Upper gastrointestinal haemorrhage in severe dengue: To scope or not to scope?

Chen Hong Lim, MS[1], Benjamin Han Sim Ng, MRCP[2], Foong Kee Kan, MRCP[3]

[1]Surgical Department, Hospital Segamat Johor, [2]Medical Department, Hospital Segamat Johor, [3]Infectious Disease Unit, Medical Department, Hospital Sultanah Aminah Johor Bahru, Johor.

SUMMARY

Upper gastrointestinal haemorrhage (UGIH) in severe dengue represents a clinical dilemma in term of management. The recommended treatment in dengue with UGIH involves blood product transfusion support and proton pump inhibitor (PPI) infusion. Despite being the mainstay of treatment in non-dengue UGIH, the role of endoscopic haemostatic intervention in severe dengue remains controversial. In the present report, we present a case of severe dengue complicated with upper gastrointestinal haemorrhage successfully underwent early therapeutic endoscopic intervention in a district hospital.

KEY WORDS:
Dengue, severe dengue, gastrointestinal haemorrhage, endoscopic, haemostasis

INTRODUCTION

Dengue fever in Malaysia recently saw a tremendous rise in cases involving high morbidity and mortality. There are already 109 mortalities reported from January to mid-May 2016 out of 48,395 dengue cases.[1] Severe dengue, defined as presence of severe plasma leakage leading to shock and respiratory distress and/or severe bleeding and/or severe organ involvement.[2] Majority of upper gastrointestinal haemorrhage in severe dengue is assumed to be due to diffuse haemorrhagic gastritis.[1] Till date there is lack of trial evaluating the role of therapeutic endoscopic haemostasis in severe dengue. The largest trial by Chiu et al. in 2005 concluded that endoscopic injection is not an effective adjuvant treatment in dengue with gastrointestinal hemorrhage.[3] The recommended treatment involves blood product transfusion and proton pump inhibitor infusion.[3] Despite being the mainstay of treatment in non-dengue UGIH, the role of endoscopic haemostatic intervention in severe dengue remains controversial.[4] Shariff et al. reported in local setting that upper gastrointestinal haemorrhage in dengue patients warrants endoscopic assessment as 53.8% of the cases had bleeding peptic ulcers that were amenable to intervention.[5] The Malaysian Clinical Practice Guideline for Dengue 3rd edition does not recommend endoscopic injection therapy.[2] We present a patient with severe dengue with duodenal ulcer bleed who underwent endoscopic intervention in a desperate attempt to secure haemostasis in a district Hospital.

CASE REPORT

A 73-year-old lady, diagnosed Type 2 diabetes mellitus, hypertension and chronic kidney disease presented with high grade fever accompanied by arthralgia and myalgia for six days. She had been complaining of epigastric discomfort with coffee ground vomitus six times a day and passing blackish stool.

She was diagnosed with dengue fever following positive IgM and IgG. Four hours after admission, she started to have repeated coffee ground vomiting and her condition deteriorated. She was drowsy and pale with poor periphery perfusion, hypotension (70/50 mmHg) with feeble tachycardic pulse (150 beats/minute). She had thrombocytopenia (platelet count: 57 x 10^3/mm^3) with haematocrit of 38.1% and blood gas showed compensated metabolic acidosis with hyperlactatemia (14.7 mmol/L).

She was intubated, ventilated in ICU and whole blood transfused with Proton Pump Inhibitor infusion.

Emergency upper endoscopy revealed active oozing (Forrest's 1B) duodenal (D1) ulcer with visible vessel. Other findings including erosions at gastroesophageal junction and multiple tiny Forrest's III ulcers at corpus and antrum. Two Hemoclips were applied to the bleeding vessel, with a single needling site injection of 30mls diluted adrenaline (1 mg Adrenaline in 20 mls water for injection) (Figure 1A and 1B). Cold saline was infused for ten minutes till clot formation seen at the intervention site.

There was an immediate hemodynamic improvement with reducing heart rate and rapid weaning of inotropic support. Serum lactate level reduced drastically. (Table I) Total transfusion included five pints of whole blood, five pints of packed cells, four units of platelet and two units of fresh frozen plasma.

DISCUSSION

Upper gastrointestinal bleeding in severe dengue remains a major challenge contributing to high mortality. The reported prevalence varies from 5 to 30%.[3] The role of endoscopic intervention is still controversial.

The pathogenesis in dengue bleed involved endothelial activation, thrombocytopenia, possible platelet dysfunction and coagulation cascade activation leading to consumption

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Corresponding Author: Chen Hong Lim, Department of Surgery, Hospital Segamat, KM 6, Jalan Genuang, 85000 Segamat, Johor, Malaysia
Email: chenhong_lim@yahoo.com

Table I: Progress of Patient's Blood Gas Indices Over the Hospital Stay

VBG	Hemodynamic instability	After initial fluid resuscitation and blood product transfusion (two hours post admission)	Immediate post upper endoscopic intervention (five hours post admission)	Day two ICU stay (14 hours post admission)
pH	7.057	7.12	7.294	7.358
HCO3 (mmol/L)	9.3	11.5	15.3	19.2
BE	NA	-16.6	-12.3	-6.8
Lactate (mmol/L)	14.7	6.6	3.8	2.5

Relook upper endoscopy 48-hour after the intervention revealed multiple small oesophageal mucosal hematoma with healing Forrest's III gastric ulcers. The Hemoclips had slough off. The duodenal ulcer had converted to Forrest's IIc ulcer. (Figure 1C and 1D) She was discharged well home on Day 11.

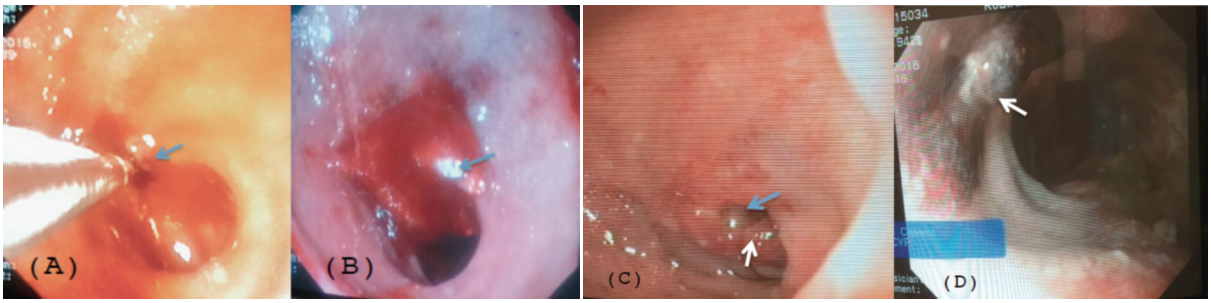

Fig. 1: (A) : Hemoclipping actively oozing vessel at ulcer base (blue arrow); (B) : After one hemoclip applied (blue arrow) , slowing down of oozing with remnant bleeding from the jaw of the hemoclip; (C) : 48-hour post endoscopic intervention, conversion of ulcer to Forrest's IIc ulcer (blue arrow) with surrounding non expanding submucosal hematoma (white arrow) after the single-needling site adrenaline injection; (D) : Submucosal hematoma (white arrow) in lower oesophagus on re-look OGDS.

coagulopathy.[2] Such is the believe leading to assumption that diffuse haemorrhagic gastritis is the usual pathology. This has also lead to the common conservative practice of transfusing blood and blood product as the mainstay of management instead of early endoscopic intervention fearing further traumatization of upper gastrointestinal mucosa. However, the flexibility and ever-reducing diameter of the endoscope, with its increasingly wider viewing angle and better camera system has made the procedure to be safer in experienced hands.

Four clinical pattern of upper gastrointestinal haemorrhage in dengue has been identified namely haemorrhagic/erosive gastritis, gastric ulcer, duodenal ulcer and oesophageal ulcer.[3] Although 67% of bleeding in the series was due to erosive gastritis, we feel that there is a role of early endoscopy to identify bleeding associated with peptic ulcers that are amendable for endoscopic intervention. Although the study showed endoscopic injection therapy to be not effective, there are at time lack of evidence on other modalities of endoscopic therapy options. Such options include thermal coagulation using a heater probe in case of oozing ulcers with no visible vessel for haemoclipping. There is also lack of evidence on effectiveness of endoscopic therapy analysing different subgroup of bleeding aetiology. There are centres reporting isolated successful outcome using haemospray on diffuse gastritis haemorrhage in severe dengue (unpublished data), however this modality is not readily available in many district setting.

In our patient, the presence of oozing visible vessel clearly demonstrated the emergency need to secure haemostasis. Haemoclipping is easily available in most of the endoscopy services. We observed minimal continuous oozing at the jaw of the applied haemoclip. The amount of bleeding had been reduced markedly after clipping. To achieve dual therapy, we had opted adrenaline injection for its tamponade effect. Fear of uncontrollable bleeding at multiple injection sites present due to thrombocytopenia and coagulopathy. Thus, we had injected a considerable large amount of adrenaline saline via a single injection site chosen for the best infiltrating tamponade effect. Continuous cold saline infused via the endoscopic port with the postulation that it causes vasoconstriction at the surrounding of ulcer base may help in reducing the rate of bleeding, thus observing a more rapid clot formation and stabilization due to less clot dislodge. Failing these, the surgical role of laparotomy and under-running of bleeding ulcer will likely render a higher morbidity and mortality with coagulopathy. There will be apparent difficulty in randomizing patients into different therapy due to the life-threatening disease with its ethical issues. Thus, evidence will only be possible by the best intention to treat the patient. More data will be needed for future guideline on the role of endoscopic intervention in severe dengue with gastrointestinal haemorrhage.

CONCLUSION

Upper gastrointestinal haemorrhage in severe dengue is life-threatening and poses great challenge due to thrombocytopenia, platelet dysfunction and coagulopathy. There is lack of evidence-based guideline for endoscopy and endoscopic interventions in such scenario. Prompt endoscopic interventions with haemoclipping, single needling site adrenaline injection and cold saline infusion may have proved to be a viable treatment option in addition to the current standard of treatment.

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