Case Report

Current Management of Mesenteric Venous Thrombosis: Case Report of a Prothrombin Gene Mutation

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Abbreviations MVT: Mesenteric Venous Thrombosis; CT: Computed Tomography; ENA: Extractable Nuclear Antigen

Abstract
Mesenteric venous thrombosis was initially described by Warren and Eberhardt in 1935, it presents when mesenteric territory blood flow drainage is inadequate, ranging from reversible physiological disturbances on tissue integrity to complete transmural infarction. Etiology can be primary or secondary, being primary in 25 to 55% of the thrombosis situations. Current reports have mentioned a decrease in primary thrombosis cases thanks to the establishment of hypercoagulability screening tests and the increase of malignant disease incidence. Intravenous contrast-enhanced computed tomography is the diagnostic gold standard. Prompt anticoagulation therapy results in low surgical intervention percentage; when bowel necrosis is established, the first line treatment is intestinal resection. Herein we report a case due to prothrombin G20210A gene mutation.

Introduction
Mesenteric Venous Thrombosis (MVT) was initially described by Warren and Eberhardt in 1935 [1,2], it presents when mesenteric territory blood flow drainage is inadequate, ranging from reversible physiological disturbances on tissue integrity to complete transmural infarction. It has a ratio of 1:15000 patients attending to emergency department, representing 5 to 15% of mesenteric ischemia cases. Superior mesenteric vein is the most affected vessel [2,3]. With regular use of imaging studies, the diagnosis is made by non-invasive approaches, being intravenous contrast-enhanced Computed Tomography (CT) the diagnostic gold standard [2]. Prompt anticoagulation therapy results in low surgical intervention percentage; when bowel necrosis is established the first line treatment is intestinal resection with the priority of preserving the most tissue possible [2-10].

Case Report
A 30 year old woman is admitted to the emergency department, with a history of sedentary life style, morbid obesity and desogestrel and ethinyl estradiol oral contraceptive the previous two
years, presenting a five hours ailment characterized for sudden colic abdominal pain in superior abdomen irradiated to left flanc, associated with distension, nausea, gastroalimentary vomit, hematochezia and one event of hematemesis. Five days earlier she noticed abdominal distension, anorexia, asthenia, and adinamy. On physical examination diaphoresis, skin pallor, severe abdomen distension, abolished peristaltic sounds, palpation tenderness, abdominal wall rigidity and peritoneal irritation signs. Blood tests report leukocytosis with neutrophilic, thrombocytopenia of 91 103/ml, and >10,000 D dimer. A double contrast-enhanced CT was performed reporting free peritoneal fluid of ten Hounsfield units, small bowel wall thickness and occlusive thrombus at superior mesenteric vein, without other site of thrombosis, intestinal necrosis or perforation (Figures 1 and 2).

Admission to intensive care unit was required for conservative management, with initial intravenous fluids administration, parenteral nutrition, wide spectrum antibiotics and gastrointestinal rest with nasogastric tube and close supervision of intestinal necrosis. Anticoagulation was set at the time of diagnosis with low-molecular-weight heparin (80 mg of subcutaneous enoxaparin every 12 hours).

Diagnostic tests were made for thrombophilic disorders, including autoimmunity profile and Extractable Nuclear Antigen (ENA) assessment where heterozygosity for prothrombin mutation G20210A was demonstrated. Improvement of symptoms were obtained four days after conservative treatment, though deterioration was present at the fifth day with tachycardia, high cardiac output, abdominal pain and elevated abdominal pressure. A new CT revealed an increase in the terminal ileum wall thickness and density (Figure 3). Surgical exploration was decided, finding abundant peritoneal fluid and seventy centimeters of terminal ileum necrosis (Figure 4). Intestinal resection of the necrotized tissue was performed with Brooke’s ileostomy and placement of a sub aponeurotic bag (Figures 5 and 6). Histopathology study confirmed bowel necrosis. On the early
Symptomatic condition length between 5 to 14 days [2,3]. Our patient are asymptomatic the previous 48 hours before the event, with a regional ischemia without intervention progress to full-thickness the translocation of bacteria from the intestinal lumen. Further gradually established, in contrast to the arterial ischemia where this happens. The transition of a normal intestine to an ischemic one is ischemia and necrosis; with sudden vein obstruction there is not Thrombosis dodges venous return, resulting in venous ingurgitation, venous stasis are directly correlated to venous thrombosis [1-6].

Increased recognition of thrombosis is due to the radiological tests usage. The average age of presentation is among 40 and 60 years, and in contrast to other vascular disorders, mesenteric ischemia primarily affect women; more than 70% of persons with this disorder are female [11]; with personal or familiar history in 17 to 38% of cases [2,3]. Etiology can be primary or secondary, being primary in 25 to 55% of the thrombosis situations. Current reports have mentioned a decrease in primary thrombosis cases thanks to the establishment of hypercoagulability screening tests and the increase of malignant disease incidence. Prothrombotic states, local vessel injury and venous stasis are directly correlated to venous thrombosis [1-6]. Thrombosis dodes venous return, resulting in venous ingurgitation, ischemia and necrosis; with sudden vein obstruction there is not enough time to develop a collateral supply and transmural infarction happens. The transition of a normal intestine to an ischemic one is gradually established, in contrast to the arterial ischemia where this happens abruptly. Early injury primarily affects intestinal mucosa and submucosa and potentially impairs mechanisms that prevent the translocation of bacteria from the intestinal lumen. Further regional ischemia without intervention progress to full-thickness injury, infarction and death [2]. Approximately, 75% of patients are asymptomatic the previous 48 hours before the event, with a symptomatic condition length between 5 to 14 days [2,3]. Our patient had unspecific symptoms five days prior to her episode. An acute event is described as an abdominal colic pain; out of proportion according to the physical examination, followed by nausea and vomit, up to one-fourth of the cases have melena. Fever as the main sign suggests pylephlebitis or portal vein thrombosis infection due to intestinal sepsis like appendicitis or diverticulitis [1-3,5,7,8].

Early diagnosis improves patients overall survival; with regular use of image studies, the diagnosis is made by a non-invasive approach, being intravenous contrast-enhanced CT the diagnostic gold standard. Data observed in these tests are the bowel wall thickness above 3 mm, engorgement of the mesentery, non-defined intestinal margins and ascites. The homogeneous enhancement with bowel wall thickening increased to 10 mm is 90% certainty to identify transmural infarction. The thrombus in the vein appears as a translucent local image, it can be seen increased caliber of the vein with a defined and thick wall [2,5,6,10].

The avoidance of thrombus and infarction extension, as well as the prevention of a long term recurrence are the corner stone of the prompt treatment of these condition, moreover general cautions such as pain control, bowel rest, fluids and electrolyte reposition, hemoderivatives transfusion, nasogastric catheter system and broad spectrum antibiotics must be proportioned [2,8]. Hasty anticoagulation therapy results in low surgical intervention percentage. Some studies have demonstrated that anticoagulation increases the veins permeability in more than 80% of the cases [1,2]. Primary instauration or intraoperative anticoagulants elevate overall survival and diminish recurrence risk [1,2,9,10]. An autoimmune test was performed, where a G20210A prothrombin gene mutation was demonstrated; which belongs to a group of acquired or hereditable diseases known as thrombophilias with a hypercoagulability state. Diverse hereditary thrombophilia exists, being antiphospholipid syndrome the most common, followed by V Leiden factor and prothrombin G20210A gene mutation, among others [12]. Prothrombin G20210A gene mutation leads to an elevation of prothrombin levels (II factor), however the exact mechanism for its hypercoagulability state in uncertain. Between the Caucasian people with an initial episode of deep venous thrombosis, 6% will be heterozygote for prothrombin G20210A gene; and in patients with MVT the prevalence is up to 25% [13]. A higher prevalence is present when there is a family history of the same mutation, and there are also other acquired risk factors added to the hereditary aspects, such as: trauma or major surgery, prolonged prostration, hematological malignancies, myeloprolipherative disorders, solid tumors, oral contraceptives, hormonal replacement therapy, heparin induced thrombocytopenia, paroxysmal nocturnal haemoglobinuria, hereditary hemorrhagic telangiectasia, obesity, pancreatitis, nephrotic syndrome and smoking. People who are heterozygote for this gene, like our patient, show 3 times more risk for thrombosis than general population [12,13]. For outpatient management of thrombophilias, the most studied and used treatment is based on vitamin K antagonist like Warfarine, though there are new oral anticoagulants like direct thrombin (Dabigatran) and activated X factor inhibitors (Rivaroxaban and Apixaban), with the advantages of having a more predictable pharmacodynamics, with no affection due to age nor weight, being dose dependent, less drug and food interactions, without the need of constant follow up, but lacking a reverse medication for over-anticoagulation [12,14]. On the studies that compare the new oral anticoagulants and Warfarine, the former seem...
to be just as effective preventing vascular brain disease and systemic embolism in patients with non-valve atrial fibrillation, they have also been approved as thrombosis prophylaxis after orthopedic surgery (hip or knee) and, dabigatran like rivaroxaban have been accepted for secondary prevention in the management of deep venous thrombosis and lung thromboembolism. On the ARISTOLE report, Apixaban showed to be better than Warfarine for vascular brain disease and systemic embolism prevention in patients with atrial fibrillation with less bleeding and mortality [15]; however there are no studies that compare the use of any of the new oral anticoagulants and Warfarine on people with mesenteric venous thrombosis with thrombophilia. As part of the non-medical management the interruption of oral contraceptive, hormone replacement therapy, smoking, and the study of other members of the family must be suggested [13].

Endovascular measures are an alternative for patients who develop clinical worsening despite anticoagulation therapy. Diverse procedures exist, such as transjugular intrahepatic portosystemic shunt, mechanical aspiration and direct thrombolysis (percutaneous transhepatic thrombolysis, superior mesenteric artery cannulation for thrombolysis, transhepatic percutaneous mechanic thrombectomy, transoperatory mesenteric venous cannulation for thrombolysis during surgery). The usefulness of these methods is controversial; outcomes are variable according to the performed endovascular procedure with some reports describing more bleeding and mortality [4,6,16].

Patients with established bowel necrosis, injured intestinal resection is the gold standard, having as priority the preservation of the healthy tissue [14,17].

**Conclusion**

Mesenteric venous thrombosis is a potential fulminant disease; early anticoagulation and delayed surgery considerably reduce morbidity and mortality.

**References**

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