Small colony variant-producing *S aureus* prosthesis joint infection highlighted by sonication and treated with prolonged high doses of daptomycin

Camille Piffaut,[1] Sébastien Lustig,[2,3,4] Frédéric Laurent,[1,2,4,5,6] Christian Chidiac,[2,4,5,7] Tristan Ferry,[2,4,5,6,7] on behalf of the Lyon BJI Study Group

[1]Laboratoire de Bactériologie, Hôpital de la Croix-Rousse, Hospices Civils de Lyon, Lyon, France
[2]Université Claude Bernard Lyon 1, Lyon, France
[3]Service de Chirurgie Orthopédique, Centre Albert Trillat, Hôpital de la Croix-Rousse, Hospices Civils de Lyon, Lyon, France
[4]Centre Interrégional de Référence Rhône-Alpes Auvergne des Infections Ostéo-articulaires complexes, Lyon, France
[5]Centre International de Recherche en Infectiologie, CIRI, Inserm U1111, CNRS UMR5308, ENS de lyon, UCBL1, Lyon, France
[6]Centre National de Référence des Staphylocoques, Lyon, France
[7]Service de Maladies Infectieuses et Tropicales, Hôpital de la Croix-Rousse, Hospices Civils de Lyon, Lyon, France

Correspondence to
Dr Tristan Ferry,
tristan.ferry@univ-lyon1.fr

DESCRIPTION

An 80-year-old woman with a history of β-lactam allergy was admitted for chronic knee prosthesis joint infection (PJI) (figure 1A). The prosthesis was removed and sonicated as previously described (400 ml of Ringer solution was added in a sterile box containing the explanted prosthesis, vortexing was performed before and after sonication in ultrasound bath, and then 100 µl of sonicate fluid was plated onto aerobic and anaerobic medium and broth).[1] All peroperative samples revealed methicillin-susceptible *Staphylococcus aureus* in cultures, whereas the sonicate fluid culture yielded additional *S aureus* small colony variant phenotype (SCV) (figure 1B). Vancomycin (1 g/day intravenously) followed by rifampin (1200 mg/day orally) were started. As a rash with eosinophilia occurred, vancomycin and rifampin were switched to daptomycin 850 mg/day (9 mg/kg/day). Reimplantation, performed after a 6-week interval, did not reveal any bacterial growth in culture. Daptomycin was continued for a total duration of 3 months, with perfect clinical and biological tolerance. At 1-year follow-up, clinical and radiological outcomes were favourable (figure 1C).

S aureus, one of the most frequent aetiological agent of PJI, is associated with a high rate of relapse, partly explained by its capacity to produce biofilm and to convert into SCV, which is a slow-growing phenotype associated with intracellular persistence.[2]

Our case highlights that (1) sonication should help to isolate these phenotypic variants, actually underestimated due to fastidious growth requirements; (2) prolonged high dose (≥8 mg/kg/J) of daptomycin (considered as an alternative for the treatment of *S aureus* PJI at the standard dose of 6 mg/kg/J[3]) might be efficient in patients with chronic PJI due to SCV expressing *S aureus*. In fact, as it was demonstrated for rifampin (compromised in our case), recent studies pinpointed the antibiofilm activity of daptomycin. Its antimicrobial activity against SCV remained to be investigated.

Learning points

- Sonication may help to show small colony variant phenotype in *Staphylococcus aureus* chronic prosthesis joint infection.
- Daptomycin could be used for the treatment of *S aureus* chronic prosthesis joint infection.

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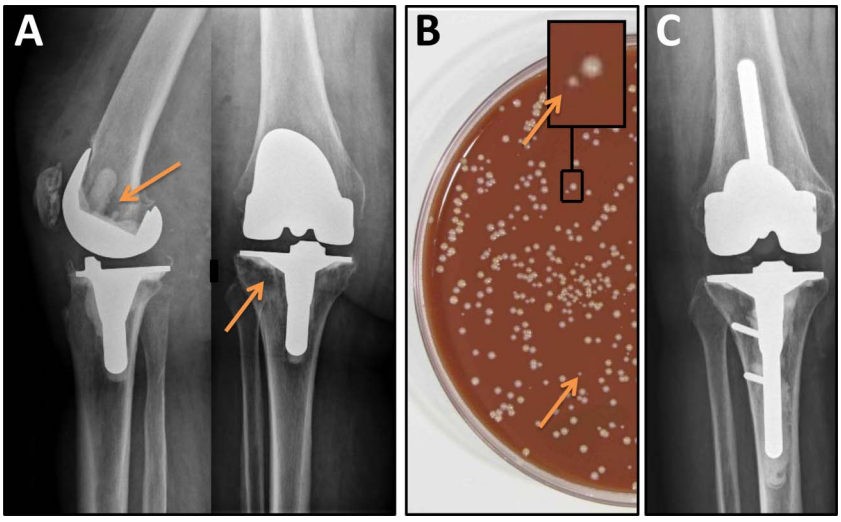

Figure 1 Periprosthetic pathological lucencies (A, arrows), associated with MSSA SCV in cultures (small colonies) obtained with sonication from prosthesis explantation (B, arrows). After reimplantation and a total of 3 months of antimicrobial therapy, no relapse occurred at 1 year (C, x-ray).

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