

### Treatment of Neonatal Gangrene: A New Perspective

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Gangrene is a rare condition in the neonatal period and has a generally poor outcome. We report a case of neonatal gangrene that was managed conservatively and showed a remarkable recovery despite an extensive involvement.

#### Case Report

A full term, 45-hours-old, female baby presented with history of bluish discoloration of the right foot and lower leg, since 20 hrs of age. The baby was delivered by cesarean section to a primigravida mother in a private nursing home. There was history of birth asphyxia and the baby had received injection sodium bicarbonate 7.5% solution after a 1 : 1 dilution into the umbilical

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vein. There was no history of femoral vein puncture or umbilical artery or vein catheterisation.

Clinical examination revealed a full term, small for gestational age baby with a birth weight of 2.32 kg and a good cry and activity and blood pressure of 80/50 mm Hg. The right foot and lower leg were blue, appeared shrunken and were cold to touch. There was paucity of movements and the tip of the great toe showed dry gangrene. The dorsalis pedis, posterior tibial, popliteal and the femoral arteries pulsations were not felt on the right side. The left lower limb and the rest of the systemic examination including the cardiovascular system was essentially normal.

Investigations revealed a hemoglobin of 19 g/dl, total leucocyte count of 6,500/cu mm and a peripheral capillary hematocrit of 60%. Blood culture was sterile, blood urea 32 mg/dl, and serum electrolytes and urine examination were normal.

In the hospital the bluish discoloration progressed to deep purple and edema and vesicles appeared. The femoral pulse became feebly palpable at the time the edema appeared and was normally felt by day 14. On day 5, the left foot was blanched with slight bluish mottling. It was cold, appeared shrunken and the femoral pulse on the left side was not palpable. Dipyridamole and heparin were added the same day. Following this, the patient made rapid and complete recovery. At a follow up at 6 months, both lower limbs were absolutely normal excepting the tip of the right great toe which had fallen off.

The baby was treated with antibiotics, Complamina (Xanthenol Nicotinate 37.5

mg/kg/day, divided 3 doses), Disprin (30 mg/kg/day, divided 3 doses) and intravenous Lomodex initially. With involvement of the left side, heparin and persantin (Dipyridamole-25 mg OD) were added. Locally the affected part was kept dry, elevated and covered with neosporin powder. Care was taken to prevent any extra local heat and to maintain a normal hydration.

## Discussion

The cause of gangrene in the present case is not apparent. What obvious is that it was caused by arterial occlusion. Arterial spasm causes diminished blood flow for not more than an hour or two(1). What caused the occlusion is not clear. Similar cases of gangrene following injection of drugs into the umbilical vein(2-5) have been reported. A possible hypothesis put forth is the possible accidental injection into the umbilical artery leading to spasm and then to occlusion(2). If the above hypothesis was to be applied to our baby, one would expect the onset of gangrene to have been even earlier (*vide supra*).

Polycythemia is a central hematocrit of more than 60%. Peripheral hematocrit is 5-20% higher than the central hematocrit(6). In our baby, the peripheral hematocrit was 60%. This falls in the normal range and hence is unlikely to have contributed to its genesis. The two possible causes may be: (i) embolism from a thrombosing ductus arteriosus, and (ii) extension of the normal thrombotic process of the umbilical arteries. These, however, are hard to establish.

A good functional recovery occurs in less than 20% of cases(7). Our baby showed remarkable recovery. The onset of gangrene on the left side could be averted with dipyridamole and heparin.

Acetyl salicylic acid (aspirin) and dipyridamole (persantin) have probably been used for the first time in the treatment of neonatal gangrene. Both act by inhibition of platelet aggregation and hence prevent thrombus formation.

We conclude that the approach in a neonate with gangrene should be a conservative one. Amputation should be deferred as much as possible as autoamputation is generally smaller than surgical amputation. In addition, aspirin and dipyridamole may have a role in the management, especially where the gangrene shows definite signs of extension.

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