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Case Report Open Access

Rectal Prolapse in Ex-premature Infant Following Bilateral Inguinal Hernia Repair under Spinal Anesthesia

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Abstract

Rectal prolapse associated with spinal anesthesia has not been described in the neonatal anesthesia. In this case, ex-premature infant underwent bilateral inguinal hernia repair under spinal anesthesia. Following uneventful surgery, the patient suffered a complete rectal prolapse that required exploratory laparotomy and rectopexy.

Keywords: Rectal prolapse; Rectopexy; Spinal anesthesia

Introduction

Children are anatomically predisposed to rectal prolapse because of a more vertical course of the rectum, flatter coccyx, poor levator support, a loosely attached rectal mucosa and a relatively low position of the rectum in the pelvis [1]. The two main causes of rectal prolapse are increased intra-abdominal pressure and pelvic floor weakness [2]. This case report describes the occurrence of rectal prolapse in a premature infant who received spinal anesthesia. Written consent from the patient mother was obtained for submission of the clinical case report for potential publication.

Case Report

Due to a non-reassuring fetal heart rate, a premature male infant was delivered at 29 weeks and 6 days *via* cesarean section to a 35-year-old mother. Small for gestational age, the neonate had an extremely low birth weight of 860 g. The prenatal course was significant for a positive noninvasive prenatal screening for Down's syndrome which was later confirmed by chromosomal studies. The patient suffered from acute respiratory failure and mechanical ventilation was initiated. Abdominal distension was evident after day 19. Gastrografin enema and upper gastrointestinal series showed moderate diffuse dilatation of small and large bowels without evidence of stricture. Necrotizing enterocolitis could not be excluded. Thrombocytopenia and anemia were treated with transfusion of platelets and packed red blood cells. A course of total parenteral nutrition and antibiotics was given. The patient was weaned off mechanical ventilation on day 24. After recovering from respiratory failure, the 2.5 kg patient, with distended but soft abdomen, was scheduled for bilateral inguinal hernia repair on day 86. Due to history of prematurity and compromised respiratory system the Neuraxial anesthesia was considered as method of choice for this procedure. The Neuraxial anesthesia was discussed with the mother, consent obtained, and the surgeon agreed with the plan.

After the placement of the ASA monitors the patient was held in a sitting position, a spinal block was performed through the L4-L5 vertebral interspace with a 2-inch 22-gauge spinal needle. After identification of clear cerebrospinal fluid 2.0 mg of Tetracaine was slowly injected. Special attention was paid to the positioning, so to avoid potential high block due to elevation of the patient lower extremities and pelvis. Patient tolerated procedure well, with no additional sedation or conversion to general anesthesia required. After completion of the uneventful bilateral inguinal herniotomy, the infant was transferred to the NICU for further observation and signed-out to the NICU team in stable condition for further management.

Within two hours after surgery, the patient presented with a complete, approximately 12 cm rectal prolapse. Manual reduction was attempted at bedside by pediatric surgical team without success (Figure 1).

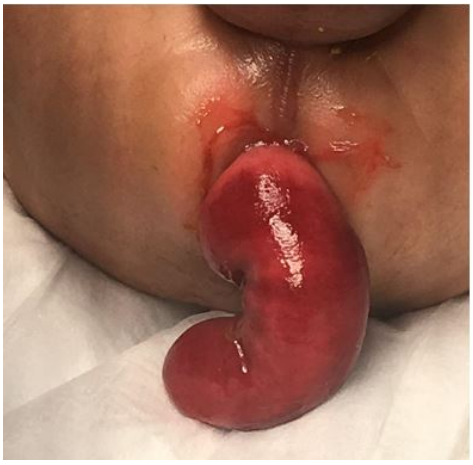

Figure 1: Complete rectal prolapse.

Emergency laparotomy with rectal prolapse reduction and rectopexy was performed under general anesthesia without complication. Rapid sequence induction with intravenous medications given in the weight appropriate dosages (Propofol 8 mg and Rocuronium 2 mg) and subsequent atraumatic laryngoscopy with Miller 0 blade and placement of the 3.0 endotracheal tube. Patient was extubated at the end of the uneventful laparotomy. The postoperative course was uncomplicated with presence of bowel sounds on the next post-operative day and discharge to the regular pediatric floor on day 7 after surgery. Off note, several weeks after the incident the patient

underwent rectal biopsy, that demonstrated the presence of the ganglion cells in the colonic submucosa and therefore excluding Hirschsprung's disease.

Discussion

The two main causes of rectal prolapse are increased intraabdominal pressure and pelvic floor weakness. Increased intraabdominal pressure may result from chronic constipation, coughing, diarrhea, Hirschsprung's disease and/or neoplastic disease [2]. Although spinal anesthesia leads to paralysis of striated muscles of the pelvic floor it has not been associated with pelvic floor weakness. Spinal anesthesia has been demonstrated beneficial for neonatal surgeries multiple studies [3]. The main benefits are attributed to the potential avoidance of the positive pressure ventilation, laryngoscopy and endotracheal intubation [3]. There are different medications and size needles have been used for spinal in neonates. The most common local anesthetic used is Bupivacaine and Tetracaine. The spinal needles sizes 25G and 22G are used commonly, and 27G in some institutions [4,5]. The incidence of the postdural puncture headache is unknown in the neonates and appears to be low. The main drawback of the spinal anesthesia in neonates is the short time of the surgical anesthesia (on average 90 minutes), that requires surgical team to work expeditiously.

A retrospective study with 262 children with rectal prolapse with a mean age of 4 years showed that the most common associated diagnosis was constipation, acute diarrhea, imperforate anus, rectal polyps, meningomyelocele and cystic fibrosis. The remaining of patients shared disease association with Hirschsprung's disease, proctitis, rectal ulcer, recurrent chest infections, malnutrition, rectal neoplasms, anorectal anomalies and ulcerative colitis [1].

Our patient showed increased intraabdominal pressure leading to abdominal distension starting on day 18. The cause of the elevated pressure remains unclear. During the subsequent hospital course, patient findings were negative for constipation, coughing, acute diarrhea, vomiting, rectal polyps, meningomyelocele, proctitis, rectal ulcer, rectal neoplasms, anorectal anomalies, ulcerative colitis and infectious disease, or Hirschprung's disease.

The other main cause of rectal prolapse is pelvic floor weakness. A lack of rectal support plays a big part in patients with anorectal anomalies like Hirschsprung's disease and imperforate anus, Ehlers-Danlos syndrome, and Marfan syndrome [2]. In addition to literature search, we reached out to the Vermont Infant Spinal Registry to discuss the occurrence [6]. Vermont Infant Spinal Registry has the highest number of neonatal cases in their database that were performed under neuraxial anesthesia. It was confirmed *via* private phone conversation with the person who is very familiar with the registry that there were no such incidences in their database. The etiology of this complete rectal prolapse in this infant remains uncertain and association with the spinal anesthesia is unclear, nevertheless we believe this case is important to be published to the benefit of the anesthesiology community.

Conclusion

Rectal prolapse in association with a spinal anesthesia in a premature infant has never been reported. It is unclear, but plausible that spinal anesthesia was a contributing factor for the development of the rectal prolapse in this case.

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