

Fractional Flow Reserve to Assess the Functional Severity of Superior Mesenteric Artery Stenosis in the Patients with Isolated Spontaneous Dissection of Superior Mesenteric Artery

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Abstract

Mesenteric ischemia is the main clinical manifestation of spontaneous isolated superior mesenteric artery dissection (SISMAD). But it is difficult to determine the clinical significance of superior mesenteric artery (SMA) stenoses. Fractional flow reserve (FFR) is an index of the functional severity of arterial stenoses, which is calculated from pressure measurements made during arteriography.

Purpose: We sought to assess the correlation between bowel ischemia findings and altered hemodynamics obtained from FFR of SMA (FFRSMA) and evaluate the feasibility and effectiveness of FFR-guided endovascular treatment for SISMAD.

Material and Methods: We conducted a prospective cohort study of 47 consecutive patients diagnosed with SISMAD between October 2014 to June 2017. We conducted FFRSMA measurement after 1-week conservative treatment. We compared clinical manifestations, CT scan imaging, quantitative SMA arteriography with FFRSMA. We divided the patients into 2 groups: conservative treatment (FFRSMA > 0.75, n=35) and stent (FFRSMA < 0.75, n=12). We evaluated the perioperative, 30-day, and 1 year outcomes of FFR-guided endovascular treatment for SISMAD. We estimated the clinical remission rates, mortality, complications, reintervention rate, and stent patency rate.

Results: The occurrence rate of mesenteric ischemia within our SISMAD cohort was 95.7% (45/47). The remission rate of bowel ischemia was 31.9% (15/47) after 1-week conservative treatment. We conducted FFRSMA measurement in 31 patients and endovascular stent placement in 12 patients with FFRSMA < 0.75. The technical success rate of the endovascular treatment was 100%. One patient underwent open surgery for intestinal necrosis during the first week conservative treatment. There was no death, dissection rupture, reintervention or contrast-induced nephropathy among the patients in the perioperative period, 30-day, and 1-year follow-up. The 1-year primary patency rate was 100%. One patient with stent implantation had a type III aortic dissection on the 659 day of follow-up.

Conclusions: In patients with mesenteric stenosis of SISMAD, FFRSMA appears to be a useful index of the functional severity of the stenoses and the need for mesenteric revascularization.

Biography

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