

## Pulmonary and Muscular Septic Metastases in Hemodialysed Patient Using Buttonhole Technique: Case Presentation

Brătescu Lavinia-Olțita<sup>1</sup>, Stancu Simona-Hildegard<sup>2,3</sup>, Gemene Marta-Emanuela<sup>1</sup>, Copăceanu Diana<sup>1</sup>, Moga Cristina-Gabriela<sup>1</sup> and Spânu Maria<sup>1</sup>

<sup>1</sup>Diaverum Morarilor Nephrology and Dialysis Medical Centre, Bucharest, Romania.

<sup>2</sup>Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania.

<sup>3</sup>Carol Davila" Nephrology Hospital, Bucharest, Romania.

### \*Correspondence:

Brătescu Lavinia-Olțita, MD, PhD, Consultant in Nephrology, Diaverum Morarilor Nephrology and Dialysis Medical Centre, Bucharest, Romania, 2A Șoseaua Morarilor, District1, Bucharest, Romania, Tel: +40-721242126; +40-21-2554212, E-mail: lavinia\_bratescu@yahoo.com.

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### ABSTRACT

*There is described a case of a hemodialysed (HD) patient using buttonhole (BH) technique, with self-cannulation for about one year. The patient presents bacteraemia with starting point in "false channels", pulmonary and muscular septic metastases. The complications associated with buttonhole technique in our case, are not so frequently reported and required a long hospitalization and careful care.*

*Cannulation of the arteriovenous fistula (AVF) in the today's population is more difficult and challenging than ever. The frequency of cannulation-related complications was significantly lower with the BH technique compared with the rope-ladder method, but infections-related should not be underestimated. More attention should be attributed to patients with self-cannulation to avoid the "false channels".*

### Keywords

Buttonhole, Hemodialysis, Infection, Septic metastases.

### Introduction

The 'buttonhole' technique has been used worldwide for about 25 years. The advantages are those related to pain relief at the puncture site, reducing the risk of hematoma and aneurysm at AVF level and performing hemodialysis at home [1-3]. These benefits are offset by the increased risk of local infections or septic complications [1-3].

Their causes are: poor technique, non-compliance with local hygiene conditions, the creation of "false channels" as the source of germs 'localization and underline the importance of aseptic and correct technique of the BH procedure [1-3].

Successful access cannulation requires a high level of awareness and skills of the dialysis nurse, and frequent monitoring, evaluation and education of the needling technique are mandatory to guarantee

that patients will receive the highest quality of care [1]. In the case of self-cannulation, the patients should be carefully monitored and periodically reevaluated, with regard to the correctness of the technique and aseptic measures.

### Materials and Methods

A 38-year-old female patient with IgA nephropathy, noncompliant to treatment, CKD stage 5, decides to start HD in 2010 on right jugular central venous catheter (CVC). A left radial cephalic AVF is performed, but its lifetime was only 2 months. A left brachial-basilic AVF was made and from February 2016, the patient performs buttonhole technique with self-cannulation after a documented training. The patient undergoes parathyroidectomy for tertiary hyperparathyroidism, in November 2016.

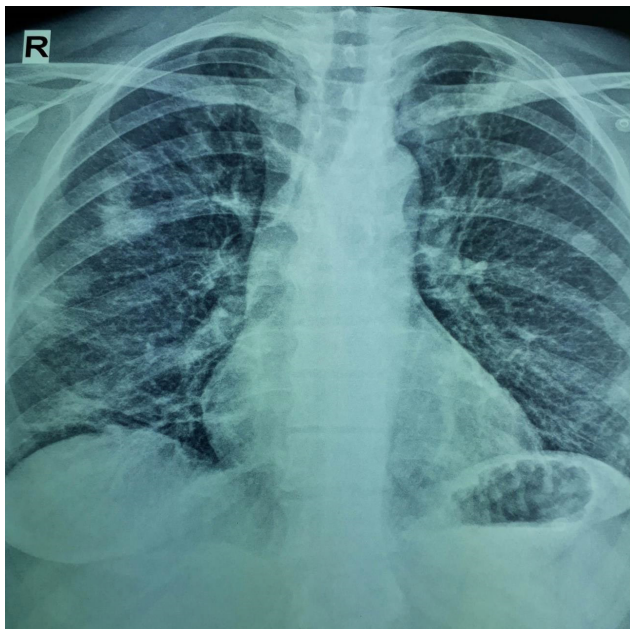
Inflamed puncture sites, without the appearance of any secretion highlighted in April 2017. The cultures at the puncture sites were Staphylococcus Aureus positive, initiating local and systemic oral treatment with Amoxicillin + Clavulanic Acid, according to

laboratory results.

After 4 days, the patient presents altered general condition and feverish syndrome. The clinical examination found: ulcerous injury at the left brachial-basilic AVF (3/4cm) [Figure 1]; 2 left parasternal and thighs mobile and painful tumor masses of 2cm.



Paraclinically have been highlighted marked inflammatory syndrome, positive *Staphylococcus Aureus* blood culture and radiographic – pneumatoceles in both lung fields [Figures 2 and 3]. A puncture was performed from the parasternal pseudo-tumor mass, with purulent *Staphylococcus Aureus* positive liquid extraction. AVF ligation was performed with continued HD sessions on CVC (initially short-life and after - long-life CVC).



Antibiotic therapy was initiated according with antibiogram: Gentamicin 80mg/HD session - 5 administration; Linezolid 600mg/day - 14 days; Vancomycin 500mg/HD session - 6 weeks, with clinically and paraclinically favorable evolution. The X-ray control images, performed at 5, 10 and 21 days, highlighted the gradual reduction of pneumatoceles and pseudo-tumor masses have disappeared.



The entire clinical and paraclinical context was interpreted as sepsis with secondary pulmonary and muscle determinations. The patient presents in addition *Clostridium Difficile*-associated diarrhea, treated with oral Vancomycin in lower doses and on alternate days. Under treatment clinical evolution was favorable. After 2 months, a right brachio-basilic AVF was performed.

### Discussions and Conclusions

The first case particularity is represented by the brutal evolution under initiated antibiotic treatment and the type of relatively rare septic complications: pulmonary (pneumatoceles) and muscular metastases. Strict hand hygiene and disinfection are thought to be particularly important with the BH technique, because the same site is repeatedly used and because removal of an overlying eschar is required [3-5].

Patient and staff compliance with the buttonhole technique is also hypothesized as being a cause of increased infection rates. Patients who self-cannulated their AVF admitted to occasional lapses in hygiene techniques prior to cannulation [3-5].

More intensive staff and patient education needs to be carried out before further buttonhole cannulation should be continued. Initial and periodic re-education and re-assessment of staff and patients should also reduce complications associated with this technique [3-5].

Making a "buttonhole workgroup" in every dialysis center is essential. Given the high rates of potentially life-threatening infections associated with the buttonhole technique, a very recent study do not recommend this technique in patients undergoing haemodialysis in dialysis unit [3-5]. Maybe the buttonhole technique should only be used in case of home hemodialysis.

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