

# Chronic Osteomyelitis Caused by *Finegoldia magna*

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A 26-year-old incarcerated man presented to the emergency department (ED) with a complication of osteomyelitis of the left ischium, which had been diagnosed previously.

## History

He had had a gunshot wound to the left hip 9 years prior to presentation, which had resulted in the development of incomplete paraplegia and a left ischial decubitus ulcer involving the bone. In the past, he had received a left ischial advancement flap and debridement to the bone. The surgeon had noted that where one area was closed, another area had opened within the scar.

At the current visit, the patient reported intermittent drainage, as well as the use of gauze pads and adult diapers to control the drainage. The patient denied any fevers, chills, sweats, or gross purulence from the wound prior to presenting to the ED.

Treatment and management. He underwent an excision and debridement of the left ischial sinus tract, revision of the rotational flap, and placement of a vacuum-assisted closure of wound device.

During the procedure, a small superficial sinus tract was found extending to the patient's perianal lesion. The cavity spanned approximately 9 cm × 4 cm with the main central area measuring approximately 3 cm × 5 cm. The tract was lined with a gelatinous material. The deep aspect of the wound extended down to the periosteum, but there was no exposed bone at the depths of the cavity. Wound cultures were sent to the hospital's microbiology laboratory and analyzed via matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS). The patient was then admitted to the surgical service. At that time, the patient was afebrile without chills or sweats.

Upon admission to the hospital, the patient was initially given a course of intravenous ceftriaxone, 1 g, every 24 hours until cultures that were taken from the wound grew *Finegoldia magna* on hospital day 6. Subsequently, ceftriaxone was discontinued, and intravenous ertapenem, 1 g/d, was initiated for additional anaerobic coverage. Ertapenem therapy was given for 5½ weeks.

Initial laboratory test results revealed an elevated erythrocyte sedimentation rate (ESR) of 19 mm/hr and an elevated C-reactive protein (CRP) level of 1.73 mg/dL. After completing a course of antibiotic therapy, the patient's ESR and CRP level returned to normal limits, 5 mm/hr and 0.58 mg/dL, respectively. The patient was able to ambulate and remained stable. He was then discharged from the hospital and returned to the detention facility with outpatient follow-up.

## Discussion

*F magna* is a pleomorphic gram-positive, nonspore-forming anaerobic coccus known to colonize human skin, the genitourinary tract, and the gastrointestinal tract.<sup>1</sup> Evidence also suggests that it is present in normal skin flora and can be present in stool cultures.<sup>2</sup> It has been identified in pulmonary, cardiac, abdominal, and urinary tract infections, as well as in native and bioprosthetic valve endocarditis, pericarditis associated with mediastinitis, and necrotizing pneumonia complicated by pyopneumothorax.<sup>3</sup>

It was originally thought to be in the genus of *Peptostreptococcus*, but 16S ribosomal RNA sequencing has shown significant differences in genetic and phenotypic characteristics between *Pep-*

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*tostreptococcus magnus* and micrococcus species.<sup>2</sup> *P magna* has since been reclassified in the new genus *Finegoldia*.<sup>2</sup>

*F magna* is a gram-positive anaerobic coccus and is very pathogenic. It is a successful opportunistic pathogen because of its specific virulence factors for adhering to and penetrating the skin, usually adhering to mucocutaneous surfaces.<sup>3</sup> The protein *F magna* adhesion factor (FAF) and sortase-dependent pili are responsible for initial adhesion to the skin's upper epidermal layer. They then bind to the galectin-7 keratinocyte cell marker, Fillibrin-1, or Fillibrin-2, which can lead to deeper penetration.<sup>3</sup> FAF also exhibits antibacterial properties by binding to histones on the skin's surface.<sup>4-6</sup> When bound by FAF, the SufA degrades histones. SufA is a subtilisin-like extracellular serine protease.<sup>4</sup> The bacterium is also able to produce biofilms, resulting in chronicity of infection and antibiotic resistance.<sup>3</sup>

*F magna* is most commonly found in skin, soft tissue, and prosthetic joint infections<sup>7</sup> but has also been found in pericarditis, mediastinitis,<sup>8</sup> empyema,<sup>9</sup> and toxic shock syndrome.<sup>10</sup> *F magna* is rarely a cause of abscess formation and rarely osteomyelitis.

Osteomyelitis is an infection of the bone. It is generally classified based on the duration of illness (acute or chronic).<sup>11</sup> Chronic osteomyelitis is categorized as a longstanding infection of the bone over months to years with associated characteristic findings that result from bone ischemia and necrosis, such as the presence of sequestra and sinus tracts, often seen on radiographic imaging.<sup>11</sup> Younger adults typically develop nonhematogenous osteomyelitis in the setting of trauma and subsequent surgical procedures.<sup>11</sup> However, other risk factors include type 2 diabetes, peripheral vascular disease, peripheral neuropathy, poor-healing soft tissue wounds such as decubitus ulcers, and the presence of orthopedic hardware.<sup>11</sup> Our patient was a paraplegic because of a previous gunshot wound to the hip, which increased his risk of decubitus ulcers, poor wound healing, and develop-

ment of chronic osteomyelitis.

Results of a retrospective case study published in 2017 showed that *F magna* was isolated from orthopedic joint implant-associated infections and that *F magna* is a rare cause of osteomyelitis.<sup>12</sup> The bacterium isolated from patients in the study was susceptible to most antibiotics, except linezolid, moxifloxacin, and rifampin. Patients in this study were mostly treated with penicillin V, ciprofloxacin, amoxicillin, clindamycin, and rifampin.<sup>12</sup>

## Conclusion

*F magna* is one of the most commonly isolated anaerobic bacteria from skin contaminants. However, it is largely unseen in most cases of osteomyelitis.<sup>13</sup> Our case study illustrates *F magna* as a rare cause of chronic osteomyelitis. When treating cases of chronic osteomyelitis, this organism should be considered.

## Patient outcome

The patient had clinically improved and remained afebrile during the rest of his hospital stay of approximately 6 weeks. In hindsight, the initial antibiotic choice may not have been adequate, and a change to ertapenem in a timely matter averted further complications and need for additional surgery.

## References

1. Finegold SM. Anaerobic infections in humans: an overview. *Anaerobe*. 1995;1(1):3-9. [https://doi.org/10.1016/s1075-9964\(95\)80340-8](https://doi.org/10.1016/s1075-9964(95)80340-8)
2. Murdoch DA, HN Shah. Reclassification of *Peptostreptococcus magnus* (Prevot 1933) Holdeman and Moore 1972 as *Finegoldia magna* comb. nov. and *Peptostreptococcus micros* (Prevot 1933) Smith 1957 as *Micromonas micros* comb. nov. *Anaerobe*. 1999;5(5):555-559. <https://doi.org/10.1006/anae.1999.0197>
3. Boyanova L, Markovska R, Mitov I. Virulence arsenal of the most pathogenic species among the Gram-positive anaerobic cocci, *Finegoldia magna*. *Anaerobe*. 2016;42:145-151. <https://doi.org/10.1016/j.anaerobe.2016.10.007>
4. Murphy EC, Mohanty T, Frick IM. FAF and SufA: proteins of *Finegoldia magna* that modulate the antibacterial activity of histones. *J Innate Immun*. 2014;6(3):394-404. <https://doi.org/10.1159/000356432>
5. Murphy EC, Mörgelin M, Reinhardt DP, Olin AI, Björck L, Frick IM. Identification of molecular mechanisms used by *Finegoldia magna* to penetrate and colonize human skin. *Mol Microbiol*. 2014;94(2):403-417. <https://doi.org/10.1111/mmi.12773>
6. Frick IM, Karlsson C, Mörgelin M, et al. Identification of a novel protein promoting the colonization and survival of *Finegoldia magna*, a bacterial commensal and opportunistic pathogen. *Mol Microbiol*. 2008;70(3):695-708. <https://doi.org/10.1111/j.1365-2958.2008.06439.x>
7. Levy PY, Fenollar F, Stein A, Borriero F, Raoult D. *Finegoldia magna*: a forgotten pathogen in prosthetic joint infection rediscovered by molecular biology. *Clin Infect Dis*. 2009;49(8):1244-1247. <https://doi.org/10.1086/605672>
8. Phelps R, Jacobs RA. Purulent pericarditis and mediastinitis due to *Peptococcus magnus*. *JAMA*. 1985;254(7):947-948. doi:10.1001/jama.1985.03360070085029
9. Boyanova L, Vladimir Djambazov, Gergova G, et al. Anaerobic microbiology in 198 cases of pleural empyema: a Bulgarian study. *Anaerobe*. 2004;10(5):261-267. <https://doi.org/10.1016/j.anaerobe.2004.06.001>
10. Rosenthal ME, Rojzman AD, Frank E. *Finegoldia magna* (formerly *Peptostreptococcus magnus*): an overlooked etiology for toxic shock syndrome? *Med Hypotheses*. 2012;79(2):138-140. <https://doi.org/10.1016/j.mehy.2012.04.013>
11. Momodu II, Savaliya V. Osteomyelitis. In: *StatPearls*. StatPearls Publishing; February 5, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK532250/>
12. Söderquist B, Björklund S, Hellmark B, Jensen A, Brüggemann H. *Finegoldia magna* isolated from orthopedic joint implant-associated infections. *J Clin Microbiol*. 2017;55(11):3283-3291. <https://doi.org/10.1128/jcm.00866-17>
13. Murdoch DA. Gram-positive anaerobic cocci. *Clin Microbiol Rev*. 1998;11(1):81-120. <https://doi.org/10.1128/cmr.11.1.81>