

Case Report

Postoperative Superior Mesenteric Artery Thrombosis - How to Play with the Dealt Cards

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Abstract

Background: Iatrogenic Superior Mesenteric Artery (SMA) injury during routine surgery is seldom reported, and although multiple techniques for its reparation have been described, this usually presents a challenging scenario.

Case: We present a case of SMA injury during scheduled nephrectomy in a secondary level hospital and discuss various scenarios and treatment options.

Keywords: Superior mesenteric artery injury; Nephrectomy; Challenges acute care surgery; Emergency surgery

Abbreviations

SMA: Superior Mesenteric Artery; CT: Computed Tomography; RBC: Red Blood Cells

Case Presentation

A 68-year-old male underwent a scheduled nephrectomy in a secondary level hospital. Kidney preoperative Computed Tomography (CT) showed a 12 cm × 10 cm × 10 cm mass compatible with a left renal papillary carcinoma, with signs of local infiltration of Gerota's fascia and pararenal spaces (cT4N0M0). A laparoscopic approach was chosen, but the procedure was converted to open surgery (through a 20 cm medial incision) due to venous bleeding adverted during renal vein dissection and laceration of the inferior pole of the spleen, both controlled after open dissection of the renal hilum and cauterization of the splenic injury. Two units of Red Blood Cells (RBC) were given during surgery, due to acute anemia (Hb 7, preoperative Hb 12.5).

On the second postoperative day, the patient presented with nausea and abdominal tenderness, the blood tests showed severe leukocytosis (21000 c/L), tendency to acidosis (pH 7.32) and discrete elevation of serum lactate levels (2.1 mmol/L) which prompted an urgent CT. The scan was reported to show segmentary thrombosis of the Superior Mesenteric Artery (SMA) with distal repermeabilisation proximal to the origin of the jejunoileal branches due to a collateral branch from the left gastric artery, signs of partial splenic and pancreatic ischemia, and minimal amount of free air and free fluid among moderately dilated small bowel segments and gastric body (Figure 1).

Citation: Centeno A, Gómez E, Mullerat JM, Castellí J. Postoperative Superior Mesenteric Artery Thrombosis - How to Play with the Dealt Cards. *Am J Surg Case Rep.* 2021;2(1):1010.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: May 03rd, 2021

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The patient remained stable, and the symptoms were controlled with endovenous analgesia and a nasogastric tube placement. A general surgeon was available on duty with an on-call urologist, but no vascular surgeon or interventional radiology procedures were available at the hospital.

What would you do?

- Anticoagulant treatment and conservative management.
- Exploratory laparotomy with intent to resect ischemic intestinal segments.
- Transfer the patient to a tertiary center (4 miles away) with intent of performing open vascular treatment.
- Transfer the patient to a tertiary center (4 miles away) with intent of performing interventional thrombolysis.

What we did and why

C. Transfer the patient to a tertiary center with intent of performing open vascular treatment.

The patient was taken to our tertiary center of reference, and directly to the operative room. Due to the findings on the CT scan, it was presumed that no interventional treatment would be effective

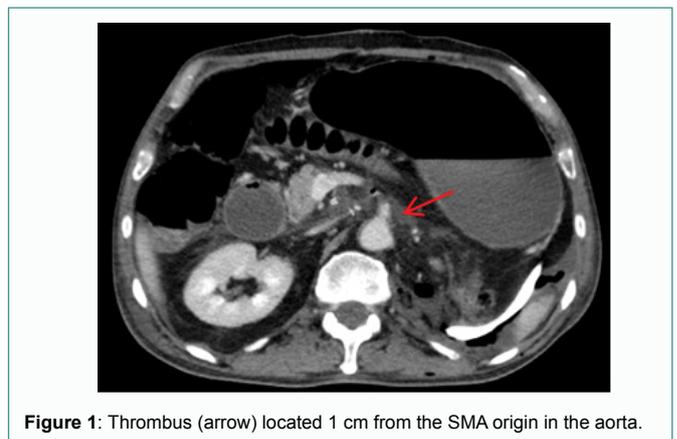


Figure 1: Thrombus (arrow) located 1 cm from the SMA origin in the aorta.

and risked further injuring the SMA. Due to the impossibility to rule out the presence of bowel ischemia, conservative management was deemed inadequate.

An iterative midline incision was performed by the on duty general and vascular surgeons. The small intestine seemed viable, but the SMA presented a weak and barely palpable arterial thrill. A Cattell-Braasch maneuver was performed and the origin of the SMA was exposed, showing multiple Hem-o-locks placed alongside its origin (Figure 2), compromising its origin and causing the decreased thrill.

It was decided to proceed with the revascularization, even though no clear signs of ischemia were found at the moment.

A thorough dissection of the proximal SMA was needed, with ligation of small collateral in order to properly prepare it for reimplantation. The infrarenal aorta was also dissected up to 7 cm proximal to the iliac bifurcation and a latero-terminal anastomosis was performed, with a 5/0 prolene suture (Figure 3). The aorta was clamped for a total of 37 min, and additional heparin was administered. Finally, flow was restored, and pulses were inspected and correct.

The patient recovered from the surgery without further complications and returned to our center on the seventh postoperative day. A control Angio-CT scan was performed which was reported to show regular flow of the reimplanted SMA.

Discussion

Vascular lesions during scheduled surgery are seldomly reported

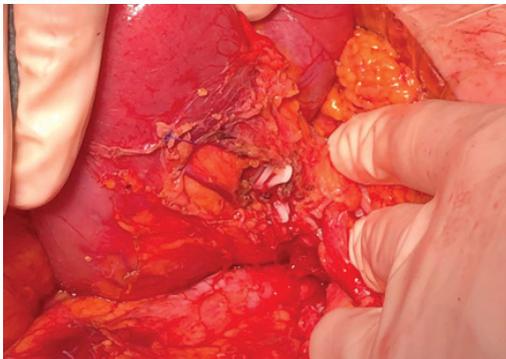


Figure 2: Hem-O-Locks placed in the SMA origin.

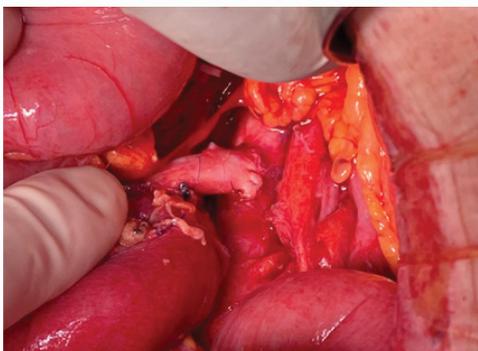


Figure 3: Latero-terminal anastomosis performed with a 5/0 prolene suture, immediately inferior to the renal bifurcation.

[1-3], not only due to its rare nature but also due to its poor prognosis and most physicians' inherent aversion to publish complications [2,4,5]. Even though unusual [6], its severity makes the ability to quick diagnosis and repair of paramount importance [2,7]. It is also mandatory to be familiar with the risks factors for this particular complication, mainly related to the tumor size [1], presence of bulky perihilar adenopathy [6], locally advanced and upper pole [2] or left sided masses [1].

When faced with the possibility of a vascular lesion, whether due to bleeding or other indirect signs, it is key to avoid further injuries [1]. Stopping the bleeding is intuitively a priority but may lead to hastiness and the occasional ligation of a major vessel. Establishing the origin of the bleeding must prevail before controlling the bleeding itself [3,6], and conversion to an open procedure to ensure proper visualization must not be taken as a defeat [6].

This case is a fine example of a feared complication and a late manifestation. When faced with any warning sign, in the scenario of a previous bleeding or surgical adversity, it is of great importance to rule out any complication such as this one [8-10]. A quick diagnosis and a rapid treatment of any vascular lesion is key to the prognosis of the patient [3,10] and a conservative treatment is contraindicated [1,11-13].

Findings such as an injury to the SMA are always challenging and technically demanding [12,14]. It is key to the prognosis of the patient to ensure that the best therapeutical option is provided [15], thus sometimes requiring referral to another center. In our case, given that the surgery was performed in a secondary level hospital with no vascular surgeon on call, we decided to promptly transfer the patient to the closest tertiary level hospital (4 miles away).

Even though multiple techniques for a SMA injury reparation have been described, there are no standard criteria that can help with the decision-making process [14,15]. Given the lack of high-level evidence and clear recommendations, technique must be chosen based on surgeon's expertise and available means [14,15]. In our patient, the injury identified was not accompanied by established ischemia signs or contamination, and a prosthesis or a graft might have been chosen and used safely [7,15], even though a primary reparation was successfully performed.

Conclusion

Iatrogenic Superior Mesenteric Artery (SMA) injury is a rare complication during routine surgery but might be related to large tumors located with closeness to major vessels. When faced with unexpected bleeding, surgeons must remain calm and avoid blindly cauterizing the suspected origin. Instead, a careful dissection and proper identification of the vessels must be performed, even if it involves conversion to open surgery. Inadvertent lesions must be suspected whenever a patient diverts from a normal postoperative course. In the event of suspicion of an arterial injury, promptness of treatment must be of priority, and technique of repair has to be chosen due to surgeon's expertise and available means.

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