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CASE REPORT

Detection of *Finegoldia magna* in Cyst Secretions from a Non-Lutating Female Breast: A Case Report

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Abstract: *Finegoldia magna* is a Gram-positive, obligately anaerobic coccus, often colonizing the skin and mucous membranes, capable of causing multi-site and mixed infections. This study retrospectively analyzed the clinical data and microbiological examination results of a case where *F. magna* was cultured from purulent secretions of a breast cyst in a non-lactating female, combined with a review of relevant domestic and international literature. In vitro drug susceptibility testing showed that the strain was susceptible to penicillin, ampicillin, ceftriaxone, and imipenem, but resistant to clindamycin. The empyema cavity was irrigated with gentamicin saline, and local dressing changes were performed, leading to good wound healing and discharge. This case suggests that clinicians should pay attention to the possibility of anaerobic bacterial infections after breast surgery, especially when routine bacterial cultures are negative, necessitating timely anaerobic culture. Combined with mass spectrometry identification and drug susceptibility test results, this approach guides precise treatment.

Keywords: non-lactating female, breast cyst, *Finegoldia magna*, anaerobic bacteria, antibiotic susceptibility testing

Introduction

Finegoldia magna (formerly *Peptostreptococcus magnus*) is the most common Gram-positive anaerobic coccus isolated from human clinical specimens, often seen in mixed infections, particularly closely related to skin and soft tissue infections, and bone or joint infections.[1,2] Breast abscesses in non-puerperal females caused by *F. magna* are particularly rare.[3–5] This article will discuss the key points of diagnosis and treatment of anaerobic bacteria in breast infections based on a case of *F. magna* detected in cyst secretions from a non-lactating female, providing a reference for clinical practice.

Case Data

Diagnosis and Treatment Process

The patient, a 31-year-old female, was admitted on August 4, 2025, due to "discovery of a left breast mass for 3 days." The patient had a generally healthy medical history, denied chronic diseases such as hypertension or diabetes, reported a history of penicillin allergy, and had no history of surgery or trauma. Menstrual history was regular, last menstrual period July 6, 2025. Physical examination: Temperature 36.6°C, pulse 81 beats/min, respiration 17 breaths/min, blood pressure 128/80 mmHg. A 2.5cm × 2.0cm mass was palpable at the 6 o'clock position of the left breast, near the inframammary fold; it was hard, with poorly defined borders, significant tenderness, overlying skin showed redness and swelling, and skin temperature was slightly elevated; no enlarged lymph nodes were palpable in either axilla. Breast ultrasound indicated: cystic echo nodule in the left breast (20.2mm × 9.2mm), BI-RADS category 2, see Figure 1. Laboratory tests: White blood cell count 9.8×10^9/L, absolute neutrophil count 7.18×10^9/L, C-reactive protein 5.7 mg/L; liver and kidney function, coagulation function showed no abnormalities.

Admission diagnosis: Left breast cyst with infection. On August 6, 2025, she underwent left breast cyst excision + abscess incision and drainage under general anesthesia. Intraoperatively, an empyema cavity measuring approximately 7cm × 5cm was found; 2mL of pus was aspirated and sent for microbial culture. The cavity was irrigated with 500mL of gentamicin saline,

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Figure 1 Breast Ultrasound.

packed with medicated gauze for drainage, and the mass was sent for pathology. Pathological diagnosis: (Left breast mass) Consistent with dermoid cyst with suppurative inflammation and surrounding chronic inflammation, see Figure 2. 16S gene sequencing strain identification results description: The specific primer amplification of bacteria shows a single clear target band, and the sequencing results are compared with the *Finegoldia magna* strain in GenBank (GenBank NO.CP085955.1) The sequence similarity is 99.93%.Original sequence:>1TSS20250905-0571-02354 GCTCCTCATTAGGTCACAGGCTTCGG GTATTATCAACTCCCATGGTGTGACGGGCGGTGTGTACAAGACCCGGGAACGC_ATTCACCGCGACATTCTGA-TCCGCGATTACTAGCAACTCCGACTTCATGTAGGCGAGTTGCAGCCTACAATCCGAACTGGGATTGGCTTTCG-AGTTTTGCATTATATCACTATATAGCTGCCCTCTGTACCAACCATTGTAGCACGTGTGTAGCCCAGGACATAAA-GGGCATGATGATTTGACGTCATCCCCACCTTCCTCCGATTTGTCATCGGC

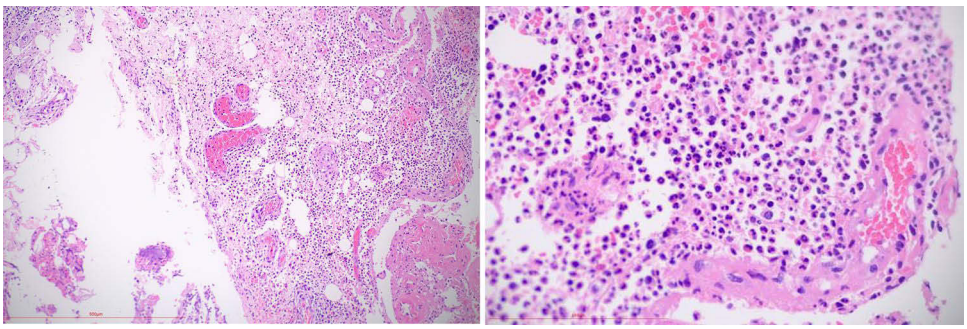

Figure 2 Pathological sections of the left breast mass. There is diffuse infiltration in the breast tissue. Left (10x magnification). Infiltrated cells are composed of lymphocytes, neutrophils and macrophages. The blood vessels are congested and dilated, and there is no specific change. Right (40x magnification).

AGTCTACTTAGAGTCCCCGACATTATTCGCTGGTAACTAAGTATAGGGGTTGCGCTCGTTGCGGGACTTA-ACCCAACATCTCACGACACGAGCTGACGACAACCATGCACCACCTGTATGGATGTCTCATAAAGAGAGGGG-TATATCTCTATACCTTTCACCCACATGTCAAGCCCTGGTAAGGTTCTTCGCGTTGCATCGAATTAAACCACAT-GCTCCGCTGCTTGTGCGGGTCCCCGTCAATTCCTTTGAGTTTCACACTTGCGTGCGTACTCCCCAGGCGGAA-TGCTTAATGTGTTAACTTCGGCACCGAGGTTTGACCCCCAACACCTAGCATTCATCGTTTACGGCGTGGACT-ACCAGGGTATCTAATCCTGTTTGCTCCCCACGCTTTCGTACCTCAGCGTCAGTTTGTGTCCAGAAAGTCGCC-TTCGCTACTGGTATTCCTCCTAATATCTACGTATTTCACCACTACACTAGGAATTCCACTTTCCTCTCCACTAC-TCAAGTTTATCAGTTTCCAATGCTTTACGGGGTTGAGCCCCGATCTTTAACATTCGACTTATTAAACCGCCTG-CGTACCCTTTACGCCCAATAATTCCGGACAACGCTCGCTCCATACGTATTACCGCGGCTGCTGGCACGTATTT-AGCCGGAGCTTTCTTCTATGGTACTGTCATTATCTTCCCATAGGACAGAACTTTACGATACGAATACCTTCTT-CGTTCACGCGGCGTCGCTGCATCAGGGTTTCCCCCATTGTGCAATATTCCCCACTGCTGCCTCCCGTAGGAG-TTTGGACCGTGTCTCAGTTCCAATGTGGCCGTTCATCCTCTCAGACCGGCTACTGATCGTCGCCTTGGTGGG-CTGTTATCTCACCAACTAGCTAATCAGACGCGAGCCCATCTATGACCGATAAATCTTTGACCGTTGAAACATG-TGTTTCTACGATTTTATGCGGTATTAATCCCGGTTTCCCGAGGCTATCCCACTGTCATAGGCAGGTTGCTCAC-GCGTTACTCACCCGTTCGCCACTCTCATTAGTAATCTTCCACCGAGGTTTCTGTCTACTAAATCCCGTTCGAC-TT. Postoperatively, local dressing changes with gentamicin were administered. On postoperative day 5, wound exudate significantly decreased; at 2 weeks postoperatively, there was no significant exudate; at 4 weeks postoperatively, the wound was dry and healed. Follow-up blood tests and C-reactive protein returned to normal, and the patient was discharged on September 3, 2025.

Microbiological Examination

Pus Smear Examination

A pus smear was prepared, Gram-stained, and examined under microscopy, revealing numerous white blood cells with intracellular Gram-positive cocci. See Figure 3.

Pus Culture

1. Aerobic Culture: The pus was inoculated onto blood agar, chocolate agar, and MacConkey agar plates, and incubated at 35°C in a 5% CO_2 incubator for 48 hours. No bacterial growth was observed on any plate.
2. Anaerobic Culture: The pus was inoculated onto anaerobic blood agar plates, placed in an anaerobic gas pack (85% N_2, 10% H_2, 5% CO_2) and incubated at 35°C for 48 hours. Small, white, flat, translucent colonies, 0.5–1.0 mm in diameter, formed on the anaerobic blood agar. Gram staining showed round Gram-positive cocci, mostly in pairs or short chains. See Figures 4 and 5.

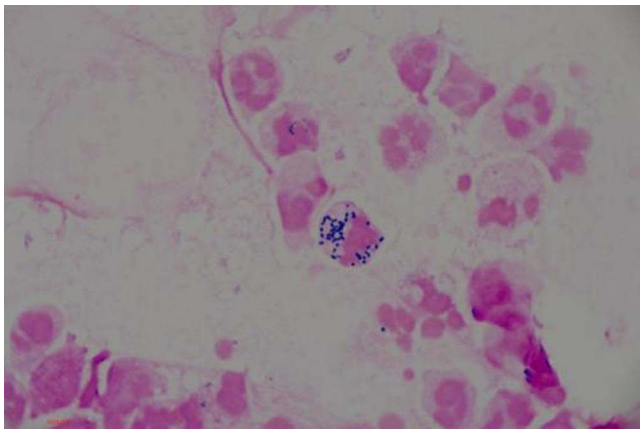

Figure 3 Gram stain results of patient's pus smear (×1000).

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Bacterial Identification

Single colonies from the anaerobic blood agar were picked and identified using the French bioMérieux VITEK MS Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometer (MALDI-TOF MS). The result was *Finegoldia magna* with 99.9% confidence. See Figure 6.

Drug Susceptibility Test

Drug susceptibility testing was performed using the E-test method: Single colonies were picked and suspended in 0.85% NaCl solution to a 0.5 McFarland standard, evenly spread on anaerobic blood agar medium. E-test strips were applied, and plates were placed in an anaerobic bag and incubated at 35°C for 48 hours. Results were interpreted according to the Clinical and Laboratory Standards Institute (CLSI) M11-A8 standard. The strain was susceptible to penicillin, ampicillin, ceftriaxone, and imipenem, but resistant to clindamycin. See Table 1.

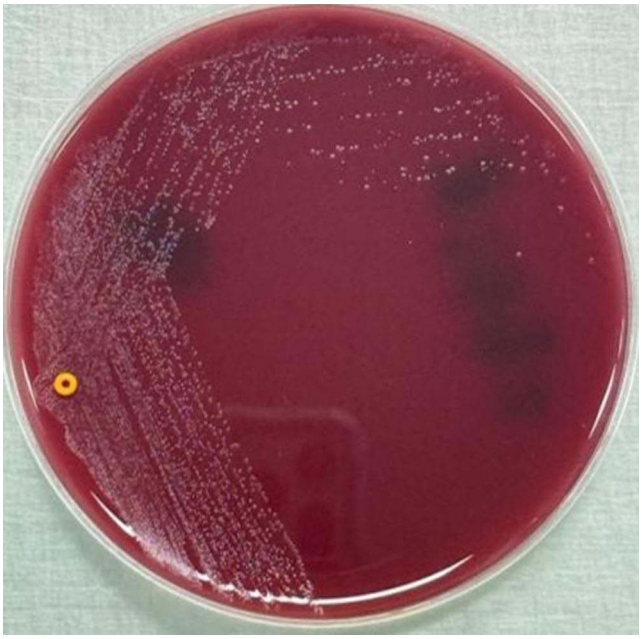

Figure 4 Colony morphology of *F. magna* from anaerobic culture.

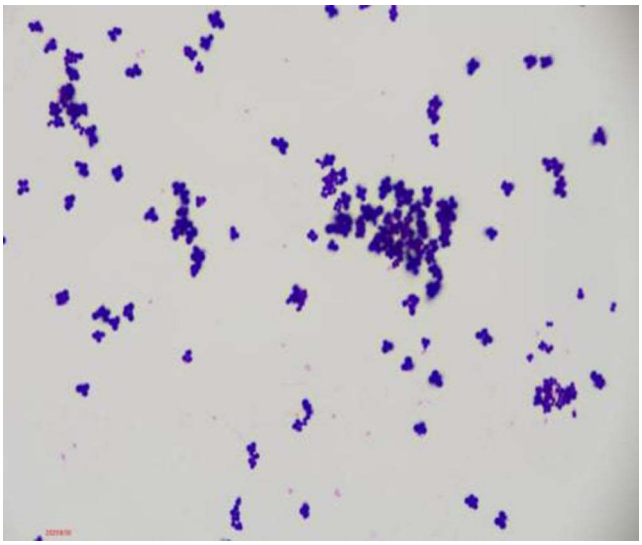

Figure 5 Gram stain morphology of *F. magna* (x1000).

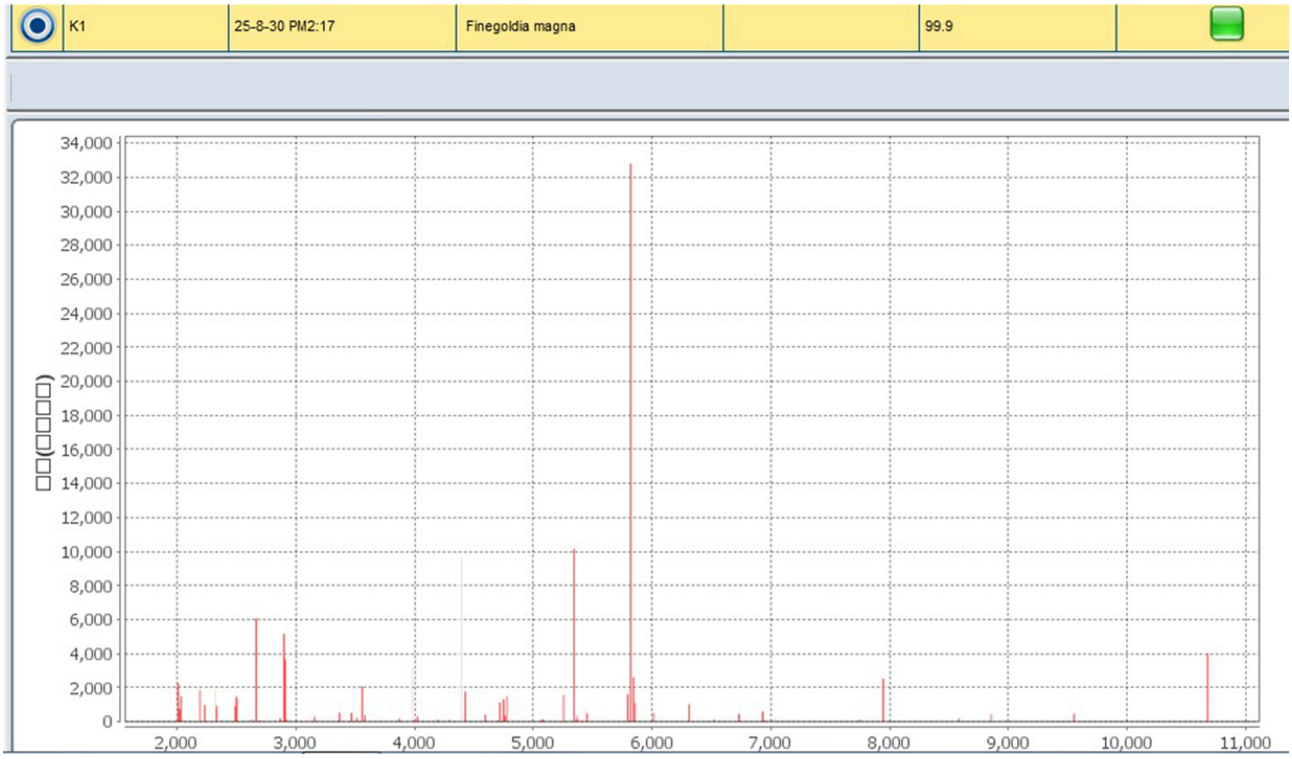

Figure 6 MALDI-TOF MS identification mass spectrum of *Finegoldia magna*.

Discussion

Finegoldia magna is an obligately anaerobic, Gram-positive coccus, previously classified as *Peptococcus* or *Peptostreptococcus*, and renamed to the genus *Finegoldia* in 1999 based on genetic and phenotypic characteristics.[1] This bacterium is widely distributed on human skin, oral cavity, vagina, and intestinal mucosa, constituting part of the normal flora. It can act as an opportunistic pathogen causing infections when host immune function declines or local tissue barriers are compromised.

Clinical Infection Types and Characteristics

F. magna infections are most commonly seen in skin and soft tissue infections, followed by bone and joint infections.[3] It can also cause breast abscesses, diabetic foot infections, infective endocarditis, etc.[4,5] Domestically, Cheng Xiangjun et al[6] reported a case of non-puerperal mastitis caused by *F. magna* combined with *Propionibacterium avidum*. This case involves a simple *F. magna* infection in a woman of childbearing age following breast cyst surgery, consistent with literature reports. Infections with this bacterium often manifest as prolonged wound non-healing and abnormal exudation, potentially related to

Table 1 Drug Susceptibility Test Results for *Finegoldia magna*

Antimicrobial Agent	MIC (mg/L)	Interpretation Result
Clindamycin	>256	R
Ceftriaxone	6	S
Imipenem	0.48	S
Ampicillin	0.25	S
Penicillin	0.19	S
Gentamicin	>256	–
Vancomycin	0.25	–
Erythromycin	>256	–

Note: No breakpoints available for Gentamicin, Vancomycin, Erythromycin.
Abbreviations: S, Susceptible; R, Resistant.

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its mechanism involving surface protein L binding to the variable region of immunoglobulin light chains, releasing inflammatory mediators.[2] The persistent postoperative wound exudation in this case aligns with this pathological mechanism.

Key Points in Microbiological Diagnosis

The microbiological diagnosis of *F. magna* relies on standardized anaerobic culture and precise identification: ① Specimen handling: Strict anaerobic procedures must be followed; specimens should be inoculated onto anaerobic culture media immediately after collection to avoid bacterial death due to oxygen exposure. ② Morphology and culture characteristics: Gram-positive cocci, occurring in pairs or short chains, forming small, white, flat, translucent colonies under anaerobic conditions, with no growth aerobically, can serve as preliminary identification basis. ③ Identification techniques: MALDI-TOF MS offers advantages of speed and accuracy, with confidence levels up to 99.9%, significantly superior to traditional biochemical identification.[1] This technique rapidly identified the species in this case, providing timely basis for treatment. ④ Drug susceptibility testing: The E-test method can accurately determine MIC values, interpreted according to CLSI M11-A8 standards. The strain in this case was susceptible to penicillins (penicillin, ampicillin), cephalosporins (ceftriaxone), and carbapenems (imipenem), but resistant only to clindamycin. This is largely consistent with the commonly reported characteristic of "F. magna being susceptible to penicillins and having a high resistance rate to clindamycin".[7–9] However, the clindamycin MIC value in this case was as high as >256 mg/L, indicating high-level resistance, warranting significant clinical attention.

Diagnostic and Therapeutic Challenges and Strategies

Currently, reports of *F. magna* infections are relatively scarce, mainly due to the low detection rate of anaerobic cultures – by the end of 2017, the rate of anaerobic culture implementation in Shanghai was only 31.4%, mostly concentrated in tertiary hospitals.[8] Reasons include high culture costs, complex procedures, and insufficient clinical emphasis on anaerobic infections.[9] Clinically, diagnosis can be delayed due to negative routine bacterial cultures. Therefore, for patients with non-healing postoperative wounds and significant exudation, especially when empirical treatment is ineffective, anaerobic cultures should be sent promptly.

Regarding treatment, there are no unified guidelines; surgical debridement combined with susceptible antimicrobial therapy is commonly used.[1] In this case, due to penicillin allergy, empirical local dressing changes with gentamicin were used, ultimately achieving good results.Despite not being treated with conventional antibiotics and the strain's resistance to gentamicin, surgery and drainage techniques played a primary role in this case, and gentamicin, administered as an adjunctive therapy, still contributed to the clinical success.[2,10] It is particularly noteworthy that this strain was highly resistant to clindamycin (MIC >256 mg/L), and clindamycin is often used as an alternative treatment for penicillin-allergic patients. Therefore, for such patients, greater emphasis should be placed on selecting drugs based on susceptibility results to avoid treatment failure due to empirical use. Furthermore, although imipenem is effective against this bacterium, as a broad-spectrum, potent antimicrobial, its use should be strictly indicated to avoid promoting bacterial resistance through overuse.

Implications and Reflections

Clinicians should fully recognize the clinical significance of anaerobic infections. For infections in sites like the breast, if routine bacterial cultures are negative, anaerobic infection should be considered, and anaerobic cultures sent promptly. Microbiology laboratories should utilize MALDI-TOF MS identification and E-test susceptibility technologies to improve the diagnostic efficiency and accuracy for *F. magna* infections, paying particular attention to the resistance status of commonly used alternative drugs like clindamycin. Treatment should combine the patient's allergy history, drug susceptibility results, and infection site to rationally select the type and route of administration of antimicrobials, achieving precise treatment to improve patient outcomes.

Data Sharing Statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

The authors certify that they have obtained all appropriate patient consent forms. The patient provided written informed consent for the publication of clinical information and photographs. This case report has been approved by the Ethics Committee of Nanjing Tongren Hospital, and the ethical review number:2025-03-078-K001.

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Disclosure

The authors declare that this paper was prepared in the absence of any commercial or financial relationships that could be construed as potential conflict of interest.

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