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Emergence infection with *Staphylococcus carnosus* in Peritoneal Dialysis: case report

(Infection d'émergence à *Staphylococcus carnosus* en dialyse péritonéale : à propos d'un cas.)

Manon Geeraert¹, Justine Schricke¹, Raymond Azar¹

¹Hôpital Alexandra Lepève, service dialyse péritonéale, Dunkerque (France)

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Summary

We report a rare clinical case of *Staphylococcus carnosus* infection at a peritoneal dialysis (PD) catheter's emergence.

The patient is an 81-year-old being treated with PD for end-stage renal disease. The patient started peritoneal dialysis on August 12, 2019, with Tenckhoff catheter placement on July 17, 2019. Since the start of PD, several emergence infections have occurred with different germs. On July 22, 2024, when the dressing was being re-dressed, the private nurse took a bacteriological sample in view of inflammation without discharge at the catheter emergence site. Bacteriological analysis revealed *S. carnosus*, which was treated with mupirocin for 8 days. The clinical and biological evolution was favorable, with a sterile control sample.

This case appears to be the first known on a worldwide and human scale and adds to the knowledge of rare infections of peritoneal dialysis catheter emergences. The germ is also present in animals and foodstuffs.

Keywords: clinical case, peritoneal dialysis, emergence, infection, *Staphylococcus carnosus*.

Résumé

Nous rapportons un cas clinique rare d'infection par la bactérie *Staphylococcus carnosus* au niveau d'une émergence d'un cathéter de dialyse péritonéale (DP).

Il s'agit d'un patient de 81 ans traité par DP pour une insuffisance rénale terminale. Le patient a débuté sa dialyse péritonéale le 12/08/2019 avec la pose d'un cathéter de Tenckhoff le 17/07/2019. Depuis le début de la DP, plusieurs infections d'émergence étaient survenues avec différents germes. Le 22/07/2024, lors de la réfection du pansement, l'infirmière libérale effectue un prélèvement bactériologique au vu d'une inflammation sans écoulement de l'émergence du cathéter. L'analyse bactériologique met en évidence la bactérie *Staphylococcus carnosus*, qui sera traitée par mupirocine pendant 8 jours. L'évolution clinico-biologique s'est révélée favorable avec un prélèvement de contrôle stérile.

Ce cas semble être le premier connu à l'échelle mondiale et humaine, et s'ajoute aux connaissances sur les infections rares des émergences de cathéter de dialyse péritonéale. On note la présence de ce germe chez les animaux et dans l'alimentation.

Mots-clés : cas clinique, dialyse péritonéale, émergence, infection, *Staphylococcus carnosus*.



INTRODUCTION

Emergence infection is a fairly frequent complication, but one that needs to be diagnosed early in order to initiate the appropriate treatment or risk catheter removal and transfer to hemodialysis. Definitive exit-site infection is defined in the ISPD recommendations on catheter-related infections as the presence of purulent discharge, with or without erythema of the skin at the catheter-epidermal interface; in the absence of purulent discharge, other signs of inflammation at the exit site (e.g., erythema, tenderness, swelling, granuloma, or crust formation) are insufficient to definitively diagnose exit-site infection [1].

According to the source of the French-language peritoneal dialysis register (RDPLF), in France, the frequency is approximately 0.16 episode per year [2].

We report a case of *Staphylococcus carnosus* emergence infection that occurred in our PD center

CLINICAL OBSERVATION

Mr. P, aged 81, has been under nephrology care since June 2019 for the management of renal failure. The patient's history is marked by chronic renal failure complicating heart failure refractory to drug treatment, thus creating a cardio-renal syndrome. He also had liver damage of common origin.

The patient had been hospitalized on several occasions for congestive global cardiac decompensation with preserved ejection fraction refractory to optimized medical treatment including sacubitril-valsartan, propranolol, spironolactone, and dapagliflozin. PD was decided, and the Tenckhoff catheter was inserted on July 17, 2019, for cardiac, renal, and hepatic PD.

Beforehand, we visited the patient's home to check on the home's hygiene and ask questions about the patient's lifestyle. The presence of pets in the home was checked: there was no pet at home.

On August 12, 2019, the patient was hospitalized for dialysis start-up; he did not wish to handle the dialysis himself. PD was performed with the help of private nurses. The PD protocol included a 4.25% hypertonic bag during the day, 4 hours of stasis, and an empty stomach in the afternoon, 7 days a week.

The first emergence infection occurred at home on June 22, 2020. This infection showed *Staphylococcus aureus*. The second emergence infection occurred on July 15, 2020, positive for *Staphylococcus epidermidis*. The third emergence infection occurred on July 24, 2020, with *Corynebacterium accolens* and *Staphylococcus warneri*. As the patient was still on antibiotic ointment (mupirocin) from the previous infection, we did not change treatment. The control swab taken on August 13, 2020, came back sterile. One year after the last emergence infection, the patient reported a new emergence infection with *S. aureus*, treated with topical mupirocin. A new infection occurred on July 22, 2024, with a positive swab for *S. carnosus*. The sample (superficial smear) was taken by the nurse at home following redness and pain at the emergence site, with no discharge. The dressing was well in place (not detached). The patient was stable and afebrile.

and had no other complaints. According to the protocol, the dressing was reapplied every day, along with antibiotic ointment. After 8 days of treatment, a new sterile swab was taken, and the emergence was no longer inflammatory or painful. Emergence infections are treated with an application of mupirocin (Bactroban®) for a period of 8 to 10 days, with a control swab taken 8 days after the start of topical treatment.

DISCUSSION

S. carnosus is a gram-positive, catalase-positive, immobile, non-spore-forming coccus [3]. They occur as single cells, in pairs, or in tetrads. *S. carnosus*, long assimilated to *Staphylococcus simulans*, has been confirmed as a new species. Nevertheless, *S. carnosus* belongs to the *S. simulans* group, which is formed by these two species (Kloos & Schleifer, 1986 [4]; Schleifer & Fischer, 1982 [5]). *S. carnosus* has been isolated from dry sausages, salami, and raw ham (Götz, 1990 [6]; Wagner et al., 1998 [7]). Its ecological niche is not well known, although it is related to the animals and meat products from which it has been isolated. No isolations linked to human or animal infections with *S. carnosus* have ever been reported, and this species produces neither enterotoxin, coagulase, hemolysin, nor clumping factor (Euzéby, 2006).

CONCLUSION

This clinical case reports the first human case of *S. carnosus* infection in a PD catheter emergence. A dog was present once a week. It is therefore possible that this germ was transmitted by the presence of the animal in the patient's home. This could be verified by taking a sample from the animal to ensure the presence of the germ in the dog in question. Unfortunately, the patient did not give his consent for this to be carried out, and multilocus sequence typing was not performed. We also know that the germ is ubiquitous in dry food such as sausages, salami, and raw ham, which constitutes another etiological possibility [8]. However, the dressing was applied every 48 hours by home care nurses, making it unlikely that sausages were responsible for the emergence infection. In this case, it is therefore impossible to confirm the origin of our patient's emergence infection, or to rule out transmission by the nurses' hands. All the more so as this is not the patient's first emergence infection, and never before with *S. carnosus*.

Declaration of interest: None

Authorships : MG, JS and RA wrote the article together, with identical roles for each.

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