

## RARE CAUSES OF ACUTE SURGICAL ABDOMEN IN CHILD

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### Abstract:

Acute surgical abdomen has one or more of the following syndromes as clinical manifestation: occlusive, peritonitis or hemorrhage. We present here 9 children who were admitted to our hospital in Pediatric Surgery Department with rare causes of acute surgical abdomen.

**Key words:** acute surgical abdomen, rare causes.

### Introduction

The acute surgical abdomen is one of the most common cause for addressing to a Emergency Room of Pediatric Surgery Department. It is defined as an intraabdominal process causing severe pain and requiring surgical intervention. There are four causes for acute surgical abdomen: inflammatory, mechanical, vascular and congenital defects. The main cause for acute inflammatory surgical abdomen is acute apendicitis. Mechanical causes like intussusception or strangulated hernia are more common in newborn and small child. In older children intrabdominal tumors and postoperative peritoneal adhesions are the main cause for mechanical acute surgical abdomen. Congenital defects like intestinal atresia, omphalocele or diaphragmatic hernia, malrotation of the intestine can be causes for acute surgical abdomen in the first day of life<sup>[1]</sup>.

*Clinical findings* include various symptoms according to the etiology, but the central symptoms is abdominal pain. Clinical exam gives informations about the type and degree of intraabdominal process and the indication for surgical intervention.

#### Laboratory Tests

Urine and blood should be examined in all cases. Complete blood cell counts may reveal pancytopenia if the bone marrow is involved in malignant tumors or high number of leucocytes with high acute phase reactants in acute inflammatory abdomen. The other laboratory findings as nutritional disturbances, iron deficiency anemia, acute dehydration helps in pre-and postoperative care.

#### Imaging Studies

##### X-ray Examination

Plain x-ray films of the abdomen in the upright positions can show air below the diaphragm, this sign being pathognomonic for perforation of hollow viscera. Dilated distended loops of intestine with air-fluid levels are

specifically in small bowel obstruction. Barium enema is used as diagnostic and therapeutic mean in intussusception of infants and children. Barium enema may also be helpful in diverticulosis or polyposis of the colon and in large bowel neoplasms. In these cases colonoscopy and biopsy are helpful.

The ultrasonography and CT scan of the abdomen and pelvis is useful in abdominal trauma. Abdominal MRI and CT scan also can be used to evaluate abdominal and pelvic lymphadenopathy, masses and visceral involvement in neoplastic tumors<sup>[2]</sup>. This helps in determining the extent of the disease and may aid in determining the most suitable site for biopsy. If neurologic signs are present CT scan or MRI of the brain or spinal cord is indicated. CT scan of chest may be also useful for discovered intrathoracic metastasis in abdominal tumors.

The endoscopy of the GI tract is the diagnostic tool of choice for confirming the diagnosis in gastrointestinal bleeding<sup>[3, 4]</sup> and in mechanical obstruction due to tumors or foreign bodies<sup>[5]</sup>.

The positive diagnosis is then established based on clinical findings, lab studies and imaging studies.

We present here 9 children who were admitted to our hospital in Pediatric Surgery Department with rare causes of acute surgical abdomen. The preoperative diagnosis was acute surgical abdomen in all these cases and the etiology was established intraoperatively.

**Patient 1:** B.E. is a girl, 2 years and 10 months old, 9 kilograms in weight.

She was admitted in Pediatric Surgery Clinic with the following symptoms: colic-like abdominal pain in the right hemi abdomen and abdominal distension, bilious vomiting, fever, nocturnal sweats, change in bowel habits with present intestinal transit.

Objective exam at admission: altered general state, deficient nutritional state (G=11 kg, Height=84 cm), anorexia, puffed eyes, pale teguments and mucosa, abdominal painful tumor in the middle right quadrant, with a diameter of about 4/5 cm, firm consistency, with not-well limited borders, fixed on the subjacent plains.

Laboratory data reveals: high number of leucocytes and thrombocytes, high acute phase reactants, high serum lactate dehydrogenase, nutritional disturbances (decreased proteins and albumins), feripriva anemia, acute dehydration with hyponatremia. The other laboratory findings were

within normal limits (alpha-fetoprotein, alkaline phosphatase, serum aminotransferase, gama-GT, urea, creatinine, glycaemia, urine brief exam).

Imagistic data:



Fig. 1 Barium enema.

Chest and abdominal X-ray did not offer useful diagnostic information.

Barium enema showed the barium column stopped below the hepatic angle of colon which is more dilated (Fig. 1).

Abdominal MRI: revealed displacement of pancreas posteriorly, dilatated ascendant part of the large intestine with enlarged and dualised wall, much thicker than normal, with ileum displacement to the right, small quantities of

liquid in the interhepato-diaphragmatic and parietocolic right space; normal findings for liver, kidneys, spleen; (Fig. 2)

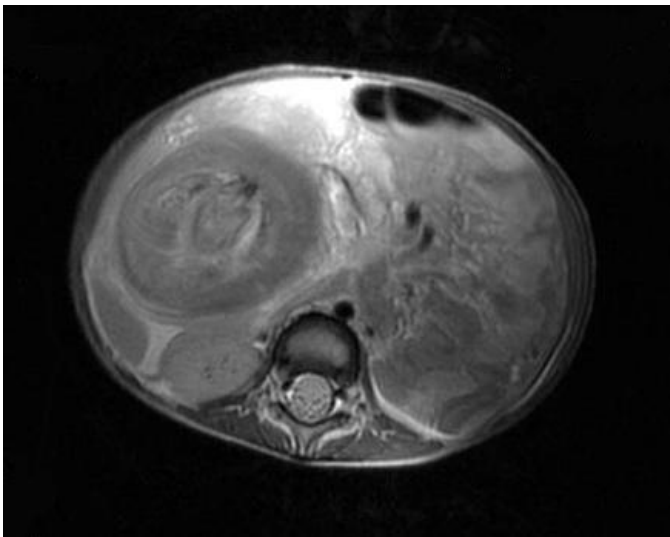


Fig.2:Abdominal MRI.

Treatment: After all these investigations we decided to do exploratory laparotomy in order to establish the diagnosis and the treatment. After a short period of preoperative preparation we performed a median laparotomy. We found moderate ascitic liquid, endoluminal

tumor of the caecum and ascendant colon extended to about 10-15 cm in length, with stenosis of the lumen, infiltrating the terminal part of the ileum with extension to the mesenter and the retroperitoneum. (Fig. 3)



Fig.3: Intraoperative details.

We practiced right hemicolectomy with ileotransversoanastomosis termino-terminalis, with biopsy of the mesenteric and epiploonal ganglia and peritoneal drainage. The evolution was favorable and the child was transferred in Oncology Department for chemotherapy.

Histopathology findings confirmed the diagnosis: Burkitt lymphoma, (abdominal beginning) with high grade of malignancy.

**Patient 2** : R.A., is a girl, 11 years old, normal weight.

She had a history of two weeks of colicky abdominal pain, nausea, bilious vomiting, lack of stools.

Physical examination: at admission in the hospital she presented altered general state, pouched eyes, pale teguments, bilious vomiting and constipation. The distended abdomen was diffusely sensitive to palpation, with signs of peritoneal irritation in the left hemi abdomen. Abdominal auscultation revealed static intestinal sounds (borborygmi). Digital rectal examination revealed empty rectal ampulla, and absence of any pathological material on the hand gloves.

Laboratory data The blood count showed a marked leucocytosis, high number of thrombocytes, high acute phase reactants, increased level of urea, and signs of acute dehydration with hyponatremia.

Imagistic data:

Abdominal X-ray showed multiple air-fluid levels without presence of air under the diaphragm, while the ultrasound examination was negative for any abnormality. A positive diagnosis of intestinal obstruction was established based on the previous examinations.

Preoperative diagnosis was acute peritonitis with inflammatory mechanical occlusion.

Treatment: we performed exploratory laparotomy and we found inflammatory intestinal adhesions, small perforation of first jejunal loop and intraluminal moveable tumor of splenico-colonic arch. Surgical treatment consisted in lysis of intestinal adhesions, jejunoraphy in double layer; lavage of the abdominal cavity using NaCl 0.9%; double drainage of the abdominal cavity, suture of the abdominal wall, anal dilatation and pull-out the tumor which was a trichobezoar.(Fig. 4)



Fig. 4 The trichobezoar.

**Patient 3:** T.A., is a girl, 10 years old, weighting 26 kg. She was admitted in Pediatric Surgery Clinic with the following symptoms: diffuse colicky abdominal pain and abdominal distension, bilious vomiting, lack of intestinal transit.

Objective exam:

Auscultation of the abdomen: struggle bowel sounds.

Digital examination of rectum revealed a painful tumoral mass, well defined borders, oval in shape with longitudinal diameter of about 15 cm, firm consistency.

Laboratory data: The blood count documented eosinophilia.

Imagistic data: Abdominal X- ray revealed multiple air-fluids levels for colon and small bowel and lack of air in pelvis.

The preoperative diagnosis was intestinal occlusion and the intraoperative diagnosis was hidatic cyst of subperitoneal pelvic space.

Surgical treatment consisted in subtotal pericystectomy (F.Lagrot) and antiparasitic treatment with Albendazole.

**Patient 4:** J.A., is a boy, six years old, normal weight.

Clinical signs at admission to the hospital were colicky abdominal pain in left inferior quadrant, bilious vomiting and fever 38.8 °C.

Objective exam of the abdomen showed signs of peritoneal irritation in left hemiabdomen. Two weeks ago the child presented a functional constipation with hard stools which were painful and difficult to expel.

Laboratory data:

Total and differential blood count documented leucocytosis with increased eosinophils percentage.

Imagistic data:

Radiological examination of the abdomen revealed 2-3 air-fluids levels on the left colon, lack of air in pelvis.

Treatment:

Treatment consisted of solution of parenteral nutrition (glucose, amino acids), antibiotics (piperacillin tazobactam), electrolytes and enemas with NaCl 0.9%.

Because the objective exam suggested peritoneal irritation we decided to perform exploratory laparotomy. The diagnosis was small blocked perforation of the colon-sigmoid junction dued to ischemia (cause being constipation). Surgical treatment consisted of suture of sigmoid perforation and peritoneal drainage.

**Patient 5:** O.N., is a boy, 13 years old, normal weight. He presented to the hospital for difuse abdominal pain, diarrhea and rectal bleeding.

Objective exam of the abdomen showed no signs of peritoneal irritation. Rectal examination revealed a lot of sessile polyps, not painful, 5-7 mm in diameter, with fresh blood on hand-gloves.

Laboratory data: revealed posthaemorrhage anemia, serum proteins and alpha-phetoprotein were in normal range.

Histological findings: bioptic polypectomy of 2 lesions was performed during colonoscopy. The first fragment was described as being a hyperplasic adenomatous tubular polyp with minimal dysplasia, and moderate fibrosis with lymphoplasmocytic infiltrate of the chorion. The second fragment turned out to be an adenomatous tubulovillous polyp with minimal dysplasia.

Imagistic data:

Colonoscopy (Fig. 5) detected hundreds of sessile polyps involving the entire colon extending from the rectum up to the cecum and hence establishing the diagnosis of familial adenomatous polyposis.

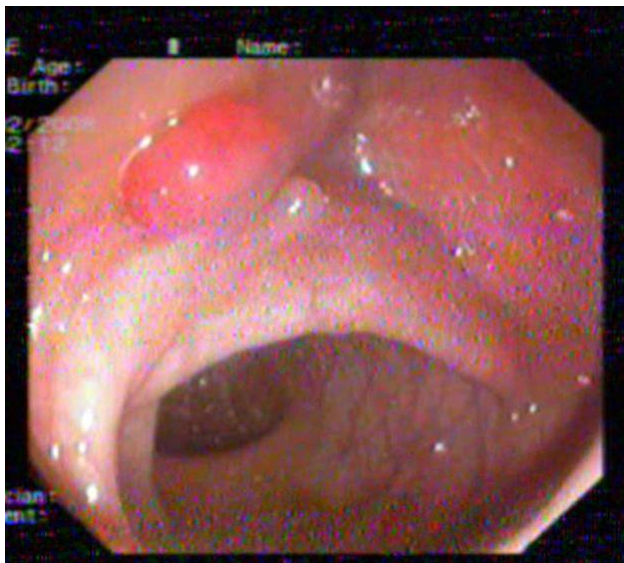


Fig. 5. Colonoscopy.



Upper G.I. tract endoscopy revealed no gastric or duodenal tumors.

Abdominal CT scan detected no extracolonic involvement and no desmoid tumors.

Barium study of the abdomen showed multiple polyps disseminated throughout the colon. (Fig. 6)

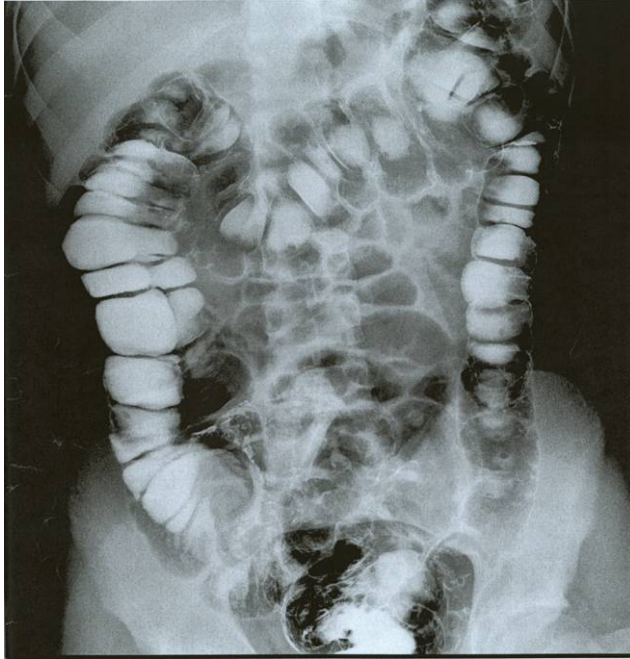


Fig.6 Barium enema.

Treatment

A prophylactic subtotal colectomy and ileoproctostomy with intraoperative diathermy of the residual polyps seemed to be the ideal procedure for this

case. Avoiding to sacrifice the rectum was a satisfactory option because the patient had few rectal polyps and the concern about keeping a near-normal bowel movement pattern. (Fig. 7,8)



Fig.7 and 8 – Colon sub totally resected was sectioned longitudinally to reveal multiple adenomatous tubulo-villous polyps involving the entire length of the colon.

**Patient 6:** C. G., five years old, normal weight.

Objective exam of the abdomen showed signs of peritoneal irritation (generalized tenderness).The patient presented abdominal pain, bilious vomiting, fever 38-39 °C.

Laboratory data:

The total blood count showed an increased number of leukocytes, increased acute phase reactants and acute dehydration.

The positive diagnosis was generalized peritonitis.

Treatment was surgical: we performed the great median laparotomy and diagnosed generalized peritonitis caused by traumatic perforation of duodeno-jejunal angle through ingested foreign body (pen). We pulled-out the pen, then we performed jejunoraphy in double layer; lavage of the abdominal cavity using NaCl 0.9%; double drainage of the abdominal cavity.

**Patient 7:** T.B., 4 years old, 15 kilograms in weight. At admission to the hospital he presented hemorrhagic shock with dyspnoea, tachypnoea, hypotension, pale teguments and cold extremities.

Objective exam of the abdomen revealed abdominal distension, signs of peritoneal irritation, absence of bowel sounds.

Treatment consisted in median laparotomy and we diagnosed massive retroperitoneal haematoma caused by spontaneously rupture of Wilm's tumor. We performed

nephrectomy, but haemostasis was difficult and the patient died in Intensive Care Unit, few hours later.

**Patient 8:** G.E., preterm baby, 4 days old, 2.3 kg weight, APGAR score= 7

He was admitted in Pediatric Surgery Clinic with the following symptoms: fecaloide vomiting, absence of bowel sounds, lethargy, and altered general state with respiratory failure. He presented normal passage for meconium.

Objective exam revealed abdominal distension and tenderness with hypogastric parietal oedema.

Laboratory data: showed anemia (Hb=6.1g%, RBC=1,820,000/ ml), acute dehydration, high values for serum aminotransferase, total bilirubin, direct and indirect bilirubin.

Imagistic data:

Plain radiographs of the abdomen in orthostatic position showed air-fluid levels in right inferior quadrant, absence of the air in pelvis, oedema of abdominal wall (Fig 9)

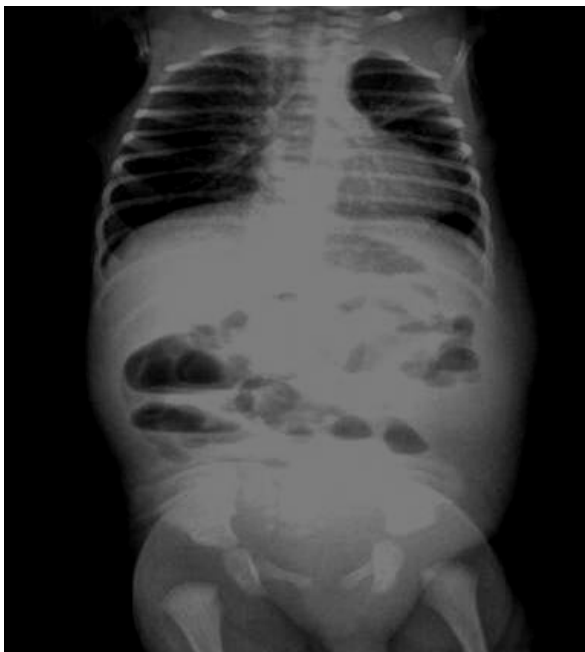


Fig. 9 Abdominal X-ray.

We diagnosed neonatal peritonitis.

Treatment consisted in median laparotomy and we diagnosed intestinal volvulus with complete gangrene of the midgut, malrotation and neonatal peritonitis .We performed volvulus correction, peritoneal drainage. We had no signs of improved blood supply for midgut so we closed the abdomen. The patient died 5 weeks later with cardio-respiratory shock.

**Patient 9:** R.R, preterm baby, 9 days old, 1680 grams in weight. At admission to our clinic she presented altered general state, jaundice and pale teguments, bilious vomiting with gastic bleeding and absence of passage for stools

Objective exam of the abdomen revealed abdominal distension, tenderness at superficial palpation, hypogastric parietal oedema. Digital examination of rectum revealed melenic stools in small quantities.

Laboratory data: showed anemia, high levels of total bilirubin, direct and indirect bilirubin, hypoproteinemia and hypopotasemia.

Imagistic data:

Plain radiographs of the abdomen in orthostatic position showed sketches of air-fluid levels, marked distension of bowel and pneumoperitoneum(Fig. 10).

The diagnosis was generalized peritonitis.



Fig. 10 Abdominal X-ray.

Treatment consisted in median laparotomy and we diagnosed generalized peritonitis with 2 perforation of ascendant and descendant colon due to preterm baby hypoxemia. We performed right colostomy, left coloraphy and peritoneal drainage. Six weeks later we decided to reestablish digestive continuity. During the second surgical intervention we diagnosed intestinal adhesions, many intrinsic stenosis of ascending colon and 2 intrinsic stenosis of descendent colon. The etiology of this stenosis probably was intrauterine hypoxia. We practiced right hemicolectomy, coloraphies and end to end ileo-coloanastomosis and peritoneal drainage.

### Conclusions

The causes of acute abdomen in these 9 cases were as it follows:

- intestinal occlusion due to Burkitt lymphoma of the caecum and ascendant colon (1 case), trichobezoar presented in the left angle of transverse colon (1 case), hidatic cyst of pelvisubperitoneal space (1 case);

- acute peritonitis with sigmoid perforation due to presence of fecal mass with decubitus lesions (1 case), traumatic duodenal perforation in incidental ingestion of foreign body (1 case);

- hemorrhage syndrome in intraperitoneal rupture of Wilm's tumor (1 case), familial adenomatous polyposis with rectal bleeding (1 case);

- congenital malformations in one case of intestinal volvulus with malrotation and one case with multiple colonic atresias with small bowel occlusion and diastases perforation in neonates.

All these children have had surgical treatment immediately. Outcomes were good, except in child having Wilm's tumor diseases who died immediately after surgery. Mortality was found after 5 weeks of operation in the child with intestinal volvulus having complete midgut necrosis. And unfortunately the child with Burkitt lymphoma survived just 3 months postoperatively. The other 6 children have a good evolution till date.

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