Erysipelothrix rhusiopathiae

A Zoonotic Gram-Positive Pathogen

Key exam facts at a glance

- Slender, pleomorphic, non-spore-forming Gram-positive rod
- **Intrinsically VANCOMYCIN-RESISTANT**
- Treatment of choice: Penicillin / Cephalosporins

Introduction & Taxonomy

Introduction

- Globally distributed zoonotic Gram-positive rod
- Primarily affects swine, poultry and fish
- Occasionally causes characteristic cutaneous and invasive disease in humans
- Particularly after occupational animal exposure
- Domestic swine are the principal reservoir
- Tonsils, lymphoid tissue and faeces are key carriage sites

Taxonomy

- Family: Erysipelotrichaceae
- Previously grouped near corynebacteria
- Two key species: E. rhusiopathiae (best characterised) & E. tonsillarum

Morphology

- Slender, pleomorphic rods
- Non-sporulating
- Gram-positive
- May form filaments in older cultures

Clinical Features & Risk Groups

Agricultural / Slaughterhouse

Farmers (pig/poultry), abattoir workers, butchers, meat-processing workers

Marine / Food Handling

Fish handlers, fishermen — most commonly cited in FRCPath exam scenarios

Veterinary / Animal Care

Veterinarians with direct animal contact, particularly swine and poultry

Other Exposures

Housewives, hunters; rare systemic cases without occupational exposure (oropharyngeal/GI colonisation possible)

Virulence Factors (not fully established): Capsule • Intracellular survival within macrophages

Erysipeloid of Rosenbach — Classic Presentation

Clinical description

- Most common presentation — high-yield for FRCPath
- Appears on fingers, hands or other exposed skin
- 1–7 days after exposure to animals or fish
- Well-demarcated, violaceous, non-suppurative plaque
- Raised borders; burning or throbbing pain
- Occasional vesicles; usually no significant systemic symptoms
- Lymphadenopathy, fever and arthralgia can occur
- Self-limiting: resolves in 2–4 weeks

Differentiating from Staph/Strep

- Violaceous (purple) hue vs erythematous
- Lack of suppuration / pus
- Less severe acute pain
- Occupational exposure history

Three clinical forms

- Localised erysipeloid (most common)
- Diffuse cutaneous disease
- Systemic / endocarditis (rare)

Diffuse Cutaneous Disease & Systemic Infection

Diffuse Cutaneous Disease

Infection extends beyond inoculation site → multiple erythematous/violaceous plaques, sometimes with bullae. Associated fever, malaise, arthralgia and myalgia. May mimic erysipelas or toxin-mediated dermatoses. Can precede or accompany bacteraemia.

Systemic Infection — Key Facts

Rare but severe. Bacteraemia often accompanied by severe sepsis. Predilection for aortic valve (native valves predominantly).

90%
of bacteraemia cases associated with endocarditis

80%
associated heart failure rate

40%
reported mortality rate

Aortic
valve most commonly affected

Comorbidities over-represented in systemic disease: cardiovascular disease, diabetes, alcoholism, chronic liver disease

Diagnosis

Specimen Selection

Specimen	Indication / Notes
Lesion biopsy (full-thickness)	Bacteria in DEEP part of lesion — must sample deep dermis
Blood culture	Systemic illness or immunocompromise → investigate for endocarditis (ECHO)

Biochemical / Laboratory Characteristics

Characteristic	Result
Growth	Small alpha-haemolytic colonies, 24–48 h
Oxygen requirement	Facultatively anaerobic
Catalase	Negative
H2S production (TSI agar)	POSITIVE — blackening of butt (key diagnostic clue)
Esculin hydrolysis	Negative
Motility	Non-motile
Vancomycin susceptibility	**RESISTANT (intrinsic)**

Identification: MALDI-TOF MS (routine) → 16S rRNA or PCR if required | Pitfall: small slow-growing colonies may be missed or dismissed as contaminants

Differential Diagnosis — Key Distinguishing Features

Feature	Erysipelothrix rhusiopathiae	Arcanobacterium haemolyticum	Listeria monocytogenes
Haemolysis	Alpha	Beta	Beta (narrow zone)
Catalase	Negative	Negative	**Positive**
Motility	Non-motile	Non-motile	**Motile (tumbling)**
H2S on TSI	**Positive**	Negative	Negative
Vancomycin	**RESISTANT**	Susceptible	Susceptible
Esculin hydrolysis	Negative	Negative	**Positive**
Typical context	Occupational animal/fish	Pharyngitis, skin infection	Food-borne; immunocomp.

Treatment & Antimicrobial Susceptibility

⚠ **CRITICAL:** Erysipelothrix is INTRINSICALLY VANCOMYCIN-RESISTANT — unlike most other Gram-positive bacteria. Do NOT use glycopeptides.

Active agents (Susceptible)

- Penicillin — treatment of choice (first-line)
- Imipenem — most active agents alongside penicillin
- Piperacillin
- Cefotaxime (cephalosporins generally active)
- Ciprofloxacin / Pefloxacin (fluoroquinolones)
- Clindamycin

Intrinsically Resistant

- Vancomycin
- Teicoplanin
- All glycopeptides
- Trimethoprim
- Sulfonamides

Clinical guidance

- Localised: oral penicillin / cephalosporin for 5–7 days
- Systemic / endocarditis: IV penicillin or cephalosporin; prolonged course
- Penicillin allergy: clindamycin or fluoroquinolone

Key Takeaways

Organism	Slender, pleomorphic, non-spore-forming Gram-positive rod; facultatively anaerobic; catalase-negative; H2S-positive on TSI
Reservoir	Domestic swine (principal); also poultry, fish. Occupational exposure is the key risk factor
Classic presentation	Erysipeloid of Rosenbach: violaceous, non-suppurative plaque on hand/fingers; 1–7 days post-exposure
Serious disease	Systemic bacteraemia → endocarditis (90%); aortic valve predilection; 40% mortality
CRITICAL point	Intrinsic resistance to VANCOMYCIN (and all glycopeptides) — the most important exam-relevant fact
Treatment	Penicillin / imipenem (first-line); cephalosporins, clindamycin, fluoroquinolones also active
ID in lab	MALDI-TOF (routine); distinguish from Listeria (catalase-positive, motile) and Arcanobacterium (beta-haemolytic)