A rare complication of a permanent venous catheter implantation to a patient on regular haemodialysis

Papazov V, Yonova D, Terziev D, Lubih M

Dialysis Clinic, Medical University Hospital "Alexandrovska", Sofia, Bulgaria

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Corresponding author: Dr Diana Yonova, Dialysis Clinic, Medical University Hospital "Alexandrovska", "G. Sofijski" Street No 1, Sofia 1431, Bulgaria; Email: dr_ionova@email.com

Introduction

Central venous catheters (CVC) play an important role in the treatment of acute renal failure. They are used for immediate vascular access in cases of urgently needed haemodialysis. Permanent venous catheters (PVC) are used for haemodialysis of intermediate duration and even for chronic haemodialysis in patients where peripheral arteriovenous access is problematic or impossible. Recently, subcutaneous port devices have been developed, suggesting that in the near future central venous access might become an acceptable alternative to a functioning arteriovenous fistula or to an arteriovenous prosthesis. In subclavian-vein cannulation a 10% rate of severe acute complications were registered such as haematoma, arterial puncture with haemothorax and pneumothorax. Moreover, when a venous catheter remains in place for more than 2 or 3 weeks, there is a 40-50% risk of subclavian-vein stenosis or occlusion. Chronic obstruction of a subclavian vein will complicate later the construction of a future arteriovenous access on that arm. The occlusion of both subclavian veins will require major reconstructive surgery or a thigh access. Venous access in the common femoral vein avoids the potential risks of pneumothorax, haemothorax, cardiac arrhythmia, and pericardial tamponade. It can easily be achieved during cardiopulmonary resuscitation and in dyspnoeic patients who are not able to lie flat. In comparison to mediastinal-vein cannulation, the frequency of bacteraemia is obviously higher even when tunnelled catheters are used. High rates of blood recirculation are registered when the catheter tip is located in the iliac vein. This problem can be solved with long catheters (20 cm or longer) so that the catheter tip should be located in the inferior vena cava. Most PVC for haemodialysis come with a complete implantation set including a Seldinger guide-wire, a tissue dilator and a 'peel-away' tool for catheter insertion. Surgical implantation should be considered after multiple previous cannulations or after neck surgery.

Presentation of the case

Having a long time experience in almost all types of the above mentioned catheterisations, we present a rare complication of a left subclavian venous catheter implantation in a patient with impossibility for further peripheral arteriovenous access. The patient was 28 years old male, he had posttraumatic paraplegia of his legs and chronic pyelonephritis and anaemia since 1998, and chronic renal failure since 1999. At the beginning of 2002 year he has started regular haemodialysis, but because of the lack of permanent vascular access (a few attempts have failed) in May 2002 he has transferred to peritoneal dialysis. Unfortunately in October 2002 a severe peritonitis (Candida albicans) forced us to remove the peritoneal catheter and after an adequate antifungal treatment a permanent catheter in right jugular internal vein has been placed. Two years later it has been removed because of a severe septicaemia. Before peritoneal dialysis and before implantation of the permanent catheter a few temporary subclavian and jugular vein catheters have been implanted. The result has been proved by angiography - a stenosis in the...
Discussion

Non-tunneled CVC allows an effective vascular access in patients with urgent need of haemodialysis. The high frequency of early and late complications, however, should be a serious reason for the exercise of great care with respect to indication, implantation, and surveillance. Unfortunately it is not always clear which catheter material and design is best for haemodialysis access.

In case of emergency, the femoral vein should be preferred. Whenever possible, the right internal jugular vein should be preserved for early implantation of a tunneled, cuffed catheter, which should be considered as soon as it becomes clear that haemodialysis will be necessary for more than 1 or 2 weeks. In patients with terminal renal failure requiring long-term haemodialysis, a peripheral arteriovenous access should be created at the time when a vascular catheter is inserted. From the aspect of catheter and patient survival, ‘permanent catheter’ is a contradiction in terms. Haemodialysis via CVC is less effective and reliable than via an arteriovenous access. A CVC reduces the success rates of later arteriovenous access procedures, enhances the risk of infection, vascular obstructions and as a result of these problems reduces the patient’s life expectancy. When the catheterization could not be escaped, to minimize the complications, especially in cases of problematic patients, we recommend (as do most of the other authors as well) a visual method as radiography or sonography to be used during the implantation.

References

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