□ Case Report □

A Case of Intussusception Caused by Meckel's Diverticulum in a Newborn

Seung Taek Yu, M.D., Yeon Kyun Oh, M.D., Won Churl Park, M.D.*
Eun A Kim, M.D.†, Chang Woo Lee, M.D. and Hyang Suk Yoon, M.D.

Department of Pediatrics, General Surgery, Radiology†,*
Wonkwang University School of Medicine, Iksan, Korea

Intussusception and Meckel's diverticulum are very rare disorders in intrauterine or neonatal periods, which are causes of intestinal obstruction. We experienced a case of intussusception due to Meckel's diverticulum which caused intestinal obstruction in the neonate who had bilious vomiting a few hours after birth. We report this case with a brief review of the literature. **(Korean J Pediatr 2005; 48:907-910)**

Key Words : Intussusception, Meckel's diverticulum, Intestinal obstruction, Newborn

Introduction

Intussusception occuring in intrauterine or neonatal period is a very rare clinical entity, which accounts for only 3% of all cases of neonatal intestinal obstruction[1]. And a Meckel's diverticulum (MD) occurs in 2% of the population[2] and was reported a 0.3% incidence in the neonatal period[3], and may manifest as a intestinal obstruction in about 30-56% of symptomatic cases[4-8]. When intussusception occurs in the intrauterine life and the time elapsed is enough to cause gangrene and resorption of the intussuscepted portions of the bowel, intestinal atresia will result. Intrauterine intussusception caused by MD is one of the rare causes of intestinal atresia or small bowel obstruction, as in our case.

We describe a case of intussusception due to MD which caused a small bowel obstruction in a neonate with a brief review of the literature.

Case Report

A male newborn, weighing 3,920 gm with a gestational age 39 weeks, developed bilious vomiting a few hours after birth and was admitted to the neonatal intensive care unit of Wonkwang University Hospital. The perinatal period was uneventful and the Apgar scores were 7 and 9 at 1 and 5 min, respectively. He passed meconium stools in a small amount but he developed vomiting and poor sucking a few hours after birth.

A physical examination revealed a mobile round mass on the right side of the abdomen. Laboratory data showed a leukocyte count of 14,400/mm^3 with neutrophil 62.7%, hemoglobin 15.3 g/dL, hematocrit 41.2%, platelet 258,000/mm^3, C-reactive protein 14.27 mg/L and few RBC and WBC in the stool. A plain film and ultrasonogram of the abdomen showed diffusely dilated small bowel loops with a tiny amount of ascites suggesting a small bowel obstruction (Fig. 1). A colon series with barium demonstrated complete obstruction at 3 cm proximal portion from ileocecal valve and the distal portion of terminal ileum to the obstruction was segmentally narrowed, which was interpreted as post-obstructive narrowing (Fig. 2). An abdominopelvic CT scan with contrast showed ectatic dilated small bowel loops but there was neither definitive evidence of the mass nor intussusception (Fig. 3). A follow up abdominal film did not show any improvement of the ileus. Therefore, we operated on the 5th admission day with the knowledge of an unknown small bowel obstruction.

A laparatomy showed that there was a large, distended MD (3×3×2 cm) and a ileocecal intussusception. There

This paper was supported by Wonkwang University in 2004.
접수 : 2005년 4월 9일, 승인 : 2005년 6월 3일
책임저자 : 오연균, 원광대학교 의과대학 소아과학교실
Correspondence : Yeon Kyun Oh, M.D.
Tel : 063)850-1102 Fax : 063)853-3670
E-mail : oyk5412@wonkwang.ac.kr

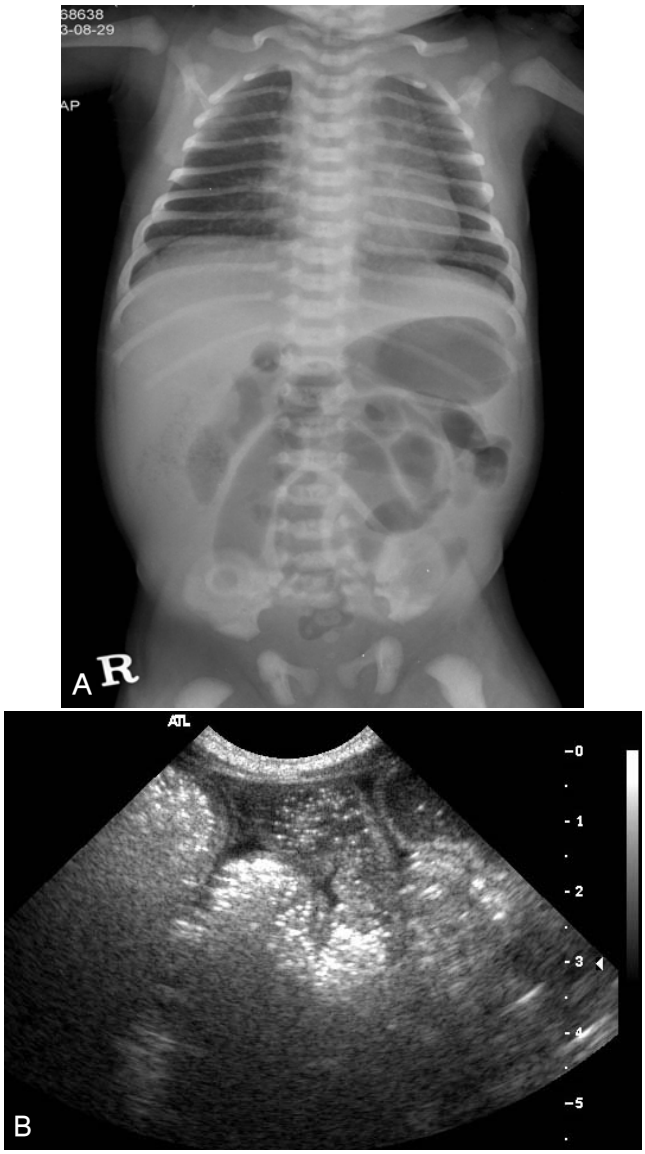

Fig. 1. Plain radiograph **(A)** and ultrasonogram **(B)** of abdomen showed diffusely dilated small bowel loops with scanty amount of ascites, suggesting distal small bowel obstruction.

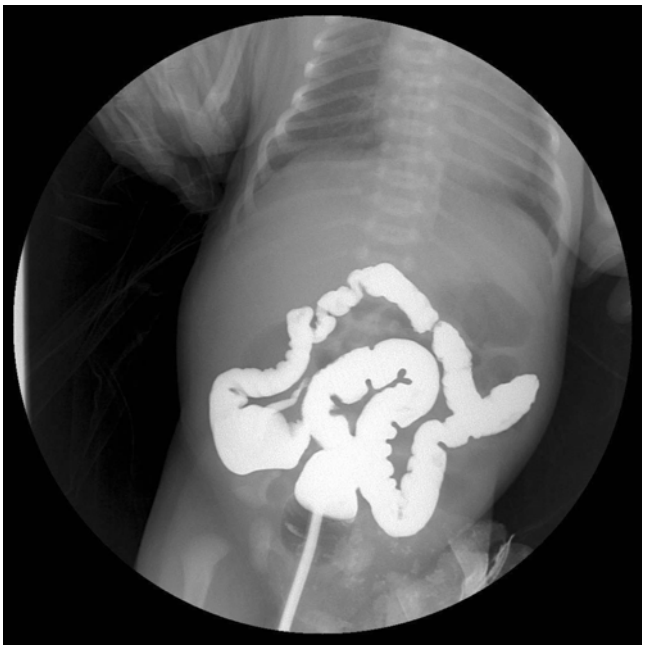

Fig. 2. Complete obstruction at about 3 cm proximal portion from ileocecal valve was demonstrated on barium enema, where the definitive cause of the obstruction was not revealed. The terminal ileum of distal portion to the obstruction was segmentally narrowed and that finding was interpreted as postobstructive narrowing.

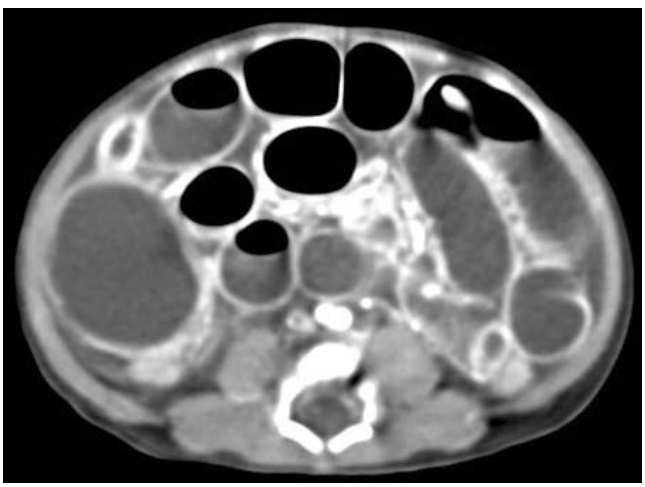

Fig. 3. Contrast-enhanced abdominopelvic CT scan showed markedly dilated small bowel loops but there was neither definite evidence of mass nor intussusception.

was fluid congestion and dilatation of the proximal bowel to the diverticulum. Manual reduction of the intussusception and a small bowel decompression with diverticulectomy were performed. Histologic examination of MD showed no mucosal necrosis or submucosal hemorrhage (Fig. 4). He was discharged in good condition 6 days later.

Discussion

The signs and symptoms of intestinal obstruction may result from a volvulus[4, 6, 8, 9], adhesion and kinking[5, 10], internal herniation[8], Littre's hernia[5], intussusception[4-8], or impaction of the MD with milk curd, or stool, or meconium[9-13]. Intussusception in childhood is a common problem. However, it is uncommon in the neonatal period and exceedingly rare in premature neonates. The average incidence of intussusception in neonatal period was 0.3% (from 0% to 2.7%) by Rachelson et al.[3] in 1995 and 1.3%

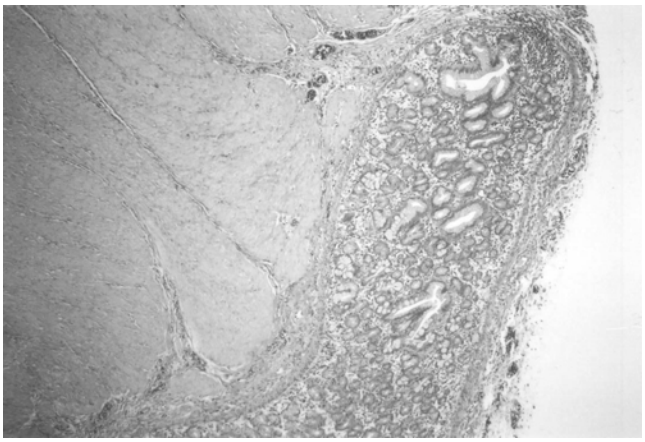

Fig. 4. Meckel's diverticulum, Mucosal necrosis or submucosal hemorrhage is not observed (×100).

by Wang et al.[14] in 1998. The etiology of intussusception in neonatal period remains unknown in the majority of cases. Many reports about neonatal intussusception suggest that there is often a pathological lesion as a lead point in full term infants and the colon is almost always involved[15]. But, preterm infants rarely have colonic involvement; the majority of cases being ileoileal. In premature infants, there were two cases which had a pathologic lead point by Mooney et al.'s review[16], when there was a polypoid protrusion in the distal end of an ileal atresia by Todani et al.[17]. The other was ileoileal intussusception with necrotizing enterocolitis reported by Smith and Giacoia[18]. However, they were not definitive leading lesions that induced the intussusception. Intussusception in premature infants is often initially diagnosed as necrotizing enterocolitis because of their similiar clinical features[19]. Prenatal intussusception, as one of the causes of intestinal atresia, produces prominent signs of intestinal obstruction immediately after birth. Preoperative evaluation usually fails to yield a definitive diagnosis, and so surgeons usually perform a laparotomy for a conclusive diagnosis.

MD is the most common congenital anomaly of the gastrointestinal tract, occuring in 2% of the population and usually found incidentally during an operation or during autopsy[2]. MD may present itself as an intestinal obstruction which may occur in 30-56% of symptomatic cases[4-8]. Senocak et al.[20] reported the first case of intestinal atresia resulting from intrauterine intussusception caused by MD in 1990. Thereafter, a few cases are still being reported. We suspected that our case also occurred during the late intrauterine period as with the above cases because of developing symptoms of intestinal obstruction within a few hours after birth. At laparatomy, there was a large distended diverticulum (3×3×2 cm) invaginated to the cecum and a congested and dilated bowel proximal to the diverticulum. Diverticulectomy and manual reduction of intussusception were performed. On biopsy, MD has no mucosal necrosis or submucosal hemorrhage with inflammation.

We think that MD led to intussusception and this event caused intestinal obstruction.

한 글 요 약

신생아에서 멕켈게실에 의해 유발된 장중첩증 1례

원광대학교 의과대학 소아과학교실, 외과학교실*, 진단방사선과학교실†

유승택 · 오연균 · 박원철* · 김은아† · 이창우 · 윤향석

신생아에서 멕켈게실에 의한 장중첩증으로 장폐쇄를 유발한 경우는 매우 드물다. 신생아기에 장폐쇄의 원인으로 장중첩증은 장폐쇄의 원인 중 단지 3%, 멕켈게실은 0.3% 정도만이 보고되었다. 저자들은 출생 수시간 후부터 담즙성 구토를 보인 신생아에서 복부 초음파, 대장소영술 및 복부 전산화단층촬영상에서도 확진하지 못하고 시험적 개복술을 시행하여 비로소 확인된 태생기에 발생한 멕켈게실에 의한 장중첩증 1례를 경험하였기에 보고하는 바이다.

References

1) Yoo RP, Touloukian RJ. Intussusception in the newborn : a unique clinical entity. J Pediatr Surg 1974;9:495-8.
2) Soltero MJ, Bill AH. The natural history of Meckel's diverticulum and its relation to incidental removal. Am J Surg 1976;132:168-72.
3) Rachelson MH, Jernigan JP, Jackson WF. Intussusception in the newborn infant. J Pediatr 1995;47:87-94.
4) Meguid M, Canty T, Eraklis AJ. Complications of Meckel's diverticulum in infants. Surg Gynecol Obstet 1974;139:541-4.
5) Michas CA, Cohen SE, Wolfman EF Jr. Meckel's diverticulum : should it be excised incidentally at operation? Am J Surg 1975;129:682-5.
6) Moore T, Johnston AO. Complications of Meckel's diverticulum. Br J Surg 1976;63:453-4.
7) Schlicke CP, Johnston EV. Experiences with Meckel's diverticulum. Surg Gynecol Obstet 1960;126:91-3.
8) St-Vil D, Brandt ML, Panic S, Bensoussan AL, Blanchard H. Meckel's diverticulum in children : a 20-year review. J Pediatr Surg 1991;26:1289-92.
9) Sy ED, Shan YS, Tsai HM, Lin CH. Meckel's diverticulum

associated with ileal volvulus in a neonate. Pediatr Surg Int 2002;18:529-31.
10) de la Hunt MN, Rangecroft L. Intraluminal milk curd obstruction in a giant Meckel's diverticulum. J Pediatr Surg 1993;28:955-6.
11) Kilic N, Kiristioglu I, Kirkpinar A, Dogruyol H. A very rare cause of intestinal atresia : intrauterine intussusception due to Meckel's diverticulum. Acta Paediatr 2003;92:756-7.
12) Gundogdu HZ, Senocac ME. Intrauterine intussusception due to Meckel's diverticulum cause of ileal atresia : analysis of 2 cases. Eur J Pediatr Surg 1996;6:52-4.
13) Leconte D, Van Kote G, Questiaux E, Bader R, Charbonnel E. A rare cause of neonatal occlusion by a palpable abdominal mass : Meckel's diverticulum. Chir Pediatr 1988;29:216-8.
14) Wang NL, Yeh ML, Chang PY, Sheu JC, Chen CC. Prenatal and neonatal intussusception. Pediatr Surg Int 1998;13:232-6.
15) Patriquin HB, Afshani E, Effman E. Neonatal intussusception. Radiology 1977;125:463-6.
16) Mooney DP, Steinthorsson G, Shorter NA. Perinatal intussusception in premature infants. J Pediatr Surg 1996;31:695-6.
17) Todani T, Tabuchi K, Tanaka S. Intestinal atresia due to intrauterine intussusception : analysis of 24 cases in Japan. J Padiatr Surg 1975;10:445-51.
18) Smith VS, Giacoia GP. Intussusception associated with necrotizing enterocolitis. Clin Pediatr 1984;23:43-5.
19) Nock ML, Wilson-Costello D. Intussusception in a premature neonate. Clin Pediatr 2002;41:721-4.
20) Senocak ME, Buyukpamukcu N, Hicsonmez A. Ileal atresia due to intrauterine intussusception caused by Meckel's diverticulum. Pediatr Surg Int 1990;5:64-6.