

Perioperative Implications

Preoperative Preparation

- Perform a thorough review of systems to identify coexisting disease in this older pt population and a thorough airway exam, including assessment for atlantoaxial instability; obtain radiographs if necessary.
- Check lytes, serum alkaline phosphatase; CBC for baseline hemoglobin.
- Echocardiography to assess cardiac function and potential sclerotic valvular disease (calcific disease of the aortic valve is most common); ECG to assess to conduction abnormalities; assess for ICP and obtain additional imaging if necessary.
- Ensure blood availability.
- If elective procedure, make sure that antipeptic therapy is instituted preop.

Monitoring

- Invasive BP monitoring may be appropriate.
- Neuromonitoring may be required for procedures involving the spine.

Airway

- Advanced airway equipment may be required for pts with significant cervical spine and/or mandibular disease; fiberoptic intubation may be indicated.

Preinduction/Induction

- If significant cardiovascular or valvular disease is present, aggressive BP management may be required during induction, including the use of cardiac neutral induction agents.
- Neuraxial anesthesia may be difficult if significant spine involvement is present
- Avoid medications contraindicated in pts with increased ICP.

Maintenance

- The majority of pts will be >50 y and may therefore require a lower MAC of anesthesia; there are no specific interactions between anesthetic agents and PD.
- Avoid medications that can increase ICP; can consider hyperventilation if ICP is an issue.

- Maintain normotension and avoid tachycardia in pts with cardiac disease; manage fluids carefully; maintain normothermia to decrease bleeding.

Extubation

- If pt has a difficult airway, it is crucial to avoid the need for emergent reintubation.

Postoperative Period

- Multimodal analgesia will be necessary, as some pts may have chronic pain at baseline due to pagetic activity.
- Mobility may be difficult depending on the extent of disease involvement.
- Lyte monitoring and telemetry may be indicated.
- Postop pulm toilet is important, given an elderly population, especially if there is thoracic involvement.

Anticipated Problems/Concerns

- Risk of injury during positioning.
- Sclerotic bone may be more difficult to manipulate and can prolong surgical time.
- IV access may be challenging if vessels are calcified.

Pancreatitis

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Risk

- Incidence of AP varies from 4.9–73.4 cases per 100,000 worldwide.
- Prevalence of CP has recently been estimated at 12–45 cases per 100,000, although its true prevalence is unknown.

Perioperative Risks

- Most mortality occurs with surgery for complications of severe pancreatitis: 10–30%
- Risk of nonpancreatic surgery probably dependent on severity of attack

Worry About

- Severe hypovolemia secondary to sequestration of fluid in the retroperitoneal space
- Lyte abnormalities, including hypocalcemia, hyperglycemia, and acidosis
- Systemic complications such as alcohol withdrawal, ARDS, acute renal failure, DIC, multisystem organ failure, and sepsis

Overview

- AP involves an intense inflammatory response caused by the release of activated pancreatic enzymes, with

resultant tissue destruction as well as the loss of fluid and electrolytes.

- AP diagnosis requires at least two of three criteria: amylase and/or lipase >3 times the upper limit of normal, abdominal pain consistent with disease, and/or characteristic abdominal imaging.
- AP is most commonly a mild self-limited disease; it is occasionally severe, with renal, pulm, coagulatory, and septic complications.
- CP results from inflammatory cell infiltration, formation of granulation tissue and fibrosis, and loss of pancreatic parenchyma, leading to exocrine and endocrine insufficiency.

Etiology

- Acute: Most common risk factors are gallstones and excessive alcohol consumption. Others include post-ERCP, drugs, viral infections, metabolic disorders, and abdominal trauma.
- Chronic: In adults, chronic alcohol use accounts for 70% of cases. In children, genetic diseases and anatomic defects are more likely.

Usual Treatment

- In most cases, nonspecific and supportive only.
- Adequate volume replacement and correction of electrolyte abnormalities.
- Intensive care of organ system failures.
- Parenteral opioid analgesia.
- Thromboprophylaxis.
- Early nutritional support; enteral better than parenteral.
- Pts with AP and concurrent acute cholangitis should undergo ERCP within 24 h of admission.
- Rarely, judiciously timed open or endoscopic surgery to drain abscesses or debride necrotic tissue.
- For biliary AP, timing of cholecystectomy dependent on severity.
- CP is primarily managed medically.
- Endoscopic/surgical management of CP is aimed at decreasing pain and treating associated complications, such as strictures (biliary and pancreatic), ductal leaks, intraductal calculi, or pseudocysts.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CV	Hypovolemia	Orthostatic dizziness Cold	Lying and sitting BP and HR Hypotension Oliguria	BUN/Cr Hct (hemoconcentration)
RESP	ARDS	Dyspnea Tachypnea	Chest exam may be nonspecific	ABG CXR
GI	Ileus GI bleed	N/V Hematemesis		
ENDO	Hyperglycemia			Serum glucose
HEME	DIC		Bleeding	PT/PTT, plts FSP, fibrinogen Hct
RENAL	ARF Hypocalcemia		Tetany	BUN/Cr Serum Ca ²⁺
CNS	Psychosis Encephalopathy		Mental status	

Key References: Inui K, Yoshino J, Miyoshi H, et al.: New developments in diagnosis and non-surgical treatment of chronic pancreatitis. *J Gastroenterol Hepatol* 28(Suppl 4):108–112, 2013; Tenner S, Baillie J, DeWitt J, et al.: American College of Gastroenterology guideline: management of acute pancreatitis. *Am J Gastroenterol* 108(9):1400–1415, 2013.

Perioperative Implications**Preoperative Preparation**

- Assess and correct volume status, hypocalcemia, hyperglycemia, and acidosis.
- For a pt with CP and intractable pain, determine current pain regimen. Consider thoracic epidural for postop pain.

Monitoring

- Consider bladder catheter to monitor urinary output.
- Consider arterial cath if there is need for blood draws or hypovolemia
- Consider CVP or PA cath for monitoring of volume status

Airway

- Routine management

Induction

- Peritoneal irritation frequently leads to ileus and increased risk of aspiration.
- Anticipate hypovolemia.

Maintenance

- CV instability due to massive sequestration of fluid; depending on severity, >10 L of isotonic fluid may be required over 24 h.

Extubation

- Will likely require postop mechanical ventilation

Adjuvants

- Multiple possible interactions of protein-bound drugs, especially if the pt is malnourished or undergoing alcohol withdrawal

Anticipated Problems/Concerns

- Pts with AP presenting for abdominal surgery are typically critically ill and require intensive care postop to manage hypovolemia, ARDS, DIC, acute renal failure, and sepsis.
- Hypoglycemia and hyperglycemia are life-threatening risks after pancreatectomy.
- Alcohol withdrawal can be life-threatening.

Papillomatosis

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Risk

- Incidence of recurrent respiratory papillomatosis (RRP) in USA estimated at 4.3:100,000 among children and 1.8:100,000 among adults.
- Vertical transmission during delivery is believed to be the major mode of transmission for juvenile-onset recurrent respiratory papillomatosis (JORRP).
- Case reports show malignant transformation of RRP to squamous cell carcinoma.
- Children diagnosed with JORRP at <3 y of age tend to have more aggressive disease.
- Adult-onset recurrent respiratory papillomatosis (AORRP) typically presents in the fourth decade of life.

Perioperative Risks

- Mask ventilation or intubation difficult due to obstruction from papilloma.
- Increased risk of complete obstruction during induction or with muscle paralysis.

- Upper airway obstruction from laryngeal papillomatosis associated with pulm Htn.

Worry About

- Laryngeal papilloma prolapse causing complete airway obstruction; unable to ventilate or intubate, leading to hypoxia and cardiac arrest
- Airway fire from CO₂ laser therapy during surgical resection

Overview

- The term papillomatosis describes multiple papillomas, or benign epithelial tumors found on the epidermis and mucous membranes.
- RRP can be further classified into adult onset (>18 y of age) or juvenile onset (age <10 y).
- Papillomas are caused by HPV.
- The hope with HPV vaccine is to prevent transmission of the virus to neonates, reducing the incidence of RRP and oropharyngeal cancers associated with HPV.

- Can have highly recurrent nature in children (HPV-11), requiring repeated exposure to anesthesia and surgical treatment
- Laryngeal papillomas may be found on vocal cords, epiglottis, pharynx, or trachea.

Etiology

- Most commonly caused by human papillomaviruses 6 and 11, rarely HPV-16 or HPV-18

Usual Treatment

- No current cure.
- Surgical debulking is the standard treatment, usually requiring multiple procedures.
- CO₂ laser is frequently used. (Laser plumes can contain viral particles.)
- Adjuvant therapy includes cidofovir injections; interferon therapy (topical versus IV).
- Prevention/treatment of gastroesophageal reflux may improve control of RRP.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Vocal cord dysfunction Obstruction of airway	Dysphonia, stridor Hoarseness	Stridor with no change with position RR, cyanosis, increased respiratory effort	Exam with flexible fiberoptic nasopharyngoscope Endoscopy, biopsy
RESP	Tachypnea, cyanosis if impending respiratory failure, extralaryngeal spread can present as lung nodules, pneumonia, bronchiectasis	Declining pulmonary status	Decreased BS, use of accessory muscles	CXR or CT may provide additional info
GI	Malnutrition, dysphagia	Failure to thrive, feeding difficulties	Malnutrition, dehydration	
CV	Pulm Htn, RV failure		Peripheral edema, hepatomegaly	ECG, ECHO
MS/DERM	Cutaneous lesions	Could have widespread manifestation in immunocompromised host	Warty growths	Biopsy

Key References: Li SQ, Chen JL, Fu HB, et al.: Airway management in pediatric patients undergoing suspension laryngoscopic surgery for severe laryngeal obstruction caused by papillomatosis, *Paediatr Anaesth* 20(12):1084–1091, 2010; Taliercio S, Cespedes M, Born H, et al.: Adult-onset recurrent respiratory papillomatosis: a review of disease pathogenesis and implications for patient counseling, *J Am Med Assoc Otolaryngol Head Neck Surg* 141(1):78–83, 2015.

Perioperative Implications**Preoperative Preparation**

- Important to coordinate care between ENT and anesthesia.
- Perform thorough preop airway evaluation with a flexible fiberoptic nasopharyngoscope to determine severity of airway obstruction.
- Have advanced airway equipment available.
- Consider anticholinergic meds to decrease secretions and prevent bradycardia from hypoxia.
- Caution with premedication if pt hoarse or has stridor with concern for worsening airway obstruction.

- Minimize risk of gastric content aspiration: H₂ blockers, promotility agents

Monitoring

- Standard monitoring

Airway

- Have ET tubes of several sizes (generally smaller for age) on hand in case a papilloma is obstructing glottic opening.
- Prepare for tracheotomy.
- Spontaneous ventilation is preferred to avoid having to deliver positive pressure when pt is apneic; also provides increased visualization for surgeons.

- Flexible fiberoptic to visualize airway
- Other anesthetic airway techniques include jet ventilation and apneic ventilation techniques; however, there is a risk for hypoxia and hypercarbia.
- Exercise caution with paralytic agents; ensure ability to ventilate via facemask before using.

Induction

- Maintain spontaneous ventilation when possible.
- Mask induction or IV induction with propofol, lidocaine atomizer to help prevent laryngospasm.
- Be prepared for cricothyrotomy or tracheotomy if obstruction occurs.