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1 **CATEGORY:** Case report

2 **TITLE:** *Sneathia amnii*, an unusual pathogen in spondylitis : a case report

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19 **ABSTRACT**

20 *Sneathia amnii* is an opportunistic pathogen of the female reproductive tract that has been
21 reported to cause infections during pregnancy and in the post-partum period. Infections
22 outside the reproductive tract have rarely been described. We report the case of a spondylitis
23 due to *S. amnii* in a 72-year old woman, successfully treated with a course of antibiotic therapy
24 for 7 weeks. Growth of this pathogen guided our diagnosis towards a gynecological
25 pathology; we discovered an endometrium adenocarcinoma. This case emphasizes the need
26 for adequate incubation of discal biopsies, both using aerobic and anaerobic enrichment broth
27 and prolonging delay of culture of negative samples.

28

29 **KEYS WORDS** : *Sneathia amnii*; Spondylitis; Endometrium adenocarcinoma; 16S rDNA
30 sequencing; Case report

31

32

33 **1. Introduction**

34 *Sneathia amnii* (formerly *Leptotrichia amnionnii*) is a fastidious anaerobic Gram-negative rod
35 considered as an opportunistic pathogen of the female reproductive tract. *Sneathia* species
36 have been associated with bacterial vaginosis and with various obstetric complications
37 including spontaneous abortions, preterm labor and post-partum bacteremia [1]. Infections
38 outside the reproductive tract have rarely been described. We report a case of *S. amnii*
39 spondylitis linked to an endometrium adenocarcinoma and review the literature on this
40 pathogen.

41 **2. Case report**

42 A 72-year old woman with a previous history of heart disease and type 2 diabetes was
43 admitted to the emergency department for a disabling back pain evolving for one week, not
44 controlled by morphine. She did not report deterioration of her general condition. On
45 admission, she presented with fever (38.3°C), lower back and paravertebral pain, without
46 sepsis nor neurological signs. Laboratory tests showed biological inflammatory syndrome (C-
47 Reactive Protein at 142 mg/L), hyperleukocytosis (19690/mm³), anemia (9,9 g/dL).
48 Dorsolumbar MRI showed a L3-L4 spondylitis with a small anterior abscess, infiltration of
49 the psoas and epiduritis. Blood cultures (Bact-Alert3D; BioMérieux, Marcy l'Etoile, France)
50 remained sterile. Discal biopsies were sampled. An inflammatory tissue with many
51 neutrophils was described by anatomopathologic analysts. In bacteriology, a Gram-negative
52 nonmotile bacilli grew in Wilkins-Chalgren anaerobic broth at the third day of incubation
53 while aerobic broth remained sterile. Subculture was performed on Columbia agar with blood
54 5% anaerobically incubated at 35°C for 6 days. On blood agar, colonies were flat, crystalline
55 α -hemolytic, with a diameter of approximately 1 mm. Catalase and oxidase were negative.
56 On the Gram stain, bacteria appeared as long and short Gram-negative rods (Figure A).
57 Bacteria were identified as *S. amnii* using MALDI-TOF spectrometry mass (Bruker Daltonics,

58 Wissembourg, France) and 16S rDNA sequencing (377 ABI Prism; PE Applied Biosystems,
59 Foster City, CA., USA). *In vitro* susceptibility tests performed by disk diffusion method with
60 an inoculum of 1 McFarland on Brucella agar with vitamin K1 and blood 5%, according to
61 the procedure and interpretation criteria proposed by the Comité de l'Antibiogramme de la
62 Société Française de Microbiologie (CA-SFM EUCAST 2019) ([http://www.sfm-](http://www.sfm-microbiologie.org)
63 [microbiologie.org](http://www.sfm-microbiologie.org)), showed susceptibility to amoxicillin-clavulanic acid, tetracycline,
64 clindamycin, rifampicin, and metronidazole. New discal biopsies were sampled 4 weeks later.
65 The same bacteria yielded in 14 days in the anaerobic broth and the subculture in 12 days
66 more on Columbia agar with 5 % blood. Both vertebral biopsies cultures being positive with
67 *S. amnii* alone, since gynecological entrance wound was highlighted in the patient, the
68 contribution of other micro-organisms such as streptococcus and other anaerobic bacteria
69 remained unclear but plausible and was considered for antimicrobial therapy. The presence of
70 complications with abscess and epiduritis was also taken into account. Treatment was initiated
71 with association of intravenous amoxicillin-clavulanic acid and metronidazole for 10 days to
72 enlarge microbiological spectrum, further replaced by clindamycin plus metronidazole for 6
73 weeks since psoas abscess and epiduritis had promptly disappeared.
74 Because of these microbiological findings and given that *S. amnii* is part of the genital tract, a
75 gynecological examination was performed: a large uterine fibroid was discovered, later
76 identified as an endometrium adenocarcinoma, with a significant increase of CA125 level (86
77 U/mL). The patient later revealed that she had metrorrhagia since one year.

78

79

3. Discussion

The review of the literature on *S. amnii* related various cases of infections associated with the female genital tract or delivery : upper genital tract infections, chorioamnionitis, abortion, stillbirth, postnatal sepsis and neonatal infections such as meningitis [2,3,4,5]. Only few cases of infections outside the urogenital tract have been described : an urinary tract infection in a renal transplant [6], a renal abscess occurring 5 weeks after vaginal delivery [7], an arthritis in a diabetic and hemodialysis man [8], an epidural abscess following hysteroscopy [9] and a spondylitis in a context of endometrium adenocarcinoma (our case) .

To our knowledge, our description is the first of a *S. amnii* spondylitis in a patient with gynecological cancer. *In vitro*, Harwich et al. pointed out *S. amnii* ability to adhere and its high cytotoxic potential for cervical epithelial cells [1]. Recent studies evocated increase of *Sneathia* sp. in vaginal flora of patients with cervical cancer [10-12]. However, these observations need to be strengthened and may not be transposable to endometrium adenocarcinoma.

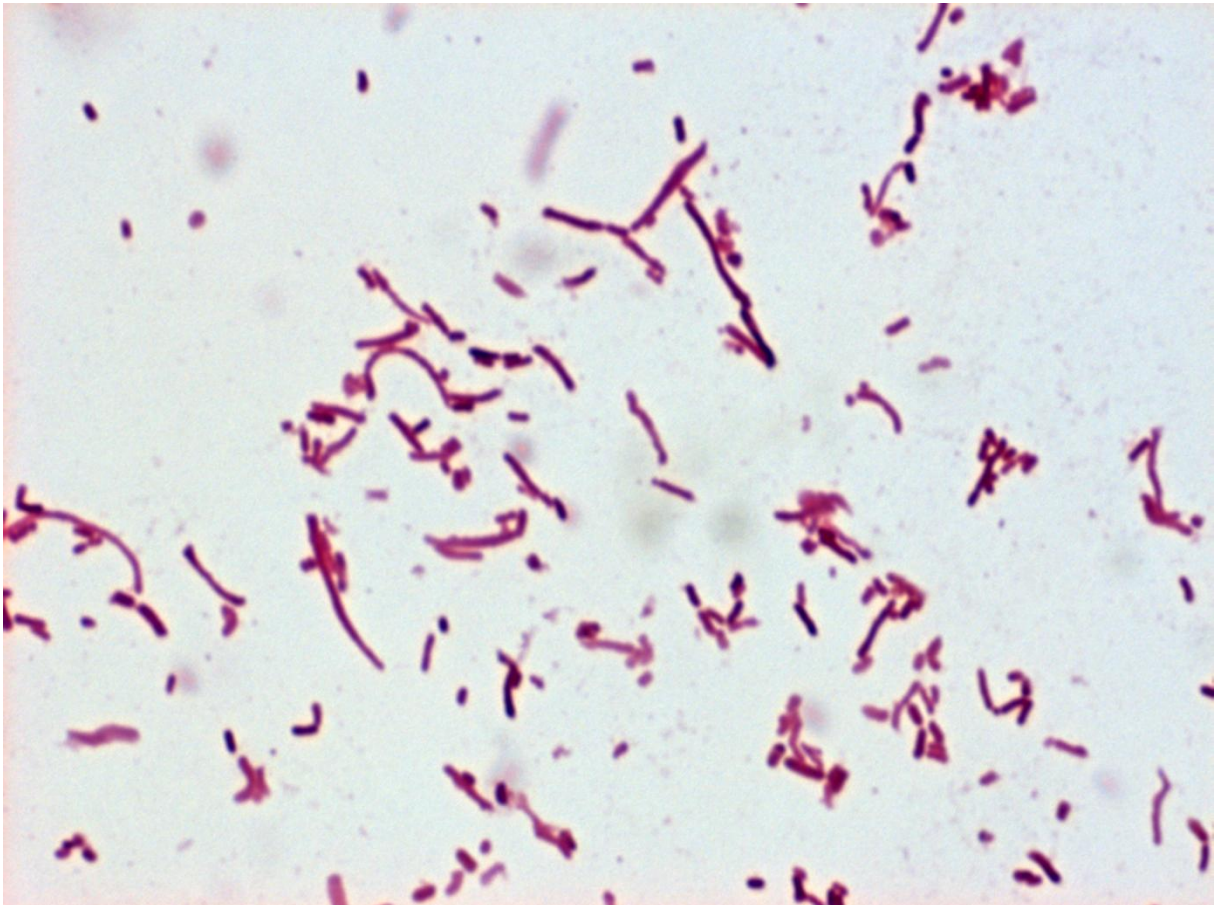
Anaerobes are rare causes of spondylitis since they are observed in less than 4% of cases [13, 14]. Indeed, *Staphylococcus aureus* is the predominant pathogen accounting for half of non-tuberculosis spondylitis, followed by *Enterobacteriaceae*, *Pseudomonas aeruginosa*, coagulase-negative staphylococci and streptococci [13]. Blood cultures are the first way to obtain a microbiological diagnosis of spondylitis and were positive in 66.0% out of the 194 documented cases in the serie by Amsilli et al. These authors recommend to perform vertebral biopsies as a second line technique since they documented 89.4% of cases without positive blood culture, and particularly, yielded all anaerobes of their serie [14]. In other studies, 39% of biopsy cultures in suspected cases of spondylitis were negative [13]. In this context, anaerobes such as *S. amnii* may be underestimated organisms since they are fastidious and slow-growing bacteria. Some authors thus consider use of broad range PCR as a valuable

105 adjunct to standard cultures for culture-negative vertebral biopsies [13]. To our view, it
106 mostly emphasizes the need for adequate incubation of these samples, both using aerobic and
107 anaerobic enrichment broth and prolonging delay of culture of negative samples. Indeed, in
108 our case, culture of *S. amnii* has been essential for gynecological cancer diagnosis (since it has
109 led us to perform a gynecological examination), more than for spondylitis treatment (since it
110 is a very antibiotic-susceptible bacterium).

111

112

113 **FIGURE A**



114

115 **Gram stain of *Sneathia amnii*.** Gram stain from colonies on blood agar, image taken at
116 magnification 1000x. Presence of long and short Gram-negative rods.

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