

Spontaneous isolated superior mesenteric artery dissection - Report of two cases

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ABSTRACT

Two cases of isolated superior mesenteric artery dissection diagnosed by contrast enhanced 64 slice CT are reported. In both, the dissection was seen extending along the entire length of the artery with one of them showing partially thrombosed false lumen. One case was associated with dissection of left renal artery with consequent renal infarcts. Although superior mesenteric artery dissection is a rare phenomenon, it should be considered in the differential diagnosis of abdominal angina.

CASE REPORT

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CASE 1

A forty six year old male presented with sudden onset of epigastric pain which did not subside with usual medical therapy. Patient was a regular user of alcoholic drinks. He was not a diabetic or hypertensive. Ultrasound examination of the abdomen was noncontributory. Blood investigations revealed a normal total and differential blood counts, mildly elevated ESR of 15 mm after one hour. Serum amylase levels were within normal limits. Serum lipase levels were not obtained.

Technique:

CT scan of the abdomen was performed using a Siemens Somatom Sensation Cardiac 64 scanner after oral and intravenous contrast administration. The plain scan was obtained from the level of domes of diaphragm to the inferior margin of symphysis pubis. Subsequently oral contrast was prepared by mixing 30 ml of Gastroscan +M (Combination of Diatrizoate Meglumine and Diatrizoate Sodium Solution) with 2 litres of plain water. Patient was asked to drink one glass of oral contrast every 15 minutes over a period of two hours. The contrast used for intravenous injection was Iohexol - a water soluble non ionic contrast media (contains 300mg of I2 /ml).

80 ml of Iohexol was injected intravenously followed by 30 ml of normal saline chase through a 18 G IV cannula, using a dual headed pressure injector at the flow rate of 3 ml/sec. Arterial and venous phase images (120 kvp and 180 mAs) were obtained after a delay of 20 and 40 seconds in cranio-caudal and caudo-cranial direction respectively. 2mm thickness axial images with 2 mm reconstruction interval were obtained both in the arterial and venous phase. Sagittal and coronal multiplanar reconstructions (MPR) of 3mm thickness with 3mm reconstruction interval were obtained using raw data images acquired in the arterial phase.

Findings:

The study revealed dissection of the SMA, starting 1.5 cm from the ostium and extending along the entire length of the artery till its terminal branches. (Fig. 1-3). No thrombus was seen. There was minimal ischemic bowel thickening involving the hepatic flexure and the proximal transverse colon (Fig. 1). In addition there was dissection of the left renal artery (Fig. 4,5) starting from a point 1.4 cm from its ostium and extending into one of the anterior hilar branches (Fig. 6). Established renal infarcts involving middle and lower cortices were seen in the left kidney (Fig. 4, 6). No aortic dissection was noted.

CASE 2

A 52 year old male presented with acute onset abdominal pain with vomiting. His habits revealed frequent consumption of alcoholic drinks. He was a hypertensive not compliant with treatment. Ultrasound examination revealed a cirrhotic liver with no features of portal hypertension. Blood investigations revealed a normal total, differential blood counts and a normal ESR. Serum amylase levels were normal and lipase levels were not obtained. CT scan of abdomen was performed with oral and intravenous contrast media as per the protocol described for the previous case. The study revealed SMA dissection starting at a point 1.6 cm from the ostium. The dissection was extending along the entire length of the artery with a partially thrombosed anterior false lumen and showing periarterial increase in fat attenuation (Fig 7-10). There was no ischemic change in the bowel loops. The entire length of the aorta was normal. In addition the study revealed a cirrhotic liver with an irregular, nodular surface suggestive of alcoholic parenchymal liver disease.

Both patients were hospitalised and managed conservatively. Both were started with anticoagulation therapy with low molecular weight heparin. The second patient was put on antihypertensive drugs. They responded well and pain subsided in 48 hours time. Stenting was not considered since the dissection was extending all the way up to the terminal portion and patients became asymptomatic with conservative therapy. They were advised follow up clinical examination after two months. The follow up clinical examination of the second case after two months revealed that he was doing well and asymptomatic. The first patient did not return for a follow up examination.

DISCUSSION

Majority of SMA dissections are associated with aortic dissections. Isolated SMA dissection with the dissection being confined only to the SMA is very rare. The first case was documented by Bauersfeld in 1947(1). Till date, only 71 cases have been reported (2). With the wide spread use of spiral CT scans for evaluation of abdominal pain, it is likely that more cases would be identified and reported.

Causes of isolated SMA dissections include atherosclerosis, fibromuscular dysplasia, mycotic infection, trauma, connective tissue disorders, vasculitidis like Giant cell arteritis, Takayasu arteritis, Polyarterteritis nodosa and iatrogenic induced dissections due to endovascular interventions. Some dissections occur spontaneously without any identifiable etiology (3,6)

SMA dissections represent the most frequent type of digestive artery dissection, with those of the hepatic, splenic, left gastric and celiac artery being even less frequent. Affected patients are predominantly males and present with sudden onset of epigastric pain, associated with nausea and vomiting. Acute bowel infarction is very rare and most cases have slow progression of ischemia.

The dissections begins 1.5 to 3 cm from the origin of the SMA, sparing the origin of the artery. This segment of the SMA corresponds to the exit of the artery from the pancreas,

and may be the site of acute or chronic stress due to turbulent flow in the vessel at this location, analogous to that resulting in aortic dissection at the ligamentum arteriosum (3). Complications arising from SMA dissection are bowel infarction, shock, intra abdominal haemorrhage, peritonitis and late complications like uraemia (3).

Spontaneous renal artery dissection is very rare, and may be caused by malignant hypertension, iatrogenic injury, trauma, underlying diseases such as fibromuscular disease, atherosclerosis, syphilitic arteritis, tuberculosis or connective tissue disease like Marfan's, Ehlers Danlos syndrome and vasculitidis like polyarteritis nodosa. Renal artery dissection is often clinically silent, when symptomatic, patients present with flank pain and persistent poorly controlled hypertension and complications such as renal infarction (5).

Interventional radiology has a double benefit, it provides good imaging of the dissection, the length and reentry point with possibility of an endovascular repair. However endovascular stent placement is indicated in cases with short segment dissection, in those cases without signs of bowel ischaemia or peritonitis and in patients not improving on conservative therapy. Surgical methods like thrombectomy, resection of the dissected segment with reimplantation to the aorta, and bypass with venous grafts is indicated in cases with signs of bowel ischaemia and perforation. Thus the methods of treatment of SMA dissection vary from conservative management with anticoagulation to endovascular stent placement and surgical procedures (7, 8).

In our cases, the aorta was found to be normal, with the SMA dissection starting at the level of pancreatic head, where the artery is subjected to maximum stress. In addition, both our patients were regular users of alcoholic drinks and a probable indolent pancreatitis can be thought of an aggravating factor, though there was no obvious radiological or biochemical evidence of pancreatitis in either of them. The first patient had an associated renal artery dissection on left side with renal infarcts, which is a very unusual finding. Cases of combined SMA and celiac artery dissections have been reported, but to the best of our knowledge a combination of SMA and renal artery dissection with renal infarcts ,without a coexisting aortic dissection has not been reported (4,6).

TEACHING POINT

Though isolated superior mesenteric artery dissection is a rare phenomenon, it should also be considered in the differential diagnosis of abdominal angina. This requires a high index of suspicion by the clinician and can be confirmed by CT studies.

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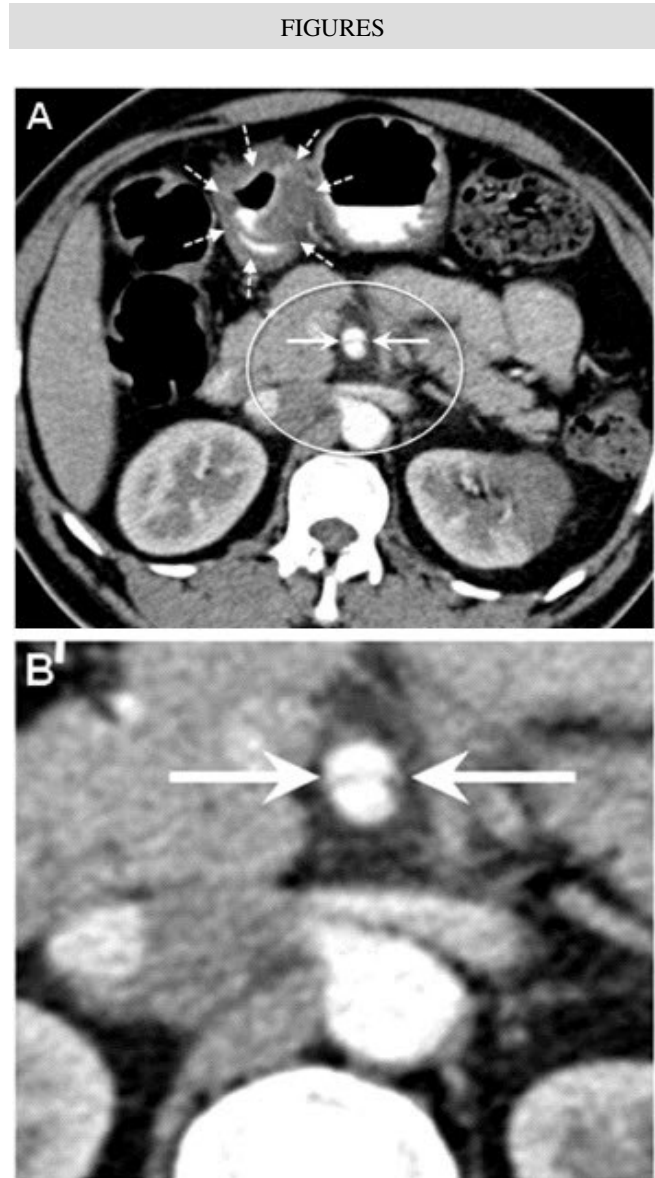


Figure 1: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Axial Contrast enhanced CT Scan in arterial phase shows dissection of the SMA with an intimal flap (arrows) and bowel wall thickening in proximal transverse colon (broken arrows) due to ischaemia.

B- Magnified image of the area of interest within the circle.

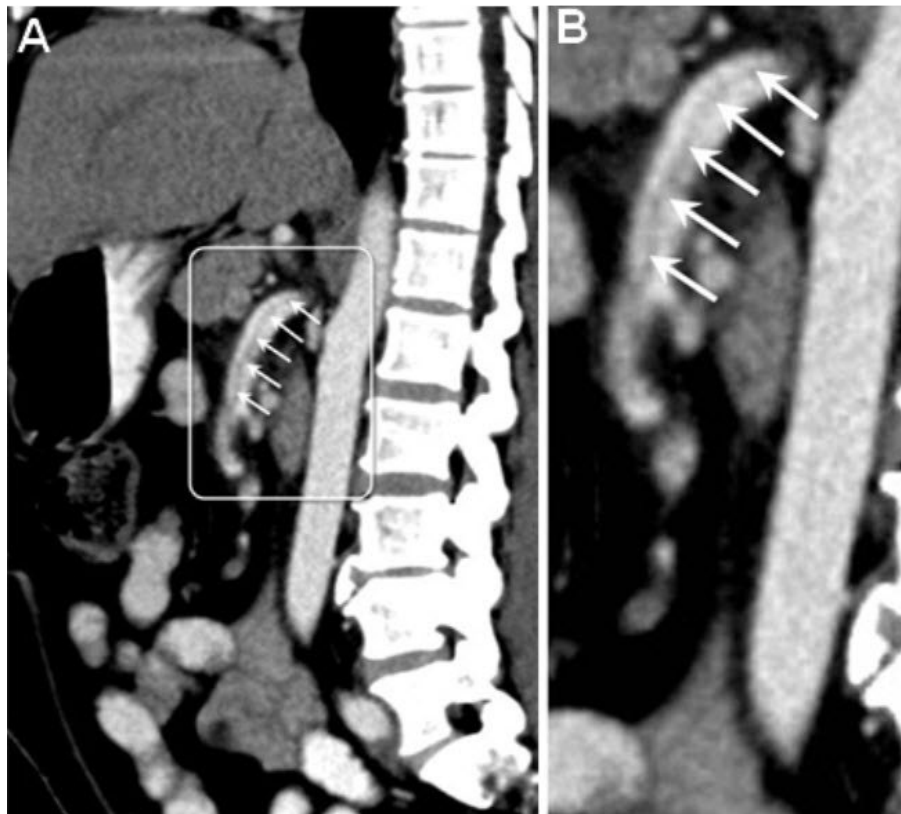


Figure 2: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Sagittal MPR from images acquired in arterial phase shows dissection of the SMA with an intimal flap (arrows) separating the vessel into true and false lumens.
B- Magnified image of the area of interest within the rectangle.

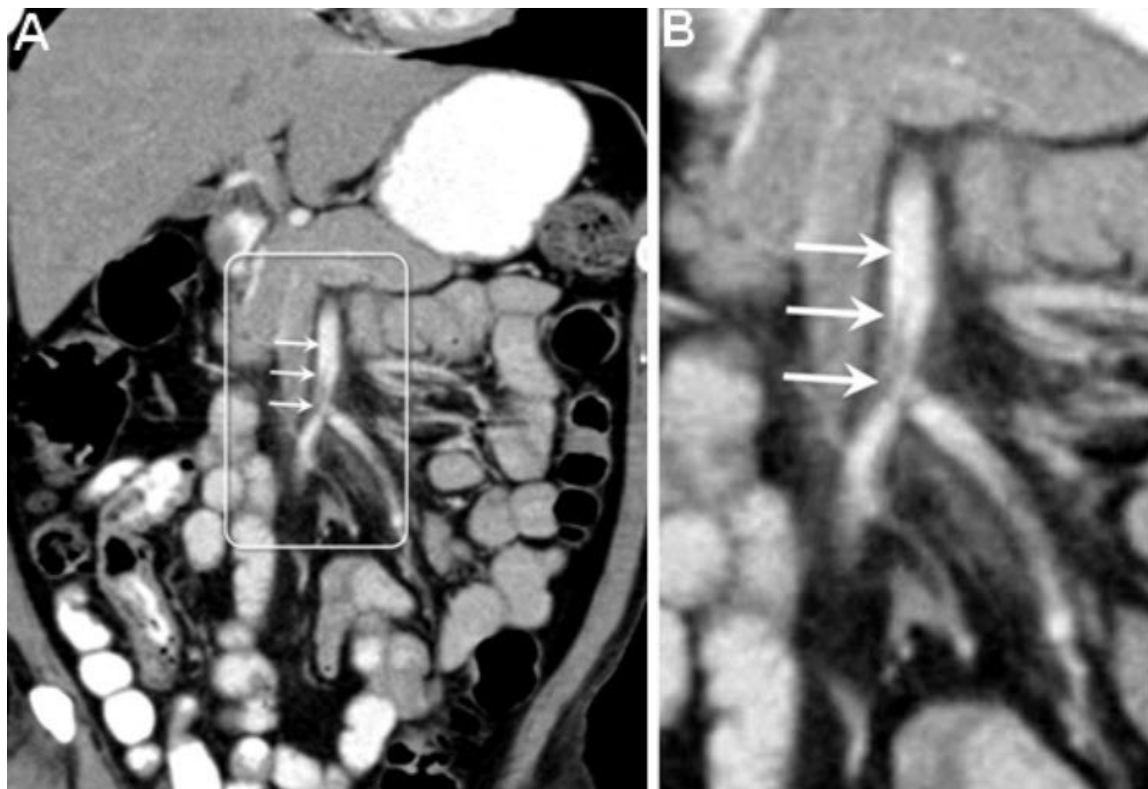


Figure 3: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Coronal MPR from images acquired in arterial phase shows dissection of the SMA with an intimal flap (arrows).
B- Magnified image of the area of interest within the rectangle.

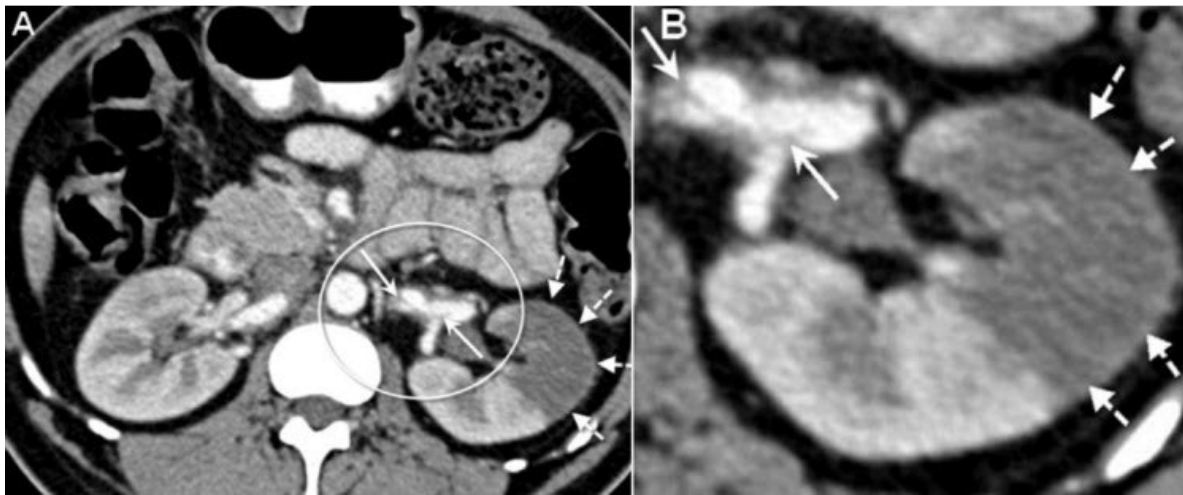


Figure 4: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Axial contrast enhanced CT , arterial phase shows dissection of the main renal artery on left side (arrows) with renal infarcts (broken arrows).
B- Magnified image of the area of interest within the circle.

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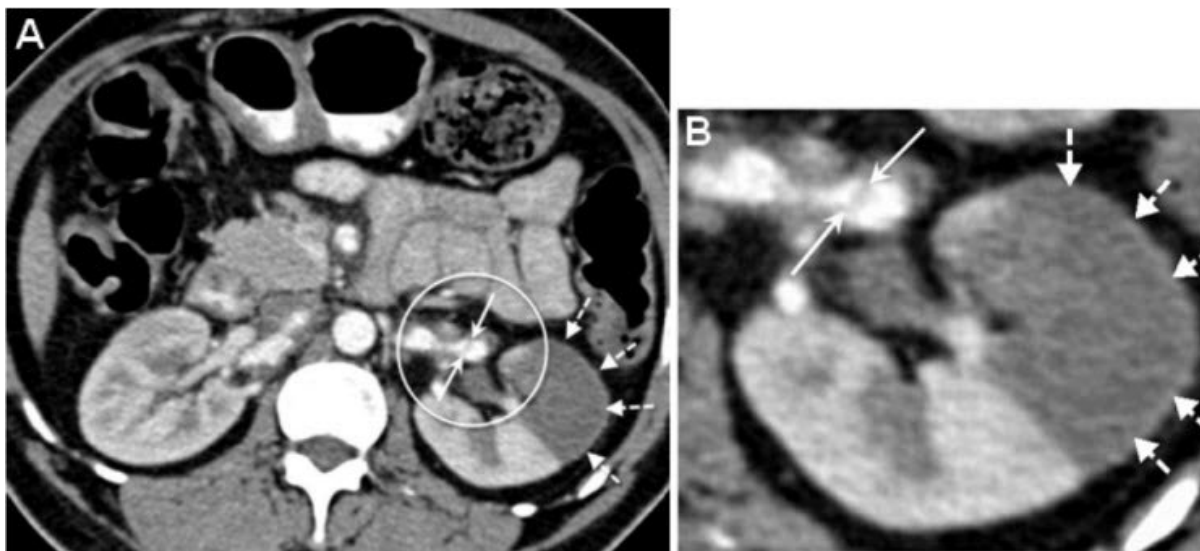


Figure 5: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Axial Contrast enhanced CT scan , arterial phase shows dissection extending into the anterior hilar branch of left renal artery (arrows) with renal infarcts (broken arrows)
B- Magnified image of the area of interest within the circle.

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Figure 6: 46 year old male with SMA dissection, left renal artery dissection, ischaemic bowel and renal infarct - Coronal MPR from images acquired in arterial phase shows dissection of the main renal artery on left side (arrows) with renal infarcts. B- Magnified image of the area of interest within the circle.

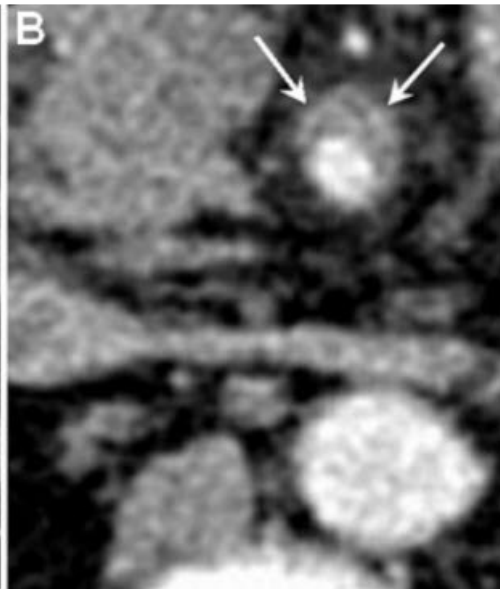


Figure 7: 52 year old male patient with isolated SMA dissection - Axial CT image acquired in arterial phase shows dissection of the SMA with anteriorly thrombosed false lumen (arrows). B- Magnified image of the area of interest within the circle.

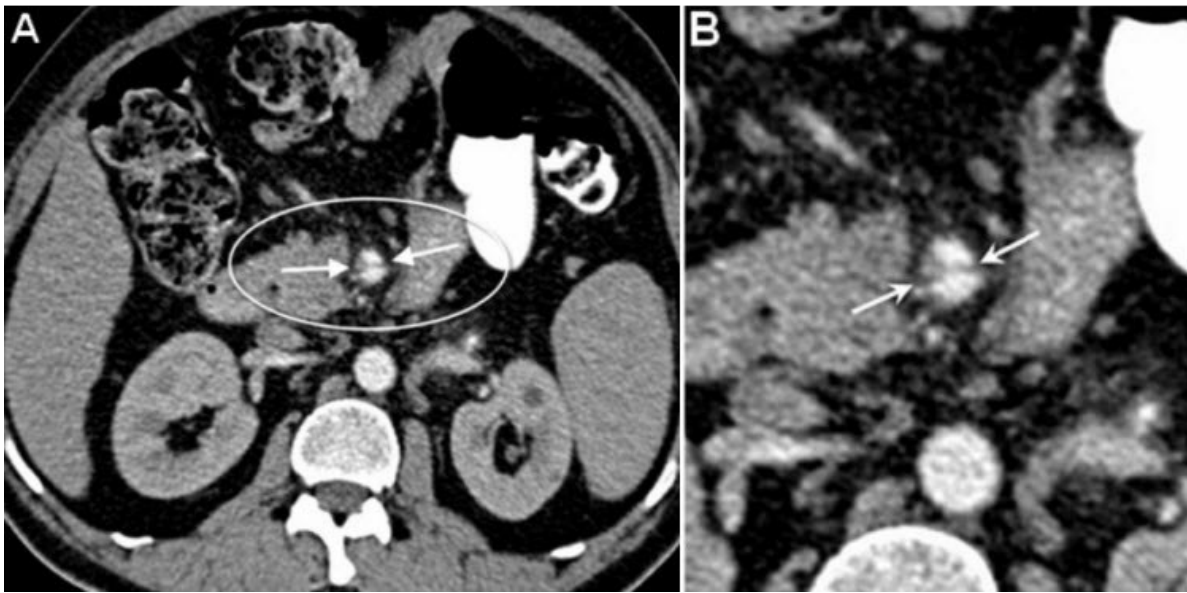


Figure 8: 52 year old male patient with isolated SMA dissection - Axial CT image, acquired in arterial phase shows dissection of SMA with an intimal flap (arrows) and partially thrombosed anterior false lumen. B- Magnified image of the area of interest within the circle.

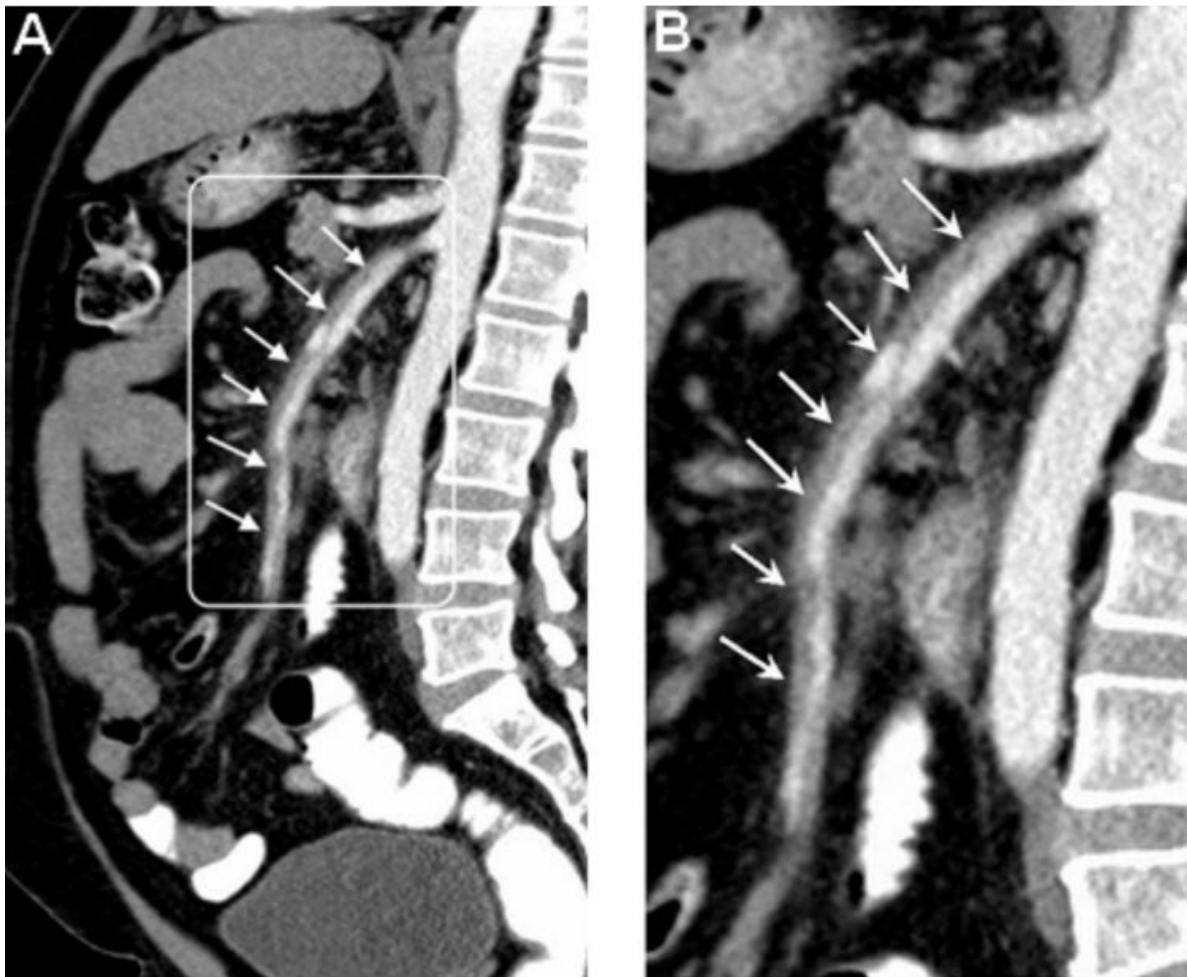


Figure 9: 52 year old male patient with isolated SMA dissection- Sagittal MPR from images acquired in arterial phase shows dissection of SMA extending along its entire length with a partially thrombosed anterior false lumen (arrows). B- Magnified image of the area of interest within the rectangle.

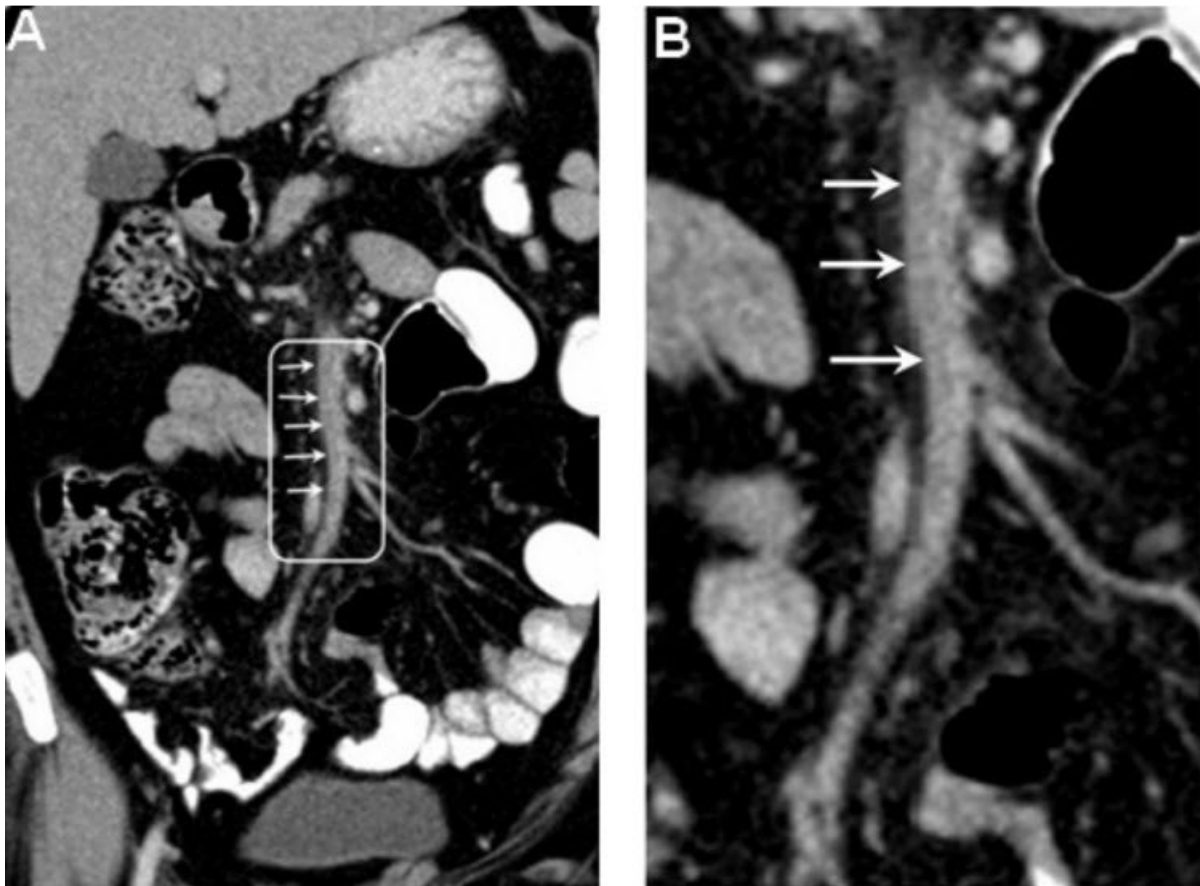


Figure 10: 52 year old male patient with isolated SMA dissection - Coronal MPR from images obtained in arterial phase shows dissection extending along the entire length of SMA with a partially thrombosed false lumen (arrows) on right side.

B- Magnified image of the area of interest within the rectangle.

ABBREVIATIONS

SMA = Superior Mesenteric artery
 MPR = Multiplanar Reconstruction
 CT = Computed Tomography
 I₂ = Iodine
 G = Gauge
 IV = Intravenous

KEYWORDS

Isolated superior mesenteric artery dissection, bowel ischaemia, renal artery dissection, renal infarcts

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