagues reported that in the culture, *Propionibacterium acnes* is most often collected from samples of the aneurysm wall and inside the intravascular plaque at the wall.<sup>8,9)</sup> However, they concluded that it was not clear whether the bacteria contributed to weakening of the aortic wall by eliciting inflammation or whether it was a



secondary colonization of the aneurysms. The postoperative course in our case was favorable. The clinical follow-up is important because infective endocarditis may be caused by *Propionibacterium acnes*.<sup>8,9)</sup>

Herein, we present some instructive findings from this very rare case of a patient with atypical primary complaints. The abdomen should always be palpated because back pain or lumbago may be caused by an intra-abdominal lesion. For a contained rupture, hemodynamics may be stable. Therefore, AAA rupture might not be considered in the absence of abdominal pain. This case demonstrated characteristic image findings. A peripheral high-attenuating crescent on non-contrast CT is one of the characteristic signs of impending or active aneurysm rupture.<sup>6)</sup> Elevation of fat density around the aneurysm and hydronephrosis due to ureter involvement are caused by inflammation and is often observed in patients with inflammatory AAA.<sup>3,4)</sup>

Contained rupture of inflammatory AAA into the iliopsoas muscle is very rare. We suggest that this diagnosis should be considered, based on clinical signs, such as those observed in this case.

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