CASE REPORT

Anaesthetic Management of Superior Mesenteric Artery Thrombosis

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http://dx.doi.org/10.18049/jcmad/219

Abstract

The diagnosis of Acute Mesenteric Ischemia (AMI) is difficult and easily overlooked, because it is an uncommon vascular emergency. The delay in the diagnosis can result in a grave outcome. Extravascular events like volvulus, strangulated hernia, intususception, adhesive obstruction, when neglected can lead to intestinal gangrene; this will be limited to AMI as a primary event.
Key words: Gangrenous small bowel, Sepsis, Septic shock, Sepsis bundles, Superior mesentric artery thrombosis

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Introduction

A famous remark by Cokkinis in 1926 states that "Occlusion of the mesenteric vessels is apt to be regarded as one of those conditions in which the diagnosis is impossible, the prognosis hopeless, and the treatment almost useless." [1] This is indicative of some of the extreme difficulties faced by physicians treating Acute Mesenteric Ischemia (AMI). Since 1930, there have been many advances in the field of imaging, which has helped to make the diagnosis of this condition and treatment, easier and earlier. [2] But in patients in whom bowel infarction has already set in, the prognosis is grave, and those who receive the treatment earlier are having more chances of recovery. [3,4] It is a life threatening emergency. [5, 6] There are number of differential diagnosis with different types of management which makes it extremely difficult condition to treat. [7]

Case Report

A 42 year old female patient presented with complains of severe abdominal pain with distension, vomitings, fever and breathlessness. No history of trauma, bleeding, loose motions. No history of Hypertension/ Diabetes/ Hypothyroidism/ Asthma/ Tuberculosis/ Hereditary diseases. No history of similar complains in the past. No history of similar complains in the family. Patient had no addictions or allergies. Pre-Anaesthetic checkup was done and revealed the following: A moderately built and well nourished female lady with history of tubectomy done 14 years ago under general anaesthesia. No history of postoperative nausea/vomiting or other complications were noted then. No history of other hospitalizations in the past. No history of drug allergies or reactions. She was having short neck with no loose dentition and a Mallampatti classification III was given to her.

On general examination she was noticed to have New York Heart Association grade 2 dyspnoea with low volume pulse of 122/min regular. Her blood pressure was 70 systolic right arm supine, temperature was 100° F and respiratory rate of 26 breaths per min. Saturations were 95% with O_2 support @ 8Lpm. Her hourly urine output was approximately 30 ml/hr.

Systemic examination revealed bilaterally decreased air sounds in both lower zone of lungs (reactionary pleural effusion), no cardiac murmurs, severe diffuse tenderness in abdomen with distension, guarding and absent bowel

sounds with a normal central nervous system examination. .

Investigation analysis revealed the patient to be in severe sepsis with total leukocytic count of 33,200 cells/cu.mm and hemoglobin of 9.8 mg% and platelets 31,600 cells/cu.mm and raised erythrocyte sedimentation rate (45mm/80mm). Arterial blood gas was suggestive of metabolic acidosis, blood urea of 60 mg% and serum creatinine 1.8 mg% with concentrated urine. Liver function test revealed a total serum bilirubin of 3 mg% with direct bilirubin of 1.8 and indirect of 1.2 with a normal SGOT and SGPT, total proteins, globulin and albumin. Ultrasonography of abdomen revealed dilated bowel loops with minimum peristalsis in abdomen- Sub acute Intestinal Obstruction (SAIO)?

X-ray erect abdomen reported multiple air fluid levels in abdomen- SAIO? Prothrombin time was 18.6 (Test)/13.5 (Control) with INR of 1.37 and activated partial thromboplastin time of 32.1 (Test) / 30.5 (Control). The contrast enhanced computerised tomography scan of abdomen MDCT morphology was suggestive of subtle edematous bowel wall thickening noted in small bowel loops in left lumbar region with minimal perienteric fat stranding- suggestive of small bowel gangrene with evidence of a thrombus in the superior mesenteric artery. Few subcentric lymphnodes were noted in the mesentery-possibility of infective inflammatory etiology, mild to moderate degree of fluid in Right subhepatic space and pelvis, minimal bilateral pleural effusion (R>L), 2 tiny nonobstructive calculi in mid pole of right kidney measuring 2 mm. Complete urine examination showed 5 to 6 pus cells with 8 to 10 RBCS with 1+ sugars. Her 2D Echocardiography, serum electrolytes, serum amylase, fasting blood sugars and post lunch blood sugars, serum magnesium levels were all normal.

Owing to the severe sepsis with septic shock, multiorgan involvement and with diagnosis of Acute Mesenteric Ischemia secondary to superior mesenteric artery thrombosis with small bowel gangrene patient was given an American Society of Anesthesiologists (ASA) score of VE.

Case was taken up for surgery after resuscitating using the sepsis resuscitation bundle and the sepsis management bundle being continued. Regional anaesthesia was not preferred in this case as the patient was in sepsis with respiratory distress and hypotension. Hence general anaesthesia was preferred in this case. Informed consent was obtained with special mention to possibility of requiring postoperative ventilator support and difficult weaning. Monitoring utilized for the procedure included five lead Electrocardiography with ST segment monitoring, Pulse oximeter (SPO2), non invasive Blood pressure, temperature, blood sugars and central venous pressure monitoring, nasogastric tube was in situ preoperatively and continuous Ryles tube aspiration was done which revealed bilious secretions.

Case started with premedications injection Glycopyrolate, injection Zofer and injection Pantoprazole given intravenous. Pre-oxygenation done for 3 mins. Case was assumed to be in full abdomen as all other case of acute abdomen. Rapid Sequence Induction was done with injection Thiopentone 200mg and injection Succinyl choline 100mg was used. Using Sellicks maneuvere intubation done with 7.5 number cuffed endotracheal tube under vision and air entry checked bilaterally, air instilled in cuff and tube fixed at 20cm. Intermittent positive pressure ventilation was carried out with 0xygen+Halothane. Injection Vecuronium was used as the muscle relaxant for maintenance. Later on after 10 minutes patient was kept on volume controlled ventilation of ventilator till the end of procedure with following settings on the ventilator:

Mode: VCV, Vti : 450 CC, BPM: 16 per min, Fio2: 70% , I: E: 1 : 2, PEEP: 4 cm of water.

N2O+O2 mixture {30:70} and Halothane 0.5% were used for ventilation once the bowel obstruction relieved and decompressed.

Under strict aseptic precautions using Seldingers technique a triple lumen central line was placed in right internal jugular vein and lines checked and fixed. Intraoperative vitals were fluctuating and constantly being corrected. Blood pressure was fluctuating from 80/50 to 130/80 mm Hg which was being corrected with Noradrenaline (5µg/min infusion), IV fluids 0.9% Normal Saline, Ringer Lactate and Dextrose Normal Saline, Whole blood- 1 pint, packed cells-1 pint. Urine output after 1 hr was only 10 ml and

injection lasix 10mg + 10mg was given and output then improved to a total output of 400 ml at the end of 5 hour surgery. Intraoperative prophylactic antibiotic used were injection Meropenem (1gm) + Sulbactam (500mg), Amikacin (80mg) and Metronidazole (500mg) were used for this case.

Figure -1: Multiple air fluid levels and occlusion of superior mesenteric artery

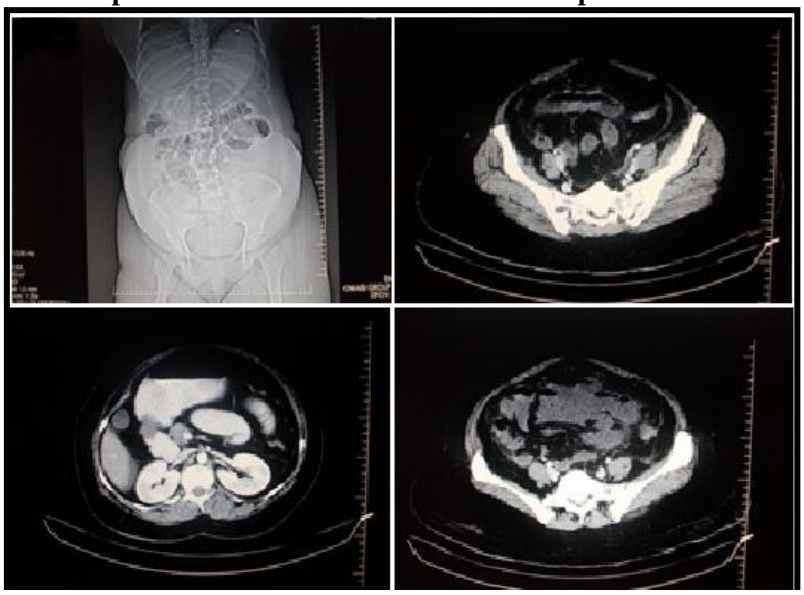

Figure -2: Oedematous bowel wall thickening

Table -1: Intraoperative Vitals Chart (fluctuating vitals in the intraoperative period)

Time	Heart Rate (Per Min)	Blood Pressure	sPO2	Urine Output	CVP	Respiratory Rate (Per Min)	Temperature (°F)
10:30AM	124	100/60	95%	Bag empty	---	24	99.3
11:00AM	122	110/70	97.3%	5	---	22	99.1
11:30AM	126	90/60	95.9%	10	5	18	99.0
12:00PM	124	80/50	95.0%	20	4	16	98.3
12:30PM	120	80/60	95.7%	40	5	16	98.6
01:00PM	118	90/60	96.0%	75	7	16	98.4
01:30PM	116	90/70	96.8%	150	8	16	98.3
02:00PM	110	100/70	97.8%	200	9	16	98.6
02:30PM	108	110/80	99.0%	300	9	16	98.6
03:00PM	104	120/70	99.8%	375	8	18	98.6
03:30PM	106	130/80	99.3%	400	9	20	98.6

Gangrenous bowel from 15 cm from Duodenojejunal junction to ileocaecal junction was noted. Complete small bowel was gangrenous and whole gangrenous segments resected and Caecum and Ascending colon mobilized. Caecum and 5 cm of ascending colon was also resected out. Jejuno-colonic [Asc. Colon] anastomosis was done. Hemostasis achieved and 2 drains were placed and surgery completed with usual abdominal closures as per protocol.

After the completion of surgery patient was given 100% O2 with intermittent positive pressure ventilation and when signs of spontaneous ventilation were noted at that point reversal was started using injection Atropine (1.2 mg) + injection Neostigmine (2.5 mg) slowly and after good respiratory efforts were established patient was suctioned thoroughly and positioned properly to prevent risk of aspiration. She was extubated successfully after ascertaining the train of 4 ratio of > 90%. Oxygenated with mask for 5 minutes and recovery was smooth. Later she was shifted to critical care unit for observation and further treatment with the specific order to look for respiratory depression, hypotension, tachycardia and check on the drains applied. She required simple analgesia with Diclofenac in the post operative phase.

In the critical care unit her vitals were fluctuating with hypotension and fever being predominant on postoperative day 0 and 1 and on treatment the blood pressure normalized and fever subsided and vitals stabilized. All vitals were stable on post operative day 3 and patient was recovering smoothly. Later she was discharged from the critical care unit of the hospital.

Figure -3: Complete gangrenous small bowel resected out in toto.

Discussion

Acute mesenteric artery ischemia is a treatable vascular emergency if specific etiology is identified which requires high degree of suspicion and prompt, aggressive resuscitation and diagnostic maneuvers to for identification of the specific underlying cause. It allows specific directed surgical management. [8, 9] There are 4 major types of acute mesenteric ischemia can occurs namely acute superior mesenteric artery thromboembolic occlusion, mesenteric arterial thrombosis, mesenteric venous thrombosis, and nonocclusive mesenteric ischemia, including ischemic colitis. Diagnostic delays are always common which is associated with high degree of morbidity and mortality. Early diagnosis needs attention to history and physical examination, a high degree of suspicion, and early investigations including CT scanning etc. [10] This case is worth mentioning because, firstly this case of Acute Abdomen was secondary to superior mesenteric artery thrombosis leading to complete small bowel gangrene and which progressed to severe sepsis with multiorgan involvement. An ASA - V E was given to this patient and there was high possibility of GA associated complications with possibility of postoperative ventilatory support but we

successfully managed the case with the use of routine conventional anaesthetic agents and successfully extubated the patient post surgery after complete stability of the patient was ascertained. The anaesthetic challenge in this case was to institute sepsis resuscitation bundles preoperatively and management bundles intraoperatively and postoperatively, and simultaneously minimizing the time from diagnosis to the specific management by doing laparotomy at the earliest after stabilizing the patient, to prevent further deterioration.

Conclusion

Early treatment in the ICU and appropriate surgical intervention maximized the patients chances of survival despite the poor prognosis associated with her pathology.

Source(s) of support: *Nil*
Conflict of Interest: *None declared*

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