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Original Research Article

Hernia of the umbilical cord: a clinical spectrum

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ABSTRACT

Background: Hernia of the umbilical cord is a rare clinical entity which presents with hernia of the small bowel into the proximal part of the umbilical cord. This is sporadically associated with other congenital malformations. This is usually poorly identified and mistakenly termed as 'omphalocele minor. Inadvertent clamping of the cord in these cases leads to iatrogenic bowel wall injury. The aim of this study is to present a spectrum of cases presenting with umbilical cord hernia in a tertiary care Govt medical college, along with demography, intra operative findings, associated malformations and postoperative outcome and 1 year follow up.
Methods: This is an ambispective study on neonates who attended the Outpatient Department (OPD) or Emergency department. The babies were evaluated by age, birth weight, gender, any gross clinical malformation. They were also evaluated intraoperatively for any associated anomalies. Post-surgery the babies were followed up until 2 years of age in pediatric surgery OPD of the same institute and outcome was recorded.
Results: Out of 90 babies, 88 babies (97.77%) had body weight more than 2.5 kg, and rest 2(2.22%) had bodyweight of 1.5kg and 1.8 kg. Regarding content of contents of umbilical cord hernia, out of 87 patients, 43 patients (49.42%) had ileal loop as, 32 patients (36.78%) had ileum with Meckel's diverticulum, 6 patients (6.39%) had cecum with appendix.
Conclusions: Most of this study cases had ileal loops as content of the hernial sacs, and 36.78% cases had Meckel's diverticulum associated, which is a remnant of Vitello intestinal duct. Prompt identification of the condition and early intervention and adequate post-natal care are affective to prevent long term morbidity.

Keywords: Associated anomalies, Cecum and appendix, Congenital hernia of umbilical cord, Ileal loops, Meckel's diverticulum, Omphalocele

INTRODUCTION

The connecting stalk of the fetus develops blood vessels and fuses with the omphalomesenteric duct to become the umbilical cord approximately 7-8 weeks after conception.[1-3] By 6 weeks of gestation, two umbilical arteries and two umbilical veins exist. By 8 weeks of gestation, the right umbilical vein regresses, leaving the left umbilical vein as the single vein within the umbilical cord.[4] Hence at birth umbilical cord contains two arteries and one vein, these are covered by Wharton's Jelly, which is a gelatinous stroma, and over all surrounded by single layer of amnion. The left and right umbilical arteries are branches of left and right Internal iliac arteries respectively. The arteries carry deoxygenated blood from the fetus to the placenta and the umbilical vein carries oxygenated blood from placenta to the fetus.

Umbilical cord may be a location of various congenital anomalies related to morphology, placental insertion, number of vessels, primary tumors etc., single umbilical artery being the commonest finding.[4]

In case of congenital Umbilical cord hernia(CHUC) the umbilical ring does not close and variable portions of the intestines remain in the extracelomic cavity which present at birth as congenital hernia into the umbilical cord.[5] Unlike omphaloceles and gastroschisis, CHUC has an intact abdominal wall, a complete umbilical ring, a sac comprising of outer amnion and inner peritoneal lining and contains contents varying from loops of intestines to any movable intraperitoneal organs. Distinctively a cuff of skin is seen extending from abdominal wall onto the neck of the sac.[6] The abnormality usually takes the form of a globular, asymmetrical swelling situated at the abdominal attachment of the cord and extending into its substance. Sometimes there is a constriction between the swelling and the abdomen. In such a case a serious accident might happen, as in the case described by Victor Bonney et al, where the practitioner removed the hernial sac and its intestinal contents, consisting of small intestine, during the process of ligature and division of the cord at birth.[7]

Here we present a study with probably largest sample size on Congenital hernia of umbilical cord keeping in view the intraoperative hernia sac contents.

This is an ambispective study, carried out in a tertiary care Govt medical college in Kolkata. The time period was from January 2009 to July 2019. The aim was to evaluate the spectrum of clinical presentation, operative management, associated anomalies, outcome (mortality and morbidity) and short term follow up.

METHODS

Institutional Review Board approval and waiver of consent were taken for the study. This ambispective study was done on neonates who presented with umbilical cord hernia, who attended the outpatient department (OPD) and Emergency department of Nil Ratan Sircar Medical College and Hospital

Inclusion criteria

Patients presenting in pediatric surgery OPD and pediatric surgery emergency of Nilratan Sircar medical college and hospital, with umbilical cord hernia with the following clinical criteria were included in the study

- An intact umbilical ring.
- Absent anterior abdominal wall deficiency.
- Presence of a sac comprising an outer layer of amnion, and inner layer of peritoneum, with the contents varying from the loop of intestine to any movable intraperitoneal organ.

Exclusion criteria

- The patients not clinically presenting with the above clinical criteria, omphalocele, gastroschisis.

This is an ambispective study. Study period was of ten years (January'2009 to January 2019) in the department of Pediatric Surgery, Nil Ratan Sircar Medical College and Hospital, Kolkata, India.

A total of 40,658 patients among which 90 patients had satisfied the inclusion criteria for umbilical cord hernia

The babies satisfying the inclusion criteria of umbilical cord hernia, were admitted and evaluated by age, birth weight, gender, any gross clinical malformation. Exploratory laparotomy through was done for the babies presenting with umbilical cord hernia. They were also evaluated intraoperatively for any associated anomalies. Post-surgery the babies were followed up until 2 years of age in pediatric surgery OPD of the same institute and outcome was recorded. Retrospective Data was also collected from hospital database.

Statistical analysis

A descriptive analysis study was used for the age and sex distribution and the intraoperative contents of umbilical cord hernia.

RESULTS

Patients diagnosed to be umbilical cord hernia underwent emergency exploratory laparotomy.

Figure 1 shows intra operative content of umbilical cord hernia having ileal loop, and (Figure 2) shows the immediate postoperative picture of the reconstructed umbilicus.

Figure 1: Intra operative finding of hernia of umbilical cord showing ileal loop.

Figure 2: Immediate postoperative picture.

Birth weight

Out of 90 babies, 88 babies (97.77%) had body weight more than 2.5 kg. And rest 2(2.22%) had bodyweight of 1.5kg and 1.8 kg, as shown in (Figure 3).

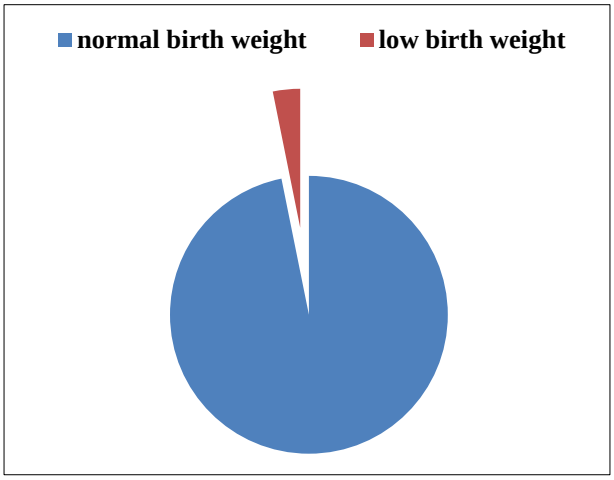

Figure 3: The birth weight distribution of umbilical cord hernia.

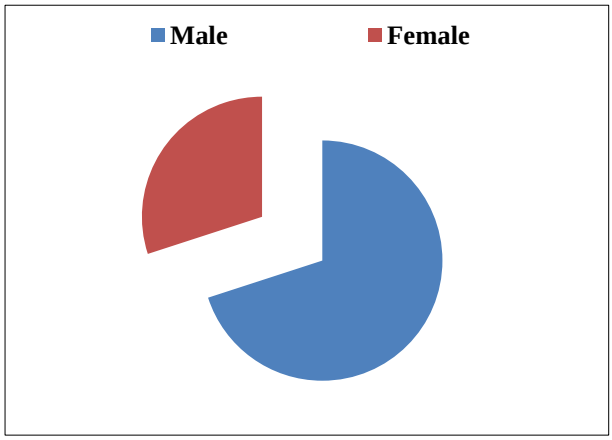

Figure 4: The gender wise distribution of umbilical cord hernia.

Gender distribution

Out of 90 patients, 63(70%) patients were male and 27(30%) patients were female, as shown in (Figure 4).

Mortality of 3 patients (3.33%) out of these 90 babies expired pre, intra or during post-operative follow up as shown in (Figure 5).

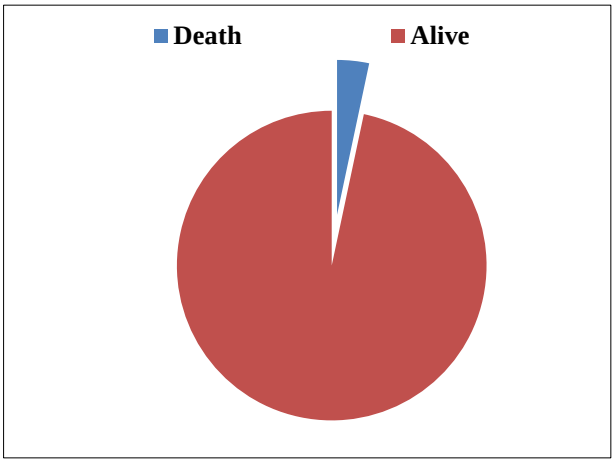

Figure 5: The mortality distribution of umbilical cord hernia.

Intraoperative findings

Out of 87 patients (excluding 3 expired babies), who underwent surgery, the following contents of the hernia sac were recorded (Figure 6).

Statistically 43 patients (49.42%) had ileal loop, 32 patients (36.78%) had ileum with Meckel's diverticulum, 6 patients (6.39%) had cecum with appendix, 3 patients (3.44%) hadileal loop with type 1 atresia and ileum with Meckels diverticula with gangrene.

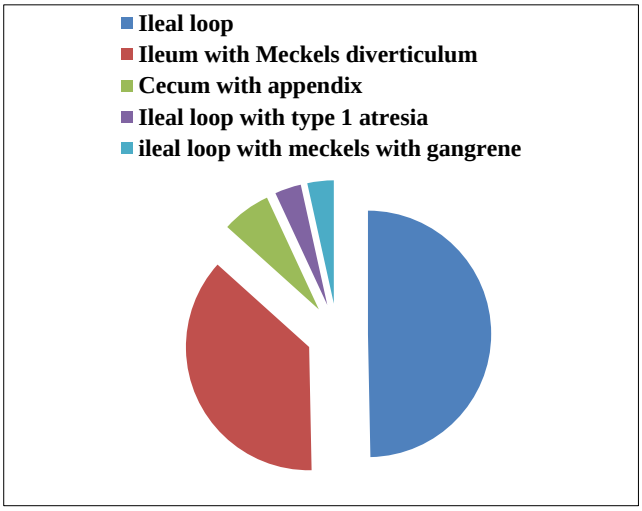

Figure 6: The intraoperative findings of umbilical cord hernia.

Associated findings

Among these 87 patients, there were 2 cases of bilateral undescended testis, 5 babies were diagnosed with Down Syndrome on follow up.

DISCUSSION

Umbilical cord hernia occurs at a specific embryological stage, and the cause of failure of return of gut into coelomic cavity is still obscure. Animal experiments and clinical scenarios have clearly described the etiopathogenesis of intestinal atresia's. Outcome is variable depending on the coexisting anomalies.

Rahul Gupta et al, reported a case of congenital hernia of umbilical cord associated with type 3 Ilealatresia.[8] Author received 3 patients with type 1 ileal atresia, who were operated. Kamalesh Pal reported a case of umbilical cord hernia with extracelomic colonic atresia with perforation of gut.[9] 3 patients in this study were found to have gangrene of ileal loop. Bilal Mirza et al, published a case series on 3 cases of umbilical cord hernia, one case was associated with in-utero evisceration of entire small bowel through the presumably ruptured hernia of umbilical cord and other two cases had associated patent vitello intestinal duct.[10] Most of this cases had ileal loops as content of the hernial sacs, 36.78% cases had meckels diverticulum associated, which is a remnant of Vitello intestinal duct. With prompt identification of the condition and early intervention and adequate postnatal care, mortality was reduced to 3.33%, as mentioned in this study.Achiron et al, has showed that umbilical cord hernia occurs at early embryological stage and this is detectable at early 2nd trimester on antenatal USG, however this study did not have any of our cases being diagnosed by antenatal USG.[11] There is no study in literature with such a vast experience of this rare entity of umbilical cord hernia. This study highlights the benefits of awareness of umbilical cord hernia among the gynecologists, early diagnosis and intervention by the pediatric surgeons to be beneficial for the neonates with a curable condition of umbilical cord hernia.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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