Intimointimal intussusception is an unusual type of acute aortic dissection, with fewer than 15 cases reported in the English-language literature [1–9]. Several reports have described the findings of aortography [1–3, 6, 8], transesophageal echocardiography (TEE) [4, 5, 8, 9], and CT [6–9], but the MRI findings, to our knowledge, have not been reported. We describe here the MRI findings in a patient with acute aortic dissection with intimointimal intussusception.

Case Report

A 49-year-old man was admitted to our hospital with sudden chest and back pain and hemiparesis in the right extremities. The patient had chronic hypertension. On physical examination, blood pressure was 180 over 110 mm Hg and pulses were absent in the right upper extremity. The chest was clear to auscultation and there were no heart murmurs.

Transthoracic echocardiography showed an enlargement of the ascending aorta, slight aortic regurgitation, and several intimal flaps freely floating in the ascending aorta and aortic arch, but intimal entries were not clear. Fast breath-hold MRI, true fast imaging with steady-state free precession (FISP), and 3D contrast-enhanced MR angiography were performed with a 1.5-T scanner (Sonata, Siemens Medical Solutions). MR images showed a relatively short flap in the aortic root (Fig. 1A), a dilated ascending aorta, and no evidence of intimal flap in the mid ascending aorta (Fig. 1B). A true lumen collapse, an unusual toe-like flap that was thicker (≈ 2 mm) than the usual intimal flap, and irregular folds showed in the distal ascending aorta and aortic arch (Figs. 1C and 1D). The dissection intimae extended into each of the brachiocephalic arteries and caused partial obstruction of them (Figs. 1D and 1E). The intimal flap was also found in the descending aorta.

Emergency surgery was done with the patient under profound systemic hypothermia. The ascending aorta was replaced with a graft. When the ascending aorta was open, the circumferential tear of the intima was noted above the aortic valve with no intimal flap in the ascending aorta. The fold intimae were located in the aorta arch and extended into each of the arch vessels. The diagnosis of a type A aortic dissection was confirmed with an uneventful postoperative course.

Keywords: aortic dissection, intussusception, MRI

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1All authors: Department of Radiology, Anzhen Hospital, Capital University of Medical Sciences, Anzhenli, Chaoyang District, Beijing 100029, P. R. China. Address correspondence to Z. M. Fan (maxiaohai@263.net).

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Fig. 1 (continued)—49-year-old man with acute aortic dissection with intimal intussusception.
B, Axial true fast imaging with steady-state free precession (FISP) shows dilated ascending aorta and no evidence of intimal flap in ascending aorta.
C, Axial MPR shows true lumen collapse and unusual toe-like flap in aortic arch (arrowheads, D).
D and E, Oblique sagittal MPRs show thickening of intimal flap with irregular folds in distal ascending aorta and aortic arch (arrowheads). Intimal flaps extend into each of arch vessels (arrows).
Discussion

Intimo-intimal intussusception is an unusual type of acute aortic dissection in which the intimal tear occurs circumferentially with intussusception of the intima downstream. Since Hufnagel and Conrad [1] described the first case in 1962, fewer than 15 cases have been reported in the literature [1–9]. The preoperative diagnosis is important to allow for appropriate surgical planning [3], but there may sometimes be difficulties in reaching the appropriate diagnosis due to lack of the classic echocardiographic and CT signs of a type A aortic dissection [9].

Because the intussuscepted flap can partly occlude the aortic arch and the brachiocephalic arteries, neurologic manifestation may be more frequent. Of the 12 cases reported with intimo-intimal intussusceptions, eight (67%) had neurologic signs and symptoms on presentation [1–9]. The same neurologic symptoms appeared in the patient presented here. In addition, it was very difficult for the catheter to pass beyond the aortic arch during aortography [1, 2, 6–8]. An aortogram showed a dilated ascending aorta, a curvilinear or a windsock linear filling defect in the aortic arch, and partially occluded arch vessels [2, 3, 6].

Noninvasive imaging examinations—including TEE, CT, and MRI—are the most important and accurate diagnostic tools for the aortic dissection. On TEE and CT, the characteristic appearance of intimo-intimal intussusception was a relatively short flap in the aortic root, absence of an intimal flap in the mid ascending aorta, windsock linear or curvilinear filling defects in the aortic arch with involvement of the arch vessels, and circumferential tears of the intima just above the aortic valve [4–9]. Currently MRI is considered to be one of the best imaging techniques for evaluating aortic dissection. In this case study, we report the characteristic MRI findings in a patient with intimo-intimal intussusception in acute aortic dissection, including an absence of an intimal flap in the mid ascending aorta, a relatively short flap in the aortic root, and a true lumen collapse and toe-like flap in the aortic arch that was thicker than the usual intimal flap and irregular folds, which were revealed by surgery and are consistent with those of TEE and CT described in several previous reports [4–9].

In summary, intimo-intimal intussusception is a rare type of aortic dissection and, because of possible rupture of the aortic wall or a neurologic event, is fatal more often than classic aortic dissection. Therefore, prompt and accurate diagnosis is essential to the prognosis of the patient. However, reaching an accurate diagnosis may be difficult because of lack of typical imaging findings of type A aortic dissection. As mentioned previously, MRI can show the characteristic imaging appearances of this condition. If intimo-intimal intussusception is suspected in a patient, MRI should be considered as one of the most reliable diagnostic tools for arriving at the correct diagnosis for this rare type of aortic dissection.

References