# Medical therapy and intervention do not improve uncomplicated isolated mesenteric artery dissection outcomes over observation alone

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## ABSTRACT

**Objective:** Isolated dissection of the mesenteric vessels is rare but increasingly recognized. This study aimed to evaluate patient characteristics, primary treatment, and subsequent outcomes of mesenteric dissection using multi-institutional data.

**Methods:** All patients at participant hospitals between January 2003 and December 2015 with dissection of the celiac artery (or its branches) or dissection of the superior mesenteric artery (SMA) were included. Patients with an aortic dissection were excluded. Demographic, treatment, and follow-up data were collected. The primary outcomes included late vessel thrombosis (LVT) and aneurysmal degeneration (AD).

**Results:** Twelve institutions identified 227 patients (220 with complete treatment records) with a mean age of 55 ± 12.5 years. Median time to last follow up was 15 months (interquartile range, 3.8-32). Most patients were men (82% vs 18% women) and symptomatic at presentation (162 vs 65 asymptomatic). Isolated SMA dissection was more common than celiac artery dissection (n = 158 and 81, respectively). Concomitant dissection of both arteries was rare (n = 12). The mean dissection length was significantly longer in symptomatic patients than in asymptomatic patients in both the celiac artery (27 vs 18 mm; $P = .01$) and the SMA (64 vs 40 mm; $P < .001$). Primary treatment was medical in 146 patients with oral anticoagulation or antiplatelet therapy (n = 76 and 70, respectively), whereas 56 patients were observed. LVT occurred in six patients, and 16 patients developed AD (3% and 8%, respectively). For symptomatic patients without evidence of ischemia (n = 134), there was no difference in occurrence of LVT with medical therapy compared with observation alone (9% vs 0%; $P = .35$). No asymptomatic patient (n = 64) had an episode of LVT at 5 years. AD rates did not differ among symptomatic patients without ischemia treated with medical therapy or observed (9% vs 5%; $P = .95$). Surgical or endovascular intervention was performed in 18 patients (3 ischemia, 13 pain, 1 AD, 1 asymptomatic). Excluding the patients treated for ischemia, there was no difference in LVT with surgical intervention vs medical management (one vs five; $P = .57$).

**Conclusions:** Asymptomatic patients with isolated mesenteric artery dissection may be observed and followed up with intermittent imaging. Symptomatic patients tend to have longer dissections than asymptomatic patients. Symptomatic isolated mesenteric artery dissection without evidence of ischemia does not require anticoagulation and may be treated with antiplatelet therapy or observation alone. (J Vasc Surg 2017;66:202-8.)

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Isolated mesenteric artery dissection (IMAD) is generally described as a rare but increasingly encountered vascular pathologic process.[1,2] First described by Bauersfeld in 1947,[3] the early literature showed that mesenteric artery dissections were associated with poor outcomes, with 5 of the first 11 reports progressing to bowel ischemia and death.[4] The underlying cause of IMAD is still unknown. One hypothesis implicates the transition from a relatively fixed to an unfixed arterial segment, causing flow stagnation and subsequent abnormal mechanical stress to the anterior arterial wall.[5,6]

Recent treatment recommendations for symptomatic and asymptomatic patients vary on the basis of the experiences of individual institutions and have been supported mostly by small retrospective reviews and a few larger retrospective reviews.[7-11] Suggested treatments include medical management with or without anticoagulation, surgery, and endovascular intervention. Whereas indications for immediate intervention can be self-evident, the optimal treatment is uncertain for patients with anything less than significant end-organ ischemia. This is especially the case for symptomatic patients whose pain does not quickly resolve. As such, some have tried to identify radiologic characteristics of the dissection that may better inform clinical decision-making at the time of diagnosis, such as subtyping of dissections based on morphology.[12]

This multi-institutional study was then conducted to evaluate patient and radiologic characteristics, primary treatment, and subsequent outcomes for IMAD. Our primary outcomes of interest were late vessel thrombosis (LVT) and aneurysmal degeneration (AD) of the dissected mesenteric artery.

## ARTICLE HIGHLIGHTS

- **Type of Research:** Retrospective multicenter cohort study
- **Take Home Message:** Only 18 of 227 patients with superior mesenteric and celiac artery dissection underwent surgical or endovascular intervention. Symptomatic patients without gut ischemia were treated with antiplatelet therapy or observation with excellent results.
- **Recommendation:** The authors suggest that isolated mesenteric artery dissections in symptomatic patients should be treated with antiplatelet therapy or observation and asymptomatic patients may be observed with serial imaging.

## METHODS

This is a multi-institutional, retrospective cohort analysis of patients evaluated or treated between January 2003 and December 2015 with IMAD of the celiac axis, the superior mesenteric artery (SMA), or both vessels. Institutions were recruited through the Vascular Low Frequency Disease Consortium (University of California-Los Angeles Division of Vascular Surgery). A call for participation to institutions with an interest was sent through e-mail. Institutions expressing interest to participate were allowed into the study once they demonstrated Investigational Review Board (IRB) approval from their home institution. The IRB at the University of California, Davis approved the study protocol. The IRB waived the patient consent process because of minimal patient risk. Data were collected by each institute's respective investigators and stored using a password-encrypted database (Velos eResearch System; Velos, Inc, Fremont, Calif) maintained by the University of California, Davis.

**Inclusion criteria and patient identification.** Patients were identified using the *International Classification of Diseases, Ninth Revision* (ICD-9) code 443.29 (dissection of other artery) while excluding codes 441.0 to 441.03 (dissection of aorta). Additional patients were identified by search of the picture archiving and communication system using search terms of "celiac dissection," "celiac artery dissection," "superior mesenteric dissection," "superior mesenteric artery dissection," and "mesenteric artery dissection." Institutions unable to perform picture archiving and communication system search queries were allowed to enter patients on the basis of ICD-9 codes only. Patients presenting with rupture of the celiac artery or SMA were not included if there was no clear imaging demonstrating an IMAD.

**Patient variables.** Data collected contained patient demographics, presenting symptoms, radiographic measurements, primary treatment, and follow-up data including occurrence of LVT or AD. Patients were defined as symptomatic or asymptomatic. Symptomatic patients presented with at least one symptom of abdominal pain, nausea, or vomiting. Symptomatic patients were also broken down into those with and without evidence of intestinal ischemia on initial evaluation as determined by the participating institution's chart review.

**Treatment.** Patients were classified by the primary treatment at the time the dissection was identified (medical, surgical, observation). Medical management was defined as initial treatment with antiplatelet or anticoagulation medications. Treatment was further classified as antiplatelet only, anticoagulation only, or combination treatment. The addition of new antihypertensive medications or a change in a patient's antihypertensive medications after identification of the dissection was also collected. Surgical treatment was defined as any operation including bypass, embolectomy, patch angioplasty, or endovascular intervention.

**Radiographic data.** We collected data on the imaging modality used for initial diagnosis of IMAD. When available, images were reviewed for dissection length, maximal