Sudden intestinal necrosis one month after acute aortic dissection

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Malperfusion of the visceral arteries is a potentially fatal complication of aortic dissection. In the chronic stage, however, it is very uncommon and seldom manifests itself as an acute abdomen. Here we describe a rare occurrence of ischemic intestinal necrosis 1 month after the onset of acute Stanford type B aortic dissection.

A 77-year-old hypertensive man with a known history of intermittent claudication of the right lower limb had a sudden onset of severe pain in the back and waist and numbness in the left leg. Emergency angiography (Figure 1, *A*) revealed acute Stanford type B aortic dissection with a large intimal tear in the distal aortic arch, an ample true lumen in the abdominal aorta, a normal superior mesenteric artery (SMA), obstruction of the left common iliac artery by the intimal flap, and atherosclerotic occlusion of the right external iliac artery. The patient underwent a left axillofemoral bypass on that day.

The early postoperative course was favorable: he had a good appetite and showed no abdominal symptoms. Three weeks later, however, he began to have mild diarrhea. Nausea, vomiting, and mild abdominal pain developed 26 days after the onset. He remained afebrile. Laboratory tests and abdominal radiographs showed no abnormal findings, but a duplex scan of the abdominal aorta revealed that the peak flow in the SMA (3.34 m/s) was accelerated in comparison with that in the celiac artery (1.54 m/s). Several hours after this duplex scan, panperitonitis and sepsis developed acutely and a state of shock ensued. In an emergency operation, the cecum and the ascending colon were found to be grossly necrotic, and right hemicolectomy was performed. Histologic examination disclosed massive gangrenous changes in the resected bowel, but thrombosis and atherosclerotic changes were absent. Repeat angiography (Figure 1, *B*) revealed both severe constriction of the true lumen of the abdominal aorta resulting from compression by the expanded false lumen and marked stenosis at the origin of the SMA. A subsequent aortic operation was refused. The postoperative course after hemicolectomy was uneventful, and the patient has been doing well for the past 7 years.

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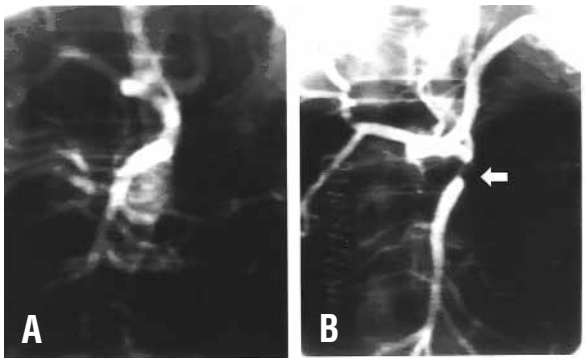

Figure 1. A, Initial angiogram revealed an ample true lumen of the abdominal aorta and a normal SMA. Because the flow in the SMA was normal, its orifice and distal branches were not opacified simultaneously. B, Repeat angiogram showed severe stenosis at the origin of the SMA *(arrow).* Its branches were somewhat narrower than those seen at the initial angiogram. As the flow in the SMA was markedly compromised, its orifice and distal branches could be visualized simultaneously and clearly.

Discussion

Intestinal necrosis resulting from visceral malperfusion is one of the most serious complications of aortic dissection. Delay in its diagnosis and treatment often has a fatal outcome. However, the absence of specific findings at an early stage of intestinal ischemia poses very difficult problems. Early diagnosis of this relatively uncommon condition requires high indexes of suspicion.[1,2] One important clue to its early diagnosis is the time course. In typical cases, visceral malperfusion develops early after the onset of aortic dissection and progresses rapidly with fulminant symptoms. In this case, however, the clinical course was quite different. The patient had been completely free from abdominal symptoms for 3 weeks. Even after that, abdominal symptoms had been latent and almost stable but, finally, some parts of the intestine became acutely necrotic 1 month after the onset. Although this clinical course is rare, physicians should be aware that this serious complication can occur at such a late stage. The schedule of follow-up visits may have to be reconsidered, at least in some patients with aortic dissection.

To detect any signs of malperfusion as early as possible, we believe that serial monitoring to ensure proper branch vessel perfusion is indispensable. In the present case, initial examinations revealed both an abdominal aorta with a wide true lumen and a normal SMA. As visceral malperfusion was not at first expected, duplex scanning was not performed for about 1 month, although it has proved to be a reliable modality for the noninvasive diagnosis

of SMA stenosis.[3,4] However, duplex scan was the only examination, of several performed before the clinical symptoms became definitive, that detected the critical condition. We suggest that a serial duplex scan may facilitate correct diagnosis and treatment before irreversible visceral ischemia occurs. Early diagnosis of this dangerous complication is often very difficult. Angiography is frequently useful, but it cannot readily be repeated. Therefore, especially in patients with a severely narrowed true lumen of the abdominal aorta, serial evaluation of branch vessel flow with a duplex scan should be included during the conservative treatment of aortic dissection, even when malperfusion is not very likely.

Finally, the indication and adequacy of the extra-anatomic artery bypass for lower limb ischemia should be reconsidered. Patients with a large entry to the false lumen, but without a large re-entry, appear to be at increased risk of expansion of the false lumen and obstruction of branch vessels, because the false lumen is almost a dead end. In the present case, moreover, the distal runoff of the aorta was markedly impaired. The right iliac artery was chronically occluded, and the flap suddenly obstructed the left side. This fact may have played a role in the unexpected late obstruction of the SMA. Emergency repair of the aorta should also be well considered in cases like the present one.

The extra-anatomic artery bypass has been a well-established and preferred procedure, particularly for poor-risk patients. However, because the problematic false lumen without a major re-entry is left untouched, cautious observation is required, especially in patients with bilateral iliac obstruction. Fenestration of the flap or stent placement[5] is advantageous in this regard and therefore can be a very good alternative in such cases.

References

1. Organ ischemia: In: Borst HG, Heinemann MK, Stone CD, editors. Surgical treatment of aortic dissection. New York: Churchill Livingstone; 1996.
2. Vincente DC, Kazmers A. Acute mesenteric ischemia. *Curr Opin Cardiol.* 1999;14:453-8.
3. Zwolak RM, Fillinger MF, Walsh DB, LaBombard FE, Musson A, Darling CE, et al. Mesenteric and celiac duplex scanning: a validation study. *J Vasc Surg.* 1998;27:1078-88.
4. Perko MJ, Just S, Schroeder TV. Importance of diastolic flow velocities in the detection of celiac and mesenteric artery disease by duplex ultrasound. *J Vasc Surg.* 1997;26:288-93.
5. Slonin SM, Miller DC, Mitchell RS, Semba CP, Razavi MK, Dake MD. Percutaneous balloon fenestration and stenting for life-threatening ischemic complications in patients with acute aortic dissection. *J Thorac Cardiovasc Surg.* 1999;117:1118-27.