VENTURA COUNTY MEDICAL CENTER

Pancreatic cancer is the fourth most common cancer in America and rates continue to rise. When possible, surgery to remove the cancer leads to the best survival. Below we have reported our recent surgical outcomes for cancer in the head of the pancreas that requires a complex surgery called the pancreaticoduodenectomy, or Whipple surgery. VCMC is committed to offering the highest quality surgical care and providing the best quality of life for our pancreatic cancer patients.

STANDARD 4.7 Quality Improvement Study: OPTIMIZATION OF PANCREATIC SURGERY AT VCMC:

OBJECTIVE:

Pancreatic surgery remains one of the most complicated intra-abdominal surgical procedures. Morbidity rates are reported to be 30-60% (1,2). Hospital stay after a pancreaticoduodenectomy (PD) are between 15-18 days (1). There has been multiple studies showing improved outcomes at centers considered high-volume (1). This effect may be due to the support services provided by a hospital with a high volume of critically ill patients. Our county-based safety-net hospital is a Level II Trauma Center seeing over 1,000 trauma activations annually. Through focused effort, we have increased the number of PD surgeries 7-fold over the past three years. This time frame coincides with the presence of fellowship trained surgical oncology surgeons who have been increasing the number of pancreatic surgeries done within the institution. Objective: To evaluate our morbidity outcomes with the hypothesis that we can safely provide the PD surgery as a "high acuity" center, working to become a specific high volume center, particularly in pancreatic surgery.

METHOD:

We retrospectively reviewed charts for patients who had pancreatic surgery at VCMC from February 2013 through June 2017. We analyzed data for preoperative factors, work up of pancreatic mass, surgical and hospital course, and postoperative morbidity and mortality.

RESULTS:

From 2012-2014 only 2 PD surgeries were performed at our hospital with a 50% mortality rate. This is considered below the standard of care and an area for improvement (1,2). Since the beginning of 2015, 14 PD surgeries have been performed. Further results focus on the latter time period containing these 14 patients. The average age of the patients was 60 (range 37 to 73). 7 of 14 (50%) of patients had EUS prior to surgery and 8 (57%) had preoperative biliary stenting. Pathology showed pancreatic ductal adenocarcinoma (PDAC) n=8, neuroendocrine n=1, IPMN n=1, peri-ampullary cancer n=1, duodenal n=1, cholangiocarcinoma n=1, and gastric cancer n=1. Of the 8 PD surgeries done for PDAC, 7 (88%) were T3, 1 (12%) was T2, none were T1, and 6 (75%) were node positive. For all PD surgeries, 3 of 14 (21%) had a positive retroperitoneal or vascular groove margin, 1 of 14 (7%) had positive bile duct margin, while the remaining 72% were considered R0 resections. 2 patients (14%) had portal vein resection with repair. 1 of 14 (7%) of patients died within 30 days of PD surgery, due to elective withdrawal of respiratory support by family decision. Only 1 (7%) patient had a postoperative pancreatic leak. This patient also had a bile leak and was treated with neo-adjuvant chemo-radiation, undergoing an extended PD with partial liver and colon resection. Including this patient, 3 of 14 (21%) patients had significant 30 day morbidity including the aforementioned leak, delayed gastric emptying leading to renal failure, and postoperative abscess requiring IR

drainage. Excluding the outlier with multiple anastomotic leaks, the average length of stay was 7.6 days prior to discharge. This is significantly better than the average stay reported in the literature of 15-18 days (1).

Pathologic T Stage	Whipple (n=13)	Distal Pancreatectomy (n=1)
T1	2	0
T2	1	0
T3	9	1
T4	1	0

Figure 1: Final pathologic T stage for pancreatic surgery when given

CONCLUSION:

Our hospital has experienced a 7-fold growth in PD surgery over the past three years. The outcomes prior to 2015 showed an unacceptably high rate of mortality. We implemented specialty trained surgeons since that time to improve outcomes. In our current era since 2015, our 30 day mortality rate is 7% and morbidity rate 21%, which is within acceptable rates based on modern series (1,2). Also in this current era, the hospital stay for our patients is an average of 7.6 days, which is significantly better than the 15-18 days reported in larger series (1). Over 80% of the PDAC cases were Stage IIB showing that these are not low-stage uncomplicated cases. Building a PD surgery program within a "high acuity" institution appears to be a safe undertaking with outcomes equivalent to high pancreatic surgery volume centers (1,2).

References:

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2. Kaye M. Reid-Lombardo et al. "Pancreatic Anastomotic Leakage After Pancreaticoduodenectomy in 1,507 Patients: A Report from the Pancreatic Anastomotic Leak Study Group." J Gastrointest Surg (2007) 11: 1451

FUTURE IMPROVEMENT OPPORTUNITY:

Discussion of the treatment of these patients with nursing care and other support staff identified a problem in education and communication of the surgery and post-operative care. This included confusion of the use and mechanics of the Moss gastro-jejunal feeding tube. We held nursing education courses on the surgery and the tube care (see handout below). We felt that it would improve our outcomes even further to develop a post-operative Whipple protocol to decrease morbidity, decrease hospital length of stay, and improvement provider communication. This was done and implemented in late 2017.

Post-Op Whipple Protocol

- Moss tube (Gastrojejunal Tube, GJT) - Gastric port to low intermittent wall suction for 24 hours, then to gravity bag drainage until tolerates clamping (2.)
    - GJT tubes are routinely placed at some institutions following pancreatic surgery.
    - Benefits- ability to feed distal to area of resection while maintaining ability to vent the stomach.

- Incidence of delayed gastric emptying 6-45% following pancreatic surgery.
- NGT vs GJT- decrease incidence of gastroparesis (25% vs 0%), duration of gastric decompression shorter than NGT, decreased length of stay (LOS, 14 vs 12 days).
- No jejunal tube feeds until return of bowel function.

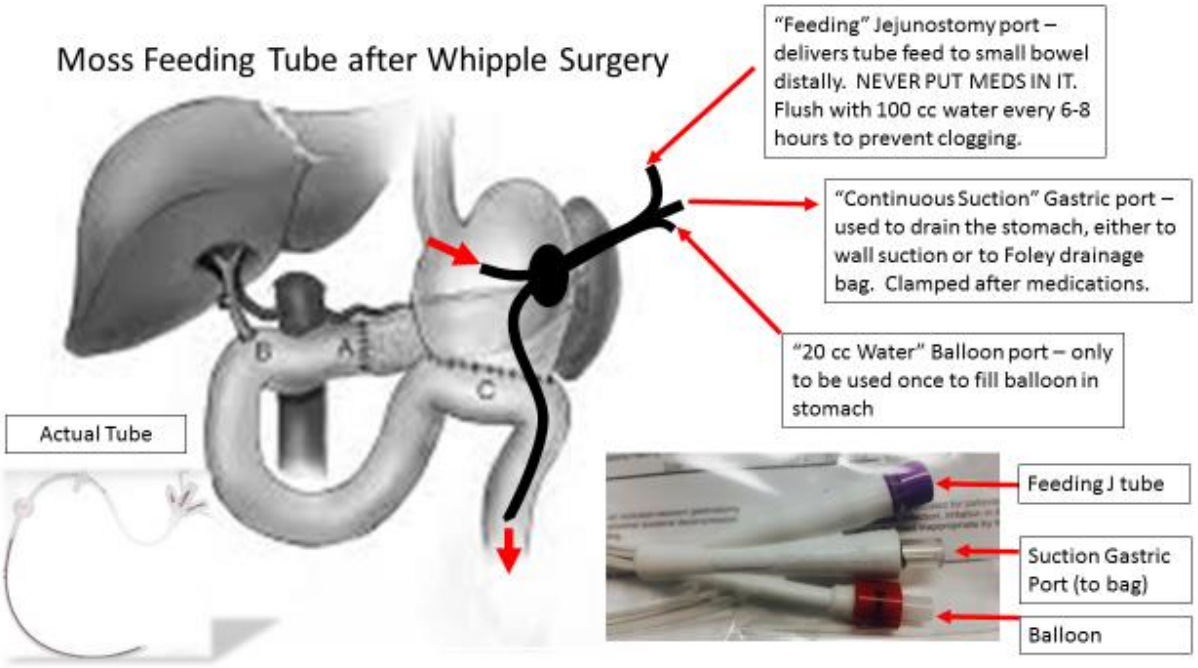
- Lovenox POD#1 if Hb stable, scds
- Pain management
    - Epidural per anesthesia, supplement as needed, HOLD lovenox in coordination prior to removal.
    - Patents treated with epidural reported significantly lower pain scales on day one with lower incidence of opioid-related side effects (respiratory depression, sedation, confusion). (3.)
- Intra-abdominal Drainage following pancreatic resection
    - Controversy exists regarding routine drain placement after pancreatic resection.
    - When drains are used, early removal is recommended.
        - Decreased risk of intra-abdominal abscess, infection when removed before POD#7.
- Octreotide IV push 100mg q8 (1.)
    - Pancreatic fistula is the most frequent complication after pancreatic resection occurs 5-35%.
    - Perioperative octreotide is associated with significant reduction in incidence of pancreatic fistula after elective pancreatic surgery.
        - Dose range 100-300mcg subQ daly for 6-8 days.
        - Well tolerated drug with few side effects.
    - Risk reduction was not associated with significant difference in postoperative mortality.
- Scheduled reglan 10mg IV q8
- Ancef 1gm q8 for 24 hours ppx
- Daily labs
- Order “PT/OT”
- Order “RD recs for Tube feed formula”

ADDENDUM 1: VCMC WHIPPLE SURGERY PROTOCOL

	Pre-Op	Post-Op
GI		-Scheduled Reglan IV q8 hours start POD 1, leave x 1 month -Octreotide 100mg IV q8h in soft pancreas only -Moss Tube- Gastric port to LIS until POD#2 then to gravity, no tube feeds through Jejunal Tube until robf
DVT prophylaxis		-Scds, Lovenox 40mg SQ BID POD#1 if Hb stable -HOLD lovenox in coordination w/ epidural removal
Pain Management		-Epidural per anesthesia, add IV ms/dilaudid for breakthrough prn
Nutrition	Optimize, NPO @ MN	-Order "RD recs for Tube feed formula" -Upper GI with gastrografin POD 7, feed if no leak and good drainage - Clears advance to soft diet as tolerated along with gradual G tube clamping trials
Labs	Routine pre-op	-Daily
Antimicrobial	Ancef w/in 30 mins	-Ancef x24 hours
PT/OT		-Daily

	Pre-Op	Post-Op
Lines/Drains		-DC a-line POD#1 -DC Foley same day as epidural removed -JP drains x 2 – lateral biliary drain removed POD 3-5, medial pancreatic drain removed 48-72 hours after starts PO intake with fat - G tube flush 100 cc every 8 hours start POD#1 - J tube flush 100 cc every 8 hours start POD#1

ADDENDUM 2: MOSS GJ FEEDING TUBE SHEET



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