A Neonatal Intussusception induced by Congenital Ileal Polyp in a two-day-old male newborn

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ABSTRACT

Intussusception is an interesting condition and is one of the most common causes of intestinal obstruction in the infant. We experienced a case of neonatal intussusception in a two-day-old male.

The patient developed bloody stool, without a history of vomiting, after passing meconium, on the second day of life. Diagnosis of ileo-cecal type intussusception, which was induced by congenital polyp, was confirmed by exploratory laparotomy performed on the 4th day of life.

The polyp was found at the proximal portion of the ileum, 45 cm from the ileo-cecal valve.

In Korea a 40-day-old patient was the youngest previously reported. We have presented this case with a review of the literature.

INTRODUCTION

Intussusception, an invagination of a segment of the gastro-intestinal tract into an adjacent segment, is one of the most frequent causes of acute intestinal obstruction in infancy and childhood (Benson et al, 1963) (Penka, 1967).

Since Jonathan Hutchinson first described a successful operation on an infant with intussusception in 1873, there has been marked progress in the management of this disease (Lee et al., 1963).

Reduction of intussusception by barium enema was successfully performed by Ravitch and McCune (1950) and therefore mortality was lowered. In previous reports of clinical studies of this disease most of patients were under the age of two years and also the etiology was unknown.

A two-day-old baby with intussusception induced by cecal duplication was presented as the youngest among 300 cases reported by Benson et al (1963). In Korean literature, Lee et al. (1963) reported a 40-day-old infant with intussusception. We had experience of a two-day-old newborn with intussusception induced by a congenital ileal polyp.

We have presented this case and reviewed the literature, especially about age distribution.

CASE REPORT

A two-day-old male newborn was admitted to the pediatric department of Severance Hospital with the chief complaint of bloody stool since the second day of life. According to his mother’s statement, there was no specific problem at birth, but bloody stool was noted after passing of meconium.
No vomiting and abdominal distension were noted at that time. There was no remarkable disease or heredofamilial disorder in his family.

Physical examination revealed a temperature of 38.6°C, respiratory rate 38/min. and heart beat 140/min.

Body weight was 3.3 kg and height 50cm, which were in the 50 percentile range as compared with the Korean standard growth chart. No mass was palpated in his abdomen at the time of admission, and bloody stool was seen on the glove without demonstrable mass or polyp on the rectal examination.

Blood cell count and serum electrolytes were recorded within normal limits. Upright abdomen showed a markedly distended small bowel without demonstrable large bowel air pattern as seen in Figure 1.

On the second hospital day vomiting, which contained bile, occurred two times with passing of mucous and bloody stool per rectum. Also abdominal distension was noted without palpable mass. On the 3rd hospital day exploratory laparatomy was performed and an intussuscepted mass of the ileo-cecal type was found proximally apart 45 cm from the ileo-cecal valve.

After resection of a segment of ileum, end to end anastomosis was done as the usual manner. The post-operative course was relatively smooth with intravenous hydration and antibiotics therapy.

He was discharged after an uneventful course.

Pathologic findings: Grossly the specimen consisted of a segment of ileum measuring 9×1 cm. and a small round mass (0.8cm in diameter) was attached to the internal surface of the ileum. On cut section of this mass, it seemed to be necrotic tissue. Microscopically the polyp showed hemorrhage and early gangrenous necrosis and also edema, congestion and hemorrhage were seen in the ileal wall.

**DISCUSSION**

The exact incidence of intussusception is difficult to determine. Vick in 1932, according to Ponka (1967), noted 15 per cent intussusception among 6, 892 patients with intestinal obstruction collected from British sources. Of practical importance is the fact that 80 to 90 per cent of intestinal obstruction in infants is due to invagination of the intestine(Ponka, 1967).

All observers point out that the incidence is greatest in patients under two years of age. Perrin and Lindsay (1921) found that 69.7% of the infants were under one year of age and Fitzwilliam(1908) and Clark et al.(1960) reported similar incidences with 71.9% and 70% respectively. But in Korean literature the in-
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cidence was lower with 49%, -Lee et al. (1963), 41.5%, -Youn et al. (1967), and 42%, -Lee et al. (1963) respectively.

These lower infant incidences may be due to the clinical studies including all adult age groups. Therefore, the majority of the cases occurred during the weaning period.

The youngest patient reported by Spencer (1964) was a 25-hour-old premature whose diagnosis was confirmed at autopsy. Benson et al. (1963) reported a two-day-old, who had intussusception induced by cecal duplication, as the youngest one among the 300 cases. Lee et al. (1963) found that a 40-day-old infant had intussusception. We experienced a case of a two-day-old newborn with intussusception induced by a congenital ileal polyp. In sex incidence it is more common in the male and the ratio of male to female was 2.23 : 1 (Ponka, 1967) and 2:1 (Benson et al., 1963) and 3:2 (Revitch and McCune, 1950).

In Korean literature a similar ratio was noted with 1.7:1 (Lee et al., 1963) and 3.1:1 (Youn et al., 1967).

In the majority of the patients there was no demonstrable cause. In 94% of the 79 infants reported by Ponka (1967) there was no convincing explanation for the occurrence of the intussusception and Benson et al. (1963) reported in 91% of 300 cases no demonstrable cause. However Perrin and Lindsay (1921) believed that in the ileocecal and enteric types the intussusceptions were caused by inflammatory swelling of the lymphoid tissue. Hyperplasia of the mesenteric lymphnodes was seen in 15 out of 79 infants reported by Ponka (1967). Youn et al. (1967) found demonstrable causes in only 6 among 33 patients: Mackel's diverticulum-1, benign polyp-2 and benign tumor of terminal ileum-2 patients.

In view of high occurrence during the weaning

<table>
<thead>
<tr>
<th>Table 1. Etiology of intussusception among the 300 cases*</th>
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<tbody>
<tr>
<td>Etiology</td>
</tr>
<tr>
<td>A. Idiopathic</td>
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<tr>
<td>B. Local lesions</td>
</tr>
<tr>
<td>1. Meckel's diverticulum</td>
</tr>
<tr>
<td>2. Lymphoid hyperplasia</td>
</tr>
<tr>
<td>3. Lymphosarcoma</td>
</tr>
<tr>
<td>4. Polyp, ileum</td>
</tr>
<tr>
<td>5. Cecal duplication</td>
</tr>
<tr>
<td>6. Polyp, transverse colon</td>
</tr>
<tr>
<td>7. Polyp, sigmoid</td>
</tr>
<tr>
<td>C. Complication of diseases</td>
</tr>
<tr>
<td>1. Henoch-Schoenlein purpura</td>
</tr>
<tr>
<td>2. Coarctation of aorta</td>
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</tbody>
</table>

* Cited by Benson et al. (1963)

period this may be related to the abrupt change of feeding.

In many reports, intussusception tends to select well nourished infants. Ravitch and McCune (1950) found that 98 out of 119 patients was in good nutritional state.

In table 1, the etiological factors can be seen among the 300 cases reported by Benson et al. (1963).

As seen in table 2, the ileocecal type was the most frequent. From an analysis of 123 infants observed at Henry Ford Hospital, Ponka (1967) found that 80 per cent were of the ileocecal type.

The child, previously healthy and well nourished, is brought to the doctor's office because of a sudden onset of severe intermittent colicky abdominal pain. After the peristaltic wave is over, the infant becomes quiet and many even

<table>
<thead>
<tr>
<th>Table 2. Type of intussusception (%)</th>
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<tbody>
<tr>
<td>Lee et al. (1963)</td>
</tr>
<tr>
<td>Ileo-cecal</td>
</tr>
<tr>
<td>Ileo-ileo-cecal</td>
</tr>
<tr>
<td>Colo-colonic</td>
</tr>
<tr>
<td>Ceco-colic</td>
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Table 3. Clinical symptoms and signs(%)

<table>
<thead>
<tr>
<th></th>
<th>Vomiting</th>
<th>Abdominal pain</th>
<th>Bloody stool</th>
<th>Abdominal distention</th>
<th>Palpable mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ravitch &amp; McCune(1950)</td>
<td>92.8</td>
<td>60.7</td>
<td>91</td>
<td>70</td>
<td>58</td>
</tr>
<tr>
<td>Lee et al.(1963)¹</td>
<td>84</td>
<td>81</td>
<td>74</td>
<td>46.3</td>
<td>46.3</td>
</tr>
<tr>
<td>Youn et al.(1967)</td>
<td>66.3</td>
<td>70.7</td>
<td>87.8</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Lee et al.(1963)²</td>
<td>85</td>
<td>90</td>
<td>80</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Gross(1952)</td>
<td>75</td>
<td>95</td>
<td>85</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

Although asleep, only to be aroused again in from 15 to 30 minutes with another paroxysm of pain. Vomiting occurs after onset of pain and is followed by passage of bloody stool, containing mucus, per rectum.

After the paroxysm of pain has subsided a sausage-shaped mass is palpable on careful abdominal examination and treatment should be done without delay on suggestion of intussusception (Lee et al., 1963).³

Palpation of the right lower quadrant may suggest an emptiness here, which is designated by the term, Dance's sign (Ponka, 1967). Later, as dehydration develops, the temperature will rise and so will the pulse. Ravitch and McCune (1950) found that 42% of 97 cases had a temperature of 101°F or more at the time of admission.

The leucocyte count was usually raised and was reported over 12,000 in 60% of cases by Ravitch and McCune (1950) and in 85% of cases by Lee et al. (1963). ⁴

In Table 3, the percentage of various symptoms and signs are seen from the different series of authors.

Use of roentgenography has been most helpful in arriving at the correct diagnosis. This study should be carried out carefully and the surgeon should be present at the time. Barium enema under fluoroscopy has been widely used as a diagnostic and therapeutic method (Benson et al., 1963).

On abdominal X-ray with barium enema the coiled-spring effect may be seen with cupping of the head of the barium column.

In 79 patients studied in the series of Ponka (1967), the intussusception was visualized on barium studies in 38 patients.

Twenty years ago in the majority of patients with intussusception manual reduction at laparotomy produced prompt recovery. However, a small minority had symptoms of long duration and required intestinal resection which was associated with a significant mortality (Hays and Gwinn, 1966).

The earliest treatment for intussusception was undoubtedly the use of hydrostatic pressure. Ravitch and Morgan (1952) emphasized that hydrostatic pressure reduction (barium enema) was the most effective and safe method of treatment and 42 out of 57(74%) were reduced by barium enema only.

The work of Ravitch (1954) has shown excellent results through the reduction of intussusception with barium enema. He was able to reduce 50 out of 65 intussusceptions without a death. In the clinical studies of Robins and Plenk (1960) successful reduction by barium enema was found in 48% of their cases and they also emphasized that contraindications to barium enema are: 1) marked abdominal distension; 2) diffuse abdominal tenderness with muscle guarding and rebound tenderness; and 3) roentgenographic evidence of free air or fluid in the abdomen.

Ravitch and Morgan (1952) also pointed out that barium enema should not be performed if clinical evidence of peritonitis or gangrene of the involved bowel was present, because there
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Table 4. Changing pattern of mortality rate among operated intussusceptions

<table>
<thead>
<tr>
<th>Year</th>
<th>Total cases</th>
<th>Operated cases</th>
<th>Mortality of resection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1938~1942</td>
<td>62</td>
<td>45</td>
<td>67%</td>
</tr>
<tr>
<td>1943~1947</td>
<td>92</td>
<td>80</td>
<td>25%</td>
</tr>
<tr>
<td>1948~1962</td>
<td>132</td>
<td>126</td>
<td>25%</td>
</tr>
<tr>
<td>1963~1967</td>
<td>107</td>
<td>96</td>
<td>9%</td>
</tr>
<tr>
<td>1968~1968</td>
<td>97</td>
<td>73</td>
<td>0%</td>
</tr>
</tbody>
</table>

* Cited by Hays and Gwinn (1966)

was a potential danger of perforation.

Hays and Gwinn (1966) indicated that early intussusception in infants was being reduced successfully with barium enema.

In Table 4, the operation rate and resection rate for intussusception during the 26 years (from 1938 to 1964) was given and the mortality rate had dropped to close to zero, according to Hays and Gwinn (1966).

The decreased mortality rate of recent years must be attributed to advances in early recognition of disease and improved surgical technique (Santulli, 1964). Ponka (1967) stated that 94 infants and children had been treated with only 2 deaths (2.1% of mortality rate) since 1945.

Ponka (1967), Benson et al. (1963) and Hays et al. (1960) suggested that the causes of death were hypovolemic shock, hypoxia, intestinal perforation, secondary peritonitis, septicemia, adrenal hemorrhage and electrolyte imbalance.

Recurrent rate: In the report of Hays and Gwinn (1966) the rate of recurrence in a small series of enema-reduced cases (20%) was significantly higher than in the operatively reduced cases (2.7%), but Ravitch (1954) reported a rate of recurrence of 3.9% following barium enema reduction without laparotomy.

Benson et al. (1963) studied 300 cases with intussusception and found a 3.9% recurrence rate following operative reduction and 4.0% following barium reduction. Also, they found almost no recurrence following segmental resection and primary anastomosis.

SUMMARY

We presented a case of a two-day-old male who had an intussusception induced by a congenital ileal polyp.

After segmental resection and end to end anastomosis he was discharged with his general condition improved.

REFERENCES


Lee, Y.W., Min, B.W., Han, K.S. and Jun, K.Y.: A review of 45 cases of intussusception. J. Korean Surg. Soc. 5:517, 1963 (b)


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