



WHAT CAUSES THE NEONATAL ACUTE SCROTUM? IS IT ALWAYS A SCROTAL PATHOLOGY?

Neonatology

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ABSTRACT

OBJECTIVE: An acute scrotum in a neonate is an emergent condition and requires immediate attention but can sometimes be misleading. The objective is to highlight the importance of thorough clinical and radiological evaluation for the correct diagnosis. **METHODOLOGY:** A retrospective analysis of the case records of the neonates who presented with acute scrotum and had associated abdominal pathology was done. The case records were reviewed for detailed history, physical examination, laboratory, and radiological investigations, and operative findings. **RESULTS:** Eight neonates who presented with acute scrotum and intra-abdominal pathology (bowel perforation=6, obstructed hernia=2) without any obvious abdominal signs were identified. Associated symptoms were excessive crying (n=4), vomiting (n=2) and mild abdominal distension (n=2). All underwent surgical exploration. **CONCLUSION:** An acute scrotum can sometimes be a hallmark for a clinically obscure intra-abdominal pathology. Neonates presenting with acute scrotum must be clinically as well as radiologically evaluated for abdominal pathologies too.

KEYWORDS

Acute Scrotum, Intestinal Perforation, Amyand And Littre's Hernia

INTRODUCTION

Neonatal illnesses present with few signs and symptoms.^[1] Early diagnosis and prompt intervention are the keys to management. An inflamed, tender scrotum in a previously asymptomatic neonate can occur due to multiple causes. Clinical and radiological (USG scrotum and X-rays) evaluation is usually diagnostic in acute scrotum.^[2] But in the absence of overt clinical sign and equivocal radiology, delay in confirming the diagnosis can occur. The prominent local signs help in diagnosing the inguino-scrotal pathology. However, sometimes the local scrotal sign may be misleading. Here, we are presenting a series of eight cases of intra-abdominal pathologies, who presented with acute scrotal signs and without obvious abdominal signs.

METHODOLOGY

A retrospective analysis of the cases of intra-abdominal pathology who presented with the complaint of the acute scrotum (swollen, inflamed, and tender scrotum) was done. The case records were reviewed for detailed history, physical examination, laboratory, and radiological investigations. Age, obstetrical history, presenting complaints, duration of onset of the swollen red scrotum, perinatal history, laterality, the progression of redness, associated pain, fever, vomiting, allergy, and trauma were noted. Physical examination included general physical examination and examination of scrotum and abdomen. In general physical examination, activity, cry, vitals and hydration status were recorded. In the scrotal examination, findings noted were the presence of redness, laterality, tenderness, swelling, testicular orientation, tender nodule, blue dot sign, cremasteric reflex. The findings of abdominal distension, guarding, rigidity, tenderness, organomegaly, palpable loop/visible peristalsis were noted to differentiate amongst intestinal obstruction, intra-abdominal bleed, inflammation, and perforation peritonitis. Laboratory investigations included routine blood investigations and urine analysis. Radiological investigations included ultrasound with doppler of scrotum and X-Ray abdomen. All underwent surgical exploration. Intraoperative findings and the clinical course were noted.

RESULTS

Eight neonates with intra-abdominal pathology presented to us with acute scrotum. The presenting complaint, findings of the examination of the abdomen and scrotum, radiological findings, operative procedure and findings have been summarized in table 1. All neonates were born at full term (five by vaginal delivery and three by lower segment cesarean section). The mean weight of the children at birth was 2.6kg. All neonates presented with acute scrotum and had no features of peritonitis and gross abdominal distension. Other complaints include excessive crying (n=4), vomiting (n=2), and mild abdominal distension (n=2). Features of frank peritonitis were not seen. Gas under diaphragm was seen in six patients, three with large ileal perforation and one each with gastric perforation, transverse colon perforation, sigmoid colon perforation. Six patients underwent exploratory laparotomy (five for gas under the diaphragm and one inconclusive diagnosis) while two were operated by an inguinal approach, because of high suspicion of obstructed inguinal hernia. Patients operated by an inguinal approach, one had inflamed appendix in the inguinal sac (Amyand hernia) (Figure 1), while the other had gangrenous Meckel's diverticulum in the inguinal sac (Littre's hernia) (Figure 1). Postoperatively, all the patients recovered well. All eight patients are on follow-up and doing well.



Figure 1: Abdominal pathologies presenting with acute scrotum; A- Sigmoid perforation; B- Perforated Meckel's diverticulum in inguinal sac; C- Inflamed appendix in inguinal sac ; D- Gastric perforation

DISCUSSION

Neonates frequently present with vague symptoms and signs that can result from various etiologies.^[1] Neonate with an acute abdomen sometimes presents with minimal abdominal symptoms. In our patients, besides acute (inflamed and swollen) scrotum (n=7), other clinical features were excessive crying (n=4), vomiting (n=2) and mild abdomen distention (n=2). Finding the cause of the non-specific clinical features can be a diagnostic challenge. Clinical history, physical examination, laboratory and radiological investigations are required to diagnose the cause of the acute scrotum. Prompt diagnosis and treatment are warranted to avoid complications. Failure to do so can even result in loss of the testicle if the testicular torsion is present^[2] A delay in diagnosis and management of strangulated hernias can inevitably lead to gangrene. While looking for a scrotal pathology in patients with the acute scrotum, abdominal pathologies must also be kept in mind. An acute scrotum in a neonate can have both local and intra-abdominal cause. The localized scrotal causes can be testicular torsion, testicular appendage torsion, epididymo-orchitis, idiopathic scrotal edema, fat necrosis of scrotum, tunica vaginalis inflammation, strangulated inguinal hernia, scrotal hematoma, trauma and allergy.^[2] The intra-abdominal pathologies can be adrenal gland hemorrhage, splenic injury, meconium peritonitis, perforated appendicitis, ileal perforation.^[4-7] In an 18-year retrospective study of 1228 children presenting with the acute scrotum, testicular appendix torsion (74.8%), testicular torsion(8.4%), tunica vaginalis inflammation(5.9%), and epididymitis (3.7%) were seen to be most common causes.^[2] Pathological diagnosis was not specified in 7.2% of patients. Children with abdominal pathology who presented with scrotal signs may have been included in this group. This clinical situation may not be common, but the clinicians must be aware to administer proper management without delay. Out of our eight patients, three had ileal

perforation and one each had gastric perforation, transverse colon perforation, sigmoid perforation, inflamed appendix in the inguinal sac, gangrenous Meckel's diverticulum in the inguinal sac. In patients with intra-abdominal pathologies, the contents of the peritoneal cavity like blood, pus, fecal matter can seep down the patent process vaginalis (PPV) into the scrotum. Therefore, a PPV can act as a window to the peritoneal cavity, giving us a glimpse of the intra-abdominal pathologies. The scrotal involvement appears before generalized involvement, may be due to the dependent position of the scrotum and large PPV. The suspicion of abdominal pathology should be stronger if patients present with bilateral acute scrotum. Three of our eight patients presented bilateral acute scrotum.

Ultrasound with doppler and X-ray abdomen play a crucial role in establishing the diagnosis.^[5,8] Three of our patients with ileal perforation and one with gastric perforation had gas under the diaphragm on the X-ray abdomen. USG was useful in the diagnosis of the bowel content in the inguino-scrotal area, so the inguinal area was explored.

It is important to categorize the patients into those who require surgical intervention and those who can be managed conservatively. All our eight patients underwent urgent surgery and recovered well post-operatively. Delay in diagnosis could have lead to loss of functional intestinal segments, prolonged morbidity and sepsis.

An acute scrotum can be a hallmark for a clinically obscure pathology requiring an urgent intervention, which if ignored can have disastrous consequences. To conclude, neonates presenting with acute scrotum must be clinically as well as radiologically evaluated for abdominal pathologies.

Table 1: Summary of patients with abdominal pathologies presenting with acute scrotum

Age/Sex	Complaint	Examination findings	X-ray abdomen and USG	Operative finding (OF) + Operative Procedure (OP)
26d/M	Excessive crying, swollen scrotum	Abd- Soft, no distension, non-tender; Scr- Left scrotum- red, swollen	XR- Gas under diaphragm; USG- Inconclusive	OF- Perforation 60 cm proximal to ileo-caecal junction; OP- Exp lap and REEA
22d/ M	Excessive crying, swollen scrotum	Abd- Soft, mild distension, non-tender; Scr-Bilateral scrotum-distended, mildly red, pneumoscrotum	XR- Gas under diaphragm; USG- Air in scrotum	OF- Perforation 100cm proximal to ileo-caecal junction; OP- Expl lap and REEA
29d/M	Excessive crying, swollen scrotum	Abd- Soft, no distension, non-tender; Scr-Bilateral scrotum- distended, mildly red	XR- Gas under diaphragm; USG- Fluid-filled scrotum	OF- Multiple ileal perforation 40 cm from ileo-caecal junction; OP- Expl lap and ileostomy
12d/M	Excessive crying, swollen scrotum	Abd- Mild abdominal distension; Scr- Bilateral scrotum- distended, mildly red	XR- Gas under diaphragm; USG- Not done	OF- Gastric perforation anterior wall; OP- Primary repair in 2 layers
20d/M	Swollen scrotum, vomiting	Abd- Soft, no distension, non-tender; Scr-Left scrotum- tender, red	XR- Normal; USG- Fluid-filled scrotum	OF- Sigmoid perforation with pus filled pocket in pelvis; OP- Loop sigmoid colostomy and biopsy
18d/M	Swollen scrotum	Abd- Soft, no distension, non-tender; Scr-Left scrotum- tender, red	XR- Gas under diaphragm; USG- Fluid-filled scrotum	OF- Large Transverse colon perforation; OP- Loop transverse colostomy and biopsy
7d/M	Swollen scrotum	Abd- Soft, non-tender; Scr-Right scrotum- Swollen and red	XR- Normal; USG- Bowel in right inguinal area	OF- Obstructed Inguinal hernia with appendix (Amyand hernia); OP- Appendicectomy by inguinal approach
30 d/M	Tender scrotal swelling	Abd- Soft, non-tender, rash; Scr- Right scrotum- Swollen and red	XR- Normal; USG-Bowel in right inguinal area	OF- Perforated Meckel's diverticulum (Littre's hernia); OP- Ileo-ileal anastomosis by inguinal approach

d- days, Abd-abdomen, Scr-scrotum, XR- X-ray abdomen, USG - ultrasound, Exp lap- Exploratory laparotomy, REEA- resection end to end anastomosis

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