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IP Journal of Surgery and Allied Sciences

Journal homepage: https://www.jsas.co.in/

Case Report

Left gastroschisis presenting along with meckels diverticulum – A review

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Abstract

Background: gastroschisis is one of the variant of anterior abdominal wall defect. Gastroschisis commonly present on the right side of the umbilical cord. Left sided gastroschisis is extremely rare entity. Both right and left gastroschisis located in periumbilical region. Case report –a 1-day old male baby weighing 2300 gram admitted at our institution. His bowel was exposed and coming out through anterior abdominal wall defect. The abdominal wall defect was located left lateral to umbilical cord. Conclusion –this index case of left gastroschisis representing here due to rarity.

Keywords: Abdominal wall defect, Congenital anomaly, Gastroschisis, Left gastroschisis, Meckels diverticulum, Umbilical cord

Received: 11-04-2025; **Accepted:** 06-05-2025; **Available Online**: 25-07-2025

1. Introduction

Gastroschisis is defined as evisceration of the abdominal contents through defect in anterior abdominal wall without any membranous covering[1] The previously reported Incidence of gastroschisis (1981) was 1 in 4000 live birth.[2]But in last two three decades incidence of gastroschisis was increasing. The updated incidence is 1-5 per 10,000 live births.[3-5] The exact etiology of gastroschisis is not clear yet. Its incidence is multifactorial. Embryologically the abdominal wall develops by lateral mesoderm and fusion of four folds caudal, cephalic and two laterals folds. All these grow centripetal and form umbilical ring.[6] But the postulated theory for gastroschisis is vascular incidence of omphalomesenteric artery which is the culprit for this anomaly.[7] Another hypothesis is the abnormal involution of right umbilical vein. This leads to weakness of abdominal wall and evisceration of abdominal contents.[8]

2. Case Report

A 1 day old male baby weighing 2300 gram admitted with exposed bowel coming out from left side of abdominal wall defect. He was born from 35 years old third gravida mother with normal vaginal delivery. Previous two babies (1 male and 1 female) were apparently healthy. No family history of similar anomaly and no history of any medication. Mother was housewife and father was health care worker. There was a well formed umbilical cord and eviscerated bowel loops were coming out from left lower quadrant of abdominal wall defect. The exposed bowel loops were thickened, oedamatous,and congested. Inter bowel adhesion was there. Meckels diverticulum was also present in eviscerated bowel loops (**Figure 1**). His respiratory rate was 77 per minute and oxygen saturation was 91% on room air. Eviscerated exposed bowel loops were covered up by sterile plastic bag. Baby was admitted in intensive care unit and resuscitation was done. Gastric decompression was done with nasogastric tube. All base line investigations were done. After optimization, the informed written consent was taken from parents and baby was taken for possible closure of abdominal wall defect. Primary closure was done by Ventral hernia formation with simple closure of skin after reposition of eviscerated bowel loops in abdominal cavity. Prior to closure urethral catheterization done with 6 french foley catheter.

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https://doi.org/10.18231/j.jsas.2025.017

Figure 1: Showing left gastroschisis with meckels diverticum

Table 1: List of reported cases of left gastroschisis

S. no.	References	Gender	Birth weight (gm.)	Associated anomalies	Location of defect
1	Blair GK et. al, 1988[20]	M	-	NA	Left periumbilicus
2	Hirthler MA et. al, 1989[21]	F	900	Hyaline membrane disease	Left periumbilicus
3	Hirthler MA et. al, 1989[21]	M	3800	NA	Left periumbilicus
4	Toth PP et.al, 1998[22]	F	1540	NA	Left periumbilicus
5	Thepcharoennirund S, 2000[23]	F	1700	NA	Left periumbilicus
6	Thepcharoennirund S, 2000[23]	F	2450	NA	Left periumbilicus
7	Pringle KC, 2001[24]	M	2065	Left testis herniating through defect	Left periumbilicus
8	Ashburn DA et. al, 2002[25]	F	2800	NA	Left periumbilicus
9	Fraser et. al, 2002[26]	M	880	NA	Left upper quadrant
10	Ameh et. al, 2004[27]	M		NA	Left upper quadrant (flank)
11	Orpen NM et. al, 2004[28]	-	2750	Pseudoexstrophy, ASD, PDA, ureteral reflux	Left periumbilicus
12	Wang KS et. al, 2004[29]	F	-	Situs inversus	Left periumbilicus
13	YoshiokaH et. al, 2004[30]	F	2604	NA	Left periumbilicus
14	YoshiokaH et. al, 2004[30]	F	1700	Necrosis of herniated bowel	Left periumbilicus
15	Gow KW et. al, 2006[31]	M	2815	NA	Left periumbilicus
16	Parsun P et. al, 2007[32]	F	-	Multicystic renal dysplasia	1.5 cm left lateral to umbilicus
17	Suver D et. al, 2007[33]	F	3100	Absent corpus callosum, optic dysplasia, panhypopituitarism, intestinal atresia	Left periumbilicus
18	Suver D et. al, 2007[33]	F	2200	Cerebral arteriovenous malformations	Left periumbilicus
19	Suver D et. al, 2007[33]	F	2200	ASD, Pulmonary valve stenosis	Left periumbilicus
20	Punia RPS et. al, 2009[34]	M	1000	Meromelia of all four limbs	
21	Patel R et. al, 2010[35]	F	2160	Small left colon syndrome	Left periumbilicus
22	Maurel A, et. al , 2010[36]]	M	2010	NA	Left periumbilicus
23	Maurel A, et. al , 2010[36]	M	2350	NA	Left periumbilicus
24	Shi Y et. al, 2012[37]	M	1920	Liver/Stomach/Spleen herniation, VSD, scoliosis, small chest	Left upper quadrant

25	Mandelia A et. al, 2013[38]	M	2260	PDA	Left periumbilicus
26	Patel RV et. al, 2013[39]	M	2740	Hypoplastic left hemiscrotum, atrophic left testis	Left periumbilicus
27	Sowmya M, ET AL, 2014[40]	M	Delivered dead	spinal and limb deformities	Left periumbilicus
28	Hombalker NN et. al, 2015[41]	M	2400	Cecal agenesis, short gut, malrotation	Left periumbilicus
29	Shin JH et. al, 2015[42]	M	1970	PDA, ASD, Peripheral pulmonary stenosis	Left periumbilicus
30	Singh AP et. al, 2017[43]	F	2000	Meckel's diverticulum	Left lower quadrant
31	Rahul SK et. al, 2017[43]	F	2000	Intestinal atresia, perforated proximal ileum	Left periumbilicus
32	Kalenga NC, 2017[44]	F		NA	Left periumbilicus
33	Soomro S, 2017[45]	F	1700	NA	Left periumbilicus
34	Ethan A. Litman et. al, 2018[46]	F	1910	Persistent superior vena cava, Left talipes equinovarus deformity, hypoplastic right third digit, right supernumerary 4th/5th digit	Left periumbilicus
35	Nam MF, et. al, 2018[47]	F	1965	Situs inversus totalis	Left periumbilicus
36	Sullivan K, et. al, 2018[48]	F	2300	optic nerve hypoplasia, pituitary hypoplasia, and midbrain defects	Left periumbilicus
37	Kumar P, et. al, 2019[49]	-	1400	NA	Left periumbilicus
38	Muta Y, et al, 2020[50]	F	2606	NA	
39	Muta Y, et al, 2020[50]	M	2014	Umbilical hernia	
40	Masden T, et. al, 2020[51]	F	2606	omphalocele	Left upper quadrant
41	Cannon R, et. al, 2021[52]	F	3290	mild laryngeal cleft, kidney size bilaterally small for age	Left periumbilicus
42	Danso P, et. al, 2021[53]	F	3000	Bifid umbilical cord	Left periumbilicus
43	Dinesh Kumar Barolia et. al., reporting case	M	2300	Meckels diverticulum	Left lower quadrant

NA – No association or not mention in literature
ASD – Atrial septal defect
VSD – ventricular septal defect
PDA – Patent ductus arteriosus

Unfortunately, on post-operative day two, baby expired. Baby was expired due to septic shock. Echocardiogram, renal scan was not possible postoperative due to poor general condition and bed side facility was not here. So, associated anomalies were not confirmed with this patient.

3. Discussion

Gastroschisis a congenital anomaly dealt by paediatric surgeon. The factors affecting the incidence of gastroschisis are low maternal age, maternal smoking, and consumption of vasoactive drugs (like nicotine, cocaine and pseudoephedrine)[9-11] The associated anomalies with gastroschisis is intestinal atresia (most common, 6.9%-28% incidence), meckels diverticulum, limb abnormalities, abnormal genitalia, umbilical cord anomalies etc.[12-16]Ahmed Elrouby et.al. reported gastroschisis as usual right side of cord, associated with malrotation and meckels diverticulum.[17] In this reporting case exposed bowel contains meckels diverticulum, and an unusual presentation.

The gastroschisis is classified in to two groups on the basis of risk (1) simple gastroschisis – low risk group and (2) complex gastroschisis – high risk group. The complex gastroschisis present with intestinal perforation, atresia, volvulus, gangrene gut or stenosis.[18] The occasional associated anomalies with gastroschisis other than gastrointestinal tract are pulmonary agenesis, hypoplasia, dysplasia and cardiac anomalies. Patent ductus arteriosus is the most common associated cardiac anomaly and other are atrial septal defect, ventricular septal defect. Undescended testis is common urogenital anomaly compare to hydronephrosis.[19]

A Paediatric surgeon deals so many cases of gastroschisis in his life but Left gastroschisis is less common to deal. Usually the defect in gastroschisis present right side of umbilical cord. It is common in male.[1] We go through the online medical literature and found that only 42 cases of left gastroschisis were reported from 1988 to till now.[13,20-53] We enlisted all reported case of left gastroschisis in a table with their possible available data about patients.(**Table 1**) According to reported cases left gastroschisis is more common in female. Maximum left gastroschisis located left side of umbilical cord in periumbilical region. Two cases of left gastroschisis presenting in left upper quadrant were reported till now[27,37] and one case in left lower quadrant.[13] We are reporting here left gastroschisis in left lower quadrant with association of meckels diverticulum.(**Table 1**)

Not only delayed arrival of baby but also improper transportation of gastroschisis case is also a cause of morbidity and mortality of these patients.[54]Primary closure of defect just after delivery and silo approach for secondary closure is the ideal approach for surgical management.[55] All these approach should be done just after delivery can improve the survival at our scenario. After and during surgical correction multidisciplinary approach is required for management of short bowel syndrome, malabsorption syndrome.[56]

4. Conclusion

This index case of left gastroschisis associated with meckels diverticulum reported here for its extremely low incidence.

5. Source of Funding

None.

Conflict of Interest

None.

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Cite this article: Barolia DK, Kumar A. Left gastroschisis presenting along with meckels diverticulum – A review article. *IP J Surg Allied Sci.* 2025;7(2):80-84.