

Delayed Complication Due to Retained Contrast Following Augmented Pressure Distal Loop Colostogram in Anorectal Malformation

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Abstract

Augmented-pressure distal loop colostogram (APDC) is the most important diagnostic investigation to delineate the detailed anatomy to plan the reparative management of anorectal malformations. APDC is generally considered safe, with a very low complication rate. Herein, we present an unreported complication of APDC, manifesting as acute abdomen, due to retained contrast in distal loop. The patient was managed with evacuation of retained contrast from distal loop. We recommend evacuating the contrast from the distal loop following APDC.

Keywords: Acute abdomen, anorectal malformation, distal loop colostogram, retained contrast

INTRODUCTION

Augmented-pressure distal loop colostogram (APDC) is an important diagnostic investigation to delineate the altered anatomy of anorectal malformations (ARM). It is used to identify the type of ARM, presence or absence of fistulae between the rectum and the urogenital tract. It is also used to assess the length and dilatation of rectal pouch and its relationship with the fixed bony points.

Patient presenting with acute abdomen due to retained contrast in the distal loop following APDC is an unreported complication. The patient was diagnosed on plain radiography and was managed with prompt evacuation of contrast.

CASE REPORT

An 18-month-old boy presented to the hospital emergency, 5 days after APDC, with the complaints of pain and distension of the abdomen and vomiting. There was no output per stoma and not passed urine since 24 h. At the time of presentation, pulse was feeble at 130/min and respiratory rate of 36/min. On examination, the patient was irritable, dehydrated; the abdomen was distended with oedematous and prolapsed proximal stoma.



Figure 1: (a) (Anterior–posterior view) and (b) (oblique view) of distal loop colostogram showing grossly distended, blindly ending distal ano-rectal pouch. There is no obvious fistulous tract seen; however, there is subtle focal area of nipple-like protrusion seen at the antero-inferior aspect of ano-rectal pouch (demarcated with arrows in both images)

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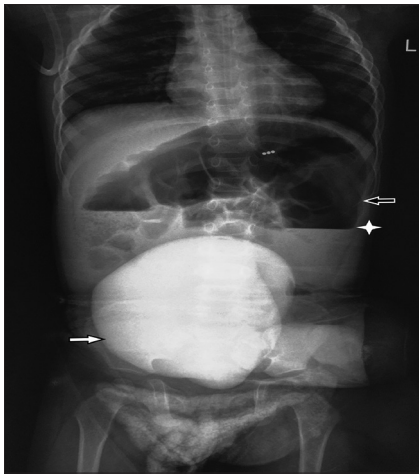


Figure 2: X-ray of the erect abdomen, obtained after 5 days of distal loop colostogram, showing grossly distended, contrast filled distal ano-rectal pouch (white arrow); gaseous distension of transverse colon and splenic flexure and proximal descending colon is also noted (black arrow) with air–fluid level in distal descending colon (asterisk), suggesting obstruction

On palpation, there was abdominal tenderness with a globular lump in lower abdomen. A provisional diagnosis of delayed perforation of distal loop following APDC was suspected.

The patient had undergone high sigmoid loop colostomy at day 2 of life for ARM. At 3 months of age, the patient developed stoma prolapse for which revision was done by dividing the loop sigmoid colostomy. Due to COVID-19 crisis and nationwide lockdown, our healthcare facility was converted to dedicated COVID hospital and all routine services were curtailed. Therefore, the patient could not come for follow-up visits.

The patient again attended the outpatient clinic after 15 months, and was further investigated with abdominal ultrasonography and X-ray of lumbosacral spine which were unremarkable. The APDC was performed using water-soluble contrast (Gastrografin®) on outpatient basis by radiology department and patient returned home [Figure 1].

The patient was admitted and intravenous fluid was started. Nasogastric tube (NG) tube was inserted, but urethral catheter could not be negotiated into the bladder. After adequate fluid resuscitation, erect X-ray of the abdomen was done showing grossly distended, contrast filled distal ano-rectal pouch; gaseous distension of colon with air–fluid level in distal descending colon was also noted. There was no evidence of free gas [Figure 2].

A 14 Fr catheter was put in distal stoma and about 450 ml fluid, turbid yellow in colour, was evacuated. After evacuation of the distal loop, abdominal distension decreased and the patient became comfortable. Proximal stoma started functioning on the same day. The prolapsed proximal stoma was revised on the next day. Oral feeds were started gradually, and the patient was discharged on 5th post-operative day. The patient was doing well in 2-week follow-up, and was planned for definitive procedure after 4 weeks.

DISCUSSION

With an estimated incidence ranging from 1 in 4000 to 1 in 5000 live births, ARMs are among the most common congenital anomalies encountered in paediatric surgery.^[1] There is a wide spectrum of presentation ranging from low to high anomalies. Depending on the type of anomaly, many patients require colostomy in neonatal period. The most common stoma done in patients with ARM is a divided stoma with a skin bridge between the proximal and distal limb.^[1,2]

The APDC is performed before the definitive repair in ARM patients who had undergone a diverting colostomy. It remains the most important diagnostic test for a paediatric surgeon to plan surgical repair.

Keiller was the first to describe the distal colostogram technique of injecting barium sulphate to visualise the distal blind end. He advised washouts of the distal colon and removal of the accumulated meconium before injection of contrast. Later, many researchers stressed the value of the augmented-pressure technique, where continued pressure is to be applied during injection to ensure that the fistula is opacified.^[3-5]

During APDC, a Foley catheter is inserted into the distal mucus fistula for variable distance and 3–5 ml of saline is injected into the balloon. Gentle traction is applied to the catheter to create a seal so that adequate pressure can be applied when injecting the contrast. Water-soluble contrast medium is injected via the Foley catheter with a 50 ml catheter tip syringe into the rectum under gentle but augmented pressure to distend the distal rectum adequately and identify the fistula. The sacrum, coccyx, perineum and bladder must all be visible during fluoroscopy. If a fistula is identified, it is suggested to continue injecting the contrast until the bladder fills and the baby spontaneously voids. If this is the case, valuable information regarding the urinary tract can be obtained.

In some cases where there is no fistula to the bladder, the study will be considered completed once contrast has reached the level below the pubococcygeal line that can be seen as contraction in fluoroscopy or the blind distal end of the colon distends and becomes convex, indicating that enough pressure has been applied. Too high pressure during APDC may give the false impression of a low rectal pouch and sometimes may cause bowel perforation. However, too low pressure will give the false impression of a high rectum with no fistula; this will show up as a flattening of the distal rectum at the pubococcygeal line, and means more pressure is required for an accurate study.^[2,5]

APDC is generally considered safe and usually performed as an outpatient procedure. Only few cases of complication have been reported as distal loop perforation during APDC mainly attributed to physical injury by stiff catheter.^[6] To the best of our knowledge, acute abdomen following APDC due to retained contrast in the distal loop is an unreported complication.

Water-soluble contrast medium Gastrografin® (Diatrizoate Meglumine and Diatrizoate Sodium Solution 76%) is a hypertonic solution and dilution of 1:4.6 is isotonic to plasma. When less diluted solution is introduced into the bowel lumen, it draws fluid from the plasma and interstitium due to osmotic gradient. The fluid shift continues till the solution is isotonic. This fluid shift into a closed compartment such as an obstructed colon could lead to overdistension of the bowel, leading to delayed perforation.^[7,8]

In the index patient, there was retention of hypertonic contrast solution in distal loop following APDC. The contrast solution was used in less dilution (1:3) during the procedure. This caused intraluminal fluid shift leading to delayed overdistension of the distal loop causing proximal angulation- and volume-dependent obstruction.

The authors recommend evacuating the contrast from the distal loop following the procedure.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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