



# **PEDIATRIC SURGERY Update** ©

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### **Ventriculo-Pleural Shunts**

Shunting of cerebrospinal fluid (CSF) into extracranial sites usually include the use of the peritoneum (ventriculo-peritoneal shunt) and atrium (ventriculo-atrial shunt) for palliation of symptoms associated with hydrocephalus. Another alternative includes the use of the pleura for absorption of the CSF using a ventriculo-pleural shunt in selected patient when conventional sites not suitable either due to adhesions, infection, thrombosis or obliteration. Ventriculo-pleural shunts are an acceptable alternative for CSF decompression in children as well among adults patients. It is estimated that up to 50% of children will experience a failure of any shunt within the first year. Clinical manifestations of early shunt failure include nausea, vomiting, irritability, altered consciousness, bulging fontanelle among infants. Depress level of consciousness and loss of milestone are the main indication of late shunt failure. CSF shunts complications are either mechanical, functional or infectious in nature. Mechanical complications include obstruction of the shunt, fracture or disconnection of the device and migration. In-growth of portions of the choroid plexus or ependymal surface of the ventricles into the inlet holes of the proximal catheter accounts for the most common cause of obstruction. CSF malabsorption leads to abnormal accumulation of the fluid resulting in functional failure of the shunt. The most common complication of ventriculo-pleural shunts (VPLS) is pleural effusion. Only 20% of the pleural effusions are symptomatic requiring revision and most of these patients are infants. Anti-siphon devices seem to reduce the incidence of pleural effusion. The hydrothorax associated with VPLS is due to impaired pleural absorption and excessive drainage of CSF into the pleural space. The fluid is clear transudate with some mononuclear cells. In most cases of pleural effusion the fluid resolves spontaneously. Pleural CSF effusion might result in respiratory distress needing thoracentesis. Administration of acetazolamide reduces CSF production and reduces respiratory symptoms. With recurrent or worsening of symptom shunt replacement must be undertaken.

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## **PET Scan Utility in Thyroid Cancer**

Thyroid cancer in children carries a good prognosis. It is followed after total thyroidectomy with serial measurement of serum thyroglobulin (Tg), antithyroglobulin antibody (TgAb), neck ultrasound and radio-iodine (RAI) whole body scan. Elevated thyroglobulin with normal antithyroglobulin autoantibodies after surgery and radioiodine ablation therapy indicates recurrent thyroid carcinoma or metastatic disease. RAI scan is more than 90% specific for detecting recurrence or metastatic disease. 30-50% with recurrent/metastatic disease can have a negative RAI scan specially small size tumors or poorly differentiated carcinomas. PET Scan using fluorine-18-fluorodeoxyglucose (FDG) is an effective tumor imaging tool in thyroid cancer patients with high Tg levels specially in cases where RAI whole body scan cannot detect metastasis due to lack of accumulation by the tumor. Other potential indications for PET Scan are locating disease in positive RAI whole body scan patients looking for other sites of metastasis, high level of antithyroglobulin and determination of prognosis. Thyroid differentiated cancer cells express the sodium iodide symporter and concentrate radioiodine. As the disease becomes more aggressive, they lose that symporter ability making RAI whole body scan negative (non-functioning metastasis) but the remnant tumor/metastasis still secreting Tg. Due to the increase growth rate these cells are detected by PET 18-FDG Scan and are more amenable to surgical extirpation if identified. While this process of dedifferentiation between the tumor cells occurs, patients can have both RAI whole body scan and PET Scan with positive disease in different anatomical areas of the body. Combining both localizing studies increase the sensitivity of finding tumor to 94%. The tall cell variant of thyroid differentiated cancer associated with a poor prognosis is associated with a positive PET Scan more frequent than the classic cell type. PET Scans are more sensitive in patients with low TSH levels. In cases of high TgAb with negative RAI scan the Tg level even if normal carries a clinical problem of interpretation and PET Scan can detect recurrence/metastatic disease. Preoperative PET Scan is not useful for prediction of thyroid cancer recurrence. Lymph node stage is the only predictor of recurrence.

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## Acute Ileitis

The terminal ileum is the most distal segments of the small bowel and hosts many toxic substances including bacteria, viruses, parasites and digested food. The term acute ileitis describes episodes of right lower quadrant abdominal pain not identified as acute appendicitis but participation of the terminal ileum is identified or suspected. It occurs in 33 cases per 100000 presenting to the ER. The term ileitis became famous with the recognition of Crohn's disease terminal ileitis. The diagnosis of acute ileitis is suspected or established with US and/or CT-Scan. CT-Scan is needed when the child has atypical clinical findings, equivocal sonographic results or a pediatric surgeon ask for the study. The causes of acute ileitis include infectious (most common cause), inflammatory bowel disease and nonsteroidal antiinflammatory drug therapy. The most common infectious microorganisms causing ileitis include *Yersinia enterocolitica* (most common frequent organisms), *Campylobacter jejuni*, *Salmonella enteritides* and *Anisakis simplex*. They start with colicky right lower pain followed later by fever and diarrhea. Stool cultures are false negative. *Anisakis* infestation is associated with eating raw, marinated or smoked fish 48-72 hours before the onset of symptoms. One third of the patients with Crohn suffer from an acute episode of ileitis. Suspicion of Crohn's ileitis should arise on a combination of clinical and biochemical findings, imaging data, absence of alternative diagnosis and history of preceding episodes. With chronic symptoms of pain and diarrhea an ileal endoscopic biopsy is warranted. Exposure to nonsteroidal antiinflammatory drugs can induce ileitis. These lesions respond to discontinuation of the drugs that its causing it. Almost 20% of acute ileitis cases are nonspecific and a specific cause cannot be determined. In females gynecological conditions (uterine disorders, ovarian pathology and pelvic inflammatory disease) can mimic the symptoms of acute ileitis. US is the initial preferred imaging study in young females to avoid irradiating the pelvic organs.

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