Diagnosis and Management of Chronic Mesenteric Ischaemia

Essay

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By

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List of Abbreviations

Abb.	Full term
3D:	*Three-dimensional*
A:	*Aorta*
AIPD:	*Anterior inferior pancreaticoduodenal artery*
AMI:	*Acute mesenteric ischemia*
AOR:	*Arc of Riolan*
aRHA:	*Accessory right hepatic artery*
aRHA:	*Accessory right hepatic artery;*
ASPD:	*Anterior superior pancreaticoduodenal artery,*
CA:	*Celiac artery*
CABG:	*Coronary artery bypass graft surgery*
CAD:	*Coronary artery disease*
CHA:	*Common hepatic artery;*
CKD:	*Chronic kidney disease*
CMI:	*Chronic mesenteric ischemia*
CPA:	*Caudal pancreatic artery*
CT:	*Celiac trunk*
CT:	*Computed tomography*
CTA:	*Computed tomographyangiography.*
CTO:	*Chronic total occlusions*
CVD:	*Cardiovascular disease*
DM:	*Diabetes mellitus*
DPA:	*Dorsal pancreatic artery,*
DSA:	*Digital subtraction angiography*
DUS:	*Duplex ulrasonography*
ECG:	*Electrocardiogram*
ER:	*Endovascular revascularization.*
ET:	*Endoscopic treatment*
GDA:	*Gastroduodenal artery*
IC:	*Ileocolic artery,*

List of Abbreviations (Cont...)

Abb.	Full term

i-FABP:.....Intestinal Fatty Acid Binding Protein
IMA:.....Inferior mesenteric artery
LC: .....Left colic artery,
LDH:.....Lactate dehydrogenase
LG:.....Left gastric artery
MC: .....Middle colic artery
MI:.....Myocardial infarction
MRA:.....Magnetic resonance angiography
OR:.....Open revascularization
OT:.....Open treatment
PCI:.....Percutaneous coronary intervention
PIPD: .....Posterior inferior pancreaticoduodenal artery
PM:.....Pancreata magna
PSV:.....Peak systolic velocity
PTA:.....Percutaneous transluminal angioplasty
RC:.....Right colic artery
RGE: .....Right gastroepiploic artery,
SA: .....Sigmoid artery
SA: .....Splenic artery
SMA:.....Superior mesenteric artery
SR: .....Superior rectal artery
SVS:.....Society of vascular surgery
TIA:.....Transient ischemic attack
TP:.....Transverse pancreatic artery
TPN:.....Total parenteral nutrition

Abstract

Since 1958, Open treatment (OT) of symptomatic CMI has been the gold standard of management. However, nowadays, mesenteric angioplasty and stenting is the first choice of treatment in patients with CMI who have suitable lesions, independent of their clinical risk. The ideal lesion for angioplasty and stenting is a short, focal stenosis or occlusion with minimal to moderate calcification or thrombus.

The decision between open surgical (OS) and endovascular therapy (ET) is nuanced and a careful review of preprocedure CTA with attention to lesion anatomy, nutritional status, and life expectancy. ET is generally preferred as a first choice of treatment for CMI given the low rates of preoperative morbidity and mortality compared to OS.

In most recent results of studies about the management of CMI clarified that ER has similar preoperative mortality and shorter hospitalization but higher rate of restenosis requiring reintervention compared with OR. Patients with ER who required reintervention appear to have longer lesions as well as higher rates of aortic occlusive disease on preoperative angiography. Patients crossed over from ER to OR had higher preoperative mortality than either primary open or endovascular patients. These findings may guide treatment selection in patients with CMI undergoing ER or OR.

Keywords: *Superior rectal artery- Superior mesenteric artery- Splenic artery- Sigmoid artery- Peak systolic velocity- Myocardial infarction*

INTRODUCTION

Mesenteric ischemia occurs when perfusion of the visceral organs fails to meet normal metabolic requirements. This disorder is categorized as either acute or chronic, based on the duration of the symptoms. Acute mesenteric ischemia (AMI) occurs rapidly over hours to days and frequently leads to acute intestinal infarction requiring resection. The most common causes are embolization to mesenteric arteries or acute thrombosis related to a preexisting plaque. Chronic mesenteric ischemia (CMI) is a more insidious process and progresses over weeks to several months. The most common cause is progressive occlusive disease of the visceral arteries, usually related to atherosclerosis. It is often unrecognized by physicians and is frequently misdiagnosed as a gastrointestinal disorder ***(Ruby and Marc, 2014).***

Chronic mesenteric ischemia (CMI) is a fairly uncommon disease that accounts for only 5 % of all cases of ischemic compromise of the gastrointestinal tract ***(Stangenberg and Schermerhorn, 2015),*** that is usually the result of atherosclerotic obstructive disease affecting the mesenteric arteries. The classic triad of post-prandial pain, food aversion and weight loss is not always present, often leading to low clinical suspicion for CMI and underdiagnosis. Non-invasive evaluation for CMI usually starts with mesenteric arterial duplex scanning, followed by computed tomography

angiography (CTA), magnetic resonance angiography (MRA) or conventional angiography, the latter being the gold standard for establishing its diagnosis. However, angiography alone has been demonstrated in coronary and other vascular beds to be inaccurate in predicting the physiologic and hemodynamic significance of a certain subset of atherosclerotic stenosis ***(Sadiq et al., 2014).***

In those older than 60 years atherosclerotic plaques are the most common cause of stenosis of the mesenteric arteries, with females affected three times more often than males ***(Loffroy et al., 2009).*** However, fibromuscular dysplasia is the most common cause in children and young adults ***(Slovut and Olin, 2004).***

Since the first successful mesenteric endarterectomy by Shaw and Maynard in 1958, significant progress has been made in the diagnosis and treatment of mesenteric vascular diseases, improvements in imaging modalities, medical therapy, and open and endovascular reconstruction have allowed treatment of acute and chronic mesenteric artery diseases with satisfactory results. Yet, delay in diagnosis remains a major problem given that mesenteric diseases are uncommon and often present with unspecific symptoms ***(Oderich and Rochester, 2015).***

CTA is an emerging diagnostic test with high sensitivity and specificity in the setting of both acute and chronic mesenteric

ischemia and should be considered the first-line imaging test. CT can also accurately assess for other causes of acute and chronic abdominal pain, and it provides excellent anatomic mapping of the mesenteric vasculature, which is essential in the preoperative planning. However; conventional angiography is the gold standard test for patients with acute and chronic mesenteric ischemia except for hemodynamically unstable patients with acute mesenteric ischemia ***(Oliva et al., 2013).***

Patients are initially treated with conservative therapy including bowel resting, smoking cessation, and administration of vasodilator drugs. Revascularization is considered if these conservative treatments fail to relieve the symptoms ***(Shirasu et al., 2013).***

The gaols of revascularization in patients with symptomatic chronic mesenteric ischemia are to relieve symptoms, improve the nutritional status, and prevent intestinal infarction ***(Kasirajan et al., 2000).***

In the past, abdominal bypass surgery was the primary treatment option for CMI; however, many of these patients have a high risk due to poor general state of health or severe concomitant disease. Thus bypass surgery is associated with a high perioperative morbidity and mortality and, therefore, is often unfeasible ***(Luther et al., 2011 & Penugonda et al., 2009).***

The decision between endoscopic treatment (ET) and open treatment (OT) in patients with CMI should be based on lesion anatomy and nutritional status as well as life expectancy. Considering the better results in terms of perioperative mortality and morbidity with ET it should be used as first approach whenever possible. Although primary, secondary, and clinical patency rate favors OT, no difference in survival rates between the two treatment groups was found ***(Pecoraro et al., 2013).***