

Early Detection of Superior Mesenteric Artery Dissection by Ultrasound: Two Case Reports

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Abstract

Superior mesenteric artery (SMA) dissection is a rare disease. Most of the cases are diagnosed through contrast-enhanced computed tomography. The use of emergent bedside ultrasound has been described to diagnose aortic dissection. However, evidence is limited regarding the use of bedside ultrasound for diagnosing SMA dissection, which is a known risk factor for aortic dissection. We present two case reports: one case of isolated SMA dissection and one case of SMA dissection complicated with aortic dissection. Both cases were initially diagnosed through bedside ultrasound and confirmed through contrast-enhanced computed tomography.

Keywords: Abdominal pain, superior mesenteric artery dissection, ultrasound

INTRODUCTION

Superior mesenteric artery (SMA) dissection is a rare condition. In an autopsy series, the incidence of spontaneous isolated SMA dissection was 0.06%.^[1] SMA dissection was first reported by Bauersfeld in 1947.^[2] Some cases of SMA dissection are isolated whereas others are combined with aortic dissection. The causes of SMA dissection are fibromuscular dysplasia, cystic medial necrosis, and other connective tissue diseases; however, no specific underlying cause of SMA dissection has been identified in the majority of reports.^[3] Symptoms of aortic dissection are various and include chest, abdomen, or back pain; loss of consciousness; weak pulse in one arm; and lower limb paralysis. Abdominal pain is the main symptom of isolated SMA dissection, and in most cases, pain onset is sudden and located in the epigastric or periumbilical area.^[3] Treatment strategies include conservative management with or without antithrombotic therapy, endovascular therapy with SMA stenting, or open surgery. Some authors have suggested conservative management as first-line treatment for symptomatic patients whereas other authors prefer endovascular treatment^[3] especially for patients with persistent abdominal pain and favorable anatomy.^[4] Most SMA dissection cases are diagnosed through contrast-enhanced

computed tomography (CECT).^[3] Aortic dissection can be diagnosed through bedside ultrasound.^[5] However, evidence is limited regarding the use of bedside ultrasound for diagnosing SMA dissection, which is a known risk factor for aortic dissection.^[5] Herein, we present two cases: one case of isolated SMA dissection and one case of SMA dissection complicated with aortic dissection. Both cases were initially diagnosed through bedside ultrasound and confirmed through CECT.

CASE REPORTS

Case 1

A 46-year-old male presented with intermittent epigastralgia for 3 days. His blood pressure was 158/106 mmHg, and his heart rate was 79 beats/min. Physical examination revealed epigastric tenderness without rebounding pain, and all distal pulses of the lower limbs were intact. His medical history, laboratory data, and abdominal plain radiograph were unremarkable. Bedside ultrasound (Toshiba Nemio SSA-550A, Curve Probe, 3.75 mHz) revealed that the SMA had a diameter

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of 16.8 mm [Figure 1]. A faint intimal flap was also detected in the SMA. Color duplex ultrasound revealed thrombosis or the presence of a false lumen in the SMA [Figure 2]. A cardiovascular specialist was consulted, and SMA dissection was confirmed through CECT [Figure 3]. The patient's symptoms improved after anticoagulant use.

Case 2

A 46-year-old male patient visited the emergency department because of the sudden onset of consciousness change. His blood pressure was 97/56 mmHg, and his heart rate was 92 beats/min. Physical examination revealed a Glasgow coma score of E3M5V2; the pupil size of both eyes was 2.0 mm with positive light reflex. Gaze deviation to the right with right-sided limb weakness was noted (muscle power less than Grade 3), and pulses in the right-upper and lower limbs were all palpable but weaker than pulses in the left limbs. His medical history included hypertension and ischemic stroke. Recurrent stroke was suspected initially; however, abdominal ultrasonography was conducted due to relative low systolic blood pressure (97 mmHg). The intimal flap and false lumen in the abdominal aorta and SMA were noted in abdominal ultrasonography images [Figures 4 and 5]. The diameter of the SMA in CECT images was 10.2 mm [Figure 6]. A cardiovascular specialist was consulted immediately. After endograft surgery, the patient's consciousness recovered to baseline.

DISCUSSION

SMA dissection is a rare condition. Most cases of SMA dissection are diagnosed through CECT, and they are rarely diagnosed through bedside ultrasound. To the best of our knowledge, only one case report of SMA dissection diagnosed through bedside ultrasound has been described in the literature.^[5]

In ultrasonography, dissection is diagnosed based on the detection of the intimal flap in the vessel.^[5] However, flap visualization is inconsistent.^[6] Occasionally, the intimal flap may be too faint to be detected through bedside ultrasound in real situations such as emergency settings. In our experience, if the diameter of an artery is extremely large, a diagnosis of dissection should be considered, even when the intimal flap is not detected through ultrasound. Dissection of an artery may result in thrombosed aneurysm, and the aneurysm is usually defined as more than 1.5 times of normal diameter.^[7] The normal diameter of the SMA has been reported as 5.7–7.3 mm in ultrasound images.^[8] Based on these diameters, we propose the diameter of a dissected SMA to range from 8.5 to 11 mm when SMA dissection is combined with aneurysm formation.

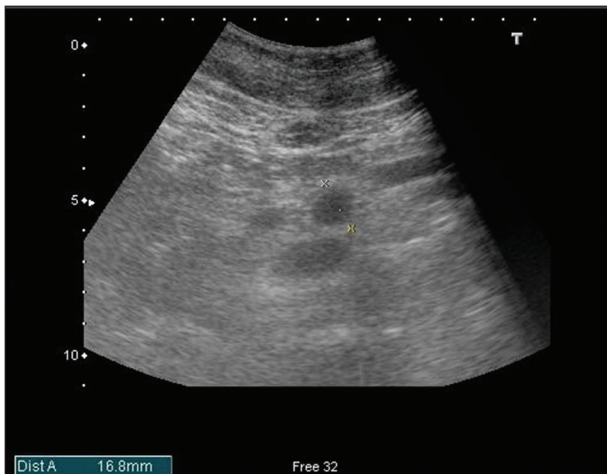


Figure 1: The diameter of superior mesenteric artery was 16.8 mm

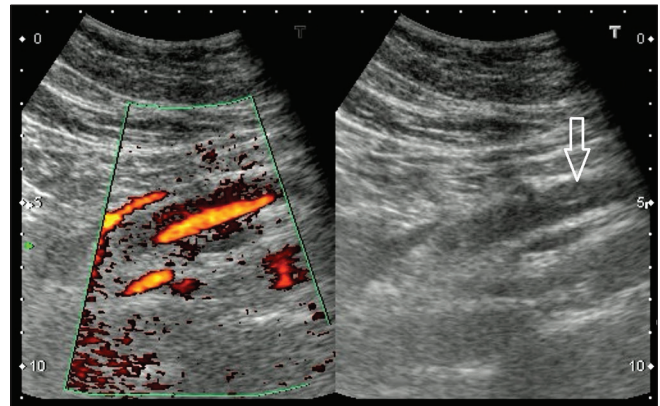


Figure 2: Intimal flap in superior mesenteric artery (arrow) and color duplex revealed thrombosis or false lumen in superior mesenteric artery (left)

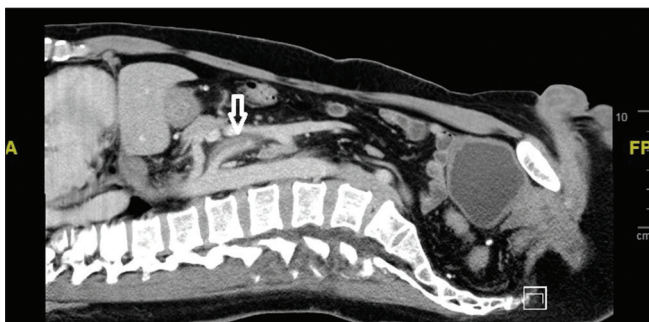


Figure 3: Contrast-enhanced computed tomography showed superior mesenteric artery dissection (arrow)



Figure 4: Intimal flap in abdominal aorta and superior mesenteric artery

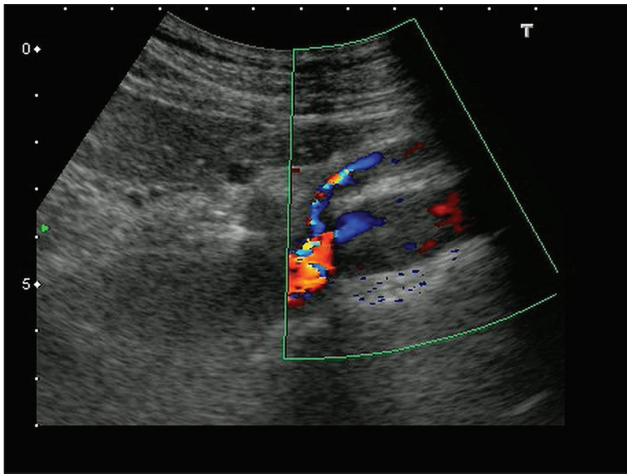


Figure 5: False lumen in abdominal aorta and superior mesenteric artery

To the best of our knowledge, no data on the diameter of dissected SMAs in ultrasound images are available. However, a study investigating 25 patients reported that the diameter of dissected SMAs ranged from 8 to 15 mm in CECT images.^[9] In our cases, the diameters of the SMAs were all more than 10 mm. Therefore, we suggest that in cases where the SMA diameter is more than 10 mm, clinicians should highly suspect SMA dissection and should perform additional imaging studies or consult a specialist.

Although SMA dissection can be successfully resolved through conservative treatment, it can also be complicated by bowel ischemia or even aortic dissection.^[10] Our two cases illustrate that bedside ultrasound can be used for the earlier detection of SMA dissection.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

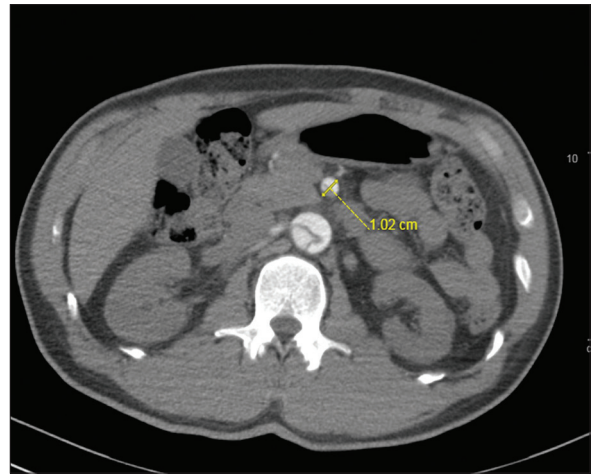


Figure 6: Contrast-enhanced computed tomography showed dissection in aorta and superior mesenteric artery, superior mesenteric artery diameter was 10.2 mm

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