Hemomediastinum and Hemothorax: A Late Complication of Subclavian Catheter Insertion for Hemodialysis

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Dear Sir,

Since its introduction in the seventies, the use of the subclavian catheter has become more and more popular in hemodialysis (HD), both in acute and in chronic patients. Although it is easily implantable, even at the patient's bedside, several complications have been described.

We report a case of hemomediastinum followed, by hemothorax 11 days after subclavian catheter insertion in a patient with acute renal failure superimposed on chronic renal insufficiency.

Case Report

The patient (B.F.), male, 55 years old, was affected by moderate chronic renal insufficiency (creatinine clearance of 36 ml/min) secondary to membranoproliferative glomerulonephritis. He was admitted on our Department because of oliguria due to dehydration secondary to persistent vomiting.

On admission, laboratory data revealed a serum creatinine of 11.3 mg/dl, Blood urea nitrogen 125 mg/dl, uric acid 12.9 mg/dl, serum glucose 104 mg/dl, serum calcium 7.4 mg/dl, inorganic phosphorus 9.0 mg/dl, sodium 137 mEq/l, potassium 3 mEq/l, chloride 95 mEq/l, bicarbonate 18 mEq/l, alkaline phosphatase 118 IU/l, total protein 4.8 g/dl, albumin 2.8 g/dl. Hematometry showed a marked anemia (RBC 2,300,00 mm³) and leukocytosis (WBC 16,900 mm³). PT, PTT, fibrinogen and platelet count were in the normal range. In the urine 24-hour protein excretion of 4 g and 15–20 red cells and 5–6 white cells/high power field were present.

Chest x-ray showed normality in both lung fields and an enlargement of cardiac profile and this radiographic pattern was unchanged a week later.

On the day of admission (April 21, 1986) a right subclavian catheter was inserted, whose proper positioning was confirmed by chest x-ray; the patient then began hemodialysis which was performed again in the following days. On the fourth day the patient received several blood units because of hematemesis and melena from gastric ulcer. With hemodialytic, nutritional and transfusional treatments, his general condition improved and the hemotocrit stabilized at about 25%.

On May 1, 1986, the patient began a new dialytic session; he was in good general condition, with a blood pressure at 140/80 mm Hg. About 5 min after the beginning of HD, he showed severe hypotension (70/40 mm Hg) with profuse sweating and dyspnea. Hematometry showed a marked anemia (RBC 1,300,000 mm³); the patient received several blood units and recovered consciousness; dyspnea and hypotension remained unchanged, however. Later on, arterial pressure rose up to 110/70 mm Hg, but because of the persistence of dyspnea, a chest x-ray was performed. It showed an enlargement of the upper mediastinum (fig. 1) which progressively increased and was followed by a right hemothorax (fig. 2). Subclavian catheter was then removed, a drainage was placed in the right hemothorax and afterwards he was dialyzed with a right arm shunt.

Comments

In HD, the use of a subclavian catheter presents several advantages, because it can be implanted in a short time even at the patient's bedside, does not need especially trained personnel and cumbersome equipment and does not cause immobilization of the patients. However, some disadvantages are described, the best known and most severe of which are represented by pneumothorax, hemothorax, hydrothorax, subclavian artery puncture, septicemia, pulmonary embolism, vascular thrombosis,

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hemomediastinum and hemopericardium with possible pericardial tamponade [1, 2]. They occur most during prothesis insertion or immediately afterwards.

The case described here began with a hemomediastinum due to superior vena cava perforation by the sub-clavian catheter, followed, after a brief period, by a right hemothorax. Both these complications appeared 11 days after prothesis insertion. The severity and rapidity with which they appeared and the possibility of death directly related to vein cannulation [3] underline the risks inherent in this technique. To avoid this, some precautions are necessary; it is advisable to use catheters with floppy tips, to exclude patients with clavicle malformations and patients who do not collaborate. Finally, any chest pain, dyspnea, hypotension or any other symptom must be carefully evaluated to establish whether they are linked to some complication in order to be able to treat them as soon as possible.

References

Schwarzbeck, A.; Brittinger, W.D.; Henning, G.E. v.; Strauch, M.: Cannulation of subclavian vein for hemodialysis using Seldinger's technique. Trans. Am. Soc. artif. internal Organs 24: 27–31 (1978).

Vanholder, R.; Lameire, N.; Varbanck, J.; Van Rattinhe, R.; Kunnen, M.; Ringoir, S.: Complications of subclavian catheter hemodialysis: a 5-year prospective study in 257 consecutive patients. Int. J. artif. Organs 5:297–303 (1982).

Fine

A.; Churchill

D.; Gault

H.: Fatality due to subclavian dialysis catheter. Nephron 29:99–100 (1981).