



PEDIATRIC SURGERY Update 8

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Pancreatic Neuroendocrine Tumors

Neuroendocrine tumors of the upper gastrointestinal tract are mainly located in the pancreas, stomach or duodenum. Pancreatic neuroendocrine tumors (PNET) are rare tumors found in the pancreas that can be either functional or non-functional. PNET are usually sporadic, but may also be associated with genetic syndromes such as Von Hippel-Lindau and tuberous sclerosis. PNET are non-functional in their majority. Functional PNET can secrete insulin, gastrin, glucagon, somatostatin and vasoactive intestinal polypeptide. Non-functional PNET can secrete non-active substance such as neurotensin or chromogranin A. PNET are classified as well differentiate tumor and well differentiated or poorly differentiated carcinomas. Most are already metastatic by the time they are diagnosed with liver the most common site followed by regional lymph nodes. Surgery with curative intent is the mainstay of treatment for localized or loco-regional disease. PNET in children should preferably undergo an organ-sparing resection. Surgery as well as other forms of local treatment like transarterial chemoembolization or radiofrequency ablation can also improve prognosis in patients with liver metastases. For the inoperable cases, cytotoxic therapy with compounds like streptozotocin, 5-fluorouracil or doxorubicin can achieve modest outcome. Treatment with somatostatin analogues like octreotide has been proven to prolong progression-free survival in patients with metastatic neuroendocrine tumors of midgut origin.

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ERCP in Children

Endoscopic retrograde cholangiopancreatography (ERCP) is a very important

diagnostic and therapeutic tool for pancreaticobiliary disorders in children and adults. Biliary indications for ERCP include common bile duct stones, choledochal cyst, aberrant biliary anatomy, duct stricture, duct hypoplasia, biliary atresia, postoperative bile leaks and bile duct injury. ERCP can be therapeutic in extracting bile duct stones, performing papilla sphincterotomy, cystoduodenostomy, stricture dilatation and endoprosthesis placement. There is controversy whether ERCP should be used routinely in choledocholithiasis since spontaneous passage of common bile duct stones is common in children. Pancreatic indications for ERCP include recurrent or chronic pancreatitis, sclerosing cholangitis, pancreas divisum, pseudocysts, trauma and choledochoceles. Therapeutic options for ERCP in pancreatic disorders include papillotomy and stent placement. General anesthesia will be needed to perform ERCP in young children, mostly between the ages of three and 12 years. The morbidity associated with ERCP is very low and consists of pancreatitis (most common), hemorrhage, duodenal perforation and cholangitis. Mortality is nil. ERCP is useful and safe in children, but previous use of diagnostic ultrasound and MRCP to detect morphologic changes should be encouraged to increase the therapeutic efficacy of ERCP.

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Gastrostomy Complications

Gastrostomy is a common and important procedure that have demonstrated to improve growth of children with developmental disabilities. A gastrostomy can be constructed open, percutaneously or laparoscopically. The morbidity associated with gastrostomy is significant. Most common reported complications in order of increase frequency include granulation tissue, tube leakage, accidental tube dislodgement, wound infection, blocked tube, bleeding, gastroesophageal reflux and colocutaneous fistula. Granulation tissue can be managed with topical silver nitrate application and Kenalog oral-base ointment. Tube mechanical problems can be managed with flushing, change of tube as

soon as dislodged, avoiding pressure necrosis from tight fit, and performing daily tube rotation. Wound infection if associated with cellulitis might need systemic antibiotics. Reflux is usually managed medically. Colocutaneous fistula needs emergency operation. The open procedure causes more complications than the percutaneous procedure. Laparoscopic gastrostomy in children avoids the serious complications caused by a blind puncture through the abdominal cavity when performing the percutaneous procedure. The frequency of minor ongoing problems necessitates ongoing support of the child and care of the gastrostomy.

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8 PSU 1993-2010
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