



Case report

First report of subcutaneous abscess caused by *Porphyromonas gingivalis*

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ABSTRACT

Approximately 90% of skin infections are thought to be attributable to *Staphylococcus aureus* and *Streptococcus pyogenes*, along with some anaerobic bacteria such as *Bacteroides* and *Prevotella* species, which are considered significant causative agents in post-operative skin infections especially in diabetics. Species from the anaerobic *Porphyromonas* genus are known to cause oral infections, but rarely cause infection of the skin. In this case report, we describe a subcutaneous abscess caused by *Porphyromonas gingivalis* in a 67-year-old man who had started chemotherapy for lung cancer (cT3N3M0 stage III B) three days prior to consulting a dermatologist. On clinical examination, a fist-sized mass with a hot sensation was observed in the left temporal region of the face, and treatment with cefazolin was commenced at 6 g/day. After three days, the mass was drained via skin incision and pus culture was performed, which revealed infection with *P. gingivalis*. The patient was successfully treated with abscess drainage and antibiotics therapy. We suggest that in tandem with immunosuppression, *P. gingivalis* could be a cause of skin infections.

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Introduction

Porphyromonas gingivalis was previously known as *Bacteroides gingivalis*, and renamed *P. gingivalis* after numerous rounds of taxonomic reclassification. *P. gingivalis* is a gram-negative anaerobic bacterium, said to be frequently detected in dental plaque [2].

While skin infections caused by *Bacteroides* and *Prevotella*, from the same taxonomic class, play a significant role in post-operative infections, infections caused by *Porphyromonas* are considered rare. Skin abscesses have known involvement with aerobic and anaerobic bacteria, including *Streptococcus anginosus*, *Streptococcus pyogenes*, and *Staphylococcus aureus*, all of which are common causes of skin infections [1,3]. However, *Porphyromonas* species are more commonly associated with oral infections [2].

In this case study, we describe the onset and treatment of a skin abscess caused by *P. gingivalis* in a 67-year-old man who was undergoing chemotherapy for lung cancer. Drainage of the abscess via skin incision and treatment with antibiotics resulted in satisfactory resolution.

Case Report

A 67-year-old man attended the Dermatology Department at JR Tokyo General Hospital with swelling to the left side of his head. He had commenced chemotherapy (weekly Paclitaxel [80 mg/m²] + Carboplatin [300 mg/m²], the 1st line regimen used for lung cancer.) for lung cancer cT3N3M0 stage III B three days prior to his consultation with Dermatology. Clinical examination revealed a fist-sized mass with a hot sensation to the left temporal region of the face. Initial laboratory workup on the day of consultation showed an elevated serum C-reactive protein level of 416 nmol/L. The patient was diagnosed with a skin infection and started on cefazolin at 6 g/day, but his symptoms did not improve. Therefore drainage via skin incision was performed three days later, and the exudate was collected and submitted for laboratory culture. Cefazolin at 6 g/day was continued, along with treatment of the wound, and *P. gingivalis* was detected from the pus culture. Sensitivity of the bacteria to various antibiotics is shown in Table 1. The patient's symptoms improved within one month, and chemotherapy was resumed.

Discussion

This patient experienced a skin abscess caused by *P. gingivalis*. While this is a common cause of oral infections, it is thought to

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Table 1

Antibacterial sensitivity test report of *P. gingivalis* cultured from exudate collected from the patient's lesion.

Drug	MIC ¹	Interpretation
Amoxicillin	≤0.06	S ²
Piperacillin	≤0.03	S
Cefazolin	≤0.12	S
Gentamicin	≤0.12	S
Arbekacin	1	R ³
Clarithromycin	≤0.12	S
Clindamycin	>4	R
Minocycline	0.5	S
Fosfomycin	≤4	S
Vancomycin	≤1	NA ⁴
Levofloxacin	>8	R

¹ MIC: minimum inhibitory concentration; ²S: sensitive; ³R: resistant; ⁴NA: not assessed.

infect the skin and other systems only rarely [2]. Due to undergoing treatment for lung cancer, the patient was considered immuno-compromised [4]. Unfortunately, as the exudate culture was submitted after administration of cefazolin, it is not known whether other causative bacteria could have been involved. However, formation of the abscess and detection of cefazolin-sensitive *P. gingivalis* only, with no other pathogens, suggests that *P. gingivalis* was the likely cause. Additionally, the patient uses dentures, which may be a contributing factor for *P. gingivalis* activity.

There has been suggestion of *P. gingivalis* involvement in oral cancer [5], but its association with lung cancer has not been reported and remains unknown. No skin infection or skin abscess due to *P. gingivalis* is reported within the PubMed search range, and this case is considered to be the first of skin abscess due to *Porphyromonas gingivalis*.

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Declarations of Competing Interest

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Informed consent

We obtained written signed consent from the patient to publish his clinical details.

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