Symptomatic presentation and management of omphalomesenteric duct remnants in infancy

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Abstract

Background: Omphalomesenteric duct (OMD) is a normal communication between umbilicus and developing midgut during embryonic life.

Objective: To determine symptomatic presentation and management of Omphalomesenteric duct remnants in infancy.

Methods: This was a cross sectional study that was performed on patients referred or brought to our Peads Surgery department at DHQ teaching hospital, Sahiwal with either symptomatic umbilical anomalies or intestinal obstruction or peritonitis which proved to be due Omphalomesenteric duct (OMD) remnants. Overall, 17 patients under 1 year were enrolled during the period of September 2016 to October 2018. They were received either through emergency or paediatric surgery clinic. Data was analyzed by using SPSS version 16.

Results: Overall 17 patients were reviewed in total, and 12 (70.58%) presented upto the age of 6 months. Patent omphalomesenteric duct was the commonest diagnosis 7 (41.17%), either presented with ileal prolapse or fecal discharge. 7 (41.17%) patients presented with umbilical discharge proved to be umbilical granuloma and umbilical polyp. Other modes of presentation were peritonitis and intestinal obstruction. Patients with patent OMD and Meckel's diverticulum (n=10) were managed through resection and anastomosis (58.82%) by performing mini laparotomy. Post operative outcome was fairly good in our series with one death (5.88%) and two wound infections (11.76%).

Conclusion: OMD remnants may be symptomatic or asymptomatic. Umbilical anomalies due to OMD remnants are picked up early and their timely management results into excellent outcome while intra abdominal remnants are usually diagnosed late and have considerable morbidity and mortality.

Keywords: Omphalomesenteric duct, Vitellointestinal duct, Granuloma, Meckel's diverticulum

Introduction

Omphalomesenteric duct (OMD) or vitellointestinal duct (VID) is a normal communication during embryonic life between the yolk sac and the primitive midgut. The OMD is closed following its resorption during the 8th or 9th week of pregnancy.[1] Sometimes resorption fails to complete partially or entirely among 2% of the population. The remains of OMD may not show any symptoms throughout life or cause various abnormalities like umbilicoileal fistula, patent omphalomesenteric duct (POMD) or patent vitellointestinal duct (PVID), umbilical sinus, Meckel's diverticulum, umbilical cyst, umbilical mucosal polyp , umbilical granuloma or a fibrous cord which connects the ileum to the umbilicus.[2] In addition to umbilical anomalies some other forms of presentation include intestinal obstruction, acute abdomen, and painless rectal bleeding. Umbilical anomalies are usually present in infancy and other symptoms show up later in childhood.[3]

Sometimes Meckel's diverticulum and omphalomesenteric cyst are lined by hetrotopic gastric mucosa and secrete hydrochloric acid; but, the presence of hetrotopic gastric mucosa has not been reported in patent omphalomesenteric duct (POMD). Umbilical discharge in infants is an important presentation of OMD remnants. There are many causes of umbilical discharge, the commonest one is umbilical granuloma which treated with chemical cauterization. If symtoms do not settle down despite chemical cauterization we have to look for other causes like POMD or patent urachus.[4] The quantity and character of the umbilical discharge may indicate origin of the lesion.[4,5] Omphalitis is identified by purulent discharge from the umbilical cord stump and bleeding. Due to delayed obliteration of the umbilical vessels bleeding may occur.[4] Clear or yellowish drainage is hallmark of urachal anomaly, whereas an omphalomesenteric duct remnant manifests as feculent drainage. The urachus is a structure which extends from the bladder part of the cloaca to the umbilicus, which normally involutes and is also called remnant of allantois.[6] If the drainage is not caused by infected granulation tissue, it may be due to patency of either OMD or VID. For patent OMD diagnosis can be confirmed

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with the help of contrast study through sinus or stoma at umbilicus. It would identify whether there is intraperitoneal communication with the bowel or extraperitoneal with the urinary tract. Some other investigations include ultrasound and Meckel's scan. Ultrasound is the firstline investigation to detect congenital anomalies affecting the umbilicus.[7,8] Management varies according to the type of anomaly and mode of presentation.[9] The objective of this study was to detect different modes of presentation in infancy, its management and outcome.

Methodology

This was a cross sectional study conducted on 17 cases of Omphalomesenteric duct remnants either diagnosed at the time of presentation or after exploration carried out in DHQ Teaching Hospital Sahiwal, from September 2016 to October 2018. Patients under 1 year only were included in this study. Medical records of all patients were analyzed for age at presentation, mode of presentation, final diagnosis, management and outcome. Patients with symptomatic umbilical anomalies included umbilical granuloma, umbilical polyp, patent OMD with or without ileal prolapse, intestinal obstruction and peritonitis. Umbilical granuloma were cauterized with silver nitrate while umbilical polyp was excised through transumbilical incision. Patent OMD was managed through infra umbilical approach by resection anastomosis and cases of intestinal obstruction and peritonitis were dealt through traditional laparotomy. Ethical approval was sought from ethical committee. Data was entered and analyzed by using SPSS version 16.

Results

A total of 17 patients were analyzed with respect to male and female ratio which was found to be 1 : 0.7 (males n= 10, females n= 7). Most of the patients presented till the age of 6 months 12 (70.58%) while only 5 (29.41%) beyond 6 months. (Table I). In this study, 7 (41.17%) were diagnosed as POMD 5 (29.41%) umbilical granuloma. 3 (17.64) Meckel's diverticulum, and 2 (11.76%) umbilical polyps. (Table-II) Most common presentation of POMD was fecal discharge 4 (57.1%) and 2nd most common presentation was ileal prolapse 3 (42.85%). Other presentations were umbilical discharge, intestinal obstruction and peritonitis (Table II). One out of 17 (5.88%) patients died due to sepsis and 2 (11.76%) got wound infection which settled after daily dressing.

Table I: Age and sex distribution

Variable	Number	Percentage
< 1 month	6	35.29%
Upto 6 months	6	35.29%
> 6 months	5	29.41%
Males	10	58.82%
Females	7	41.17%

Table II: Mode of presentation management

Diagnosis	Presentation	No	%	Management
POMD	Fecal discharge	4	23.52	Resection and anastomosis
POMD	Ileal prolapse	2	11.76	Resection and anastomosis
POMD	Ileal prolapsed with intussuception	1	5.88	Resection and anastomosis
Umbilical Granuloma	discharge	5	29.41	Chemical cauterization
Umbilical Polyp	Bloody discharge	2	11.76	Transumbilical excision
Meckel's diverticulum	Intussuception	1	5.88	Resection and anastomosis
Meckel's Diverticulum with band	Volvulus	1	5.88	Resection and anastomosis
Perrforated Meckel's Diverticulum	Peritonitis	1	5.88	Resection and anastomosis

Discussion

Among the number of congenital anomalies resulting from the persistence of a part of omphalomesenteric duct which is mostly connected to the ileum and in rare cases to the appendix, the most common is Meckel's diverticulum.[3] Sometimes, part of the vitelline enterocyst, or a fibrous band connects ileum to the umbilicus.[3] These abnormalities occurring in approximately 2% of the population either remain dormant during entire lifespan or present with intra abdominal catastrophes like intussusceptions, volvulus or peritonitis.[9] Meckel's diverticulum is sometimes attached to the umbilicus by a fibrous cord or by a fibrous band between the ileum and the umbilicus and may result into intestinal obstruction. Herniation or prolapse of the bowel through a patent omphalomesenteric fistula at the anterior abdominal

wall is a rare occurrence in neonatal period.[9,10] Our 7 (41.17%) patients presented with features of patent OMD either ileal prolapse or fecal discharge and 2 (11.76%) with features of intestinal obstruction. Meckel's diverticulum was found in 3 (17.64%) preoperatively, one of them presented with features of peritonitis due to perforated Meckel's diverticulum, one with intussusception and another with small bowel obstruction. A retrospective analysis of 217 children with OMD anomalies demonstrated that approximately 40% of these lesions were symptomatic, and among these, 80% presented in first 2 years of life.[3] In another retrospective study, 59 children presented with a symptomatic OMD remnant during a period of 17 years. 36% of the patients presented with intestinal obstruction, 31% acute abdomen, 29% umbilical abnormalities, and 5% rectal bleeding.[11]

It is not possible to predict beforehand which one of the patent OMD cases will develop such complication. The mechanism of ileal intussusceptions is also very difficult to be explained into the patent OMD, but two mechanismss have been described in literature; wide mouth of patent OMD and shorter distance between OMD and ileocecal valve in infancy which leads to higher intraluminal pressure.[5,11] The diagnosis of a patent OMD anomaly is based on the history of type of discharge from the umbilicus and physical examination. Newborns with obstructive symptoms should be resuscitated as rapidly as possible to obviate the need for ischemic bowel resection. Those with significant hemorrhage should be transfused.[12] The principle of surgical management is a reduction of the intussuscepted bowel along with complete excision of the vitelline duct and restoring the ileal continuity as well as umbilical reconstruction. Three surgical approaches are described, i.e., infraumbilical, supraumbilical, or through the umbilicus.[12,13] The incision chosen varies with the symptoms and the age of the patient. Newborns with feculent umbilical drainage or prolapse of the omphalomesenteric duct remnant can be explored by a small infraumbilical incision. We followed the above given recommendations of literature for diagnosis and management. Umbilical granulomas were treated with chemical cauterization, 2 out of 5 needed two sessions. Umbilical polyps were initially treated with chemical cauterization but did not respond. So they were excised through intra umbilical approach. Intraumbilical excision of umbilical polyp has been mentioned by many authors. Zejiofor IF et al mentioned that umbilical polyp is different from umbilical granuloma and definite management is intraumbilical excision.[14] Pacilli et al. also showed that surgical excision is adequate and that inspection and probing of the base of the polyp after its excision is not necessary.[15] He did exploration of the abdominal cavity in 6 patients with umbilical polyp suspected to have an associated OMD anomaly, and none had OMD anomaly associated with it. His 7 patients who did not undergo exploration of the peritoneal cavity remained asymptomatic after 5.8 years of follow-up.[15] All other cases of ileal prolapse, fecal discharge and intestinal obstruction were explored through supra umbilical mini laparotomy and resection anastomosis was done. One patient with peritonitis died (5.88%) due to sepsis and there were two wound infections (11.76%) in our series which settled after repeated dressings. As mentioned by Ameh EA,[16] the prognosis is generally good except omphalitis associated with VID anomalies. There may be significant morbidity if presentation is delayed or patient already in sepsis. Two patients died in their series due to umbilical sepsis.[16] The sample size was small due to unavailability of this rare condition.

Conclusion

Omphalomesenteric duct remnants may present just after birth or may stay silent for months to years. Presentation may be just a symptomatic umbilical lesion like umbilical polyp, patent OMD or with abdominal catastrophe due to intestinal obstruction or peritonitis which may result into high morbidity and mortality. Their timely diagnosis and management may improve the ultimate outcome. Likewise we had some mortality and morbidity due to sepsis and wound infection and this may have happened because of late presentation.

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