

Fever and a spectacular rash

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No disclosures

CC: Fever and rash

- 70yoM with hx of T2DM, HTN, CAD s/p CABG presenting with fevers and rash

A “spectacular” rash



HPI

- Ten days prior to admission:
 - He **scraped his left lower leg on one of his welding tools**; the wound was superficial and healed
 - The same day, **he was bit by a neighbor's dog on his right hand**. The wound was shallow and healed without incident
- Two days prior to admission:
 - **Awoke with chills, followed by profound fatigue**
 - The following day, he noticed **red spots on his thighs that subsequently spread to his trunk, back and bilateral upper extremities**
 - **The rash and fevers worsened** the following day, so he presented to the emergency room

Past Medical History / Social History

PMH

- T2DM
- HTN
- CAD s/p CABG 10/2021
- No recent hospitalizations

Medications

Atorvastatin, dulaglutide, metformin, insulin glargine, fluoxetine, losartan, omeprazole, aspirin, MVI

Allergies: NKDA

Notable immunizations: Tdap 8/2021

Family history: noncontributory

Social history:

- Lives at home with wife, no pets.
- Welder, carpenter; former construction company owner
- No hiking, gardening, or recent insect/tick bites
- No recent contact with young children, sick contacts, travel
- Served in military in Vietnam, Guatemala, Philippines
- No smoking, EtOH

Physical Exam

- Vitals: T **103.1F**, BP 134/76, RR 18, HR 80, O2 95% RA
- Gen: well developed, well nourished, **chilled, lying under multiple blankets**
- HEENT: EOMI, anicteric sclera, MMM, OP clear, no LAD
- Pulm: CTAB
- Cardiac: RRR, no murmurs
- Abdomen: soft, NTND
- Ext: WWP, no edema
- Neuro: alert, fully oriented, non-focal
- Skin: **large scattered, annular erythematous, blanchable, plaques with irregular borders scattered over trunk, back and bilateral UE and LE. Non-pruritic. Well healing abrasions on L shin and R hand**

But a picture is worth a thousand words...



Welding wound

Healed dog bite, right hand



A “spectacular” rash



Labs and Imaging

LABS

- WBC 10.8 (87% segs, 0.3% eos), Hgb 11.6, plts 199
- **Na 128**, K 3.4, Cl 96, CO2 24, Bun 14, Cr 0.94, glucose 220
- LFTs unremarkable
- **CRP 24**
- **ESR 44**
- Lactate 1.4
- UA noninflammatory
- **HgbA1c 6.9**

- HIV screen neg
- Syphilis screen neg
- COVID / flu negative

IMAGING

- CXR: unremarkable
- Left tib/fib XR: no abnormalities
- Right hand XR: no abnormalities

???

ID Consult: initial management

- Start ampicillin/sulbactam
- F/u blood cultures and repeat daily while febrile
- Recommend dermatology consult (and skin biopsy)
- Respiratory viral panel
- EBV PCR, CMV PCR, cocci serology, parvovirus PCR, adenovirus PCR, Lyme EIA
- If decompensates, add doxycycline

Differential diagnosis- canine zoonoses

Transmission	Organism	Human symptoms	Canine symptoms	Geographic distribution
Infectious saliva	Rabies	Acute progressive encephalitis	S furious, and paralytic	
	Pasteurella	Skin and soft-tissue infections, septic arthritis, osteomyelitis	M cavity	
	Capnocytophaga	Skin and soft-tissue infections, sepsis, meningitis		
	Brucella	Fever of unknown origin; varied and nonspecific symptoms	S disease	

Dog was reportedly vaccinated

Likely more rapid onset

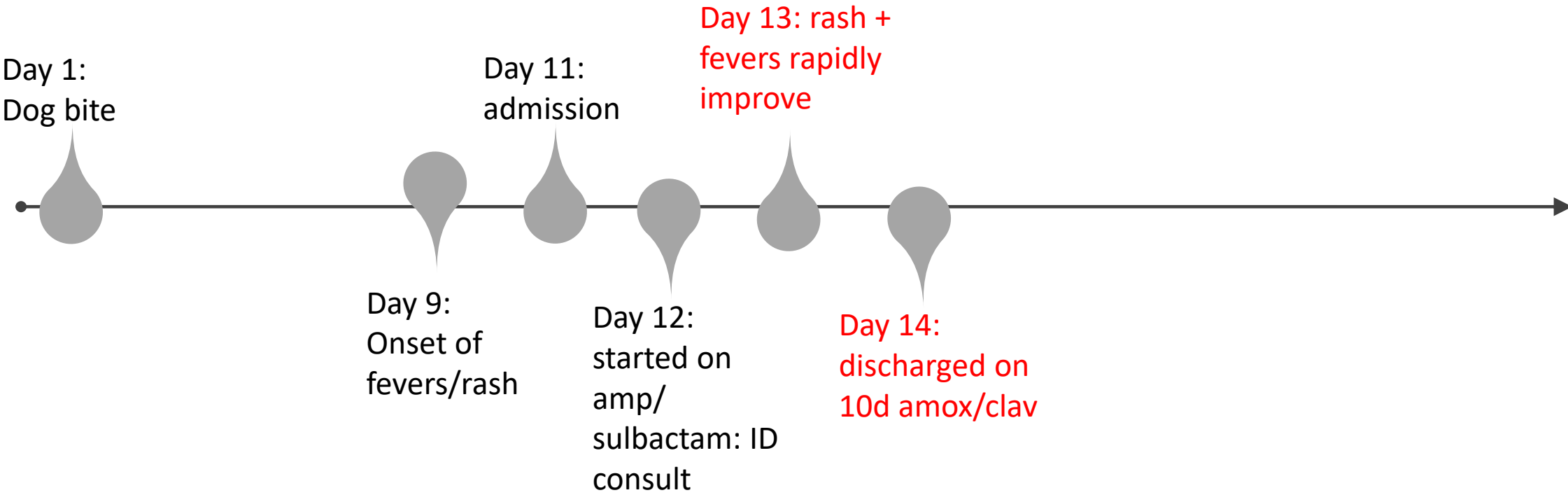
Not the host (asplenic, immunocompromised)

More indolent

Other canine zoonoses

Fecal transmission	Insect bites	Other
<ul style="list-style-type: none">• Salmonella/ cryptosporidium/ giardia• Campylobacter• Toxocara canis (visceral larva migrans)• Ancylostoma caninum (cutaneous larva migrans)• Echinococcus granulosus• Dipylidium caninum (tapeworm)	<ul style="list-style-type: none">• B. Burgdorferi• Rickettsia rickettsia• Ehrlichia and Anaplasma• Babesia• Francisella tularensis• Yersinia pestis• Dirofilaria immitis (heartworm)• Leishmania <p>Relapsing fever? Unknown tick bite?</p>	<p>Aerosol:</p> <ul style="list-style-type: none">• Bordetella bronchiseptica• Coxiella burnetii <p>Urine</p> <ul style="list-style-type: none">• Leptospirosis

Hospital course

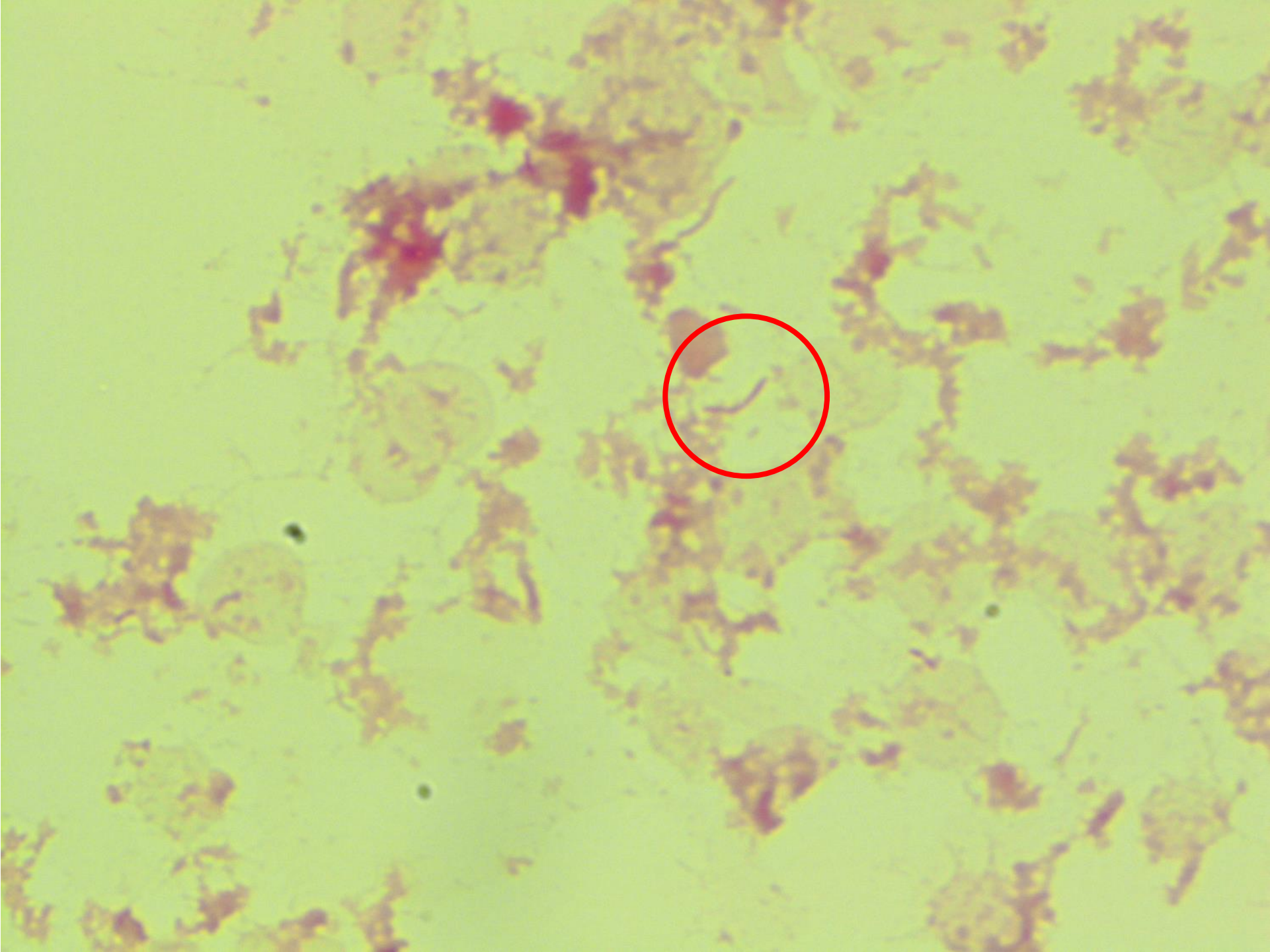


Improvement in rash



The day after discharge: a call from the micro lab...

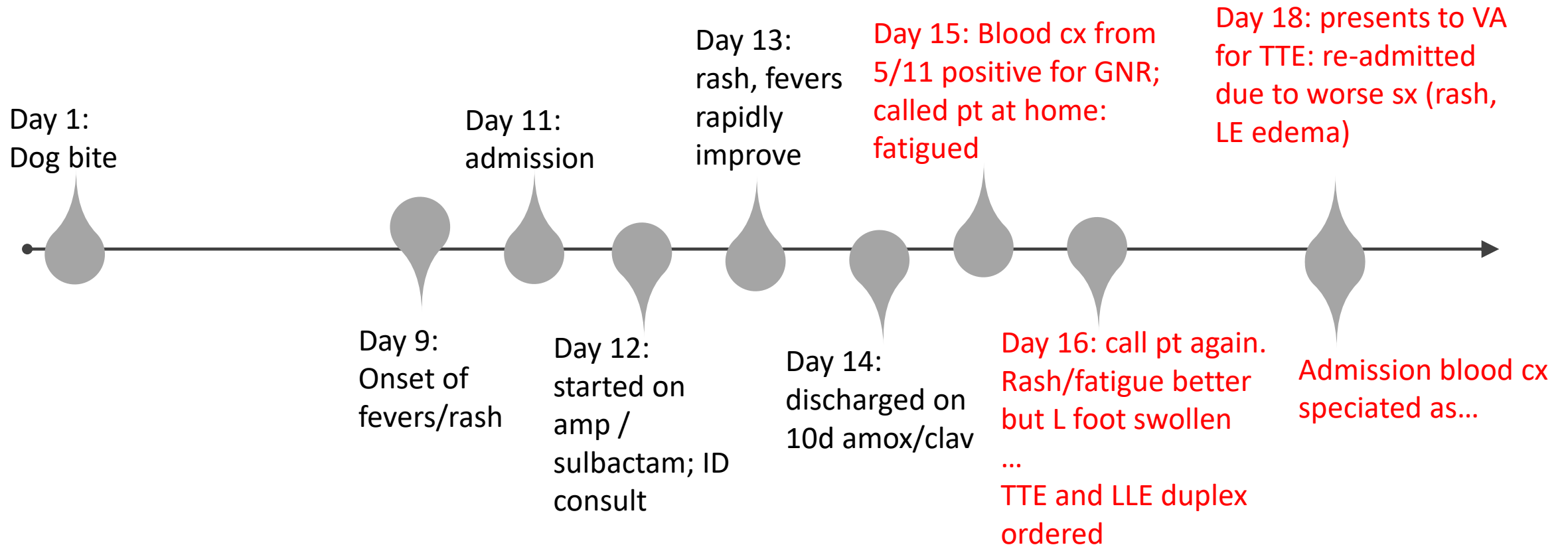
- Positive blood culture for **thin gram-negative rod** from day of admission (**TTP ~4 days**)
- 1 out of 4 bottles (aerobic bottle)



The day after discharge

- ID team calls patient at home:
 - Feeling tired. No fever/chills
 - Rash on back is persistent and slightly pruritic
 - Some loose stools
 - No HA, neck stiffness, cough, dyspnea, abdominal pain, n/v
 - Taking and tolerating amox/clav as directed
- Lab follow up:
 - RVP neg, Cocci neg, EBV IgG+/IgM-, CMV IgG+
- Pt states he needs more sleep, would prefer not to return to ED yet
- ID team will f/u by phone tomorrow

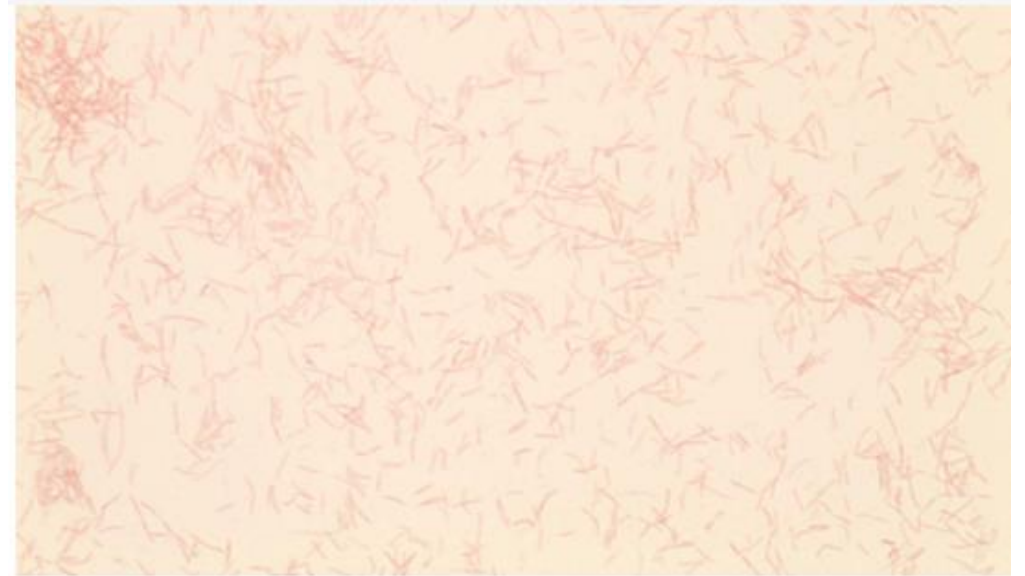
Clinical course



Capnocytophaga canimorsus

Capnocytophaga: taxonomy, microbiology

- Slow growing, capnophilic, facultative anaerobic, fusiform, encapsulated, gram-negative rod
- Requires enriched agar, longer time to grow, 35-37C and 5-10% Co2 (tell the micro lab!)
- 9 species:
 - *C. canimorsus*, *C. cynodegmi*, *C. canis* normal in oral cavity of dogs and cats (58-70% of dogs; 15-57% of cats)
 - Remainder in human oral cavity
 - 9 known capsular serotypes of *C. canimorsus*, but types A/B/C predominate and cause 90% of human infections (only in 8% of dogs oral microbiota)



Reproduced from: Brichacek M, Blake P, Kao R. Capnocytophaga canimorsus infection presenting with complete splenic infarction and thrombotic thrombocytopenic purpura: a case report. BMC Res Notes 2012; 5:695. Copyright © 2012 Brichacek et al; licensee BioMed Central Ltd.

Capnocytophaga: epidemiology

- Annual incidence of 0.5 - 10.0 infections/1 million population per year, or 15—300 cases in USA/ year
- Highest risk (zoonotic infections): immunosuppression, splenectomy or functionally asplenia, cirrhosis, alcohol use
- Endogenous infections: children or adults with significant neutropenia, malignancy, immunosuppression (mucositis/periodontal disease)
- Case fatality 13-33%, can be higher 60—80% if septic shock

Capnocytophaga canimorsus: an emerging cause of sepsis, meningitis, and post-splenectomy infection after dog bites

T. Butler^{1,2}

Compiled 484 lab confirmed cases of *Capnocytophaga canimorsus* from the literature: 1976-2014

Average delay between dog bite and clinical presentation: 5-6 days (range 1-30 days)

Table 1 Features of laboratory-documented cases of *Capnocytophaga canimorsus* infections during historical periods before 1990 and during the 25 years of the period 1990–2014. In parentheses are the percentages of cases with relevant information reported

	Before 1990 (1961–1989)	After 1990 (1990–2014)
Total numbers of documented cases	192	292
Median age, years	52	56
Males/females (% males)	50/71 (70)	180/276 (65)
No. of cases in USA/total cases (%)	43/71 (61)	84/292 (29)
No. of cases with prior splenectomy	23/71 (31)	36/283 (13)
No. of cases of hyposplenism*	1/71 (1)	9/283 (3)
No. of cases with alcoholism**	16/71 (23)	42/217 (19)
No. of cases with leukemia, myeloma, HIV, macroglobulinemia, other lymphoproliferative disease, diabetes, or corticosteroid use***	3/71 (4)	13/283 (5)
Dog bites before illness (%)	43/71 (60)	122/209 (58)
Other dog contact, such as scratches, licking, and owning pets, before illness (%)	17/71 (24)	51/209 (24)
Cat bites, scratches, or licking	2/71 (3)	7/209 (3)
Case-fatality rate (%)	21/71 (30)	60/251 (24)

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Table 3 Update of clinical presentations in documented *C. canimorsus* infections in 1990–2014. Numbers of reported cases*

Feature	No. of patients
Sepsis with positive blood culture	222
Purpura or petechiae	25
DIC	31
Shock	30
Gangrene or amputation of digits or extremities	18
Abdominal complaints with pain, distention, diarrhea, or need for laparotomy	28
Myocardial infarction	3
Meningitis with positive CSF findings	32
Endocarditis with positive culture of blood, artery, or aneurysm	12
Wound infection	5
Eye infection	6
Other sites**	5

*Patients with more than one of the features were entered more than once

**Includes joints [40, 88], pleura [34], peritoneum [67], and brain abscess [139]

Clinical presentation:

- Most severe: sepsis with fever, disseminated purpuric lesions (→ purpura fulminans, gangrene)
- FUO
- Meningitis
- Cellulitis
- Endocarditis
- Respiratory tract infection
- Septic arthritis

Capnocytophaga sp: antibiotic treatment

Highly susceptible	Intermediate	Resistant or inconsistent
Imipenem	However, beta lactamase production is usually solely found in human oral <i>Capnocytophaga</i> groups; not in zoonotic <i>C. canimorsus</i>	
Meropenem		
Piperacillin/tazobactam	Erythromycin	Polymyxin B
Amoxicillin/clavulanate	Tetracycline	Trimethoprim
Tigecycline	Aztreonam	Ceftazidime, Cefotaxime, Amoxicillin

Duration of therapy

- No randomized clinical trials examining duration of therapy...
- Duration should be based on site of infection, clinical presentation and response to therapy

Back to the case...

- 48h into re-admission, patient continued on amp/sulbactam, feeling better
- TTE negative; ankle swelling resolved
- Repeat blood cultures negative
- Discharged on amox/clav, total 14d course
- Abx susceptibilities returned: pan-sensitive by Kirby-Bauer (amox/clav, doxy, levo, clinda) – no CLSI breakpoints but large zone sizes
- Seen in ID clinic 4 weeks later
 - Feeling mildly fatigued but overall better
 - Derm biopsy: interstitial dermatitis with neutrophils (per path, ddx includes neutrophilic urticaria vs. neutrophilic urticarial dermatosis)



Thank you