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## Letter to the Editor

### Retained Umbilical Venous Catheter: A Preventable Complication

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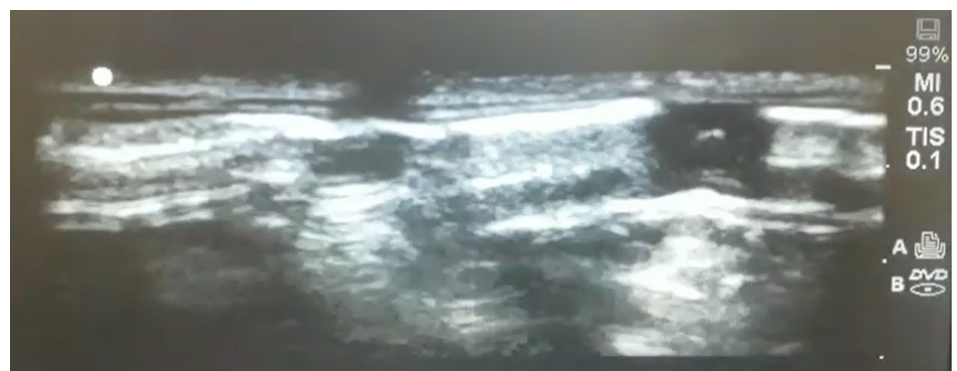
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To the editor,

Umbilical venous catheter (UVC) is a widely used venous access device in neonates of any gestational age due to the immediate accessibility of the umbilical vein and the simplicity of the procedure of its placement. Several complications of UVC have been reported, including the thrombotic and infective ones, its dislodgement, and embolization. [1] Retained UVC is an uncommon complication and needs prompt intervention to prevent its migration. We present a case of retained UVC and the algorithm for managing such cases.

A 7-day premature male weighing 2.1 kg was brought to the emergency with a retained UVC, inserted at another center. He had a normal vaginal delivery at 35 weeks of gestation. The UVC got transacted accidentally at the time of removal, and there was a failed attempt to retrieve it. At presentation, he was active with a normal cry and was hemodynamically stable with a pulse rate of 138/minute with regular rhythm and a blood pressure of 84/50 mm Hg. There was no respiratory distress. Local examination revealed a few silk sutures with clotted blood at the umbilicus with no visible catheter. Emergency blood investigations showed normal blood counts, electrolytes, and Prothrombin time. An emergency ultrasonogram (USG) was used to locate the catheter and its tip (**Figure 1**). A portion of the catheter was still in the upper portion of the umbilical vein. For retrieval,



**Figure 1:** Ultrasonogram showing the retained umbilical venous catheter in the umbilical vein.

through a small supraumbilical incision, the umbilical vein was approached; the entire umbilical catheter could be palpated, manipulated down, and successfully retrieved (**Figure 2a, b**). The postoperative period was uneventful.

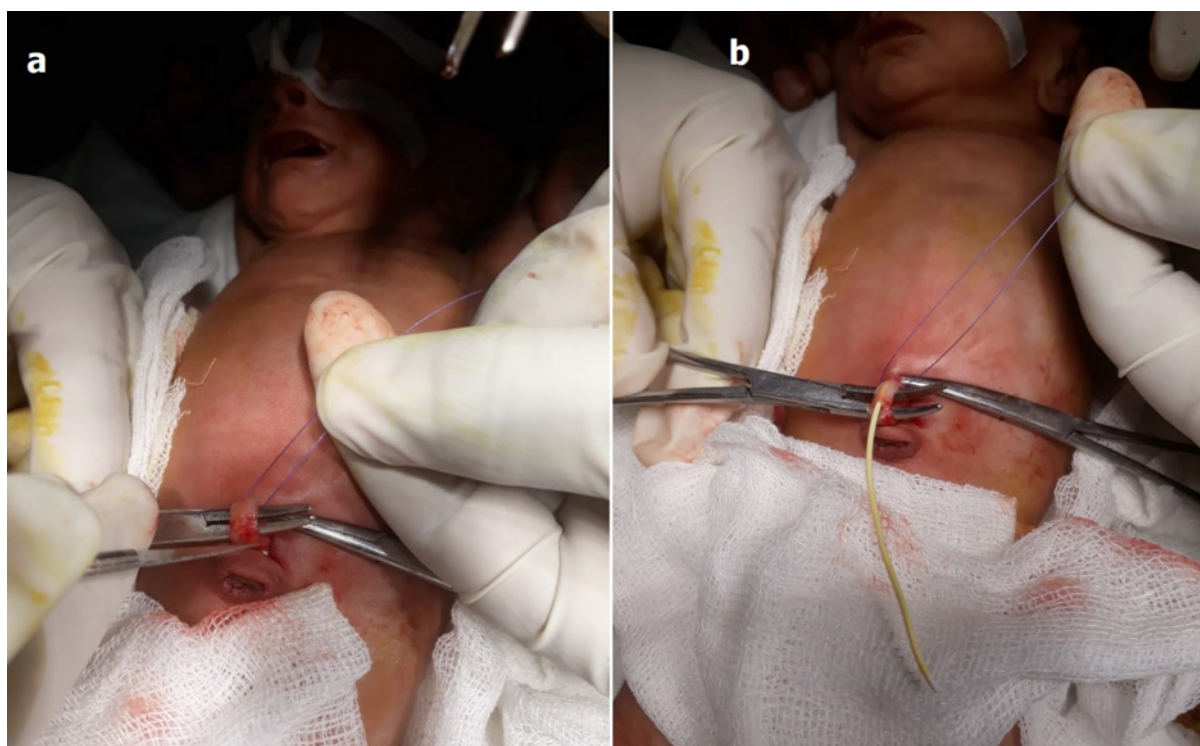
UVC has been indispensable in the management of sick neonates. While the arterial line allows invasive monitoring in neonates, the umbilical venous line provides access for intravenous fluid and drug administration. Although beneficial, UVC has been notorious for several complications like malposition, sepsis, vasospasm, vascular perforation, [2] thrombosis, embolism [3] (air, thrombus, retained portion of UVC), portal hypertension, and hepatic atrophy secondary to portal vein thrombosis [4] and liver injury. [5] In a review of 108 cases of UVC insertion at their center by Goh et al., as many as one-third of UVCs were malpositioned, and catheter-related sepsis, bloodstream infection, peritoneal extravasation, and venous thrombosis were the complications seen. [6] Therefore, the use of UVC for central venous access has a spectrum of complications with several management issues.

Although reported to be rare earlier, Central Venous Catheter fracture and its embolization have become more frequently reported with increased use of these lines for prolonged administration of medications and total/partial parenteral nutrition in the management of sick neonates. In their review of literature, Dhua et al. could find only 14 cases of this complication, including their case in 2013. [1] A few other investigators have reported different positions of broken UVC, determining the approach to retrieve them. [7,8] Joshi et al. reported the case of a neonate where a broken umbilical artery catheter migrated to the right iliac artery and had to be retrieved by arteriotomy, in the absence of endovascular

facilities. [8] Lackey and Taber had to retrieve the migrated arterial catheter surgically from the thoracic aorta. [9]

Local and surgical exploration for retrieval have their limitations and can be successful if the broken catheter is stable in its position and well localized by USG. If found unstable in its position or in case of distant embolization, endovascular retrieval is the best option. Its non-availability at many centers and the small caliber of neonatal vessels are its limitations. Several investigators have reported successful retrieval of broken catheters through an endovascular approach. [1,10–12] Endovascular approach to migrated catheters provides controlled retrieval under fluoroscopic guidance. In our case, the broken UVC had retracted proximally into the umbilical vein but had not receded beyond 2 cm of the umbilical scar. Both its ends could be well localized through a local USG. So, we could retrieve it via a small supra-umbilical incision. Had it migrated more distally, endovascular options would have been the safest approach for successful retrieval.

The importance of USG during insertion of UVC for proper location of the tip and catheter position is well established; any local complication and position of retained UVC after dislodgement can also be detected by USG. Depending on this, the decision for retrieval through local umbilical exploration, surgical exploration, or endovascular intervention can be taken. Bairagi and Maharaj have described a protocol for managing patients with retained UVC. [13] He also described the role of echocardiography in case the broken UVC goes to the heart and in case of unsuccessful endovascular retrieval, the role of computed tomographic angiogram to find out any vascular anomaly which would then need exploration under cardiopulmonary bypass and thoracic surgical approach for UVC retrieval. [13]



**Figure 2:** (a) Supraumbilical incision to access the retained umbilical venous catheter (UVC) in the umbilical vein. (b) Retrieved retained UVC in the umbilical vein.

A simple procedure like UVC insertion and its removal must be done with care to avoid damaging or weakening the wall of the catheter while fixing the catheter or while removing it. Choi et al. have proposed the mechanism for catheter damage while describing their two cases of broken umbilical catheter. [14] Mitchell et al. described the different steps to avoid broken and retained UVC. [15] Care must always be taken about inspecting the retrieved ends of the catheter and ensuring that it has been removed entirely.

UVC insertion and removal should both be done carefully; USG is indispensable for proper positioning of UVC and to detect any complications. Position of the retained or migrated UVC determines the approach to its successful retrieval.

## PATIENT CONSENT

Written informed consent was obtained from the patient for the publication of this case report and all associated images.

## AUTHORS' CONTRIBUTION

All authors have significantly contributed to the work, whether by following the case at the bedside, conducting literature searches, drafting, revising, or critically reviewing the article. They have given their final approval of the version to be published, have agreed with the journal to which the article has been submitted, and agree to be accountable for all aspects of the work.

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## CONFLICT OF INTEREST

None.

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