

Is it pet or pest?

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Background

- ❑ 38 yo man with Marfan Syndrome and congenital kidney abnormalities
- ❑ Aortic metallic valve replacement, Mitrofanoff appendicovesicostomy and renal transplant (respectively 16years, 5 years and 6 months prior to admission)
- ❑ On steroids and tacrolimus
- ❑ Penicillin allergy (previous rash)

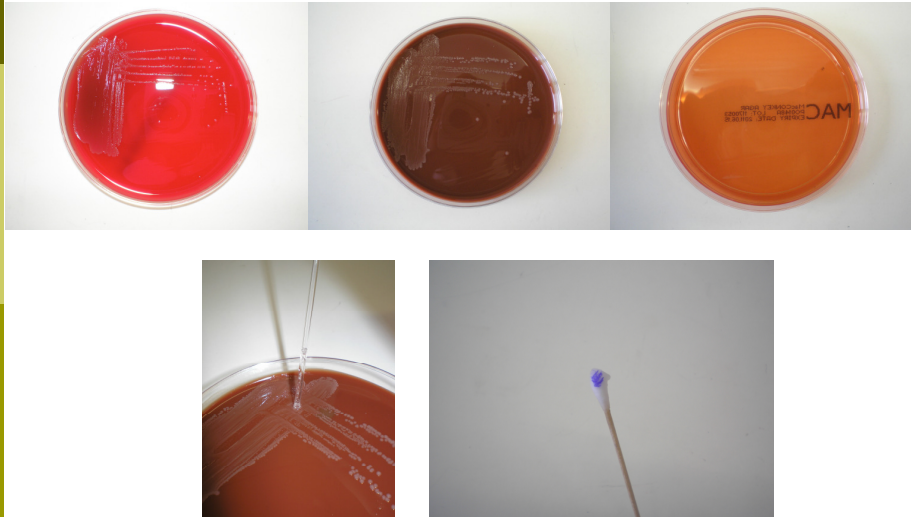
Current problem

- ❑ 2 days history of fever, malaise and cellulitis around the Mitrofanoff abdominal catheter
- ❑ Recent cellulitis of the right arm successfully treated with doxycycline (2 weeks prior to admission)
- ❑ WBC 5.09×10^9 , CRP 45 mg/L, creatinine 163 $\mu\text{mol/L}$ and urea 8.1 mmol/L
- ❑ Chest X-ray and abdominal ultrasound both normal

Microbiology

- ❑ Urine: no growth
- ❑ Abdominal swab: mixed anaerobes
- ❑ Blood culture taken on admission: **Gram Negative Cocco-Bacilli** (both aerobic and anaerobic bottles)

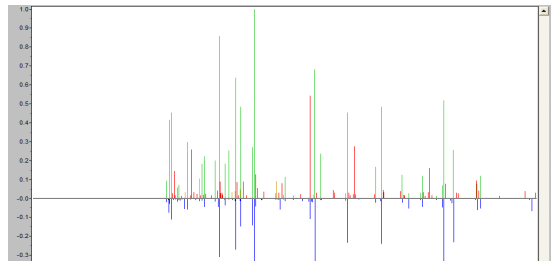
Microbiology



Identification

- ❑ API20NE and API20E: ***Pasteurella multocida*** (confidence value 53%)
- ❑ BD Phoenix panel: ***Pasteurella spp.***
- ❑ Misidentification of ***P. multocida*** as ***Haemophilus spp.***, is common, thus, confirmation of species identification was performed using 16S rRNA sequencing and MALDI-TOF proteins profiling
- ❑ 16S: 584bp fragment sharing 99% sequence homology to that of ***P. multocida sub species septica***
- ❑ MALDI-TOF: ***P. multocida*** with a confidence value of 2.321 indicating highly probable species identification

MALDI-TOF



Meaning of Score Values

Range	Description	Symbols	Color
2.300 ... 3.000	highly probable species identification	(+++)	green
2.000 ... 2.299	secure genus identification, probable species identification	(++)	green
1.700 ... 1.999	probable genus identification	(+)	yellow
0.000 ... 1.699	no reliable identification	(-)	red

Clinical management

- TOE revealed the presence of vegetation (0.57 x 0.2 cm) above the atrium of RCA
- All subsequent blood cultures taken after starting antibiotics were negative
- A diagnosis of *infective endocarditis* (IE) was made according to *Duke criteria*: **one major criterion** (evidence of endocardial involvement) and **three minor criteria** (predisposing heart condition, fever and microbiological evidence with positive blood culture)

Pasteurella multocida

- *P. multocida* is normally found in the oral cavity of dogs and cats
- Wide range of infections:
 - Cellulitis/wound infection as a result of bites, licking or scratching
 - Pneumonia
 - Bone and joint infections
 - Invasive infections (meningitis, abdominal, bacteraemia)
- Risk factors: immunocompromised patients, cirrhosis and chronic respiratory illness
- Lack of previous animal exposure in 30% of cases



Treatment of endocarditis

- Endocarditis is a rare complication with only 20 cases described (around 50% without a confirmed identification or diagnosis according to Duke criteria)
- **Penicillin** remains the best antimicrobial agent
- There are no clear guidelines about the treatment of *P. multocida* endocarditis in penicillin-allergic patients
- **Aminoglycosides** have moderate to poor activity in vitro and probably should not be used, particularly given the paucity of clinical experience

Sensitivities

Antibiotic	MIC (mg/L)	Interpretation
Ampicillin	0.125	Sensitive
Ciprofloxacin	0.016	Sensitive
Doxycycline	0.5	Sensitive
Co-trimoxazole	0.032	Sensitive
Ertapenem	0.016	Sensitive
Ceftriaxone	< 0.016	Sensitive
Gentamicin	2	Sensitive (breakpoint 2mg/L)

Further management

- Patient penicillin allergic (previous rash). He was initiated on **Ertapenem** IV 1g/OD and then he was switched to **Ceftriaxone** IV 2g/OD
- PICC line was inserted in the right arm and he was discharged under the OPAT service to complete six weeks IV antibiotics as an outpatient
- On follow-up his repeat echocardiography showed clear aortic valve

Learning points

- *P. multocida* endocarditis remains a rare infection
- Clinicians may face various challenges, from achieving the correct species identification to choosing treatment regimens in penicillin-allergic patients
- New diagnostic techniques such as 16S rRNA sequencing and MALDI-TOF can be used for species confirmation
- Cephalosporins and carbapenems are good substitutes for penicillin in case of allergy

References

- Nettles RE, Sexton DJ. *Pasteurella multocida* prosthetic valve endocarditis: case report and review. *Clin Infect Dis* 1997 Oct;25(4):920-1.
- Fayad G, Modine T, Mokhtari S et al. *Pasteurella multocida* aortic valve endocarditis: case report and literature review. *J Heart Valve Dis* 2003; 12(2): 261-3.
- Graf S, Binder T, Heger M, Apfalter P, Simon N, Winkler S. Isolated endocarditis of the pulmonary valve caused by *Pasteurella multocida*. *Infection* 2007 Feb;35(1):43-5.

