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Pneumothorax in A Hemodialysis Patient: A Case Report

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Abstract **Case Report**

Introduction*:** Pneumothorax is one of the unfortunate mechanical complications of central venous catheter placement in chronic end-stage renal failure. Clinically, it manifests itself by sudden pain located on one side of the thorax, a dry irritative cough that increases the pain. The aim of our work was to describe the clinical, paraclinical and therapeutic aspects of pneumothorax in hemodialysis patients. ***Observation: It was a male subject, 56 years old, non-insulin-dependent diabetic and hypertensive under treatment. For two years he had been followed for renal failure. The patient was hospitalized in the medical emergency department for disorders of consciousness. The biological assessment found a urinary tract infection with decompensated diabetes, terminal renal failure. The patient was put on antibiotic treatment then transferred to nephrology for management. The indication for emergency dialysis was made in view of acute pulmonary edema requiring the placement of a central catheter in the right jugular vein. After two dialysis sessions, the patient presented with sudden pain located on the right side of the chest, a dry irritating cough which increased the pain, moderate dyspnea and insomnia. The clinical examination found an altered patient, poorly colored, afebrile with a blood pressure of 117/110, heart rate of 101 beats per minute, respiratory rate of 23 cycles per minute, subcutaneous emphysema occupying the neck and thorax. The chest X-ray showed diffuse subcutaneous emphysema of the neck and thorax with low-abundance right pneumothorax. The evolution was favorable with resolution of symptoms after removal of the central venous catheter. ***Conclusion*:** Catheter placement is not a trivial procedure because patients who benefit from it may develop a complication such as pneumothorax. The risk is greater for patients with extreme body mass. Echo-guided internal jugular placement considerably reduces this risk.

Keywords: Catheter, pneumothorax and hemodialysis.

INTRODUCTION

Pneumothorax is a partial or complete collapse of the lung due to the presence of air between the two layers of the pleura. It is one of the unfortunate mechanical complications of the placement of an old central catheter. The placement of a central venous catheter has become a common practice in patients with terminal chronic renal failure. Its mastery by nephrologists must be mandatory. Its frequency is 1 to 3% of cases, especially secondary to the subclavian central catheter [1]. Clinically, pneumothorax manifests itself by sudden pain located on one side of the chest, a dry irritating cough that increases the pain, shortness of breath (or dyspnea) not always present but generally moderate [2]. The aim of our work was to describe the clinical, paraclinical and therapeutic aspect of pneumothorax in hemodialysis patients through observation and review of the literature.

OBSERVATION

It was a male subject, 56 years old, non-insulin-dependent diabetic for 15 years under Metformin, hypertensive 4 years ago. For two years he had been followed in nephrology for renal failure in the nephrology and hemodialysis department of the CHU point "G". The patient was hospitalized in the medical emergency department for disorders of consciousness. The biological assessment had found a urinary infection with decompensated diabetes, terminal renal failure (creatinine = 2086 umol/L, Urea = 24 mmol/L, GFR = 2.6 ml/min/ 1.73 m2). The patient was put on antibiotic treatment then transferred to nephrology for better management. Emergency dialysis was indicated due to acute pulmonary edema requiring the placement of a

central catheter in the right jugular vein. After two dialysis sessions, the patient presented with sudden pain located on the right side of the chest, a dry irritating cough that increased the pain, moderate dyspnea and insomnia. The clinical examination revealed an altered patient, with little color, afebrile with a blood pressure of 117/110, a heart rate of 101 beats per minute, the respiratory rate was 23 cycles per minute, subcutaneous emphysema occupied the neck and chest. The chest X-ray showed diffuse subcutaneous emphysema of the neck and chest with a low-abundance right pneumothorax (Figure 1 and 2). The evolution was favorable with resolution of symptoms after removal of the central venous catheter.

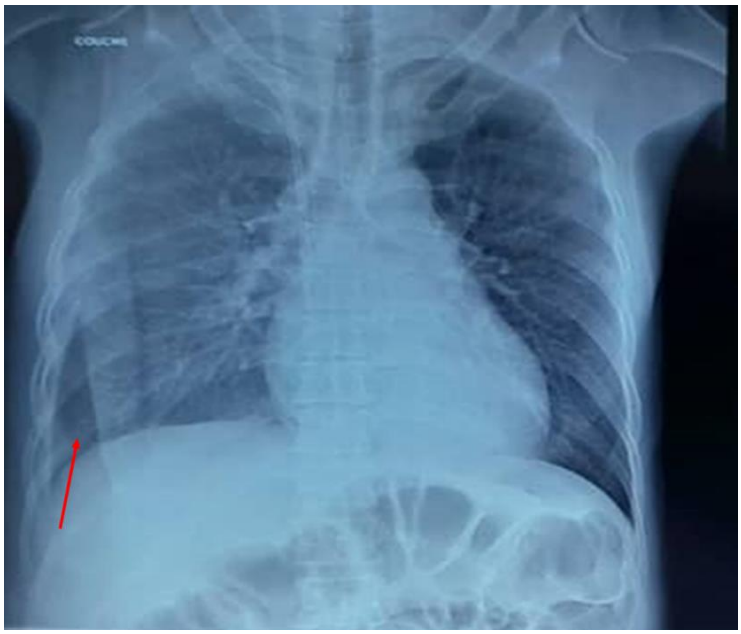

Figure 1: Frontal chest X-ray in a hemodialysis patient with low-volume pneumothorax (Red arrow)

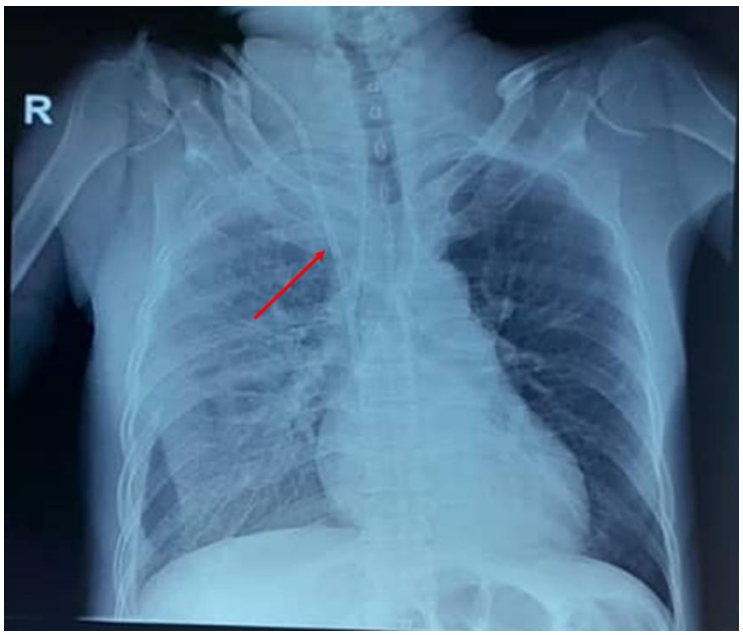

Figure 2: Frontal chest X-ray in a hemodialysis patient with low-abundance pneumothorax with linear opacity of the venous catheter (Red arrow)

DISCUSSION

Pneumothorax that occurs after the placement of a central venous catheter is due to a pleural breach with eruption of air between the visceral pleura and the parietal pleura. It results from the pressure difference between the pulmonary parenchyma and the pleural space [1]. The evolution of pneumothorax by the central catheter can be towards the closure of the breach and the cessation of the escape of air by resulting in a minimal detachment well tolerated clinically or the air leak becomes perpetuated occupying the entire pleural space with the occurrence of pulmonary collapse and gas

tamponade. In the literature, 10% of cases of pneumothorax are accompanied by cardio-circulatory arrest [2]. Its risk is assessed at 1 to 3%, it is mainly secondary to the central subclavian catheter, low with the internal jugular route with a rate lower than 0.5% [1]. In the anterior approach the pneumothorax rate is higher due to the longitudinal path of the needle and oriented towards the pleural dome [3]. On the other hand, in the posterior approach, the needle path is transverse, a priori avoiding any pneumothorax [4]. In our case the pneumothorax occurred via the anterior route because of the needle path oriented towards the pleural dome. Radiography is the first-line examination for any suspicion of pneumothorax regardless of the etiology. Pneumothorax can have several etiologies such as traumatic, primary or secondary [5]. In our observation, the etiology was post-traumatic and the standard frontal X-ray was requested and allowed us to confirm the diagnosis of low-abundance pneumothorax. Pulmonary CT scan should be requested in case of diagnostic doubt on the standard chest X-ray or in the context of a recurrence in search of etiology [5]. Our 56-year-old patient did not need to perform a CT scan because the standard X-ray was largely sufficient. Ultrasound also allows the detection of a pneumothorax by the so-called FAST-echo method. Our observation did not benefit from ultrasound.

CONCLUSION

Catheter placement is not a trivial procedure because patients who benefit from it may develop a complication such as pneumothorax. The risk is greater for patients with extreme body mass. Echo-guided internal jugular placement considerably reduces this risk.

Conflict of interest: No conflict of interest, declare the authors

Consent: Informed consent was abstained

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