



Catheter Malposition in Liver Transplantation Recipients

Karaciğer Nakli Alıcısında Kateter Malpozisyonu

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Dear Editor,

As a routine for preoperative anesthesia, central venous catheters (CVC) are usually applied especially to help medicine practices and venous pressure measurements and on the occasions when the peripheral intravenous fails. Because there is fewer numbers of complications, jugular vein is more commonly preferred. Catheter malposition, one of the most frequent complications in central venous catheter practices, constitutes 14-81% of all complications (1,2). In internal jugular vein catheterisation, the catheter should be directed up to the atrio-caval junction. This letter presents a rare hepatic vein malposition case of preoperative central catheter of a planned liver transplantation due to acute fulminant hepatitis.

The planned liver transplantation for acute fulminant hepatitis was that of an 11-year-old patient (32 kg, 144 cm) whose mother has given written and verbal consent for the study. It was not possible to communicate with the patient because of his grade III-IV hepatic encephalopathy and his underage status. Patient's Glasgow coma scale was 10 points. Bispectral index was added to routine monitoring (electrocardiogram, pulse oximetry, noninvasive arterial blood pressure, nasopharyngeal temperature probe). His heart rhythm was normal sinus rhythm at a heart rate of 115 beats / min.; the peripheral oxygen saturation was 91%; non-invasive arterial blood pressure was 88/44 mmHg while his body temperature was 38°C. Following the induction of anesthesia with thiopental, remifentanyl and lidocaine and the muscle relaxation with cis-atracurium, the intubation was performed. The patient was ventilated on pressure-controlled ventilation mode. The invasive blood pressure measurement was performed through left radial artery cannulation. During preoperative examination, an ultrasound-guided right internal jugular central venous catheter insertion (Certofix Trio V-720, 7 French, 20 cm, Braun ®) was performed because of the INR measurement at 3.2 IU; since the distance between the assumed catheter site and the atrio-caval junction projection was up to about 20 cm, the catheter site was determined as 20 cm. An 8 µg/kg/min. noradrenaline infusion was administered through central access and the mean arterial pressure was changed so as to keep it at 60-80 mmHg. During the clamp placement process in

the hepatic vein, a process that was needed for the orthotopic liver transplantation, we have noticed a central catheter tip and thus the catheter was pulled back; it was re-identified at 16 cm allowing the surgery to continue as planned. At the end of an uneventful surgery, the patient, now intubated, was moved to the intensive care unit with the noradrenaline infusion.

Malpositions concerning the catheter placement may lead to errors in the follow-up and treatment processes as well as to other serious complications. Early recognition of incorrectly positioned catheter will help reduce the possible complications. The most common misplacing occurs in internal mammary, vertebral, and azygous veins (3). As an example to hepatic vein malposition in the literature, Lindner et al. reports a dialysis catheter case (4). They have also pointed out that the malposition in hepatic vein in dialysis catheter would be dangerous. In our patient's case, the noradrenaline infusion through central vein and the measurement of the venous pressure were carried on smoothly up to the moment when the clamp placement in the hepatic vein was needed. We may have had a problem-free time due to the use of peripheral vascular access for the patient's intravenous fluids and blood products during the operation.

In clinics where central venous catheters are used very often, the catheter is applied in clinics where patients are awake. Pain in the back and the chest pain can be determined in awake patients regarding catheter malposition. After catheterization, the catheterised place is routinely checked with chest x-ray radiography. In patients undergoing surgery in the operating room, catheters are often preoperatively applied while patients are under general anesthesia. In our operating theater, although children and organ transplantation patients are routinely catheterised through ultrasound-guided catheterisation, we do not check the patients by X-ray chest radiographs unless patients are at risk. The length of the catheter, the distance between internal jugular vein and the projection of the atrio-caval junction, is estimated in cm. This distance was measured and identified at 20 cm in our patient. Controversial even today, the use of X-ray chest radiography display in

confirming catheter's place is still recommended. Some researchers argue that confirmation through chest X-ray radiographs is costly and unnecessary except for the cases in which x-ray verification is needed (5). In a study that focused on routine x-ray chest imaging following the implementation of central venous catheters conducted by experienced people, a rate of 29-33% malpositioned catheters have been detected (6). To reduce catheter malpositionings, ultrasound should be used while applying puncture to the central vein. Any resistance encountered while advancing the catheter guide wire during the insertion of the catheter may be a warning about a misdirected catheter tip. In awake patients, patient's description of the pain in the back should be taken into consideration and the catheter insertion should be checked. To determine the location of the catheter, x-ray radiography, and, if necessary, venography and magnetic resonance imaging are still recommended although these techniques are still controversial (7,8).

As a result, hepatic vein catheter malposition is a rare complication. It is our firm belief that using imaging methods during catheter insertion and a carefully made decision on the appropriate length for the detection level of the neck are necessary to a great extent in preventing such malpositions.

Best regards.

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