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Gips Procedure

Pilonidal disease (PD) is a common inflammatory condition of the gluteal cleft and sacrococcygeal region in children and adults. Pilonidal disease is characterized by sinus, cyst, or a combination of both associated with abscess formation in association with midline openings which entrap hair and granulation tissue. Enlargement and subsequent inflammation and infection of the midline gluteal follicles leads to the formation of pilonidal pits. The entry of hair and foreign material into the pits allows disease progression from asymptomatic sinuses to chronic draining sinus tracts, abscess, and secondary wounds. Children with PD complain of pain, cellulitis in the area, poor wound healing, drainage, bleeding, poor quality of life, lost school time, and increased costs. The disease process can range in severity from small, asymptomatic pits to multiple tracts, abscess and fistulization far away from the midline. Peak incidence of PD is between fourteen and 25 years of age with a higher incidence in males. PD is endemic in the tropics due to the high humidity. Factors associated with an increased risk of developing PD include coarse hair growth, poor hygiene of the affected area, and obesity. The diagnosis of PD is by history and physical examination of the lumbosacral area. Images are rarely needed unless you need to corroborate an abscess by using ultrasound of the affected region. The prevertebral fascia avoids the infectious process to cross toward the spine bony elements. Throughout time many different surgical procedures have been utilized in the management of PD ranging from simple abscess drainage, hair removal and hygiene alone, excision and primary wound closure, excision, and secondary wound closure to wide excision with multi flaps closure. Surgical therapy of PD is frequently complicated by surgical site infection, delayed or failed wound healing, pain and protracted convalescence, and recurrence of disease. Pilonidal recurrence rates are as high as 40-50% after drainage, 40-50% with rigorous hygiene and shaving and 30% after surgical intervention. Gips procedure is a minimally invasive procedure which consist of trephination of pilonidal pits using a round biopsy tool with curettage and debridement of hair leaving the small wounds open. The trephination procedure is performed in the operating room under general anesthesia. The resulting wounds and underlying subcutaneous tissue cavity is extensively curetted to remove any associated epithelialized lining and granulation tissue. Hair, debris, and residual granulation tissue is removed from the cavity and the cavity is copiously irrigated with saline and/or dilute hydrogen peroxide. Gips procedure resolves 92% of patient's pilonidal symptoms with no disease recurrence at an average of 5 months. Advantages of this minimal invasive procedure include ease of performance in the outpatient setting, well

tolerated, minimal postoperative care, rapid recovery time, and favorable results. There is a low complication rate with Gips trephination when compared to wide local excision with closure. Children undergoing trephination are not at risk for the wound dehiscence associated with primary closure. Trephination patients have fewer postoperative restrictions than those undergoing wide excision returning to school or work sooner. Recurrence rate and reoperation rate for trephination is 8-16%. Trephination is a minimally invasive technique associated with a lower wound complication rate and fewer postoperative follow-up appointments than wide excision. Multiple preoperative clinic visits are associated with a lower recurrence rate in children undergoing trephination for PD. Multiple clinic visits preop increase the interval between initiation of lifestyle modifications and eventual surgical excision. By increasing this interval, more time is permitted for hygiene and hair control to reduce the preoperative burden of disease, allowing for smaller areas of excision and potential recurrence. Ensuring that patients demonstrated these positive behaviors during the preoperative visit encouraged the continuation of these practices postoperatively and thus decreased risk of recurrence. Minimally invasive Gips procedure have the advantage of reducing extent of surgical injury and preserving patient quality of life and should be regarded as the first-line treatment in PD patients.

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Contrast-Enhanced Ultrasonography

Ultrasound with color Doppler techniques is the imaging method of choice to evaluate superficial and deeply located organs such as the thyroid gland, lymph nodes, ovaries, testes, uterus, spleen, gallbladder, pancreas, kidneys, and adrenal gland. Ultrasound has a wide availability, speed, superior spatial resolution, and high specificity in a variety of pathological condition in children. Contrast-enhanced ultrasound (CEUS) is an accepted imaging modality for evaluating focal liver lesions which is already used off-label to image the spleen, gallbladder, and pancreas in children. Contrast-enhanced ultrasound can increase the sensitivity and specificity of ultrasound The most frequent indication for splenic imaging with CEUS in children is blunt abdominal trauma. CEUS can also be used in children to confirm the presence of congenital variants such as aberrant splenic nodules,

and to assist in characterizing splenic lesions, including benign lesions, tumors, infection, and infarction. CEUS is very useful to distinguished simple splenic cysts from abscess in selected cases, and focal solid benign lesions such as hemangiomas or hamartomas from malignant ones. In gallbladder and bile duct imaging CEUS is utilized for assessing difficult or atypical cases to demonstrate wall infection, infiltration, or rupture and to differentiate dense, non-mobile sludge from neoplastic intraluminal lesions. In pancreatic imaging, CEUS can be particularly useful for evaluating necrotizing pancreatitis and for problem-solving in complex pancreatic masses. Limitations of CEUS for the spleen, gallbladder and pancreas include difficulty to accurate see the subdiaphragmatic areas of the spleen because of lung or colonic gas obscuration. For gallbladder imaging suboptimal visualization on CEUS might occur due to obesity, motion air, calcification, or overlying dressing. Wall calcifications are accentuated at CEUS which can worsen obscuration of internal content of the gallbladder. For pancreatic CEUS imaging then deep retroperitoneal location of the pancreas, large body habitus, or excessive bowel gas can obscure visualization and proper assessment of the organ. Lesion in the tail of the pancreas can be missed or mimic accessory spleens. Ultrasound is also the first-line imaging modality to evaluate the pediatric kidney and adrenal glands. Images are acquired without radiation or the need off sedation. CEUS is recommended for evaluation of parenchymal perfusion disorders, indeterminate solid and complex cystic lesions and complicated pyelonephritis and abscesses, as well to distinguish between pseudo- and real renal tumors. The ultrasound contrast agents (UCA) used for CEUS are microbubbles composed of inert gas within a phospholipid and/or protein shell. UCA are administered through either a central or a peripheral intravenous line. Because of the lack of renal excretion of UCA, CEUS may be performed in children with poor renal function and neonates with immature renal function. Microbubbles resemble RBC in their ability to pass through the capillary bed to allow visualization of both venous and arterial circulation. SonoVue/Lumason is usually the indicated contrast agents utilized for CEUS in children. The two other UCA agents utilized such as Optison and Definity are not FDA-approved for children. No renal or liver function test is necessary for the administration of UCA. Unlike CT-Scans, CEUS does not use ionizing radiation and UCA have no soft-tissue deposition, unlike gadolinium-based contrast agents utilized in MRI. Also, CEUS can be performed portable, and is ideal for patients who are too ill for safe transport. Mild adverse events reported with UCA include headache, nausea, hot sensation, chest discomfort, altered taste, tinnitus, light-headedness, injection site pain, urticaria or rash, and hyperventilation.

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Frostbite

Frostbite is a severe cold exposure injury that occurs when tissues freeze, resulting in long-lasting consequences for both children and adults. It happens when the skin and underlying tissues freeze at temperatures below the freezing point of water, typically between -3.7°C to -4.8°C. In children, frostbite injuries can occur at temperatures below -6°C, with an increased risk of tissue loss at temperatures below -23°C. The damage is caused by tissue freezing, reduced oxygen supply (hypoxia), and an inflammatory response that triggers substances like bradykinin, prostaglandin F2a, thromboxane B2, and histamine. This freezing also directly damages cells by forming ice crystals, which harm cell membranes and disrupt metabolic processes. Additionally, an excessive inflammatory response in blood vessels leads to the formation of microvascular thrombus, worsening the frostbite injury by narrowing blood vessels and damaging the inner lining, resulting in further tissue loss. The severity of frostbite depends on how well frozen tissues are rewarmed during thawing. Frostbite symptoms can range from a sensation of coldness and stinging to severe joint pain and a loss of muscle dexterity. In severe cases, frostbite can lead to tissue loss due to damage in deeper tissues. Frostbite is categorized into four degrees of tissue damage based on depth of injury and the surrounding tissue's reaction to injury. Another classification system evaluates the anatomical extent of cold-induced skin lesions and bone scanning on the second day, which can better predict the need for amputation. Most frostbite cases occur in urban areas, where factors like social disadvantage, physical disabilities, homelessness, substance use disorders, and psychiatric conditions contribute to cold exposure, putting lives and body parts at risk. People over the age of 60 are at a higher risk of frostbite due to their diminished physiological and behavioral responses to cold. Children are also vulnerable because they have a higher body surface area relative to their mass and less subcutaneous fat. After suffering from frostbite, individuals may experience complications such as amputations and chronic pain, while children may face the risk of growth impairment due to premature closure of the epiphysis. Preventing frostbite requires three key components: education and training, appropriate equipment, and field care. Patients who are rewarmed before their body parts freeze generally have better outcomes. Lack of supervision and intoxication are major risk factors for frostbite in children, with younger children more commonly sustaining injuries through unsupervised activities, highlighting the importance of close supervision in cold conditions. Intoxication is often associated with frostbite in adolescents. An essential aspect of the initial evaluation is identifying patients who may benefit from intervention to reverse ongoing, clinically significant soft-tissue necrosis. Patients with intact distal blood flow or a long period of warm-ischemia time and who are not suitable candidates for thrombolytic therapy should be treated conservatively. This conservative approach includes elevating the injured extremity, managing pain, providing topical wound care, selectively removing or decompressing blisters, avoiding smoking and repeat cold exposure, excising necrotic tissue, wound closure, and rehabilitation. Other key components of evaluation include assessing for trauma and hypothermia, checking for head trauma and intoxication in cases of depressed mental status, carefully examining small-vessel perfusion in affected body parts once they

are thawed and warm, and estimating warm-ischemia time. The use of anticoagulant therapy after frostbite treatment is a subject of debate. Thrombolysis is considered for frostbitten hands with no blood flow distal to the proximal phalanx, and local protocols established as safe and effective for stroke and myocardial infarction may be considered. However, thrombolysis carries substantial risks, including major bleeding and stroke. In hospitals with quick access to angiography, direct intra-arterial thrombolysis may be an option with limited dosing. In the long term, many affected patients may experience permanent peripheral neurological damage, including symptoms like tingling (paresthesia), arthritis, and heightened sensitivity. Early on, negative pressure wound therapy can be beneficial in preserving epiphyseal cartilage in children and preventing long-term complications. Hyperbaric oxygen therapy may have a positive impact on the demarcation level in frostbite patients without causing long-lasting complications.

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