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A Clinical Study of Neonatal Intestinal Obstruction

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Abstract:
Background; *Neonatal intestinal obstruction is the most common surgical emergency in a new born requiring prompt intervention. It is a life threatening condition with high mortality especially in developing countries. The aim is to study the etiology, sex incidence, age of presentation, management and outcome of neonatal intestinal obstruction in our tertiary care institute.*
Materials and methods*; This is a retrospective study, collected the data from medical records of all the neonates who underwent surgery for neonatal intestinal obstruction during 2015 and 2016 (2 year period) in our institute, Sri Venkateswara medical college, Tirupati. The data was reviewed for etiology, clinical features, investigations, management and outcome in neonatal intestinal obstruction cases.*
Results; *A total of 86 neonates, males 58, females 28, were operated for intestinal obstruction . 58 cases (67.4%)presented in first week of life. out of 86 cases 39 were (ARM) Anorectal malformations (45.3%), 17 were of malrotation(19.7%), 11 cases were intestinal atresia (12.6%), out of 11 cases (jejunal atresias 6, ileal atresias 3 and duodenal atresias 2 cases). 8 were of (HD) Hirschsprungs disease (9.3%), 6 were (NEC) Necrotizing enterocolitis (6.9%). 3 were (IHPS) Hypertrophic pyloric stenosis (3.4%). 1 case of pyloric atresia (1.1%). 1 case of small bowel duplication cyst (1.1%). All the cases were investigated according to their disease with abdominal radiography, ultrasonography, upper and lower gastrointestinal contrast studies. The overall mortality after surgery was 15.1% i.e 13 cases expired out of 86 operated cases of neonatal intestinal obstruction.*
Conclusion: *Anorectal malformation is the most common cause of neonatal intestinal obstruction in our study. Low birth weight and post operative complications like Septicaemia and Pnuemonitis led to mortality of the neonates in this study. The survival is good in our study with mortality rate of 15.1%.*
Keywords: *Neonates, Intestinal obstruction, Anorectal malformation, Atresia,*

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I. Background

The Neonatal period is defined as the first 28 days after birth. Neonatal intestinal obstruction occurs 1 in 1500 live births[1]. Neonatal intestinal obstruction is one of the most common new born surgical emergencies[2] . The successful management depends on timely diagnosis and prompt management [3]. Failure to recognize neonatal intestinal obstruction can result in aspiration, sepsis, bowel gangrene, perforation and enterocolitis[4]. Common causes of neonatal intestinal obstruction are Anorectal malformations, Hirschsprungs disease, Intestinal atresias, Meconium ileus and Malrotation with or without Volvulus. The common clinical features of neonatal intestinal obstruction are bilious vomiting, failure to pass meconium or delayed passage of meconium and abdominal distension. Early vomiting in the first 24 hours indicates high obstruction (duodenal, jejunal) , while the later onset of vomiting indicates a lower obstruction (ileal, colonic, Hirschsprungs disease and Anorectal malformation)[5] . Management of neonatal intestinal obstruction in developing countries remains challenging with poorer outcome compared to developed countries[6,7]. Some factors contributing to the high mortality in developing countries are prematurity, delayed presentation, associated severe congenital anomalies, complications of surgery and lack of NICU facilities[8]. The purpose of this study is to analyze the etiology, sex incidence, age of presentation, management and outcome of neonatal intestinal obstruction at our tertiary center.

II. Materials And Methods

This retrospective study was conducted at paediatric surgery department in SV medical college , Tirupati, over a period of 2 years from 2015 to 2016. All the new borns who underwent surgery for neonatal intestinal obstruction were included in this study. Anorectal malformation cases that underwent colostomy, cut back anoplasty and direct single stage anoplasty for low ARM are also included in the study. Esophageal

atresias, exomphalos and gastroschisis are excluded from our study. Data was collected from patients hospital records and analyzed for etiology, age at presentation, sex incidence, surgery performed and their outcome.
A total of 86 neonates with neonatal intestinal obstruction were operated in our department during the study period. Dehydration and electrolyte imbalance were corrected, naso gastric decompression was done, necessary investigations like, blood routine, X ray abdomen, Ultrasound and in some cases contrast studies were done. Surgical intervention was carried according to the cause. For ARM cases either colostomy, cut back anoplasty or directly single stage anoplasty was done depending on the type and level of the anomaly. Ladds procedure for malrotation, sigmoid loop colostomy for HD, resection and anastomosis for ileal and jejunal atresia, drain insertion and resection anastomosis for necrotizing enterocolitis , Ramstedts pyloromyotomy in pyloric stenosis, Kimuras duodenoduodenostomy in duodenal atresia, pyloro duodenostomy in pyloric atresia and for small bowel duplication cyst resection and end to end anastomosis was done. Post operatively patients were managed in NICU by naso gastric aspiration, intra venous fluids, antibiotics and warm care. Patients were discharged in 7-10 days.

III. Results

A total of 86 cases were operated from January 2015 to December 2016. Among them 39 cases were of ARM, 17 were of malrotation, 11 were of intestinal atresias(6 of ileal, 3 of jejunal and 2 of duodenal atresias), 8 were of HD, 6 were of NEC, 3 were of Pyloric stenosis, 1 case of pyloric atresia and 1 case of small bowel duplication cyst . ARM was the most common cause of neonatal intestinal obstruction seen in 45.3% cases followed by malrotation 19.7% then intestinal atresias 12.6%, HD 9.3%, NEC 6.9%, IHPS 3.4% , pyloric atresia 1.1% and small bowel duplication cyst 1.1%.

Table 1: Causes of Neonatal Intestinal Obstruction (NIO) and incidence

S.no	Causes of NIO	Incidence
1.	Anorectal Malformation	45.3%
2.	Malrotation	19.7%
3.	Small Bowel Atresia	12.6%
4.	Hirschprungs Disease	9.3%
5.	Necrotizing Entercolitis	6.9%
6.	IHPS	3.4%
7.	Pyloric Atresia	1.1%
8.	small bowel duplication cyst	1.1%

The age at presentation; The average age of all neonates at presentation was 11 days in our series. 59 cases presented within first week of life (68.6%). After first week 27 cases (31.3%) presented. Among the 59 cases 35 cases are of ARM, 9 cases of malrotation, 5 case of HD, 2 cases of NEC, 3 cases of ileal atresia, 2 cases of jejunal atresia, 2 cases of duodenal atresia, and 1 case of small bowel duplication cyst . among the 27 cases who presented after first week of life are 4 cases of ARM, 8 cases of malrotation, 3 cases of HD, 4 cases of NEC, 3 cases of ileal atresia, 3 cases of IHPS, 1 case of jejunal atresia, 1 case of pyloric atresia.

Table 2 : Age At Presentation

S.no	Disease	Before 1st week	After 1st week	Total Cases
1.	ARM	35	4	39
2.	Malrotation	9	8	17
3.	HD	5	3	8
4.	NEC	2	4	6
5.	Ileal Atresia	3	3	6
6.	IHPS	0	3	3
7.	Jejunal Atresia	2	1	3
8.	DuodenalAtresia	2	0	2
9.	Pyloric Atresia	0	1	1
10.	small bowel duplication cyst	1	0	1
Total		59	27	86

Sexual distribution; Out of 86 patients 58 (67.5%) were males and 28 (32.5%) were females. The overall Male to female ratio was 2.07 : 1. The male to female ratio in ARM was 1.6:1, in malrotation 1.8:1, in HD 1.6:1, in ileal atresia 2:1, in jejunal atresia 2:1, in duodenal atresia 1:1. In IHPS, NEC, pyloric atresia and small bowel duplication cyst all the neonates are males.

Table 3 : Sexual Distribution

S.no	Disease	Sex		
		Male	Female	Total Cases
1.	ARM	24	15	39
2.	Malrotation	11	6	17
3.	HD	5	3	8
4.	NEC	6	0	6
5.	Ileal Atresia	4	2	6
6.	IHPS	3	0	3
7.	Jejunal Atresia	2	1	2
8.	DuodenalAtresia	1	1	2
9.	Pyloric Atresia	1	0	1
10.	small bowel duplication cyst	1	0	1
Total		58	28	86

Surgery and Mortality; After appropriate resuscitation and preparation all the neonates underwent for surgery in emergency operation theatre. Blood and fresh frozen plasma was transfused when required before and after surgery. Among 39 ARM cases, left sigmoid loop colostomy was done in 25 cases, cut back anoplasty was done in 7 female cases and direct single stage anoplasty was done in 7 male neonates with low ARM. 4 babies expired out of 39 cases due to low birth weight, sepsis and may be due to congenital heart disease. Ladds procedure was done in 17 cases of malrotation. 2 cases expired out of 17 cases. 6 patients underwent levelling colostomy for HD and 2 babies underwent ileostomy for total colonic aganglionosis, which was expired. Resection and end to end anastomosis was performed in 3 cases of NEC and drain insertion done in 3 cases under local anaesthesia because of poor general condition. 2 cases of drain insertion and 1 case of resection and end to end anastomosis expired due to low birth weight, sepsis, leak and pneumonitis. Out of 6 ileal atresia cases 5 cases underwent end to back anastomosis and ileostomy was done in 1 case. out of 6 cases 1 case expired due to low birth weight and prematurity. Ramstedts pyloromyotomy was done in 3 cases, all cases survived. End on back anastomosis was done in 3 cases of jejunal atresia, out of 3 one case expired because of low birth weight, prematurity and sepsis. Kimuras duodenoduodenostomy was done in 2 cases of duodenal atresia, both the cases survived. Pyloro duodenostomy was done in 1 case of pyloric atresia, the case developed leak postoperatively on 5 day so redo laparotomy and gastro jejunostomy was done but the case expired due to sepsis. Resection and end to end anastomosis of the small bowel done in 1 case of small bowel duplication cyst .

Table 4: Results of surgery

S.no	Disease	Survival		Mortality		Total cases
		No. of cases	Percentage	No. of cases	Percentage	
1.	ARM	35	89.7%	4	10.2%	39
2.	Malrotation	15	88.2%	2	11.7%	17
3.	HD	7	87.5%	1	12.5%	8
4.	NEC	3	50%	3	50%	6
5.	Ileal Atresia	5	83.3%	1	16.7%	6
6.	IHPS	3	100%	0	0%	3
7.	Jejunal Atresia	2	66.6%	1	33.4%	3
8.	DuodenalAtresia	2	100%	0	0%	2
9.	Pyloric Atresia	0	0%	1	100%	1
10.	small bowel duplication cyst	1	100%	0	0%	1
Total		73	84.8%	13	15.2%	86

Complications; The most common complication in our study was sepsis in 13 cases, pneumonitis in 6 cases, ileus in 4 cases, anastomotic leak in 3 cases, wound infection in 3 cases and burst abdomen in 1 case. The over all post operative mortality in our series was 15.1%. out of 86 cases 13 cases expired.

Table 5 : post operative complications

S.no	Complication	No. of cases	Percentage of cases
1.	Sepsis	13	15.1%
2.	Pneumonitis	6	6.9%
3.	Ileus	4	4.6%
4.	Anastomotic Leak	3	3.4%
5.	Wound Infection	3	3.4%
6.	Burst Abdomen	1	1.1%

IV. Discussion:

In our study Anorectal malformation is the most common cause of neonatal intestinal obstruction. This study is similar to D. Rathore et al study (in 2015) in which the most common cause of neonatal obstruction is imperforate anus[9] . Other studies in which ARM is the most common cause of neonatal intestinal obstruction were of Ameya et al study[6] and AK Saha et al studies[10] . The overall male to female ratio in our study is 2:1 when compared to D. Rathore et al study[9] the male to female ratio is 7:1 . There is a male predominance in our study which agrees with reports from other studies also[9,10]. The second common cause of neonatal intestinal obstruction in our study is Malrotation (19.7%). According to other studies small bowel atresias are the second most common cause of neonatal intestinal obstruction[9,11]. The survival in malrotation cases is 88% in our study when compared to D. Rathore et al study it is 92%. Small bowel atresia is the third common cause in our study (12.6%), according to Anjali verma et al study [11] the most common cause of NIO was small bowel atresia, this may be because they didnot included ARM cases. Similar etiological prevalence of small bowel atresia is seen in studies of Ameya etal [12].

The overall prognosis in cases of neonatal small bowel obstruction is good. since mid 1970 advances in neonatal care have allowed progressive reduction in mortality from a historical high of more than 90%. Many authors have reported over all survival exceeding 70% [13,14]. This is due to ability to provide long term nutritional support after surgery. In our study the mortality rate of neonatal small bowel atresia was 18% (i.e 2 cases expired out of 11 cases) when compared to Chadha R et al the mortality is 33% [15] . This may be due to less number of cases in our study. In developing countries poor nutritional status of the patients, late presentation or diagnosis, inadequate management at primary and secondary health centers, lack of nutritional support are the reasons for high mortality in patients with bowel atresias [16,17] . Early recognisation of anastomotic leak or peritonitis is essential. Clinical findings are usually adequate for this purpose[17,18].

In our study the incidence of HD is 9.3%(8 cases). According to D. Rathore et al study the incidence of HD is 5.6% [9] . Hirschsprungs disease is a developmental disorder characterized by absence of ganglia in the distal colon, resulting in a functional obstruction[19] .The mortality in neonatal intestinal obstruction ranges between 21% - 45% in developing countries unlike less than 15% in Europe [12,20,21] . The overall post operative mortality in our study was 15.1%, Hanif et al[21] observed a post operative mortality of 15.4% and Islam et al [22] reported 20.8% mortality which is close to our study.

V. Conclusion

The most common cause of neonatal intestinal obstruction in our study was Anorectal malformation and second most common cause is Malrotation. The over all male to female ratio is 2:1. The survival rate is good in this study with nearly 85%. Low birth weight and post operative septicaemia and pnuemonitis are the major causes of mortality. Early diagnosis, early intervention , delicate handling, dedicated staff and good neonatal intensive care facilities are the crucial factors in improving operative out come in neonatal surgery.

References

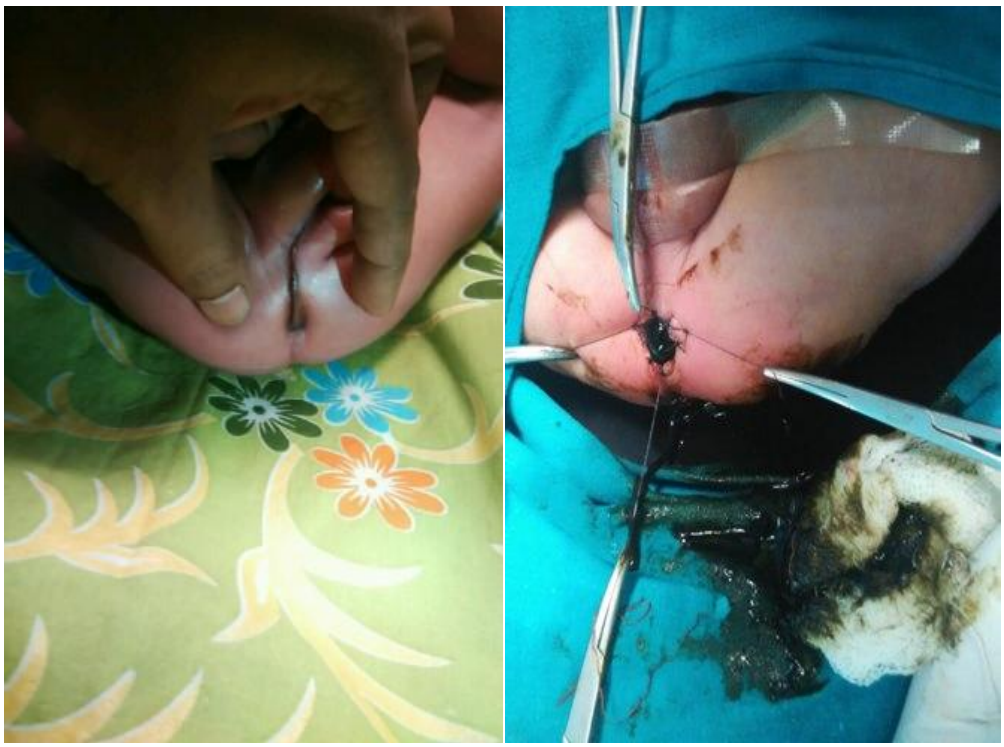
[1]. WyllieR. Intestinal atresia, stenosis and malrotation; In: kliegman RM, Behrman RE, Jenson HB, Stanton BF(Editors) Nelsons text book of pediatrics, 18th edition, vol-2, Philadelphia; Saunders-Elseiver, 2008;1558-62.
[2]. Adejuybe o, Jeje EA, Owa J, Adeoba EA. Neonatal intestinal obstruction in Ife, Nigeria. Niger Med J 1992; 22:24-28.
[3]. Smith GHH and Glasson M. Intestinal atresia: Factors affecting survival, Aust AZ J Surg 1989; 59;151-56.
[4]. Kimura k. Bilious vomiting in the new born: Rapid diagnosis of intestinal obstruction. Am FAM physician may 2000; 61(9):2791-8.
[5]. Spitz L. Neonatal intestinal obstruction and intussusception in children, In: Schwartz SI and Ellis H (editors) Maingots abdominal operations, 8th edition, vol 2, New york: Appleton-centuary-croft,1985;1054-62.
[6]. Ameya EA, Chirdan LB. Neonatal intestinal obstruction in Zaria, Nigeria. East Afr Med J 2000; 77: 510-13.
[7]. Nasir GA, Rahman S, Kadim AH. Neonatal intestinal obstruction. East Meduterr Health J 2000; 6:187-93.
[8]. Uba AF, Edino ST, Yakubu AA, Sheshe AA. childhood intestinal obstruction in north western nigeria. west Afr J Med 2004; 23:314-18.
[9]. D. Rathore, J. Ramji, R. Joshi, A. Shah, T. Dilhare, M. Bachani. Neonatal intestinal obstruction- four year experience. Bjkines-NJBAS volume -7 (1), June 2015.
[10]. AK Saha, MB Ali, SK Biswas, HMZ Sharif, A Azim. neonatal intestinal obstruction; patterns, problems and out come. Bang Med(khulna) 2012;45:6-10.
[11]. Anjali verma, Kamal nain rattan, Ravi yadav. Neonatal intestinal obstruction; A 15 year experience in a tertiary care hospital. Journal of clinical and diagnostic research, 2016 feb. Vol-10 (2): SC 10-13.
[12]. Ademuyiwa AO, Sowande OA, Ijaduola TK, Adejuyigbe O. Determinants of mortality in neonatal intestinal obstruction in ILE IFA, Nigeria, Afr J Ped Surg. 2009; 6: 11-13.
[13]. Skandalakis JE, Gray SW, Ricketts R et al. The small intestine. In: Embryology for surgeons: The embyological basis for the treatment of congenital anomalies. Baltimore: Williams and Wilkins, 1994: 184-241.
[14]. Louw JH, Barnard CN. Congenital intestinal atresia: Observations on its origin. Lancet 1955: 2:1065.
[15]. Chadha R, Sharma A, Roy Choudary S, Bagga D. Treatment stratergies in the management of jejunoileal and colon atresia. J Indian association Paediatric surgery 2006. 11: p 79-84.
[16]. Sato S, Nishijima E, Muraji T, Tsugawa C, Kimura K. Jejunoileal atresia; A 27 year experience. J Pediatr Surg 1998; 33: 1633-5.
[17]. Millar AJ, Rode H, Cywes S. Intestinal atresia and stenosis. In : Ashcraft K (ed). Paed Surg. Chapter 30. Sauders: Philadelphia PA ; 2000.P.406-24.

[18]. Raffensperger JG. Jejunoileal atresia and stenosis. In: Raffensperger JG (editor). Swensons Paediatric Surgery, chapter 65. Appleton and Lange: Norwalk, Connecticut; 1990.P.523-32.
[19]. Heanue TA, Pachnis V. Enteric nervous system development and Hirschsprungs disease: Advances in genetic and stem cell studies. Nat Rev Neuro Sci. 2007; 8:466-79.
[20]. Bustos IG, Orbea GC, Dominguez GO, Galindo LA, Cano NI. Congenital anatomic gastro intestinal obstruction: Prenatal diagnosis, morbidity and mortality. An pediatric (barc) 2006; 65: 134-9.
[21]. Hanif A, Hasina K, Hossain AZ, Alam MM, Huda SMS, Hossan MK et al. Neonatal surgery: Demand and survival both increasing : 8 years experience in DMCH, Bangladesh, J Ped Surg Bang 2010; 1 (1): 30-5.
[22]. Islam SS, Jafor A , Faisal i , Ahmed M. Etiology and treatment outcome of the neonatal intestinal obstruction in a tertiary hospital, J Ped Surg Bang 2010; 1 (1) : 30-36.

photos:

High Anorectal Malformation:

Low Anorectal Malformation:



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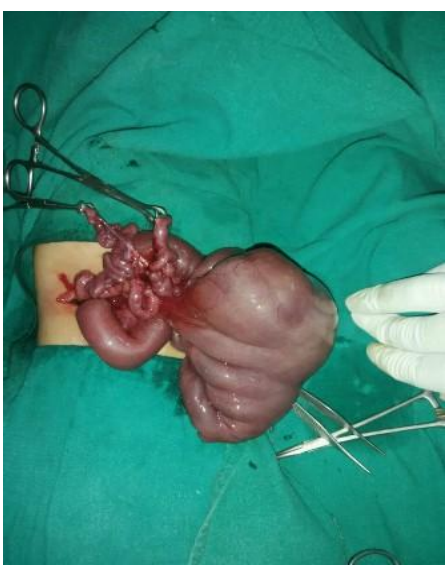

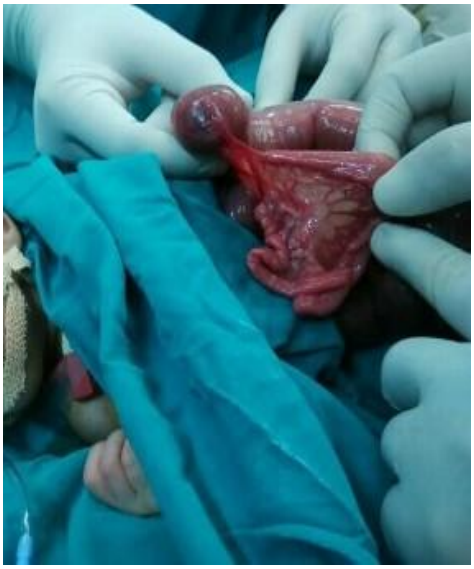

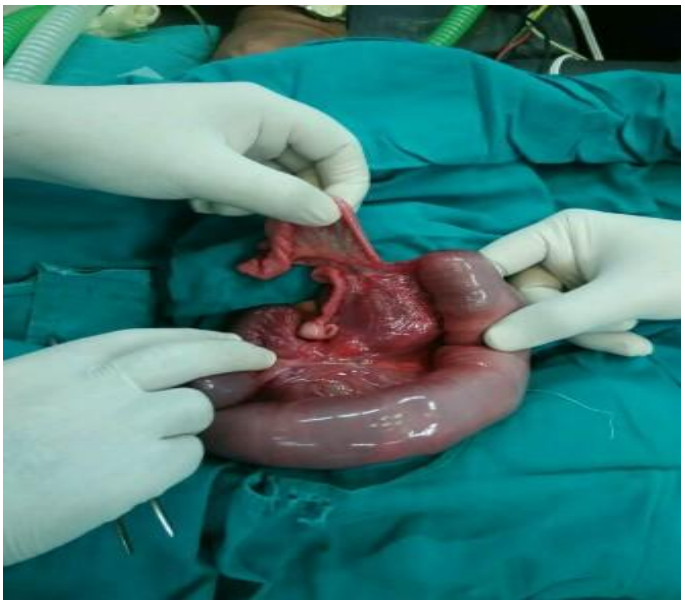

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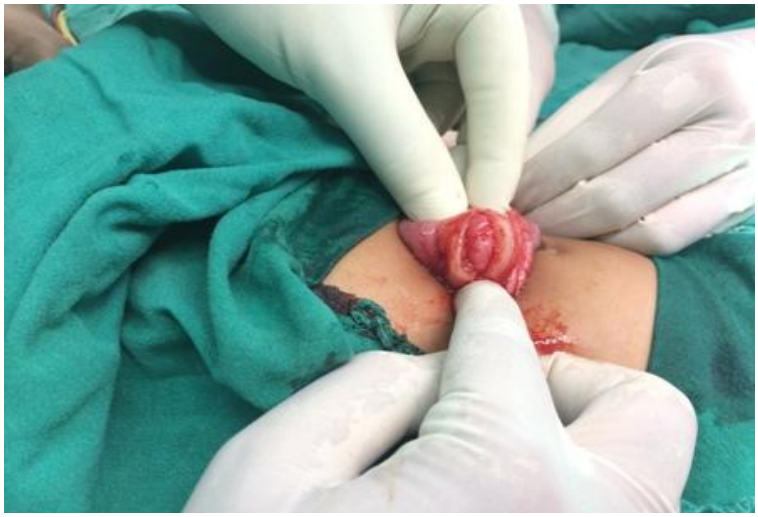

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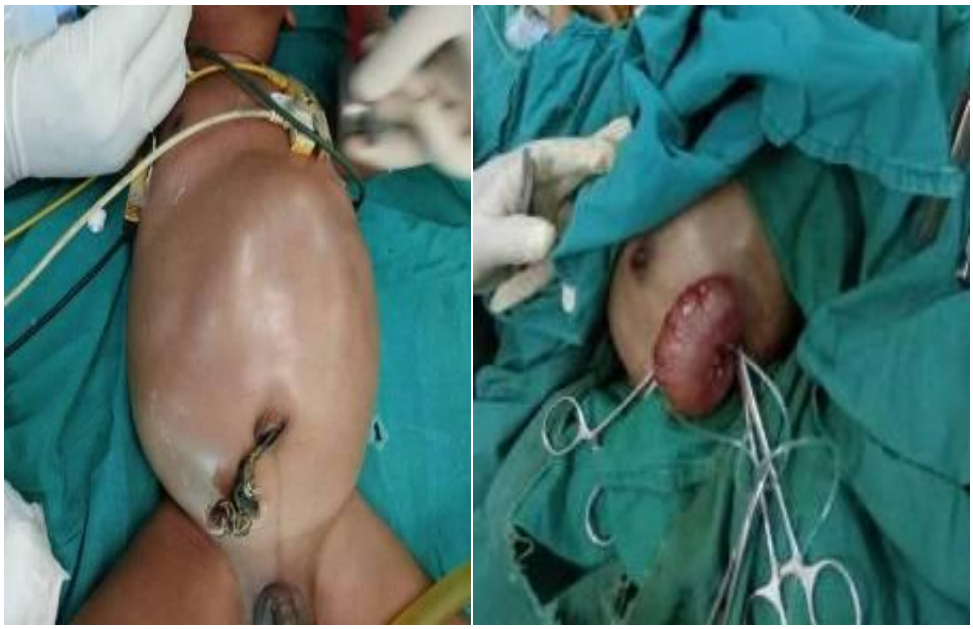

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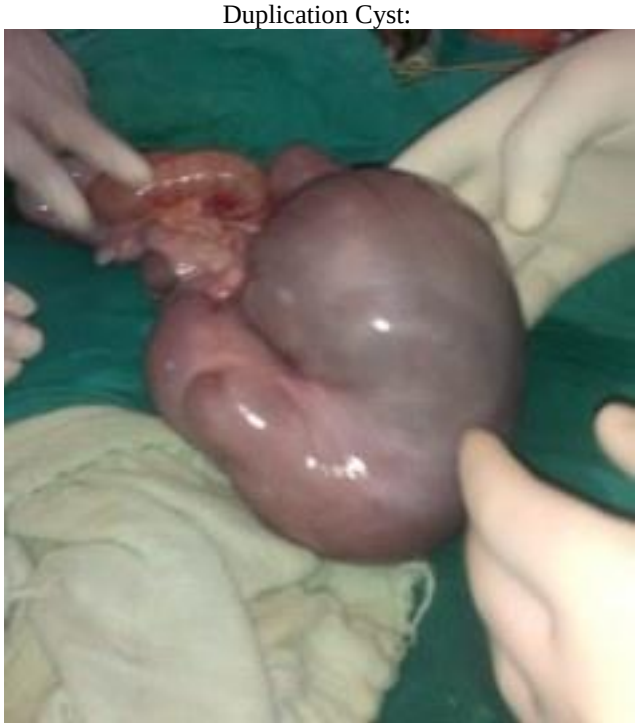

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