SUCCESSFUL MANAGEMENT OF THE SUPERIOR MESENTERIC ARTERY OCCLUSION IN 86-YEAR-OLD FEMALE: CASE REPORT

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SUMMARY – Chronic superior mesentery ischemia often presents a clinically asymptomatic diffuse atherosclerotic process. There are no compelling recommendations on the benefits of early revascularization strategy besides antithrombotic prophylaxis and statin treatment. Conversely, long-term prevalence of symptomatic cases in surgical patient cohorts is rarely reported in the literature. Acutization of chronic ischemia has a severe clinical course, so timely recognition may be considered lifesaving. We present a case of an 86-year-old woman hospitalized for acutized atherosclerotic narrowing of superior mesenteric artery. The patient was urgently operated on by aorto-mesenteric ring prosthesis revascularization. Postoperative course was uneventful and the patient regained 10 kilograms in the next few months.

Key words: *Atherosclerosis; Superior mesenteric artery; Mesenteric ischemia; Bypass surgery; Statins; Acetylsalicylic acid*

Introduction

Mesenteric ischemia occurs from insufficient circulation supply over the arterial or venous beds. Acute form follows occlusive changes, embolism or vasospasm in the arterial circulation. Venous thrombosis or strangulation is likewise responsible part of acute presentations. Chronic mesenteric ischemia or "abdominal angina" represents relapse-remitting or constant chronic intestinal hypoperfusion, mostly due to advanced atherosclerotic process. Symptomatic phase of intestinal angina includes emblematic postprandial cramps or dull abdominal pain, usually one hour after eating and persisting for up to two hours[1]. Acute-on-chronic ischemia is a life threatening condition, in contrast to interventional treatment of chronic symptomatic episodes of steady angina[1]. Consequently, proper thought of diagnosis, mandatory early recognizing and timely treatment represent life-saving emergency. Earlier interventions offered improvement in survival and quality of life, resembling the short door-to-balloon benefits of percutaneous coronary interventions[2].

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Received December 19, 2011, accepted April 11, 2013

Case Report

An 86-old-woman with diabetes was hospitalized through emergency department due to acute severe abdominal pain, general worsening with dehydration, nonketotic hypoglycemia and hypotension, after more than 6 months of progressive weakening and significant weight loss of 25 kilograms associated with chronic abdominal pain. Medical records showed hypothyroidism, well regulated hypertension, atrial fibrillation, valvular heart disease with dilated

ventricles and diastolic dysfunction. Routine laboratory tests were non diagnostic, fecal occult blood test was negative, and so were oncology serum cancer antigens. There were no signs of proliferative disorders on endoscopies or transabdominal ultrasound. Contrast enhanced multidetector row computerized tomography showed atherosclerotic narrowing of the celiac trunk and superior mesenteric artery (Fig. 1). Culprit lesion was inappropriate for percutaneous dilatation and stenting due to convoluted morphology and calcifications, thus the patient was urgently operated on by aorto-mesenteric revascularization using ring prosthesis. During hospital stay, the patient received total parenteral nutrition and probiotics, i.e. enteral substitution in the early postoperative course. Postoperative follow up was free from complications and the patient was subjectively well, capable of usual daily vocational activities and regained 10 kilograms in the next months.

Discussion

Acute mesenteric ischemia usually manifests with sudden over proportionate pain intensity for a few of clinical status changes. Nausea, vomiting and forceful stool evacuation are common accompanying symptoms. Mesenteric thrombosis, on the other hand, has subacute manifestations, with a more prolonged symptomatic course lasting up to couple of weeks. More severe pain is generally related to occlusion of the superior mesenteric artery supplying small bowel and right sided colon, while the remainder colonic ischemia has milder manifestations. Development of transmural bowel infarction set grounds for peritoneal irritation and inflammation, distension of the abdomen and quiescent bowel sounds on auscultation. The pathoanatomic substrates of abdominal ischemia are archetypal and include acute mesenteric embolism, acute mesenteric artery thrombosis, venous mesenteric thrombosis and non-occlusive ischemia[3,4]. Patients of younger age are frequently prone to embolic events rather than metabolic syndrome complications and atherosclerosis related comorbidities occurring in more advanced age[5].

In order to alter the poor natural course of acute mesenteric ischemia, it is of utmost importance to establish the diagnosis prior to the development of intestinal infarction. Laboratory tests are generally non diagnostic, representing a set of unspecific metabolic changes. Exception in laboratory diagnosis is negative predictive value of the low D-dimer test ruling out mesenteric ischemia. Digital angiography is the gold standard in the diagnosis and/or interventions with documented ameliorative overall survival changes in the last two decades[6]. Wide availability of angiography has shown clear benefits of early interventions with nearly 70% survival rates within 12-hours of event *versus* 70% mortality in the pre-angiography era[7]. Continuous infusion of vasodilators, papaverine could be applied for up to 5 days in occlusive or non-occlusive cases[8]. Surgical embolectomy of arterial embolus in clinical instance could be followed by re-laparotomy, i.e. "second look" in 24-48 hours for resection of the gangrenous tissue. Warfarin therapy combined with clopidogrel was found to have a synergistic effect for prevention of re-embolization events[9]. Atheroscle-

Fig. 1. Superior mesenteric artery atherosclerotic occlusion – multidetector row contrast enhanced computerized tomography: (A) superior mesenteric artery; (B) magnified superior mesenteric artery; (C) celiac trunk.

rotic mesenteric artery thrombosis is best managed with revascularization, either surgical or percutaneous with stent implantation[10]. The "two-vessel" revascularization approach was developed in order to attain better control of symptoms, which *de facto* increased the prevalence of combined chronic comorbidities in the population and more complicated atherosclerotic lesions, the most commonly outspread beyond single vessel disease[11]. The management of acute mesenteric venous thrombosis includes anticoagulation therapy and operative resection of gangrenous tissue. Recently, multi-row detector computerized contrast enhanced tomography (MDCT) and magnetic resonance angiography (MRA) have become very important diagnostic tools with overall accuracy of over 95%, wide availability, and improvement in survival rates[12].

On the other hand, the diagnosis of chronic mesenteric ischemia is a more challenging issue, since a great deal of angiography detected irregularities are also seen in control patients without symptoms[13]. Other modalities of chronic mesenteric ischemia diagnosis are of even lower accuracy and cannot be considered as significantly reproducible. Treatment possibilities for patients with symptoms that could be associated with chronic mesenteric ischemia include surgical revascularization or percutaneous stent insertions, depending on patient age, comorbidities and morphological characteristics of the lesion(s). Significant difference in mortality rates and a less pronounced difference in long-term success of symptom control depend on whether surgery was performed for chronic or acutized-chronic ischemia. Acutized form is related to worse outcomes in both categories of outcomes[14].

Due to relative shortage in prospective randomized controlled trials, current recommendations are based on sets of case series, observational studies, or clinical experience. Management algorithms represent sound principles; however, bearing in mind lower evidence based grades. Therapeutic algorithms on acute *per se* or acutized chronic mesenteric ischemia include high index of clinical suspicion based on history data and typical set of symptoms or clinical signs. Positive radiomorphological studies in addition to signs of pharmacotherapy unresponsive peritoneal irritation clearly indicate the earliest possible emergency revascularization[13]. Based on the associated comorbidities and common crescendo course, well-adjusted parenteral nutrition support in intensive care units seems to offer benefits over regular feeding or enteral nutrition[15]. The possibility for ameliorative effects of antibiotics or probiotics in order to decrease bowel bacterial overgrowth and septicemia has not yet been systematically addressed. Position statements about indications for revascularization in chronic mesenteric ischemia are not clear, as they are based on the unknown expected clinical course that might be benign *versus* not negligible surgery risks. Percutaneous intervention is consistently emerging as a valuable parallel to surgery with comparable short- and long-term outcomes[16]. Percutaneous angiographic interventions have recently become the first-line treatment option owing to technical success rates in over 90%, good symptom control in nearly 80% and one-year patency rate in 85% of patients[17]. In angiography patients, the length of hospital stay is almost half that in surgical patients[18]. Endovascular interventions are often challenged with diffuse atherosclerotic process unsuitable for single vessel stent implanting, risk of stent thrombosis, and need of surgery in case of bowel gangrene development. Regular diagnostic follow up using MSCT or color Doppler ultrasound is mandatory for early detection of the possible complications such as restenosis[19].

Large bowel is the most common anatomic part of gastrointestinal tube affected by intestinal ischemia, accessible by endoscopy and showing the following forms of colitis: a) reversible, b) transient, c) chronic, d) stricture, e) gangrene, and f) fulminant pancolitis[13].

Primary and secondary preventive therapy measures include a variety of drug groups[20]. Long-term follow up of chronic venous mesenteric thrombosis showed better outcomes in patients on beta blockers and anticoagulation therapy[8]. However, clear position and relative benefits of antiplatelet therapy, anticoagulation, vasodilators, beta-blockers, antidiabetics or statins in mesenteric ischemia have not yet been systematically studied in prospective randomized settings.

In conclusion, chronic mesenteric ischemia frequently epitomizes asymptomatic atherosclerosis. Convincing evidence in favor of early revascularization strategy over primary or secondary prevention

with pharmaceuticals is lacking. In addition, community prevalence of symptomatic cases is described as exceptionally scarce. Critical ischemia management by operative revascularization is as efficient as percutaneous stent insertion. The perspectives of anticoagulation and antithrombotic therapy are being investigated. Acute worsening of chronic ischemia has a majorly underprivileged course, hence a high index of clinical suspicion and early diagnosis using digital angiography or computerized tomography at emergency department are a life-saving protocol.

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Sažetak

USPJEŠNO LIJEČENJE OKLUZIJE GORNJE MEZENTERIČKE ARTERIJE U 86-GODIŠNJE BOLESNICE: PRIKAZ SLUČAJA

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Kronična ishemija gornje mezenteričke arterije obično predstavlja klinički asimptomatsku pojavu difuznog aterosklerotskog procesa. Trenutno u pogledu medicine zasnovane na dokazima ne postoje jasne preporuke o korisnosti pristupa rane revaskularizacije prema terapiji antitrombocitnim lijekovima ili statinima. Na drugoj strani, studije učestalosti uz dugotrajno praćenje operiranih bolesnika su kroz literaturu oskudno zastupljene. Akutizacija kronične ishemije obično ima vrlo ozbiljne posljedice s visokom stopom smrtnosti, pa veća klinička pozornost uza što raniju dijagnostiku i pravodobnu terapijsku intervenciju predstavlja potencijalno spasonosni oblik liječenja. Prikazan je slučaj 86-godišnjakinje koja se javila u hitnu službu zbog akutizirane aterosklerotske okluzije gornje mezenteričke arterije. Bolesnica je hitno operirana uz primjenu aorto-mezenteričke prstenaste proteze. Poslijeoperacijski tijek bio je uredan, bez komplikacija, te je bolesnica povratila oko 10 kg u slijedećih nekoliko mjeseci.

Ključne riječi: *Ateroskleroza; Gornja mezenterička arterija; Ishemija crijeva; Vaskularna kirurgija; Statini; Acetilsalicilna kiselina*