

Acquired anterior abdominal wall defect in a neonate following umbilical catheterization: a case report

Chukwubuike Kevin Emeka^{1*}; Eze Thaddeus Chikaodili²

¹Pediatric Surgery Unit, Department of Surgery, Enugu State University Teaching Hospital, Enugu, Nigeria.

²General Surgery Unit, Department of Surgery, Enugu State University Teaching Hospital, Enugu, Nigeria.

Received Date : Nov 30, 2021
Accepted Date : Jan 18, 2022
Published Date : Jan 25, 2022
Archived : www.jcmimagescasereports.org
Copyright : © Chukwubuike Kevin Emeka 2022

***Corresponding Author:** Chukwubuike Kevin Emeka, Department of Surgery, Enugu State University Teaching Hospital, Enugu, Nigeria.
Email: chukwubuikeonline@yahoo.com

Abstract

Background: Congenital anterior abdominal wall defects are well known clinical entities. However, acquired abdominal defects are uncommon.

Case summary: A newborn baby was admitted into the newborn special care unit of a tertiary hospital on account of prematurity. There was no abdominal defect at presentation but developed an abdominal wall defect following the course of treatment which included umbilical vein catheterization. Non-operative treatment (serial bandaging) was effective in the treatment of the acquired abdominal defect.

Conclusion: Acquired anterior abdominal wall defect can result from minor trauma such as umbilical vein catheterization. We suggest that acquired abdominal wall defect should be added to the list of complications that may result from umbilical vein catheterization.

Introduction

Gastroschisis and omphalocele represent the 2 most common congenital abdominal wall defects in the newborns [1]. Gastroschisis is characterized by a full thickness paraumbilical abdominal wall defect with associated evisceration of the bowel and sometimes solid intra-abdominal organs. The umbilical cord is normally sited on the abdominal wall. Gastroschisis is believed to result from involution of the right umbilical vein [2]. In omphalocele, the abdominal defect is covered by a membranous sac consisting of 3 layers: peritoneum, Wharton's jelly and amnion. The umbilical cord inserts at the apex of the sac. Omphalocele result from incomplete closure of the ventral abdominal wall before the ninth week of gestation [3]. In contrast, acquired abdominal wall defect may result from trauma to the anterior abdominal wall following an intervention (inadvertent or intentional). The trauma required to cause the defect on the abdominal wall could be low energy or high energy [4]. The low energy trauma may be in the form of traumatic catheterization of the umbilical vein which may cause separation of the layers of the anterior abdominal wall leading to an abdominal wall defect. We report a case of an acquired anterior abdominal wall defect in a neonate resulting from traumatic umbilical vein catheterization. A literature

search and to the best of our knowledge, there is no report of such abdominal wall hernia in a neonate following umbilical vein catheterization. The focus of this article is to highlight the complications that may follow umbilical vein catheterization and the need to draw the attention of the neonatologist and clinicians to this entity.

Case summary

A day old male neonate was presented to the neonatal unit of a tertiary hospital with a history of premature delivery at 33 weeks following an emergency caesarean section on account of pre-eclampsia. Prior to delivery, the mother of the child was admitted for one week due to raised blood pressure. However, the blood pressure was rising and uncontrollable necessitating operative delivery. The neonate was a product of preterm gestation, born by a 37-year old para-5 mother. The baby cried spontaneously at birth, passed meconium within 24 hours of postnatal life but suckles the breast poorly. The baby was delivered in a peripheral hospital and was referred to Enugu State University Teaching Hospital (ESUTH) Enugu on account of the prematurity. The mother booked for antenatal care at a gestational age of 20 weeks and there was no history of ingestion of herbal concoction in early pregnancy. She took routine antenatal drugs that contain iron and folic acid. The

Citation: Chukwubuike Kevin Emeka, Eze Thaddeus Chikaodili. Acquired anterior abdominal wall defect in a neonate following umbilical catheterization: a case report. J Clin Med Img Case Rep. 2022; 2(1): 1069.

mother had no skin rashes or foul smelling vaginal discharge during pregnancy and she is not a known diabetic.

At the initial evaluation at ESUTH, he had a temperature of 35.6 degrees Centigrade, respiratory rate of 40 cycles per minute, heart rate of 140 beats per minute, occipitofrontal circumference (OFC) of 30 centimeter (cm). His weight was 2.1 kilograms. The fontanelles were patent and normotensive. No abdominal wall defect was present at admission. A diagnosis of moderate prematurity was made. Laboratory investigations showed no abnormality in the hemogram and serum chemistry. Umbilical vein catheterization was done for venous access. At the eighth day following the umbilical catheterization, an anterior abdominal swelling was noticed which was not present at presentation (Figures 1, 2, 3, 4, 5). There was no associated bowel or urinary symptoms. Examination of this swelling showed a fascial defect (8cm by 4 cm) in the midline of the anterior abdominal wall with bowel herniating from the defect. The swelling was soft in consistency, non-tender and reducible with an intact skin. A diagnosis of acquired abdominal defect (traumatic abdominal wall defect) was made. The umbilical catheter was removed and the neonatologist continued their care through a peripheral vein. The pediatric surgical unit placed the neonate on serial bandaging to support the anterior abdominal wall and the swelling resolved/healed in 6 weeks (Figure 6). The baby is currently being followed up in the clinic and there is no evidence of any abdominal wall defect.



Figure 1: AP view of the abdominal defect (blue arrow).



Figure 2: Lateral view.

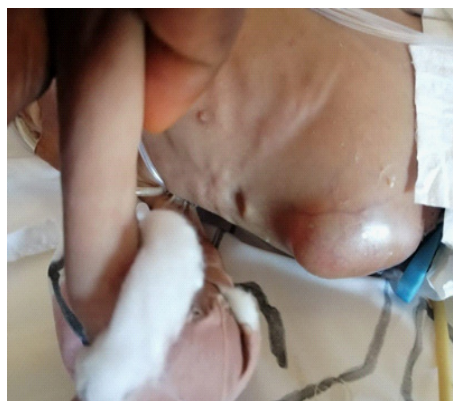


Figure 3: Lateral view (Baby lying on the side).



Figure 4: Lateral view from above.



Figure 5: Focused view of the abdominal swelling.



Figure 6: After 6 weeks.

Discussion

An acquired abdominal wall defect following abdominal trauma in a neonate is a form of traumatic abdominal wall hernia. This type of hernia is a rarely described type of hernia resulting from trauma to the abdomen [5]. Some authors have defined traumatic abdominal wall hernia as herniation of an abdominal organ or bowel through a disruption of the musculature and fascia resulting from trauma with no evidence of skin penetration or pre-existing hernia [6, 7]. Shearing and separating effects of the umbilical catheter on the abdominal wall may be the etiological factor responsible for the hernia. Historically, the entity of abdominal wall hernia resulting from trauma is not new. It was first described by Shelby more than a century ago [7]. The detection of acquired abdominal wall hernia in a neonate may be clinical as well as radiological depending on the size of the defect. In the index patient, the size was significant such that the diagnosis was made clinically. The defect in the abdominal wall could be palpated clinically. However, in less obvious hernias the diagnosis is only made through imaging or at laparotomy [5]. The size of the hernia may be related to the severity of the trauma [4]. A computed tomography (CT) grading system has been proposed by some authors to define the different degrees of abdominal wall disruption [8]. Due to the rarity of this condition in neonates, there is no established protocol for the treatment of this acquired anterior abdominal wall defect in a neonate. In our patient, non-operative treatment was adopted. This non-operative treatment involved serial bandaging, urethral catheterization and prevention of constipation. The principle of this modality of treatment is the avoidance of increased intra-abdominal pressure which allows the approximation and healing of the muscles and fascia. The high level of growth hormones in infants facilitates this healing process. However, where non-operative treatment fails, there is a place for operative treatment of the ventral hernia that results. In adults with traumatic abdominal wall hernia, there is no role for non-operative treatment. Adults require primary surgical repair or use of prosthetic material (mesh).

Conclusion

Umbilical catheterization is not free of complications. A traumatic abdominal wall hernia (acquired abdominal wall defect) can result following umbilical vein catheterization. Non-operative management is successful in neonate. We suggest that acquired abdominal wall defect should be added in the list of complications that may result from umbilical vein catheterization.

References

1. Christison-Lagay ER, Kelleher CM, Langer JC. Neonatal abdominal wall defects. *Seminars in fetal and neonatal medicine*. 2011; 16:164-172.
2. Oakes MC, Porto M, Chung JH. Advances in prenatal and perinatal diagnosis and management of gastroschisis. *Semin Pediatr Surg*. 2018; 27(5):289-299.
3. Bielicki IN, Somme S, Frongia G, Holland-Cunz SG, Vuille-Dit-Bille RN. Abdominal wall defects-current treatment-Current Treatment. *Children (Basel)*. 2021; 8(2):170.
4. Holzheimer RG. Traumatic abdominal wall hernia 14 years after a bad fall with lumber spine fracture. *Eur J Med Res*. 2008; 13(10):487-492.
5. Al Beteddini OS, Abdulla S, Omari O. Traumatic abdominal wall hernia: A rare report and literature review. *Int J Surg Case Rep*. 2016; 24:57-59.
6. Damschen DD, Landercasper J, Cogbill TH, Stolee RT. Acute traumatic abdominal hernia: case report. *J Trauma*. 1994; 36(2):273-276.
7. Liasis L, Tierris I, Lazarioti F, Clark CC, Papaconstantinou HT. Traumatic abdominal wall hernia: Is the treatment strategy a real problem? *J Trauma Acute Care Surgery*. 2013; 74(4):1156-1162.
8. Dennis RW, Marshall A, Deshnukh H, Bender JS, Kulvatunyou N, Less JS et al. Abdominal wall injuries occurring after blunt trauma: incidence and grading system. *Am J Surg*. 2009; 197(3):413-417.