**CASE REPORT**

## An unusual cause of hydronephrosis in a preterm infant

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**Abstract** - A preterm girl was born at a gestational age of 30+4 weeks, with hydrops foetalis and accompanying ascites due to supraventricular tachycardia. Progression of the ascites was noted during an infection. Ultrasonographic evaluation revealed a cystic mass in the right abdomen and a right-sided hydronephrosis. Milky fluid, corresponding with parenteral nutrition, was obtained at ultrasound-guided aspiration of ascites. A contrast radiograph showed intra-abdominal extravasation from a central venous line inserted in the right lower limb. After removal of the central venous line both the cystic mass and the hydronephrosis disappeared. To our knowledge, retroperitoneal extravasation from a central venous line leading to hydronephrosis has not been reported before. Malposition with extravasation is a well-known complication of such catheters [1]. We describe a preterm girl with a right-sided hydronephrosis due to retroperitoneal extravasation of parenteral nutrition.

**Keywords** - Central venous line, malposition, extravasation, hydronephrosis

### Introduction

Peripherally inserted central venous catheters are commonly used in (neonatal) intensive care for long-term parenteral nutrition or medication [1]. Malposition with extravasation is a known complication of such catheters [1]. We describe a preterm girl with a right-sided hydronephrosis due to retroperitoneal extravasation of parenteral nutrition.

### Case report

A preterm girl was delivered by caesarean section at a gestational age of 30+4 weeks because of severe hydrops foetalis due to supraventricular tachycardia. Considerable ascites was present at birth for which a single ultrasound-guided aspiration was performed. A central venous line was inserted through the right saphena magna vene on day 10. Progression of the ascites was noted during an infection at the age of 28 days. This resulted in a distending and more tense abdomen and was accompanied by circulatory and respiratory problems. Ultrasonographic evaluation at that time revealed a cystic mass in the right abdomen (Figure 1). The mass was not palpable on physical examination and was not a solid lesion on ultrasound. In addition, a right-sided hydronephrosis was noted, due to secondary pelvic outflow obstruction (the cystic mass pushed the right kidney upwards, (Figure 2). Previous ultrasounds of the abdomen did not show any mass or hydronephrosis. Milky fluid, corresponding to parenteral nutrition, was obtained by ultrasound-guided aspiration of the cystic mass. This milky fluid tested positive on a stick for glucose. A contrast radiograph of the central venous line showed intra-abdominal extravasation of contrast medium.

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(Figure 3). The central line was removed. In the blood culture, one of the ascites cultures and in the culture of the aspirated fluid a coagulase negative staphylococ was found.

Ultrasonographic evaluation two days after removal of the central venous line showed a considerable decrease in the size of the cystic mass and the right-sided hydronephrosis had disappeared.

The ascites eventually resolved after treatment with fluid restriction and diuretics.

**Discussion**

Peripherally inserted central venous lines are often necessary for prolonged administration of parenteral nutrition and medication in the (neonatal) intensive care unit [1]. Important catheter-related complications include infection, thromboembolism and catheter migration and malposition with extravasation [1-3]. The prevalence of central venous catheter extravasation in the neonatal intensive care unit has been estimated at 0.05% to 1.1% [2,4]. The mechanism of delayed perforation of the vessel wall is assumed to be the combination of repeated direct contact of the catheter tip and local irritation caused by hyperosmolar fluid, such as parenteral feeding [5]. Secondary complications including cardiac tamponade, myocardial infiltration, pleural effusion, ascites, pericarditis, erosion into pulmonary vessels, diaphragmatic paralysis, paraplegia and myoclonus have all been described, depending on the site of extravasation [1-3].

**Figure 3** Abdominal radiograph during contrast infusion through the central venous catheter. Extravasation of contrast is clearly visible. Furthermore, the extent of the ascites is clearly seen.
Retroperitoneal extravasation, as well as intraperitoneal extravasation, may present with signs of an acute abdomen, including abdominal tenderness and distension [6]. This is often accompanied by fever, leucocytosis and induration of the abdominal wall [6]. Failure to aspirate blood from the central venous line may point towards a diagnosis of extravasation, although this is a relatively common finding in neonatal and paediatric central lines [6]. Ultrasound-guided aspiration and contrast radiography may confirm the diagnosis [6]. Removal of the line is indicated and will often resolve the symptoms [6].

Conclusion
Malposition with subsequent fluid extravasation is a well-known complication of central venous lines. This can lead to various complications, including the appearance of a cystic mass leading to obstruction of urine flow and hydronephrosis as in our case. Malposition with extravasation should be considered when unexplained local signs and symptoms occur in any patient with a peripheral central venous line.

References