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Prenatal Biliary Congenital Dilatation

In 1995, we reviewed the literature regarding prenatal diagnosed choledochal cyst. At that time, we found that congenital biliary dilatations, which cause obstructive jaundice, evidence of growth, or marked delay in bile-enteric excretion, should undergo prompt surgical therapy.

Prenatal biliary congenital dilatation is caused by either, and most commonly, a choledochal cyst (CC-type 1 cyst), or biliary atresia (B- type III-d) due to a solitary cyst in the fibrous remnant, according to the Japanese Biliary Atresia Society. They stress the importance of distinguishing between prenatally diagnosed BA and CC as soon as possible in order to institute appropriate treatment after birth. Prenatal differential diagnosis of BA and CC is achieved based on chronological changes in cyst size, cyst pattern, or timing of expression. Cyst size decreases between prenatal diagnosis and birth in BA babies but does not change in CC patients; in fact, they grow. A cyst size of equal to or less than 2.1 cm is a promising criterion for BA in the fetus after the 35th gestational week.

US is a useful diagnostic tool for the differential diagnosis of BA and CC, while stool color is not since it's normal at birth in both BA and CC children. The use of prenatal US uncovered CC at 15 weeks at the earliest and averaging at 27 weeks of gestation. The prenatal US features of CC include the diameter of the common bile duct being greater than 3.1 cm, the cyst usually being located in the region between the lower edges of the liver or hilum, and well separated from the gallbladder, and the cyst wall being smooth and slightly thickened. There is no blood flow in the cyst, and there is a connection between the cyst and the intrahepatic bile ducts and gallbladder. The size of the cyst increases during follow-up. The US features of BA include a small cyst with a diameter of less than 2.5 cm, with the size of the cyst not changing significantly during follow-up. BA patients have an abnormal gallbladder or undetected gallbladder, the cyst is usually round, with a clear border, smooth edge, higher tension, and without intrahepatic ductal dilatation. Using fetal MRI, only dilatation of the intrahepatic bile ducts may help differentiate CC from BA.

The level of G-GTP is elevated at birth in all BA patients, with a characteristic tendency to decrease postnatally. In CC, the level of G-GPT tends to increase in cases that develop liver fibrosis. Both the elevation of direct bilirubin and changes in G-GPT levels should be considered, and early surgery is performed if there is a persistently increase in the latter. Neonatal surgery is recommended in cases of CC with jaundice, liver dysfunction, and when BA cannot be excluded. Liver fibrosis is observed in prenatal CC children who have some cholestatic changes, such as sludge, large cyst, and prolonged elevation of serum

GGT. The appropriate management for a prenatally diagnosed CC after birth is to follow a serial serum GGT and cyst size as well as the presence of symptoms and sludge with US. With prolonged elevation of GGT and cyst size above 30 mm, surgery at birth, patients with intrahepatic bile duct dilatation at birth, and patients whose cyst enlarged more than 30 mm after birth require early surgery to avoid liver fibrosis. Some consider this should be performed within three months old to prevent progressive liver fibrosis. Intrahepatic bile duct dilatation seen in CC, but not in BA babies, is considered a risk factor for the development of symptoms.

Intraoperative cholangiography is the only reliable method for differentiating BA from CC.

Management of children with CC is different from those with BA. CC is managed with open or laparoscopic cyst excision and enterohepatic (either hepaticoduodenostomy or hepaticojejunostomy) reconstruction. While BA is managed with an open Kasai procedure, namely portojejunostomy to the most proximal fibrous portion in the porta hepatis as soon as the diagnosis is suspected to avoid further liver damage.

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Robotic Pediatric Surgery

The development of laparoscopy in the 90's brought a new era in technical procedures performed in pediatric surgery. Throughout the past 30 years, laparoscopy has demonstrated benefits such as shorter hospital stays, less use of pain medication, better cosmesis, improved postoperative rehabilitation, and safety. Relentlessly, some pediatric surgery laparoscopic procedures have been replaced with the use of a robot.

The word "robot" stems from the Czech word "robota," meaning servitude. Actually, the current definition of a robot is an automated device that can accomplish a programmed task. Neither automated nor programmed, the robot movements are a direct result of an operator inside a high-pitch cockpit console. Movement is controlled with two wristed hands and a variety of foot pedals and instrumentation. Tremor is eliminated, vision is three-dimensional, visibility is magnified 10-15 times, and wristed hand movements articulate more than what the human hand can accomplish.

With the robot, the size of the patient matters. Procedures that focus on a single location have the highest probability of success, such as those in the pelvis or needing suturing.

Positioning is of utmost importance. Trocar placement is often not the same as trocar placement in standard laparoscopy due to ergonomic issues for the surgeon. Collision of robots' arms can occur if they are placed close together, so they are placed farther apart rather than closer together.

Currently, the only robotics system that is approved for pediatric use is the Da Vinci Surgical System. Available instrument sizes are 5 mm and 8 mm, which is a limitation of use for neonates and small children. Recently, the Senhance robotic system offers 3 mm instrumental sizes for small pediatric patients.

Advantages of using robotic surgery include those found in laparoscopic procedures, such as minimizing operative trauma, decreasing postoperative pain, limiting the need for opioid use, reducing hospital stay, and quicker return to school. The highly three-dimensional images provided by the robot console allow for a degree of visualization that cannot be achieved open or laparoscopic. The ergonomically designed console allows optimization of visualization without requiring surgical assistants or risking human fatigue or loss of control as with open surgery. Robotic arms are created to mimic the movement of the human wrist, allowing for seven degrees of freedom compared to traditional instruments' four degrees. Robotic cameras provide tremor filtration and operator-controlled views, making steadier and more precise visualization.

Costs are the most prohibitive restraint. There is the initial cost of purchasing and maintaining the robot, as well as increased costs from the disposable robotic equipment and longer operative times. The robotic platform requires at least 8 cm of distance between trocars to prevent collision between robotics arms. Comfort using the robot is obtained faster than laparoscopy, attributed to the intuitive symmetric movement of the robotic system that moves in line with the surgeon's hand. Examining operative time, novice users who have had significant prior conventional laparoscopy training tend to have decreased operative times when beginning to perform robotic surgery, as opposed to novice robotic users who had minimal prior conventional laparoscopic training.

In children, the most common procedures described using robotics are urological, namely pyeloplasty and ureteral implants, followed by fundoplication. Over time, a wider variety of cases are performed, including thoracic cases, Kasai portoenterostomy, and excision of choledochal cyst. Other procedures gaining wide acceptance with the robot include partial or complete nephrectomy, cholecystectomy, appendectomy, splenectomy, pull-through, colectomy, and bowel resections. Likewise, thoracic procedures using the robot have increased significantly in pediatric surgery.

Regarding safety issues, access by the anesthesiologist is limited after the robot is docked, changes in position require detachment of the robot, and patients must remain entirely paralyzed while docked. Robotic-assisted surgery requires steeper Trendelenburg positions, causing hemodynamic consequences and extra care in patient securing and positioning.

With the use of the robot, intra-abdominal tumors including neuroblastoma can be safely resected. Mediastinal tumors are easily resected robotically regardless of their pathology. The robotic method has been developed as the technique of choice for all mediastinal masses' resection. It is also ideal for adrenal tumors resection.

Robotic-assisted surgery is safe and effective in children, steadily increasing in use around the world.

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Phlegmonous Gastritis

Phlegmonous gastritis (PG) represents a rare but serious infection of the gastric wall characterized by suppurative inflammation of the submucosal layers and muscularis propria. It poses significant diagnostic and therapeutic challenges due to its nonspecific presentation and potentially rapid progression to septic shock and death if not treated promptly.

PG is uncommon, with sporadic cases reported globally, affecting adults predominantly, though it can occur at any age. The condition shows a slight male predominance. The pathogenesis is not entirely understood; however, predisposing factors have been consistently identified across studies. These include previous gastric surgery, underlying malignancy, chronic alcohol abuse, and states of immunosuppression. In about 30-40% of cases, no clear predisposing factor is identified, suggesting that other unrecognized environmental or physiological factors may be involved. Even children could present with similar symptoms.

The typical symptoms of PG include acute onset of severe abdominal pain, nausea, vomiting, and fever. These symptoms are vague and can mimic other acute abdominal conditions such as acute pancreatitis, perforated peptic ulcer, or even myocardial infarction, making the diagnosis challenging without a high index of suspicion. The rapid progression of the disease highlights the critical need for prompt medical attention to prevent severe complications like septic shock.

Computed tomography (CT) of the abdomen is a crucial diagnostic tool in suspected cases of PG. It often shows gastric wall thickening with possible intramural gas formations, pneumogastria - a pathognomonic feature of the disease. However, given the rarity of PG, these findings may initially be interpreted as other more common gastric pathologies. Upper gastrointestinal endoscopy can provide direct visualization

and biopsies of the gastric wall, revealing edematous and erythematous mucosa with possible purulent exudates. However, endoscopy carries risks of perforating the friable gastric wall in affected patients.

Immediate broad-spectrum antibiotic therapy is the cornerstone of PG treatment, often requiring adjunctive surgical intervention. Empirical antibiotics should cover common causative organisms such as Streptococcus species, and adjustments can be made based on culture results. In cases where medical management fails or complications such as perforation develop, surgical interventions like partial or total gastrectomy may be necessary. Recent case reports have shown that early diagnosis and aggressive medical therapy can significantly improve outcomes, potentially avoiding the need for surgery. Recent literature includes several case reports that illustrate the varied presentations and outcomes of PG. These cases emphasize the heterogeneity of PG presentations and the need for individualized treatment plans.

This review underscores the importance of considering PG in the differential diagnosis of acute abdomen, especially in patients with risk factors such as recent gastric surgery or immunosuppression. The integration of clinical, imaging, and endoscopic findings is crucial for accurate diagnosis. Moreover, the literature suggests a shift towards more conservative management strategies involving aggressive antibiotic therapy, which could potentially reduce the need for surgical interventions.

Phlegmonous gastritis remains a challenging clinical entity due to its rare occurrence and nonspecific symptoms. This review highlights the essential role of comprehensive diagnostic evaluation and the effectiveness of prompt, aggressive antibiotic therapy in improving patient outcomes. Continued awareness and education about PG among healthcare providers are crucial to enhancing diagnosis, optimizing management strategies, and ultimately reducing morbidity and mortality associated with this severe gastric infection.

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