J Surg Res 2021; 4 (4): 616-620 *DOI: 10.26502/jsr.10020174*

Case Report

Hemostatic Spray; A Rescue to Severe Post-pancreaticoduodenectomy Hemorrhage - A Novel Technique to use

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Received: 30 August 2021; **Accepted:** 08 September 2021; **Published:** 02 November 2021

Citation: Azka Naeem, Awais A Malik, Rohma A Rana, Ghiasul Hassan, Farooq Afzal. Hemostatic Spray; A Rescue to Severe Post-pancreaticoduodenectomy Hemorrhage - A Novel Technique to use. Journal of Surgery and Research 4 (2021): 616-620.

Abstract

Pancreaticoduodenectomy (Whipple's Procedure) being an immensely intricate procedure, is accompanied by morbidities out of which some can pose a considerable threat to human life. A morbidity worth discussing is post-pancreaticoduodenectomy hemorrhage. Being classified as early or late and mild, moderate or severe, PPH can be life threatening leading to hypovolemic shock and death if untreated. We describe a case of a 52 year old South-Asian female, who underwent pancreaticoduodenectomy with pancreatico-gastrostomy for a non metastatic periampullary tumor, experienced an intraluminal post pancreaticoduodenectomy hemorrhage on fourth postoperative day leading to hypovolemic shock, with no evidence of extraluminal bleed. Urgent upper gastrointestinal endoscopy showed ulcerated pancreaticogastric anastomosis and marginal ulcer at the site of anastomosis of small intestine and stomach. Hemostatic spray was applied and hemostasis was secured. After meticulous literature review, it became evident that hemostatic spray has been used for a variety of cases of upper gastrointestinal bleeding but has never been utilized for the post-pancreaticoduodenectomy hemorrhage as delineated in the concise discussion of the article.

Keywords: Whipple's procedure; Periampullary tumor; Post-pancreaticoduodenectomy Hemorrhage; Hypovolemic shock; Pancreaticogastrostomy; Marginal ulcer; Hemostatic spray; Upper gastrointestinal endoscopy

1. Introduction

Pancreaticoduodenectomy commonly known as Whipple's Procedure described by an Italian surgeon, Alessandro Codi villa, is a highly complex surgical procedure demanding proficient expertise, done for resection of ampullary and periampullary tumors, chronic pancreatitis or pancreatic trauma. The advent of safer surgical techniques and cautious postoperative care has brought forth, the dwindling post-operative mortality rates to 4-6% [1] but unfortunately, the morbidity rates after the procedure still escalate to 18-25% [2] owing to the complications like delayed gastric emptying, anastomotic leakage and formation of pancreatic fistula , hemorrhage or intra-abdominal abscess formation. Post Pancreaticoduodenectomy Hemorrhage (PPH) is a rare but a life threatening complication. International Study Group for Pancreatic Surgery classifies pancreaticoduodenectomy hemorrhage to be early (less than 24 hours post operatively) intermediate (24 hours to five days) or late (later than five days post operatively), intraluminal or extra luminal [3]. Early hemorrhage is usually due to technical failure in achieving hemostasis, whereas, causes enlisted for late hemorrhage are erosion of vessel after pancreatic fistula formation , marginal ulcer, dehiscence of suture line, vascular injury preoperatively. The severity of pancreaticoduodenectomy hemorrhage is further classified into mild (decrease in hemoglobin levels <4g/dl) or severe (decrease in hemoglobin levels >4g/dl or requiring transfusions of at least four pints of PCVs in 24 hours rendering the patient vitally unstable in hypovolemic shock) [4]. Severe pancreaticoduodenectomy hemorrhage usually presents with sentinel bleed which is defined as the loss of blood via abdominal drains, nasogastric tube or wound prior to the episode of major hemorrhage. A number of ingenious endoscopic and surgical or radiological techniques are devised to deal with the intraluminal and extra luminal pancreaticoduodenectomy hemorrhage respectively. Apart from all the mechanical, chemical and contact endoscopic modalities, use of hemostatic spray is technically simple, clinically effective and safer method of achieving hemostasis in massive pancreaticoduodenectomy hemorrhage when other endoscopic techniques failed to do so. Several articles advocate the use of this hemostatic spray in upper and lower gastrointestinal hemorrhage regardless of the cause with positive outcomes[5] but no literature is available discussing the use of this novel spray in pancreaticoduodenectomy hemorrhage, hence, we are reporting this first case of control of pancreaticoduodenectomy hemorrhage with an inorganic hemospray for securing hemostasis and not followed by any adverse event of rebleed.

2. Case Presentation

A 52 year old female, housewife by occupation, known case of type 2 diabetes mellitus, hypertension and Hepatitis C, presented in the outpatient department with complaints of pain epigastrium for one month and intermittent vomiting. Her contrast enhanced CT abdomen and pelvis and Endoscopic Retrograde Cholangiopancreaticography (ERCP) depicted 1*6cm ulcerated and friable growth at ampulla of vater with dilated CBD, the obstruction was stented and histopathological diagnosis of moderately differentiated adenocarcinoma of ampulla of vater was made. Tumor markers, CA 19-9 were in normal limits. On 25th May 2019, she underwent exploratory laparotomy and pylorus preserving Whipple's procedure with reconstruction of pancreatic stump as pancreatico-gastrostomy and intra-abdominal drains

were placed at sub-hepatic space and at the site of pancreaticogastrostomy and nasogastric tube was passed per operatively. Her treatment plan included gastric ulcer prophylaxis (proton pump inhibitors), sandostatin (100mcg) and deep venous thrombosis prophylaxis (low molecular weight heparin). She was having an uneventful recovery when at fourth postoperative day she had an episode of malena and on fifth postoperative day she had one episode of hematemesis with vomitus approximately one cup full and containing fresh blood, while the patient was still nil per oral. She developed tachycardia (heart rate 120 bpm) and hypotension (80/40mmHg) with oliguria (grade C PPH) [6]. The intra-abdominal drains had no evidence of extra luminal bleed. Her investigations depicted a significant drop of hemoglobin from 13g/dl to 9g/dl whereas her platelet count and INR were normal, hence coagulopathy was ruled out. Patient was resuscitated with crystalloids and colloids and fresh whole blood was transfused. An urgent upper GI endoscopy was arranged after stabilizing the patient. As the endoscope advanced through the esophagus into the stomach, it was filled with clotted blood and a huge clot was seen at the posterior wall of the stomach that couldn't be dislodged and No active bleeding was found. Patient was returned to HDU with suspicion of bleeding at the site of pancreaticogastric anastomosis. Her stomach was washed with warm normal saline hourly to remove clots, prokinetic and sucralfate was added along with a proton pump inhibitor infusion pump. Follow up upper GI endoscopy on the sixth postoperative day depicted ulcerated surface of pancreatic stump visible in stomach, also clean based ulcers were seen at the anastomotic site of the small intestine with stomach (marginal ulcer). Hemospray was applied on the pancreatic surface and hemostasis was secured. She did not have any other episode of intraluminal bleeding and remained vitally stable throughout.

3. Discussion

High mortality rates observed in the literature for pancreaticoduodenectomy hemorrhage makes it a highly dreadful and fatal complication to deal with after pancreaticoduodenectomy, hence, every possible measure should be taken to subside the chances and low threshold of suspicion should be considered in case of sentinel bleeds observed prior to life threatening hemorrhage. Early hemorrhage happens due to failure of maintaining hemostasis in the operative field, bleeding from anastomotic suture line, or bleeding from pancreatic stump. Literature shows that the causes of late hemorrhage includes erosion of a vessel by either pancreatic and biliary fistula or intra abdominal abscess, pseudo aneurysm of pancreatic arteries [7]. Extra luminal hemorrhage may require either surgical or radiological maneuver of securing hemostasis in the form of laparotomy or angioembolization of the bleeding vessel however, endoscopic management remains the management of choice (after resuscitation) for intraluminal bleeding. With the evolving and burgeoning field of interventional endoscopy in our tertiary care hospital, reams of hemostatic treatment options are available for upper GI bleeding, regardless of the cause. These options include contact modalities like bipolar hemostatic forceps, endoscopic hemoclips, band ligations, epinephrine and fibrin injections, cyano-acrylate tissue adhesives and some non contact modalities like photodynamic therapy and argon plasma coagulation [8]. A new emerging and safe modality in use is hemostatic powder. As discussed in a review article by Changela et al. 2015, hemospray has been successfully used in control of hemostasis in

variceal bleeding, bleeding from malignant tumors, bleeding after polypectomy, endoscopic mucosal resection, Dieulafoy lesions, GI ectasias, spurting vessel at the base of gastric ulcer [9]. It has also been used in securing hemostasis and blockade of bile flow from the site of sphincterotomy[10]. It can either be used as a sole therapy or in combination with other modalities. Hemospray is preferred to other endoscopic treatment options as it is easy to deploy, reaches the sites not accurately accessed by clips, injections and radiation therapies. From all the cumulative review articles, case reports and case series available for the use of hemospray, none demonstrated its use in management of PPH particularly at the site of pancreaticogastrostomy. Therefore, we are sharing our experience of management of post pancreaticoduodenectomy hemorrhage quite successfully with hemospray where other modalities were not easy to use as generalized oozing was the cause of hemorrhage.

4. Conclusion

Among myriads of endoscopic techniques available for securing hemostasis in cases of upper gastrointestinal hemorrhage, hemostatic powder has proved to be easy to use, highly accessible and effective means to terminate bleeding. Hence, it can be eminently used in maintaining hemostasis after life threatening class B or class C intraluminal hemorrhage from either anastomotic suture line or marginal ulcer at the site of anastomosis, without any risks of rebleeding and major adverse effects.

Human subjects

Consent was given by the patient.

Conflicts of interest

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work.

Financial relationships: All authors have declared that they have no financial relationships at present or previously with any organizations that might have an interest in the submitted work.

Other relationships: All authors have declared that there are no other relationships or activities that could have influenced the submitted work.

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