



PEDIATRIC SURGERY Update*

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Neuromonitoring in Thyroid Surgery

Thyroid surgery can cause temporary or permanent damage to the recurrent laryngeal (RLN) and superior laryngeal nerve (SLN) causing hoarseness, impaired vocal phonation, dysphonia, dysphagia and even aspiration dyspnea. Bilateral damage to the RLN can be life-threatening leading to airway obstruction. Damage to these nerves depends on the type of disease (benign or malignant), extent of thyroid resection (lobectomy vs. total thyroidectomy), type of resection (first surgery or reoperation) and the training and experience of the surgeon. Surgical exposure and identification of both nerves during surgery is the gold standard in avoiding damage. For the past ten years refinement in neuromonitoring (NM) has helped introduced electrodes in the endotracheal tube in contact with the vocal cords to monitor the functional viability of both nerves during thyroid surgery. Throughout this time NM of the RLN/SLN during thyroid surgery has allowed visual identification and exposure of both nerves, allowing recording affording a valid legal protection in case of damage. NM localizes the exact location in case of injury and determines if the injury is reversible by repairing a damage nerve. NM allows young surgeons and surgeons-in-training to approach thyroid surgery more safely. NM can also help identify anatomic variants present in less than 5% of all patients. NM has become an asset in difficult thyroid dissections, substernal goiters, redo surgery and bloody thyroidectomy. Electric nerve testing at the end of the thyroidectomy can serve for postoperative prognostication of nerve function. Detecting nerve injury intraoperatively aids in staging bilateral lobectomies to avoid bilateral vocal cord paralysis and tracheotomy. It is estimated that NM should be included as standard of care of thyroid surgery in children and adults. NM studies are not based in class 1 evidence randomized clinical trials, but in evidence 2 and 3 studies. NM is actually the only way to verify the functional integrity of the RLN and SLN during thyroid procedures. As recurrent laryngeal nerve injury is one of the most common causes of medicolegal litigation after thyroid and parathyroid surgery securing the nerve is an increasing demand in these procedures.

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Lupus Associated Pancreatitis

The most common etiologies of acute pancreatitis in children consist of hepatobiliary disorders related with mechanical obstruction such as gallstone, drugs (steroids, cyclophosphamide), infectious (viral), alcohol, hypercalcemia and hypertriglyceridemia. In almost 20% of patient a cause cannot be found (idiopathic). Systemic lupus erythematosus (SLE) can be a rare cause of pancreatitis in children. The incidence of acute pancreatitis associated with SLE varies from 0.7 to 4%. Pathogenic features of SLE pancreatitis may include vasculitis, interstitial edema, arteriolar microthrombus formation from immune complex deposition, anti-pancreatic antibodies, drug toxicity, inflammation due to T-cell infiltration and complement activation. Cytomegalovirus have also been associated with lupus pancreatitis. Patients with lupus associated pancreatitis are typically female with clinically active SLE developing within the first two years of disease onset. The diagnosis of lupus associated pancreatitis is based on clinical symptoms, pancreatic enzyme elevation and characteristic imaging findings (CT-Scan or US). A diagnosis of SLE pancreatitis can be made after the exclusion of other causes of acute pancreatitis. Clinical signs include abdominal pain, nausea and vomiting. Pancytopenia (anemia, leukopenia and thrombocytopenia) is a distinguishing feature of lupus associated pancreatitis. SLE articular involvement and occurrence of generalized tonic clonic seizures are significantly more common in patients with pancreatitis. Lupus associated acute pancreatitis can be self-limited to severe with fulminant progression. The mortality of acute pancreatitis in pediatric cases of SLE is higher when several organs are involved, in particular renal, hepatic and neurological. Within the context of SLE there are also cases of subclinical pancreatitis in which there is an elevation of pancreatic enzymes without clinical symptoms. Around 30% of asymptomatic SLE patients have hyperamylasemia. The management of SLE pancreatitis is with steroids and supportive measures. Somatostatin therapy during the acute pancreatitis has helped a few patients.

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Carbuncle

A carbuncle is an infection of the hair follicles extending in the surrounding skin and deep underlying subcutaneous tissue. When two or more furuncles coalesce, a carbuncle develops. Clinically the patient present with a tender, inflamed, erythematous (cellulitis), fluctuant nodule with multiple draining sinus tracts or pustules in the surface of the lesion. The child can have fever, fatigue, malaise and ipsilateral associated lymphadenopathy. Carbuncles develop more commonly in hair bearing areas such as the back of the neck, buttock, axilla, groin, back and thighs. Carbuncles are usually solitary, though multiple can be seen rarely. The most common organism associated with a carbuncle is staphylococcus aureus, including the methicillin resistant variant. When the skin barrier is broken or disrupted by an infected follicle, bacteria proliferate leading to folliculitis, furuncle and then carbuncle. When compared with adults Carbuncles are rare in the pediatric age. They are associated with diabetes, hyperhidrosis, alcohol use, malnutrition, immunodeficiency, obesity and overall poor hygiene. The diagnosis is done by physical examination. There is no need to perform imaging studies for diagnosis or treatment purposes. It is important to culture the carbuncle before antibiotic therapy is started. A carbuncle can cause a diabetic patient to lose control of blood sugar or even develop sepsis. Hemogram can demonstrate leukocytosis with a shift to the left, or it can be normal depending on the systemic response of the patient. Carbuncles are managed with systemic antibiotics and surgical intervention. Antibiotics should be broad-spectrum. In children this is done in the operating room under anesthesia. Incision and drainage of multiple loculations and debridement of necrotic center are the surgical treatment of choice. A drain is usually placed and removed 48 hours later. If methicillin resistant staph aureus (MRSA) grow in culture antibiotics might need to be changed accordingly. Recurrence is rare but may need surgical excision in a few cases. Prognosis is favorable.

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