



## Case report

# Cellulitis and bacteraemia caused by *Streptococcus dysgalactiae* post radical vulvectomy and bilateral inguinal lymph node dissection for FIGO IB squamous cell carcinoma of the vulva, a case report

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## ABSTRACT

**Background:** *Streptococcus dysgalactiae*, also known as Group C/G Streptococci, causes infection to humans and animals. Infectious syndromes range from mild pharyngitis and cellulitis, to bacteraemia and life-threatening sepsis. This report uniquely presents a case of *Streptococcus dysgalactiae* subspecies *dysgalactiae* causing fulminant sepsis post-radical vulvectomy.

**Case:** Four months post modified radical vulvectomy with bilateral lymph node dissection, a 78-year-old woman presented with pyrexia and associated intercrural, upper thigh and suprapubic erythema. Aside from being a smoker, there was no documented history of immunosuppression. Blood cultures yielded growth of *S. dysgalactiae*, and she improved with intravenous antibiotics, fluid resuscitation and electrolyte replacement.

**Conclusion:** *Streptococcus dysgalactiae* is an important pathogen associated with bacteraemia, cellulitis, meningitis and pneumonia. Prompt and appropriate antibiotic therapy in addition to further investigations with potential surgical intervention are essential.

## 1. Introduction

*Streptococcus dysgalactiae* is a beta-haemolytic Gram-positive coccus associated with the same spectrum of infection caused by *S. pyogenes* (Group A Streptococcus) - in particular pharyngitis, cellulitis and bacteraemia – although usually less severe due to its low virulence. We report a case of a 78-year-old female who presented with severe vulval cellulitis and septic shock using SCARE guidelines [1]. This report is unique as it presents only the second report of *Streptococcus dysgalactiae* subspecies *dysgalactiae* (SDSD) causing fulminant sepsis in humans [2] and the first case reported post radical vulvectomy.

## 2. Case report

A 78-year-old female presented with pyrexia and associated spreading intercrural, upper thigh and suprapubic erythema four months following modified radical vulvectomy with bilateral groin lymph node dissection for stage 1B invasive moderately differentiated squamous cell carcinoma of the clitoris. The modified radical vulvectomy was performed as standard by the consultant gynaecological

oncologist with primary wound closure without the requirement for reconstructive techniques with good anatomical and functional outcomes post-operatively. Histopathological analysis revealed bilateral deep (1 right and 1 left) and superficial inguinal lymph nodes (8 right and 6 left) were all negative for malignancy. She did not require adjuvant therapy and treatment was considered complete with surgery alone at the post-operative gynaecological oncology multi-disciplinary meeting. She was planned for clinical follow up at 6 monthly intervals.

She was a heavy smoker with no history of diabetes or immunosuppression. Examination revealed an extensive erythematous appearance to the vulva and surrounding area. Her inflammatory markers were raised, with profound electrolyte disturbance resulting in an acute kidney injury. She was started on intravenous flucloxacillin (1 g QDS) to cover for cellulitis. *S. dysgalactiae* was isolated from blood cultures in both aerobic and anaerobic conditions after 11 h of incubation. The antibiotic regime was amended to reflect hospital guidelines in the management of necrotising fasciitis with a combination of intravenous piperacillin-tazobactam (4.5 g TDS initially reduced to BD due to CrCl), vancomycin (dosing calculated based on creatinine clearance and weight; 25 mg/kg loading dose and 15 mg/kg BD) and clindamycin (1.2

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g QDS).

*Streptococcus dysgalactiae* was identified via MALDI-TOF (Matrix-assisted laser desorption/ionization-time of flight mass spectrometry), and the isolate tested susceptible to penicillin (MIC – minimum inhibitory concentration - <0.06) and clindamycin (MIC <0.25); tested via VITEK AST (Antibiotic Susceptibility Testing) and interpreted using EUCAST (European Committee on Antimicrobial Susceptibility Testing) Clinical Breakpoints. She required significant fluid resuscitation due to a high lactate measurement, persistent hypotension and acute kidney injury. An echocardiogram was negative for vegetations. The antibiotic regimen was rationalised to oral amoxicillin (1 g TDS) and clindamycin (450 mg QDS) due to a combination of clinical and biochemical response and microbiology results. The patient completed a total of 12 days of antibiotic therapy with resolution of infection without the need for surgical debridement. Her total hospital stay was 24 days.

### 3. Discussion

*Streptococcus dysgalactiae* is a normal human commensal of the skin, nose and pharynx. It is associated with mild infections including pharyngitis, but, less commonly, can also cause life-threatening infections including bacteraemia and cellulitis. Deep infections involving bone and joints and infective endocarditis have been described [3].

Streptococci are facultative anaerobic Gram-positive cocci and are grouped dependant on their degree of haemolysis – i.e. alpha (partial) haemolysis, beta (total) haemolysis or non-haemolytic. The Lancefield grouping system further classifies beta-haemolytic streptococci on the basis of presence of antigens in the bacterial cell wall. *S. dysgalactiae* is a beta-haemolytic streptococcus and identifies as a group C/G streptococcus [4].

The *S. dysgalactiae* group has four subspecies: *S. dysgalactiae* subspecies *dysgalactiae*, *S. dysgalactiae* subspecies *equisimilis*, *S. equi* subspecies *equi* and *S. equi* subspecies *zoepidernicus*. *S. dysgalactiae* are usually penicillin susceptible and effective treatment includes penicillin or a 3rd generation cephalosporin i.e. ceftriaxone is recommended bacteraemia and vancomycin in the case of severe beta-lactam allergy [5].

Infections secondary to *S. dysgalactiae* may be spontaneous, but risk factors include immunosuppression, recent surgery, chronic skin disease and intravenous drug use. Broyles et al. reports the incidence of non-group A or group-streptococcal infection as 3.2 cases per 100,000 population, with a reported mortality rate of hospitalised patients of 12 % ( $n = 55$ , out of 450 hospitalised) [6].

Infection demonstrates a seasonal prevalence pattern with cases increasing across warm summer months [3]. One study showed that 48 % of cases of *Streptococcus dysgalactiae* bacteraemia were preceded by a cellulitis caused by the same organism [7]. Postoperative infection is rare, however the organism has been reported to cause prosthesis infection following total knee arthroplasty [8].

This case highlights a severe, life-threatening infection with *S. dysgalactiae*. Appropriate investigations were performed and specialist advice was sought leading to excellent clinical improvement with prompt, suitable antibiotic therapy.

### Abbreviations

SDSD	<i>Streptococcus dysgalactiae</i> subspecies <i>dysgalactiae</i>
SDSE	<i>Streptococcus dysgalactiae</i> subspecies <i>equisimilis</i>
MIC	minimum inhibitory concentration

MALDI-TOF matrix-assisted laser desorption/ionization-time of flight

### Provenance and peer review

Not commissioned, externally peer-reviewed.

### Funding

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### Ethical approval

Ethical approval was not required.

### Consent

Informed consent was obtained from the patient for publication of this case report.

### Author contribution

Ruairí Floyd (RF) planned the report. RF, Darren Gilheany (DH) and Elaine Houlihan (EH) collected patient details and wrote the report. EH supplied microbiology specific expertise. RF, DH, EH and Tom D'Arcy (TD) reviewed and edited the report. RF submitted the report.

### Registration of research studies

This case report was not registered.

### Guarantor

Ruairí Floyd (RF) and Tom D'Arcy (TD) are responsible as overall guarantors for the work.

### Declaration of competing interest

There are no conflicts of interest to declare.

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