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Case Report

Retrieval of Broken Umbilical Venous Catheter Fragment in a VLBW Neonate

Md Habibullah SK[1], Bijan Saha[2], Ashadur Zamal[3], Sayantan Saha[4]

[1] Senior Resident, Department of Neonatology, IPGME & R and SSKM Hospital, Kolkata 700020, India.
[2] Associate Professor, Department of Neonatology, IPGME & R and SSKM Hospital, Kolkata-700020, India.
[3] Post doctoral Trainee, Department of Neonatology, IPGME&R and SSKM Hospital, Kolkata 700020, India.
[4] Divisional Medical Officer, B.R. Singh Hospital, Kolkata, India.

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Corresponding Author
Bijan Saha
Department of Neonatology,
IPGME&R and SSKM Hospital,
Kolkata- 700020, India.
Email ID: bijansaha18@gmail.com

Abstract

Fracture of umbilical venous catheters is a serious uncommon complication. We are reporting a 31+4 week male neonate weighing 1390 gm with a broken umbilical venous catheter and successful retrieval of the catheter by an open surgical technique.

Introduction

Umbilical venous catheter (UVC) is commonly inserted in critically ill and preterm newborns to facilitate clinical care. High osmolarity fluid, medication, and blood products are administered through the catheter.[1] Many unavoidable complications can occur with umbilical venous catheters which include thrombus formation, infection, and fractured catheter fragments.[2,3] Herein, we describe a neonate with a broken UVC lodged in the umbilical vein and its uneventful removal.

Case Report

A 31^{+4} week male neonate weighing 1390 gm was referred on eigth day of life from another hospital to our NICU because of a broken UVC. He was admitted for prematurity and early onset sepsis where a 5 Fr UVC was inserted during the initial days of his stay for intravenous medications and parenteral nutrition. During the removal of umbilical venous catheter, accidentally some portions of it got broken and remained inside abdomen.

A plain X-ray abdomen showed a 6 cm of broken fragment of the UVC lying in the umbilical vein (Fig 1). And a transcatheter retrieval of the broken fragment was planned by Paediatric cardiology team and the baby underwent cardiac catheterization. An informed written consent was obtained from the patient's parents for the procedure. Following percutaneous insertion of a 5 Fr sheath into right femoral vein, a 5 Fr JR catheter with a 0.035 inch guidewire was introduced into the femoral vein and advanced to the inferior caval vein (IVC). But it was not possible to grasp the distal end of the broken segment by snare as it was supposedly trapped within the liver structure. So, the procedure was aborted.

Figure 1: X-ray chest and abdomen showing the fractured segment of UVC

Figure 2: The removed broken part

Then an exploration by a supra umbilical transverse incision was attempted on next day in the operating room. After exploration it was observed that distal tip of the UVC was present in the peritoneal cavity by piercing the venous wall. Then the catheter was retrieved successfully through the peritoneal cavity. (Fig 2)

The baby did not have any further complications during his NICU stay and was discharged uneventfully on 32 days of life.

Discussion

Despite the clinical utility of UVC, adverse events may occur both during catheter insertion and removal. Breaking of UVCs are rare, but can be a dreadful situation. This has been very uncommonly reported in the newborn period. The literature includes few reported cases of percutaneous or surgical retrieval of a broken UVC.[4–7] A major issue in percutaneous retrieval of any foreign body in such fragile neonates is vascular access. Though access with larger sheath may help in retrieval of the foreign body, there are high chances of local vascular complications. Surgical removal is an alternative option.

Gasparis et al described a successful removal of a dislodged UVC through the umbilical vein using endovascular Amplatz loop snare.[7] We also reported successful retrieval of a broken UVC lodged within both right atrium and left atrium by this minimally invasive route.[8] In this case also, we tried transfemorally through a 5 Fr JR catheter with help of a 5 Fr sheath and a Gooseneck snare by the paediatric interventional cardiologist but this attempt failed. Then under general anesthesia supra umbilical transverse incision was done. It was revealed after exploration that distal tip of the broken fragment of UVC had actually pierced the umbilical vein and hence its removal was possible through the peritoneal cavity.

To our best knowledge, a total of 34 cases were reported since 1970 including our case. Their gestational age ranged from 25 weeks to 40 weeks and birth weight from 630 gm to 4400 gm. Intervention through femoral catheterization was done in 56% cases while in the rest of the cases the broken part was removed by open surgery. The most reported sites of dislodgement were left superior pulmonary vein, left atrium, right atrium, right ventricle and IVC. To the best of our knowledge, there were no reported cases of displacement within the peritoneal cavity. The endovascular retrieval techniques are the preferred mode if the distal catheter tip lie within the IVC or beyond. But if the catheter tip lies within the liver structure or in the peritoneum, such attempts might unsuccessful. Hence, one should first see the location of the dislodged catheter before taking a decision of endovascular technique or surgical approach.

The proposed mechanism of UVC breakage has been discussed by Choi et al.[9] He proposed that it is possible that the UVC can get inadvertently damaged by needles or scissors during catheter insertion and fixation. As a standard practice one should always inspect the tip of the removed catheter for checking that its intactness and also if needed to insist for a check radiograph, since small broken fragment tip from these long catheters can be overlooked and missed.

Conclusions

In the advanced care of preterm neonates, umbilical venous catheterization is a necessity. Even with utmost care, few complications cannot be avoided. Fractured catheter fragments are one of them. Our case is the first case reported from the LMICs wherein a broken and displaced UVC in the peritoneum was retrieved successfully. For retrieval of catheter in such situation, an open surgical technique can be used, else endovascular retrieval techniques should be opted where catheter tip lie in the IVC and beyond

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