Vascular radiology

CT follow-up of medically treated type-B aortic dissection: a case report

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Abstract: The fate of the false lumen of a type-B aortic dissection was studied using computed tomography (CT) in a 64-year-old woman with hypertension. The CT follow-up showed the disappearance of the false lumen in the thoracic aorta; shrinkage and thrombosis of the false channel in the proximal abdominal aorta (in these sections no major vessel arose from the false lumen); and persistence of the false lumen in the distal abdominal aorta, where the right common iliac artery arose from the false lumen. Such different findings at the various levels of dissection have not been described previously, and confirm the presumption that the fate of dissection depends on the blood flow in the false channel.

Key words: Aorta, dissection, CT

Introduction

Aortic dissection is one of the most common catastrophic events affecting the great vessels [1]. The pathological basis of this condition is a tear in the intima allowing blood to track within the aortic wall [2]. The initial intimal tear occurs more commonly in the ascending thoracic aorta; the proximal descending aorta is the second most common site [3, 4].

Several reports have described the fate of the false lumen after the surgical repair of a type-A aortic dissection [1, 5–10], but there have been few reports of follow-up of a type-B aortic dissection [9, 11–14]. The false lumen continues to persist in the majority of patients, while obliteration and complete healing is less common. To our knowledge, the case presented here is the first in vivo demonstration of both of these possibilities in a patient with type-B aortic dissection.

Case report

A 64-year-old woman, treated for ischemic heart disease and hypertension, was admitted to the hospital with an acute intense pain in her back, radiating to both flanks, the epigastrium, and under the right shoulder blade. A blood pressure of 180/100 mmHg, tender resistance under the right costal arch, and vertebral analgesia at thoracic vertebral levels 7 to 8 were found. Her electrocardiogram and chest radiograph were normal.

Laboratory findings, clinical symptoms, and the suspicion of a small stone in the gall-bladder neck (revealed by sonography), led to a cholecystectomy on the fifth day. Post-operative laboratory tests gradually returned to normal, but pain still persisted. Six days after surgery a CT of the pancreas was performed. This showed a normal pancreas, but revealed a dissection of the abdominal aorta. Therefore CT of the whole aorta was completed and revealed a dissection of the descending thoracic and abdominal aorta with partial thrombosis of the false lumen and bilateral pleural fluid effusions.

Based on these findings, the patient was transferred to a specialized centre. Angiography of the thoracic and abdominal aorta revealed a normal ascending aorta and arteries arising from the aortic arch. Behind the origin of the left subclavian artery the false lumen was slightly filled, being more distinct in the abdominal aorta, and continuing into the right common iliac artery. Visceral abdominal arteries were filled from the true lumen and showed irregular contours.

Conservative therapy was instituted. Blood pressure was decreased using both beta and alpha blockers, and a calcium antagonist (Trimepranol, Deprazolin, Cordafen, respectively). At a systolic blood pressure of 120–140 mmHg the patient’s symptoms abated. Blood pressure was maintained at about 110/70 mmHg with maintenance of satisfactory renal parameters. After four weeks the patient was discharged from hospital. At present (18 months after the onset) the patient is asymptomatic.

The initial CT examination (on day 11 following the onset of symptoms) was followed by two examinations.
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Fig. 1 a, b. CT follow-up at the level of the aortic arch. a First examination 11 days after onset of symptoms. True lumen in the distal part of the aortic arch is compressed by a thrombus in the false channel. Displaced intimal calcifications (arrowheads) were better seen on other window setting. b Third examination, 14 months after the first. Complete healing of the aorta is seen at this level. (arrowheads indicate positions of intimal calcifications)

Fig. 2a, b. Descending thoracic aorta. a First examination: the patent lumen (opacified by contrast) is eccentric, surrounded by the thrombosed false channel. Note bilateral pleural effusions. b Complete healing at this level after 14 months

made 2 and 14 months later. All examinations were performed on a Somatom DRH scanner (Siemens) using three techniques: (1) 4-mm contiguous slices of the abdomen during the intravenous administration of 100 ml of contrast medium and was completed by 4-mm scans with 8 mm interslice spacing of the thoracic aorta during the administration of 100 ml of contrast medium; (2) 8-mm contiguous scans of the whole thoracic and abdominal aorta after administration of 120 ml of contrast medium and (3) 8-mm scans with 12 mm interslice spacing scans during the injection of 120 ml of contrast medium.

CT follow-up showed complete disappearance of the false lumen and healing of the dissection in the thoracic aorta (Figs. 1, 2), and gradual thrombosis and shrinkage of the false channel in the proximal abdominal aorta (Fig. 3). In the distal abdominal aorta, the false lumen continued to be open, and its opacification was found in all CT examinations (Fig. 4). This was also true of the right common iliac artery (Fig. 5) and it was the only major branch of the aorta arising from the false lumen, as shown by angiography.

The long-term outcome of the dissection essentially depends on the blood flow in the false lumen. Thus, if the proximal inflow and distal outflow are high, the false lumen may be endothelialized forming a so-called double-barrelled aorta. On the other hand, a low flow predominantly causes thrombosis of the false lumen, leading to fibrosis and scarring [4]. There are only a few reports of complete spontaneous resolution of the false lumen in vivo [11-13]. Our case demonstrated such a finding in the thoracic aorta; thrombosis and shrinkage of the false channel in the proximal abdominal aorta, and persistence of the false lumen in the distal abdominal aorta. To our knowledge, such different findings in various levels of dissection have not been described previously.

Type-A aortic dissections heal less frequently when compared to type-B dissection [15]. Several reports describe the persistence of a residual false channel distal to the graft in 76–94% of cases [1, 7–10]. Although surgical repair usually results in the resection of the primary tear or entry site and oversewing of the edges of the false channel at both ends of the interposed dacron graft, blood flow can enter the false channel of the distal aorta via one or more of these distal fenestrations to maintain flow in the false channel [7]. Turley et al. [1] report six patients with pre-operative angiograms and CT examinations after surgery. In five of these patients, in whom persistence of the false lumen was noted at CT, major

Discussion

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