Bleeding Complication after Pancreatic Surgery: Role of Harmonic Scalpel

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Abstract In this modern era of technological advancements, though many centers are contemplating complex surgical procedures on the pancreas, morbidity is still high and around 30–35 %. Post-operative bleeding complications are the most worrisome of all, which need vigilance by the operating team. Early recognition and prompt management using endoscopy, intervention radiology or urgent surgery, with a low threshold for relaparotomy is needed to avoid mortality. After successfully completing more than 500 Whipple's operations and over 300 Frey's procedures in the last 10 years, our bleeding complication, which is around 2 %, has substantially increased. This increase over the last couple of years is seen with usage of harmonic scalpel in pancreatic surgery. Here we report our recent encounter with bleeding in the post-operative period after Whipple's pancreaticoduodenectomy and Frey's procedure, where harmonic scalpel was used. We have recommended our suggestion to avoid this complication, by adopting a simple technique. We have achieved optimal results by applying this technique in our subsequent cases.

Keywords Bleeding complication · Frey's procedure · Harmonic scalpel · Whipple's pancreaticoduodenectomy

Introduction

Bleeding in the post-operative period is a dreaded complication after pancreatic surgery. Though the incidence is 5–16 % [1], managing the complication requires earlier detection and timely intervention by an experienced team

comprising of gastroenterologists, intervention radiologists and general surgeons. We share our recent encounter of early bleed after Whipple's surgery and Frey's procedure, its timely management and the lessons learned from the experience.

Case 1

A 39-year-old male presented to our department with painless progressive jaundice and pruritus of 1 month duration. Investigations revealed obstructive jaundice due to periampullary carcinoma. Whipple's operation was done after transecting the neck of the pancreas using harmonic scalpel. Pancreaticogastrostomy was done by the dunking technique. On post-operative day 1, the patient brought out 1 l of coffee ground blood through the ryles tube with hemoglobin level falling >3 g/dl, suggestive of severe early bleed as per the ISGPS classification [2]. The patient was resuscitated with blood transfusion. After stabilization, upper gastrointestinal endoscopy was done to look for the site of bleed. At endoscopy, the stomach was found to be filled with blood clots. As attempts to flush and suck it with saline were futile and angiogram could not be done, he was taken for emergency laparotomy. At laparotomy, anterior gastrostomy revealed an arterial spurter (transverse pancreatic artery) (Fig. 1) from the pancreatic stump. It was suture ligated using 3–0 prolene suture. Anterior gastrostomy was closed in two layers. Post-operative recovery was uneventful.

Case 2

A 17-year-old girl presented with upper abdominal pain for 2 years duration. Investigations revealed tropical pancreatitis with inflammatory head mass. Head coring with

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Fig. 1 Whipples's pancreaticoduodenectomy: Pancreatic stump bleed

longitudinal pancreaticojejunostomy (PJ) was done on her. During head coring, bleeding was arrested using bipolar cauterization. On the second post-operative day, she had melena with falling hemoglobin level. She was managed conservatively for 5 days with blood transfusion. Since melena did not stop, upper gastrointestinal endoscopy was done to identify the site of bleed. It was normal. On the twelfth post-operative day, angiogram was done. It did not reveal the bleeding site. She was taken up for laparotomy. At laparotomy, blood was seen in the small intestine with clot filled PJ anastomosis. There was dehiscence of the anastomosis at the tail region. PJ was dismantled and clots evacuated to find the arterial spurter from the anterosuperior part of the cored out head region (gastroduodenal artery branch) (Fig. 2). It was ligated with 3-0 prolene suture. PJ anastomosis was resutured by single layer interrupted 3-0 prolene sutures. The abdomen was closed after keeping a redovac drain and a tube drain. Post-operatively, the patient recovered without any complication.

Fig. 2 Frey's Procedure: Post operative bleed from cored Head of Pancreas

Discussion

Whipple's operation and Frey's surgery are still demanding procedures. While operative mortality is <5 %, morbidity is still around 30 % [3]. Early bleed after pancreatic surgery will warrant emergency laparotomy after a failed conservative treatment [4]. Though pancreatic leaks are cited as the reason for late hemorrhage, early bleed is due to technical failure during the primary surgery [5]. Technical failures may be due to improper hemostasis, >3–4 mm distance between successive sutures during the PG or PJ anastomosis, poorly or hurriedly done gastrojejunostomy or duodenojejunostomy and relief of vasospasm of small vessels during the post-operative period [6]. Bleeding may be intraluminal or extraluminal. Management of early bleed initially is by conservative methods in the form of colloids and blood transfusion. Upper gastrointestinal endoscopy with therapeutic intervention in the form of glue injection is useful, if bleeding site could be identified. When conservative treatment and therapeutic angiogram fail, then emergency relaparotomy only can save the life of the patient. In Whipple's procedure, pancreatic neck transection was done using harmonic scalpel. Though it seals vessels nicely, it is not always so, as is seen from the arterial spurter. In Frey's procedure, we used harmonic scalpel for tissue excision and bipolar cauterization to arrest the bleeding. Early bleed will show up like this in the post-operative period once vasospasm gets relieved. After this recent experience, we have started to voluntarily skirt the raw surface of the pancreas with a gauze, make it bleed and suture ligate all the vessels. We recommend this, especially in the region of the transverse pancreatic artery and the gastroduodenal artery.

Summary

Bleeding after pancreatic surgery, though low in incidence, is still a difficult complication to manage. The best measure is prevention, by achieving meticulous hemostasis during the index surgery. Threshold for relaparotomy to arrest the bleed should be low, when conservative as well as intervention procedures have failed or not feasible. Though modern gadgets like harmonic scalpel and bipolar cautery machines are available and have made surgery much easier and bloodless, it is still not foolproof to avoid bleeding, especially in pancreatic surgery where patient suture ligation is vital.

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