

## GANGRENE OF THE EXTREMITIES FOLLOWING UMBILICAL VESSEL CATHETERISATION: A REPORT OF TWO CASES.

By

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### Summary

**Background:** Umbilical vessel catheterization is a common practice but fraught with dangers.

**Objective:** To share our experience with two cases of umbilical catheterization complicated by peripheral gangrene

**Method:** The case records of the two patients were reviewed. Relevant literatures on the subject are presented.

**Results:** - There were neonates with neonatal sepsis. Initial attempt to secure peripheral veins failed and umbilical catheterization was done without bleaching. Both developed peripheral gangrene between 4 - 9 days post catheterization.

**Conclusion:** We reaffirm earlier observations that umbilical catheterization beyond 48 hours is associated with high risk of peripheral gangrene.

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**Key Words:** Umbilical catheterization, septicaemia, peripheral limb gangrene

### INTRODUCTION

Umbilical vessel (artery or vein) catheterization is a common procedure for injection of medications in the neonatal intensive care units. It is associated with the risk of vascular spasm, embolization, thrombosis, perforation, infection and impaired circulation with subsequent gangrene<sup>1, 2</sup>. The risk of these serious complication is between 2-5%<sup>1</sup>.

In this communication, we present two cases of peripheral limb gangrene following umbilical vein catheterization at the neonatal unit of Federal Medical centre (FMC), Abakaliki, Ebonyi State, Nigeria. It is intended to draw the attention of practitioners to the reality of this serious complication of a common procedure.

### CASE 1

A day-old out born male neonate was admitted into the neonatal intensive unit. The mother, an unbooked primigravida, was a peasant farmer. She had spontaneous vertex delivery at a maternity home following a 3-day history of spontaneous membrane rupture. The weight on presentation was 1800g and gestational age was 32 weeks by Dubwitz chart. The primitive reflexes were present but sluggish. There was no bluish discoloration of the extremities. Diagnoses of mild pre-maturity and neonatal sepsis were made. Umbilical vein catheterization was done with small size Ryle's tube for intravenous injections and infusions; no blanching was noticed. He was placed on intravenous ceftadizime, and intravenous 10% dextrose water. He was also nursed in an incubator. There was remarkable improvement

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and by the 4th day, he was on expressed breast milk and receiving only intravenous ceftazidime. On the fifth day, gangrene of the distal phalanges of the left upper limb 2 - 5 digits was noted. Left radial artery pulsation was present. The umbilical catheter was discontinued and a peripheral line secured for the remaining doses of intravenous ceftazidime. The Orthopaedic surgeon was consulted. He planned to amputate the affected digits after full demarcation of the gangrenous parts. The parents did not consent for the surgery and requested for discharge against medical advice.

## CASE 2



FIG 1: GANGRENE OF THE RIGHT TOES IN THE 2ND PATIENT.

A termed male neonate delivered via spontaneous vaginal delivery to a booked primigravid mother, was admitted into the neonatal intensive unit. The mother was a university undergraduate. There was a 24- hour history of premature rupture of membrane and the baby was delivered with an Apgar score of 3 and 4 at 1 and 5 minutes respectively, after 18 hours of labour with a birth weight of 3.4kg. Patient was breathing in gasps with bluish extremities and primitive reflexes were diminished. There was marked caput succedaneum and moulding. A diagnosis of

severe birth asphyxia and neonatal septicaemia were made. Cardiopulmonary resuscitation was successfully carried out. Umbilical vein catheterization was done with fine bore Ryle's tube. No blanching was noticed with the procedure. Patient was placed on intravenous ceftazidime, mannitol, dexamethasone, phenobarbitone, intranasal oxygen and intravenous 10% dextrose water. Full blood count showed a packed cell volume of 37%, leucocytosis, neutrophilia and toxic granulations. Patient improved progressively and by the fourth day was no longer oxygen dependant. By the ninth day, gangrene of the right forefoot with patchy discoloration of the heel and distal one third of the leg was noticed (Figure 1). Right dorsalis pedis artery pulsation was present. Umbilical catheter was discontinued. Transmetatarsal amputation was done after the gangrene had demarcated. On follow up On follow up visits at three and twelve months of age, the patient has remained well and walks unaided.

## DISCUSSION

Impaired circulation resulting in gangrene is an established complication of umbilical vessel catheterization<sup>1, 2, 3</sup>. This is usually subsequent to vascular spasm, thrombosis, embolization and infection. In the presence of septicaemia, umbilical catheterization could lead to development of thrombus and septic micro-emboli resulting in blockade of distal small vessels, especially the end arteries with gangrene of the areas supplied. This is the probable mechanism of gangrene in our patients, considering that peripheral gangrene was a late event in them. This process was further enhanced by late removal of umbilical catheter giving enough time for septic emboli to develop and propagate. No clinical evidence of right to left shunt was noticed in the two patients. Most texts recommend that umbilical catheters should not be allowed to stay beyond 48 - 72 hours<sup>1</sup>. Failure to secure a peripheral venous access was the main reason for the late removal of the umbilical catheters in our Patients. In both cases, the presence of the catheter in the

vein was supported by absence of blanching, which is a feature in arterial catheterization. It can also be speculated that septic micro emboli and subsequent gangrene could have developed regardless of the presence of the umbilical catheter. That is to say that, the gangrene in our patients could have happened from other causes not related to the passage of the umbilical catheter. Meningococcal septicemia and other related forms of neonatal septicaemia are known to produce necrosis and peripheral gangrene<sup>4</sup> of anticoagulant therapy. These were not done in our patients on account of lack of facilities. In most other centers in Nigeria as in Abakaliki, the correct umbilical catheters are not always available and nasogastric tube size 5 or 6 is commonly used. Previous study has not demonstrated significant difference in complication between the use of polyvinyl umbilical catheters of and other materials<sup>5</sup>.

In conclusion, this report supports earlier reports that, umbilical catheterization beyond 48

hours in the presence of neonatal septicaemia is associated with higher risk of peripheral limb gangrene. Prevention can be achieved through strict adherence to the time frame, ultrasonographic supervision to detect thrombus and early institution of anticoagulant therapy. At all times, peripheral venous access should be preferred for intravenous medications in the neonatal period especially when

septicaemia is present.

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