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Whipple Procedure Recovery: A Case Study

My Cancer: The solid pseudopapillary tumor of the pancreas, otherwise known as solid cystic tumor or Frantz tumor, is a rare malignancy. It has a 10:1 female predilection, affecting young women at an average age of 24 years. It is slow-growing and carries a better prognosis than the more common adenocarcinomas of the pancreas. Metastatic disease can occur usually involving the liver and peritoneum; however most primary tumors (85–90%) are localized to the pancreas at the time of diagnosis. Complete removal is the treatment of choice for a tumor arising anywhere in the pancreas. Survival following primary resection approaches 95% at 5 years. Despite its potential for local infiltration, recurrence is rare following complete excision.

Clinical Symptoms: The clinical presentation of the tumor is nonspecific. Symptoms are usually vague and include abdominal discomfort or pain, nausea and vomiting due to a gradually enlarging mass compressing local structures. I also experienced poor digestion, and an intolerance to alcohol. Depending on the size and location of the tumor, some patients are completely asymptomatic with the tumor detected incidentally by imaging studies or routine physical examination. Upon blood testing there is usually no evidence of pancreatic insufficiency, abnormal liver function, elevated pancreatic enzymes or an endocrine syndrome. Tumor markers (AFP, CEA, CA 19–9 and CA 125) are also generally within normal limits.

Treatment: The Whipple Procedure, or pancreaticoduodenectomy, is the most commonly performed surgery to remove tumors in the head of the pancreas. In a standard Whipple procedure, the surgeon removes the head of the pancreas, a portion of the common bile duct, the gallbladder, the duodenum of the small intestine, the pylorus of the stomach, and the surrounding lymph nodes. The surgeon then reconnects the remaining pancreas and digestive organs so that pancreatic digestive enzymes, bile, and stomach contents will flow into the small intestine during digestion. The surgery usually lasts between 5-8 hours. Most patients stay in the hospital for one to two weeks following the Whipple procedure. Usually after 7-10 days the stomach regains function.

Complications: Immediately after the Whipple procedure, serious complications affect up to one-third of patients. The most common complication is delayed gastric emptying, a condition in which the stomach takes too long to empty causing abdominal distention, pain, vomiting and malabsorption. The most serious potential complication is abdominal infection due to leakage where the pancreas has been connected to the intestine. This occurs in approximately 10% of patients and in my case was prevented by a surgically placed (Jackson-Pratt) drainage tube into the abdominal “dead space”. Patients who have undergone the Whipple procedure may experience long-term digestive difficulties. Because recovery can be slow and painful, patients usually need to take prescription or over-the-counter pain medications. At first, patients can eat only small amounts of easily digestible food. They may also need to take pancreatic enzymes—either short-term or long-term—to assist with digestion. Diarrhea is a common problem during the two or three months it usually takes for the rearranged digestive tract to fully recover. If the patient continues to complain of loose oily stool, long-term treatment with oral pancreatic enzymes is usually required to counteract malabsorption and prevent malnutrition. Other possible complications include weight loss (most patients can expect to lose about 10% of their body weight) and Diabetes which can develop if too many insulin-producing cells are removed from the pancreas.

DRUGS: Pharmacologic Category and Use, Mechanisms of Action, Significant Adverse Effects and Drug Interactions

Percocet (oxycodone & acetaminophen); an opioid-analgesic combination used for treatment of moderate to moderately severe pain.

MOA: Oxycodone binds to opiate receptors to block pain perception, while acetaminophen inhibits prostaglandin synthesis in the CNS blocking peripheral pain impulse generation.

Adverse effects include: nausea, vomiting, constipation, dizziness, headache, sedation and xerostomia.

Avoid: Azelastine, Fusidic Acid, Pimozide, Thalidomide, St John's Wart (and acetaminophen contraindications).

Tylenol Extra Strength (acetaminophen); an analgesic and antipyretic used for treatment of moderate pain (when Percocet was not tolerated).

MOA: Inhibits prostaglandin synthesis in the central nervous system (CNS) blocking peripheral pain impulse generation.

Adverse effects include: nephrotoxicity and hepatotoxicity (with chronic use/overdose).

Avoid: Pimozide, Prilocaine, Anticonvulsants, Barbituates, Vit. K Antagonists (warfarin) and alcohol.

*Tylenol PM (acetaminophen & diphenhydramine); an analgesic combo used for relief of insomnia and minor pain during sleep.

Zofran (ondansetron); an antiemetic used to treat and prevent moderate to severe nausea and vomiting.

MOA: Blocks specific serotonin receptors (5-HT₃) which are responsible for initiating vomiting reflex.

Adverse effects include: headache, fatigue and constipation.

Avoid: local anesthetic with vasoconstrictor/epinephrine because the Q-T interval of the heart is prolonged in a dose-dependent manner.

Colace (docusate); a stool softener used as a prophylaxis for the valsalva maneuver (to prevent straining during defecation).

MOA: Reduces the surface tension of the oil-water interface of stool, yielding softer stool with increased water and fat content.

Adverse effects include: intestinal obstruction, diarrhea, abdominal cramping and throat irritation. It is not appropriate for long-term use because it becomes ineffective and can lead to colon dysfunction.

No drug interactions are indicated.

Nexium (esomeprazole); a proton-pump inhibitor to prevent acid reflux while stomach regains function.

MOA: Suppresses gastric acid secretion.

Adverse effects include: headache and flatulence.

Avoid: Rifampin, Fluconazole, Vitamin K Antagonists (warfarin) and St John's Wart.

Creon (pancrealipase); digestive enzymes for treatment of pancreatic exocrine insufficiency.

MOA: A natural product harvested from the pancreatic glands of pigs containing a combination of amylase, lipase and protease which dissolve in the small intestine and act locally to breakdown fats, protein and starch.

Adverse effects include: headache, abdominal pain, ear pain, neck pain, dyspepsia, diarrhea, nasal congestion and lymphadenopathy.

No drug interactions are indicated.

Multivitamin; a dietary supplement consisting of a variety of essential vitamins and minerals to treat and prevent deficiencies.

Follow Up: After a Whipple operation patients are instructed to ingest smaller meals and to snack between meals to allow better absorption of food and to minimize symptoms of feeling distended and over-stressing the digestive system. All patients who undergo surgical excision of a pancreatic tumor are followed up every six months with routine blood studies, chest X-ray, CA-19-9 levels, and either a computed tomography (CT) scan or magnetic resonance imaging (MRI) of the abdomen. This biannual follow-up screening is recommended for life or a minimum of 5 years post-op.

Questions for the Class:

1) What post-operative clinical symptoms might indicate malabsorption/malnutrition?

Weight loss, diarrhea, loose fatty stool

2) Name a condition patients are at an increased risk of developing after pancreatic surgery.

Diabetes; less insulin is bioavailable with loss of insulin-producing pancreatic tissue

3) What factors associated with post-operative medications and biological changes may contribute to caries development?

Xerostomia, vomiting, frequent snacking and dietary changes, difficulty brushing with physical exhaustion/weakness

4) What anatomical structures are removed during a Whipple procedure?

Head of pancreas, duodenum of small intestine, gall bladder, pylorus of the stomach, and surrounding lymph nodes

Sources:

- Jr, C., E, D., & Dr, G. (2003). Management of a solid pseudopapillary tumor of the pancreas with liver metastases. *HPB: Official Journal of The International Hepato Pancreato Biliary Association*, 5(4), 264-267.
- The Whipple Procedure and Other Pancreas Surgeries. (n.d.). Retrieved December 6, 2014, from http://www.hopkinsmedicine.org/kimmel_cancer_center/centers/pancreatic_cancer/treatments/whipple_procedure.html
- Todani, T., Shimada, K., Watanabe, Y., Toki, A., Fujii, T., & Urushihara, N. (1988). Frantz's tumor: A papillary and cystic tumor of the pancreas in girls. *Journal of Pediatric Surgery*, 23(2), 116-121.
- Wax, MD, A. (Ed.). (2012, September 21).
- Whipple Procedure: Effects, Success Rate, and More. Retrieved December 6, 2014, from <http://www.webmd.com/cancer/pancreatic-cancer/whipple-procedure>
- WHIPPLE OPERATION. (2002). Retrieved December 6, 2014, from http://www.surgery.usc.edu/divisions/tumor/pancreas/diseases/web_pages/pancreas_resection/whipple_operation.html
- Whipple procedure (pancreaticoduodenectomy). (n.d.). Retrieved December 6, 2014, from <http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/surgery/whipple-procedure-pancreaticoduodenectomy/>
- Wynn, PhD, R., Meiller, DDS, T., & Crossley, DDS, H. (Eds.). (2014). *Drug Information Handbook for Dentistry* (20th ed., p. 29, 35, 474, 537, 1086, 1101, 1119, 1502). Lexicomp.
- Yagci, A., Yakan, S., Coskun, A., Erkan, N., Yildirim, M., Yalcin, E., & Postaci, H. (2013). Diagnosis and treatment of solid pseudopapillary tumor of the pancreas: Experience of one single institution from Turkey. *World Journal of Surgical Oncology*, (11), 308-308.