

Successful Treatment of Acute Mesenteric Ischemia Using Rotarex Mechanical Thrombectomy

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Abstract

Acute ischemic bowel is a life-threatening emergency. Herein we presented a case of 81-year-old male patient with acute Superior Mesenteric Artery (SMA) thrombosis successfully treated by Rotarex mechanical thrombectomy. The patient with a history of hypertension presented with severe abdominal pain, nausea, and vomiting. Initial computed tomography scan confirmed SMA thrombosis. Angiography also revealed 100% occlusion of the SMA. After discussing with family, we used Rotarex mechanical thrombectomy for SMA and followed by Catheter-Directed Thrombolysis (CDT). Follow-up angiography showed significant improvement in SMA blood flow. The patient was discharged on Rivaroxaban without complications. This case demonstrates the efficacy of Rotarex mechanical thrombectomy in treating acute mesenteric ischemia, particularly in elderly patients.

Keywords: Acute Mesenteric Ischemia; Rotarex Mechanical Thrombectomy; Catheter-Directed Thrombolysis; Superior Mesenteric Artery Thrombosis

Introduction

Acute Mesenteric Ischemia (AMI) is typically defined as a group of diseases characterized by an interruption of blood supply to various portions of the small intestine, resulting in ischemia and secondary inflammatory changes. If left untreated, this process can lead to life-threatening intestinal necrosis [1]. Mortality rates for acute mesenteric ischemia remain high. Statistically, the overall mortality rate for cases requiring surgical intervention exceeds 50 percent [2]. Treatment options for AMI caused by acute mesenteric thrombosis include endovascular and surgical revascularization. For endovascular intervention, both of percutaneous mechanical thrombectomy (PMT) and catheter-directed thrombolysis (CDT) can be used for treatment of AMI; however, PMT might decrease the treatment duration and improved the success rate. Herein, we presented a case of acute superior mesenteric artery (SMA) thrombosis successfully treated by Rotarex PMT.

Case Presentation

The patient is an 81-year-old man with a history of hypertension. He presented with acute onset diffuse abdominal pain that

had been ongoing for four days, accompanied by complaints of abdominal fullness, nausea, and vomiting. Initially, he sought medical attention at another hospital's emergency room. Abdominal computed tomography scan at the previous hospital revealed suspected thrombosis of the SMA (**Figure 1**), result-



Figure 1: Abdominal computed tomography with contrast. Abdominal computed tomography demonstrated thrombosis (white arrow) at proximal SMA (superior mesenteric artery).

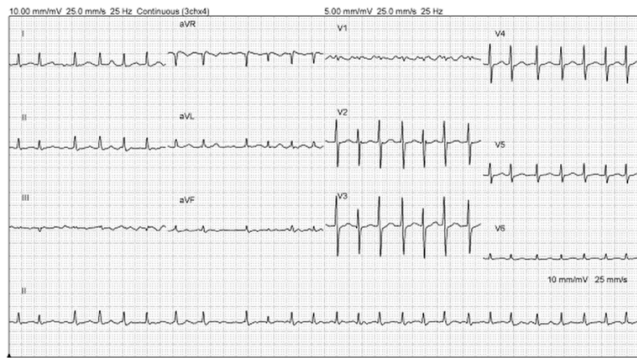


Figure 2: The electrocardiography showed atrial fibrillation at emergency room.

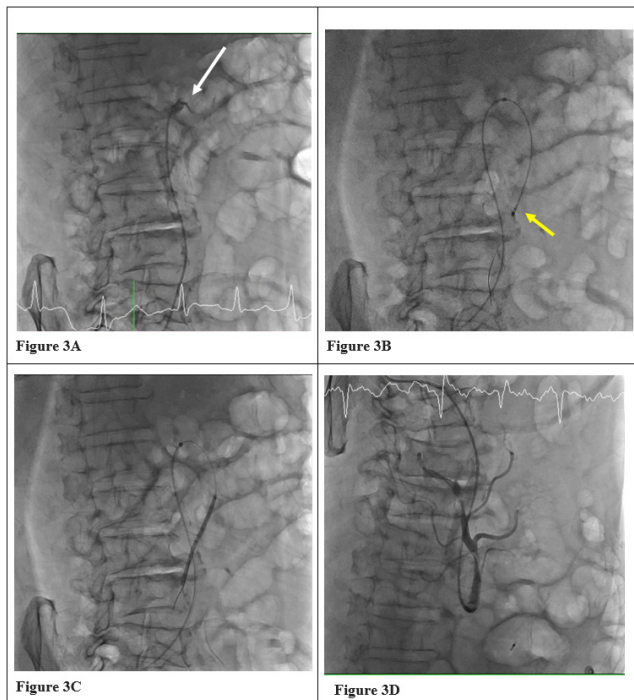


Figure 3: Angiography findings.

Figure 3A: Angiography revealed thrombosis and occlusion at proximal SMA (white arrow);

Figure 3B: Rotarex thrombectomy was performed in the SMA (yellow arrow);

Figure 3C: After Rotarex atherectomy, we performed balloon angioplasty throughout the SMA.

Figure 3D: Restoration of flow of SMA after mechanical thrombectomy and balloon angioplasty.
SMA: superior mesenteric artery

ing in bowel ischemia. Subsequently, he was transferred to our hospital for further management. Upon arrival at the emergency room, his initial vital signs were as follows: blood Pressure: 146/91 mmHg, heart rate: 97 beats/minute, respiratory rate: 15 breaths/minute, body temperature: 38.1°C, and oxygen saturation (SpO₂): 100%. The electrocardiography showed atrial fibrillation (Figure 2). Laboratory tests indicated lactate acidosis and elevated C-reactive protein (CRP) levels [Lactate: 3.39 mmol/L, HCO₃⁻: 18.5 mmol/L, CRP: 222 mg/L]. Due to the suspicion of acute SMA thrombosis, we promptly arranged angiography for him. The angiography revealed a 100% occlusion of the SMA from its orifice with a significant thrombus burden (Figure 3A). We performed balloon angioplasty and Rotarex PMT to treat the SMA thrombosis (Figure 3B-C) and inserted a Fountain catheter for further CDT. After several days treatment of CDT, follow-up angiography showed greatly improve blood flow of SMA (Figure 3D). Afterward, we initiated treatment with Rivaroxaban 15mg daily and patient was discharged uneventfully.

Discussion

Acute SMA thrombosis is a severe and potentially fatal condition as it provides the primary arterial supply to the small intestine and ascending colon [3]. Early detection and prompt treatment are crucial in managing mesenteric artery thrombosis. When there is clinical suspicion of AMI, performing computed tomography angiography as soon as possible is essential. Delay in diagnosis is the predominant factor contributing to continued high mortality rates, which can range from 30% to 70% [4].

Treatment options for AMI resulting from AMI include both endovascular and surgical revascularization. The use of percutaneous endovascular intervention in treating AMI remains a topic of debate, primarily because it does not involve direct inspection of the bowel. Because relative infrequency of AMI, it is difficult for any center to obtain a large experience and provide a guideline [5]. There are also no randomized controlled trials comparing laparotomy versus endovascular treatment as a first-line strategy for the management AMI [6]. However, percutaneous intervention offers the advantage of being a less invasive procedure compared to laparotomy, making it particularly suitable for older and more frail patients.

The Rotarex system is a device of PMT that employs a catheter to remove detachable occlusion materials within the artery. The catheter generates a powerful vortex that breaks down the debris and creates suction to transport the materials into an external collection bag [7]. Following thrombectomy, additional management options include balloon angioplasty, CDT, or stent implantation. PMT helps restore blood flow to the mesenteric artery more rapidly and can prevent further bowel ischemia, such as in our case. Additionally, it may shorten the duration of CDT and parenteral anticoagulation.

Conclusion

AMI carries a high risk of mortality, emphasizing the importance of making an accurate diagnosis. PMT by Rotarex device is a rapid and convenient option for AMI, particularly for frail or elderly patients. In addition, PMT may also reduce the treatment duration and restore blood flow to the SMA sooner. This could potentially decrease the ischemic duration of the SMA and improve the outcome.

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