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## Anaesthetic management of duodenal perforation in a patient of acute coronary syndrome: A case report

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### Abstract

A 54-year-old male, recovering from dengue fever, presented with duodenal perforation and acute inferior wall myocardial infarction (IWMI). He had a history of fever, thrombocytopenia, and was being treated on an outpatient basis for dengue, which was confirmed by a positive Dengue IgM test. Upon admission for severe chest pain, ECG revealed ST segment elevation in leads II, III, and aVF, with elevated troponin I levels. Imaging revealed pneumo-peritoneum and duodenal perforation. The patient was monitored hemodynamically and managed conservatively with intravenous heparin, antiplatelets, and diuretics. After stabilization, he underwent a laparotomy for duodenal perforation. The Choice of Anaesthesia was General anesthesia with invasive monitoring. The surgery was uneventful, and the patient was extubated and transferred to critical care unit for further observation. Postoperative management included regional anesthesia for pain control, strict fluid management, and the continuation of anti-platelet therapy. The patient recovered well over 10 days.

**Keywords:** Inferior wall MI, dengue, laparotomy, duodenal perforation

### Introduction

Acute coronary syndrome in a patient with duodenal perforation is a rare event and can have significant mortality if immediate intervention is delayed. We present a case of a 54-year male, who was in a recovery phase of dengue fever and developed duodenal perforation along with acute IWMI and mild left ventricular failure (LVF).

### Case Report

A 54-year-old male, chronic smoker, weighing 60 kg was brought in for laparotomy in view of perforation peritonitis.

He had a history of fever with thrombocytopenia for which he was being managed by physician on OPD basis for last 4 days. He was tested positive for dengue IgM levels along with which he developed abdominal distension and Sub-Acute Intestinal Obstruction. His X-Ray chest erect and CECT whole abdomen were suggestive of pneumo-peritoneum and duodenal perforation. He later developed shortness of breath and was admitted in hospital. At the time of admission, he had severe chest pain for which ECG was done which showed ST segment elevation in leads II, II and aVF. All necessary lab investigations were done and ECG was repeated after 2 hours which suggested a self-resolving ST segment elevation (Compared to the previous ECG) and troponin-I levels of 11000 ng/ml. Other positive findings included a platelet count of 75000 cells/mm<sup>3</sup> and Serum sodium of 124 mmol/l. He had no history of Type 2 Diabetes mellitus or Hypertension. He was admitted under Cardiologist and surgical reference was given in view of X Ray and CT findings. The initial plan of treatment was conservative and included I.V heparin and diuretics. The patient was afebrile throughout the hospital stay. A provisional diagnosis of intestinal perforation with resolving ST elevation MI was made and patient was planned for laparotomy on Day 3 of admission.

At the time of PAC, patient was hemodynamically stable, had complaint of abdominal distension, bilateral chest was clear with no added sounds and CBC revealed a platelet count of 1.75 lacs cells/mm<sup>3</sup>. He was Nil by mouth with ryle's tube in situ, A detailed 2d Echocardiography was done which revealed Global left ventricular hypokinesia with severe LV systolic dysfunction and LVEF of 20-25%. His treatment plan included iv heparin along with Inj Lasix 10 mg IV 8 hourly and antibiotics.

The patient was advised to withhold Inj. Heparin 6 hours prior to the surgery. Random donor platelet and a Single Donor Platelet (SDP) were arranged from blood bank.

General anaesthesia with invasive cardiovascular monitoring was planned as the choice of Anaesthesia. The patient who was nil per orally received Inj. Pantoprazole 40 mg IV and inj. Ondansetron 8 mg IV pre-operatively. In addition to the standard monitoring, a triple lumen, 7 French central venous catheter in Right Internal Jugular Vein and 20G arterial cannula in right radial artery was inserted. In situ Foley's catheter was used for urine output monitoring. ECG trace showed a normal sinus rhythm with a HR of 75-80 beats/min. CVP of 6cm of water and Invasive BP of 126/86 mmHg was recorded. Patient was pre-oxygenated and pre-medicated with Inj. Glycopyrrolate 0.2 mg IV and Inj. Midazolam 1.5 mg IV.

Induction was done using Inj. Fentanyl 250 mcg, Inj. Rocuronium 60 mg with inhalational sevoflurane. Airway was secured using cuffed ET tube size-8.5 which was fixed at 22 cm mark after ensuring B/L symmetrical air entry. He was put on controlled ventilation with a tidal volume of 8ml/kg and a respiratory rate of 14 breaths/ min. The patient maintained an ETCO<sub>2</sub> of 35-40 mmHg. Anaesthesia was maintained using sevoflurane 0.5%- 1% using an admixture of Oxygen-nitrous oxide in the ratio of 40: 60. He was given a balanced salt solution at the rate of 40 ml/hr and the Blood pressure was titrated to a mean arterial pressure of around 80 mmHg. One unit of SDP was arranged in case there was excessive blood loss intra operatively (In view of recent history of dengue), but SDP was not required as the surgical homeostasis was good.

The surgery was uneventful with primary closure of duodenal perforation. Blood loss was negligible. The total duration of surgery was 50 minutes. The residual effect of NMBA was reversed with Inj neostigmine 2.5 mg IV and glycopyrrolate 0.5 mg IV. The patient was extubated following return of spontaneous ventilation and oropharyngeal reflexes. He was observed for an hour in post-operative ward and then shifted to intensive care unit for further monitoring.

Ultrasound guided B/L Subcostal TAP block was given using 20 ml of 0.25% bupivacaine (Plain). Post-op analgesia was managed with Inj. Paracetamol IV 8 hourly. The total fluid intake was restricted to less than 1.5 liters/24 hrs. Urine output was around 50 ml/hr. Anti-coagulants were resumed post operatively. Patient was comfortable, pain free and maintained vitals within normal limits.

### Discussion

This patient presented to us with acute IWMI (ST segment elevation in lead II, III and aVF along with markedly elevated Troponin I levels and LV global hypokinesia with an LVEF of 20-25%) was in his recovery phase from dengue fever and had intestinal perforation as suggested by pneumo-peritoneum on Chest X ray and CT abdomen.

Primary percutaneous coronary intervention (PCI) remains the gold standard procedure for the definitive management of acute IWMI [1]. While there is lack of data regarding whether surgical treatment of perforated viscus or Primary PCI should be prioritized, comprehensive data supported superior outcome following early revascularization [4]. As the patient was diagnosed to have a surgical abdomen, an operative intervention was planned and because of self-resolving ST segment elevation and hemodynamic stability,

the patient was kept on I.V heparin and given I.V diuretics. Percutaneous coronary intervention and placement of either DES or BMS challenges the initiation and maintenance of intravenous anti-platelet therapy, stopping which poses a very high risk of acute stent thrombosis [8].

In case the patient would not have stabilized on the given treatment, it is recommended to intervene with the coronary lesion first, and PTCA is warranted. It is recommended to give IV GP IIb/IIIa inhibitors (Tirofiban or eptifibatide) for such cases as the risk of stent thrombosis is very high, which can be continued up to 4 -6 hours before surgery and DAPT can be resumed within 24 hours after the procedure<sup>5</sup>. Management of such patients usually requires multidisciplinary approach involving the cardiologist, physician, surgeon, and the anaesthetist along with capable post-operative recovery team to prepare for sudden coronary intervention if needed.

Early Laparotomy and Primary repair of the intestinal perforation is the definitive treatment of perforated bowel, reducing the morbidity and mortality of the patient, who otherwise would have deteriorated metabolically and developed sepsis which in the setting of CAD with very poor LV function would have carried a high mortality.

General anaesthesia with high dose Opioid based induction remains the safest induction sequence for the patient with poor LV function and Acute Coronary Syndrome. It offers maximum hemodynamic stability avoiding fluctuation in cardiovascular parameters during induction and intubation. Patients with severely impaired left ventricular function may not tolerate anaesthesia – induced myocardial depression. In such cases, addition of nitrous oxide and midazolam along with low dose inhalational anaesthetic agent ensures amnesia during surgery. Rocuronium was used as it provides excellent intubating conditions and have minimal or no effect on the heart rate and systemic blood pressure [10].

Adequate post-operative analgesia should be provided either parenterally and/or via regional block. Hence, paracetamol 1 gm IV 8 hrly for the next 48 hrs was advised. IV Nalbuphine was our drug of choice for break through pain, though it was not required. Ultrasound guided Bilateral Subcostal TAP block is the safe and effective choice in this patient. IV diclofenac was avoided due to increased incidence of major adverse cardiovascular events [11].

The patient recovered well subsequently in the Cath Lab recovery room over the period of 10 days.

### Conclusion

In the case of viscus perforation along with Acute STEMI and recovery phase of dengue, as in this case, decision of what to treat first rests on the clinical stability of the patient. Surgical intervention being done first has the advantage of avoiding risks of acute stent thrombosis or re-infarction due to interruption of antiplatelet therapy. Although priority must be given to the cardiovascular event, early intervention of perforation is important before sepsis and metabolic disturbances sets in making the management more challenging.

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