Atypical Cutaneous Infections

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Human wounds ≠ Animal wounds

Heart disease
Obesity
Venous insufficiency
Cancer
Diabetes
Smoking
Alcoholism

Seriously & adversely affect wound healing

1. Most veterinary wounds heal without complication.
2. Much of wound literature is non-controlled, and may not be relevant to animals.
3. Product claims are extrapolated from humans to animals.

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Typically, animals heal well

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Impaired wound healing

- Failure in any part of the healing process
- Management factors: tension, motion, pressure
- Systemic factors
- Wound factors

Melville

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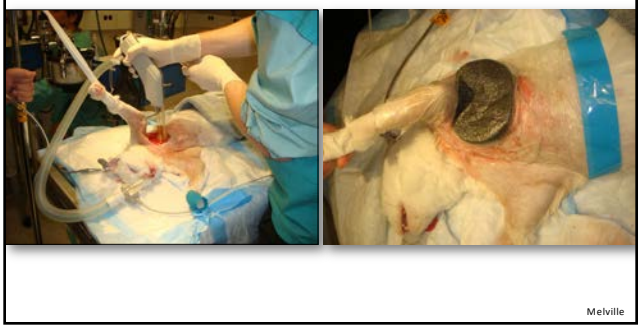

Melville

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Systemic factors

- Malnutrition
- Uremia
- Endocrinopathies
- Exogenous corticosteroids
- Geriatric
- Chemotherapy

Midnight, 11 yr FSH
Renal disease, not eating
Chronic non-healing wound
Several previous attempts at repair

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Systemic factors

Need augmented measures to achieve healing.

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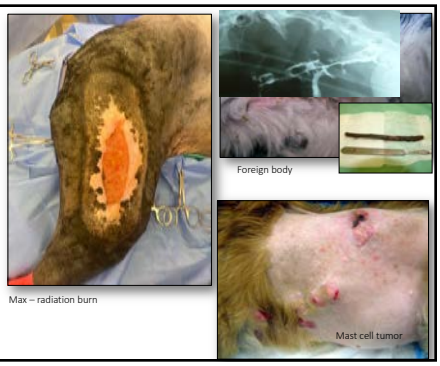
Wound factors

- Irradiation
- Neoplasia
- Foreign bodies
- Envenomation
- Infection



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Wound factors

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Wound factors

- Irradiation
- Neoplasia
- Foreign bodies
- Envenomation
- Infection
  - Acute
  - Chronic

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Atypical Mycobacterial Infections

- Challenging
- Characteristic appearance
  - Skin & subcutis
  - Fatty panniculus layer
- Underdiagnosed
- Challenging

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Atypical Mycobacterial Infections

- Predisposition:
  - Females
  - Obesity
- Inciting inoculation?
  - Trauma
  - Scratch
  - Bitewound
- Often resemble cat bite abscesses
  - Early in infection

Carmel

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Carmel – M. fortuitum

Comet – cat bite abscess

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Difference:

- Do not respond to drainage and short course antibiotics
- Recurrence following initial treatment
- Insidious enlargement and spread of lesion.
- Confined to subcutis

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Signs of atypical mycobacterial infections:

- Discolored skin - purple
- Thinning, alopecia
- Tropism for fat - flank, inguinal fat pad, axilla
- Subcutaneous lumpiness

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Signs of atypical mycobacterial infections

- Punctate draining sinuses
- Serous, watery discharge (not classically purulent)
- Confined to the cutis and subcutis
- Refractory to treatment

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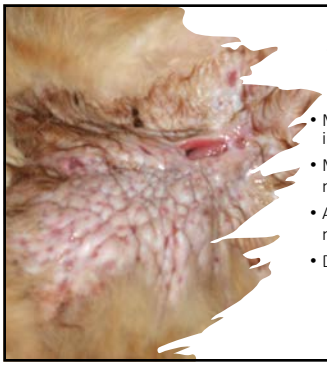

Signs of atypical mycobacterial infections

- May see lethargy, inappetance, intermittent pyrexia, weight loss
- Many cats appear to be systemically normal, apart from local irritation
- As the lesions persist → induration, multiple draining tracts, spread
- Ddx foreign body, neoplasia

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Atypical Mycobacterial Infections

- Underdiagnosed
- Ubiquitous in soil, dust, water, milk
- Saprophytic but capable of replication in mammalian tissue if breach in integument
- Extremely hardy
  - Can grow at 45F
  - Some resistant to chlorine, formaldehyde and organomercurials
- Other less common organisms:
  - Actinomyces, Actinobacillus, Nocardia

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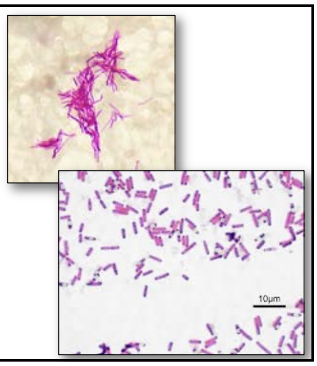
The mycobacteria:

- Acid-fast, Gram-positive bacilli
- Cells walls waxy, mycolic fatty acids
- "Rapidly-growing mycobacteria" RGM
  - Visible growth 7 days
  - Non-tuberculous
- Runyon IV
- Common species in cats:
  - M. fortuitum
  - M. smegmatis
  - M. chelonae
  - M. thermoresistable



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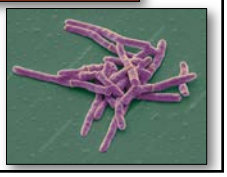
M. fortuitum



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CULTURE:

- Patient NOT on antibiotics
- Incubate aerobically
  - Lowenstein Jensen agar
  - MGIT
  - 5% sheep blood agar
  - Ogawa egg yolk medium
  - 25C and 37C
- Sensitivity testing
- Species ID – often send out.
  - Biochemical tests
  - PCR

M. fortuitum

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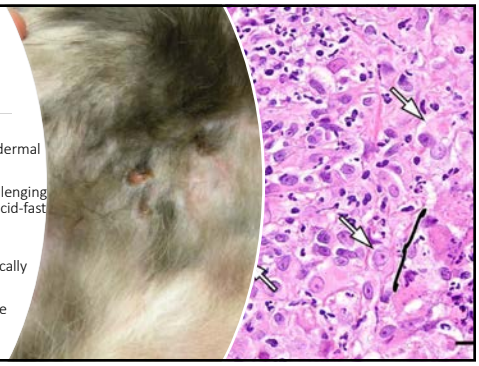
HISTOLOGY

- Pyogranulomatous inflammation of hypodermal fat & dermis.
- Organisms can be challenging to find - occasionally acid-fast bacilli can be seen in macrophages.
- Tell pathologist specifically your suspicions.
- Collect in normal saline



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Atypical mycobacterial infections

- Some community acquired and hospital acquired infections in humans.
- Immunosuppressed

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Any non-responsive or atypical wound:

- Manage appropriately – motion, tension, pressure
- R/O systemic factors – CBC, Chemistry, Lytes
- Rule out wound factors – neoplasia, FB
- Be suspicious of an atypical mycobacterial infection
- **Deep macerated tissure culture** (not swab) – several punch biopsies → aerobic, anaerobic, mycobacterial and fungal (phone bacteriology lab)
- Biopsy for histopathology (phone pathologist)

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Treatment = surgical excision & prolonged antibiotics

- Prep widely around affected area
- Meticulously resect all affected skin and subcutaneous tissues.
- Characteristic discoloration of fat
- Closure may require flap or tension-relieving technique.

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Dusty

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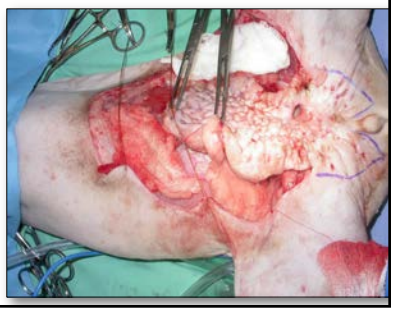

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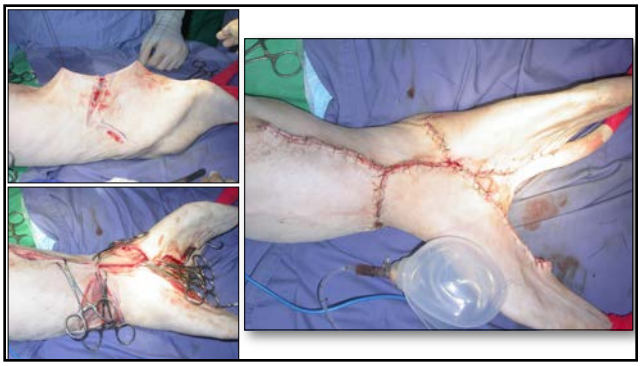

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Antibiotics – choice & duration

- Duration – 2 months following resolution or excision of lesions
- Can start before surgical excision
- Fluoroquinolones – marbofloxacin, moxifloxacin, pradofloxacin
- Humans – often at least 2 antibiotics
  - Amikacin, cefotaxime, ciprofloxacin, imipenem, erythromycin, clarithromycin, doxycycline, linezolid
  - No standard guidelines

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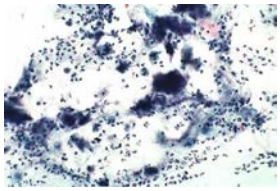
Actinomyces

- Gram + rod, anaerobic
- Opportunistic
- Normal mucosal flora
- Require bite or penetrating injury to establish infection in tissues
- Cervicofacial, retroperitoneal, lumbar, thoracic
- Migrate from lung > crus > hypaxial & retroperitoneum



Tangled clumps of filamentous organisms, often with acute angle branching, sometimes showing irregular wooly appearance. Swollen filaments may be seen with clubs at periphery. A cotton ball like acute inflammatory response is common.

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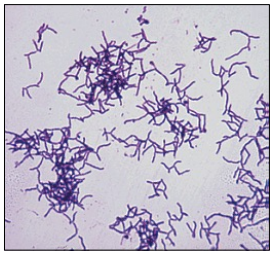

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Actinomyces

- Uncommon… but… hunting dogs
- Underdiagnosed
- Characteristic appearance – similar to mycobacterial infections
- Panniculus layer
- Difficult to culture
- Difficult to treat
  - Radical surgery
  - Prolonged antibiotics (amoxy)

Layla

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Layla
3.5 yr FS Lab, bird hunter, ND

- No history of penetrating injury or bitewounds.
- Developed swelling with draining tract left flank.
- Surgically explored three times by RDVM.
- Multiple rounds of antibiotics.
- Recurrent draining tracts & swellings.

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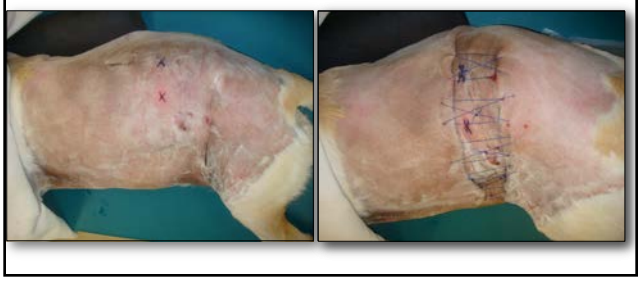
- BW, CT, histopathology, macerated tissue culture (asking for atypical culture)
- Actinomyces cultured on both aerobic and anaerobic culture
- Pretensioned region for 3 days



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- Resection of all affected tissues, including muscle of body wall

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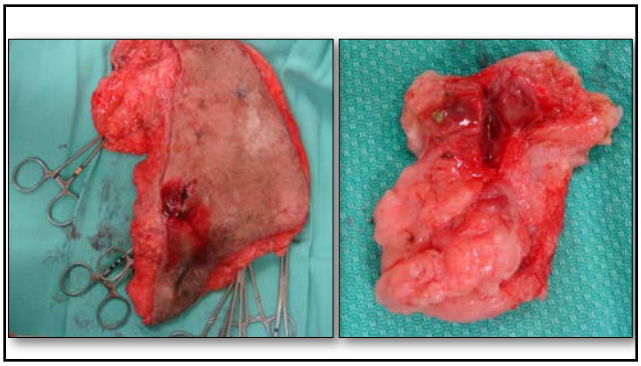

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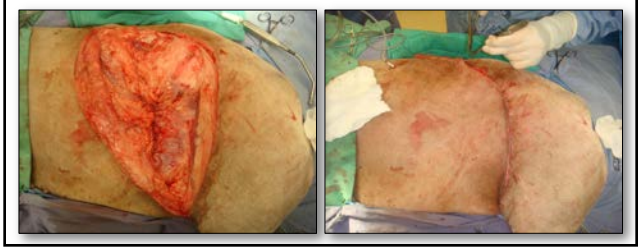
- Three layer closure
- Amoxycillin for 12 weeks



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Dexter 3 yr MC golden retriever… hunting dog

9 month history of draining tract

- Off antibiotics, deep tissue culture.
- Numerous Actinomyces spp. grown → sent to Tennessee for sensitivities & typing.
- CT

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- Plan - resection and reconstruction.
- CT images available in the O.R.

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- 12 weeks of ampicillin

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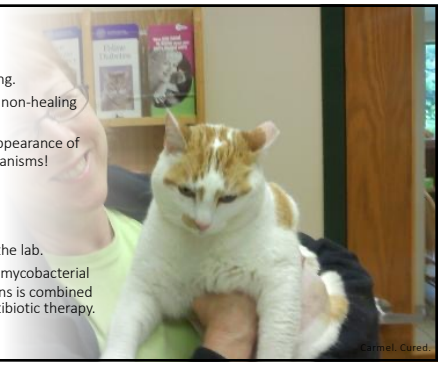
SUMMARY

- Know normal wound healing.
- Recognize and analyze the non-healing wound.
- Be suspicious of atypical appearance of wounds. Think atypical organisms!
- Prepare owner for
  - Further diagnostics
  - Prolonged therapy
- Biopsy, culture – befriend the lab.
- Best prognosis for atypical mycobacterial and actinomycotic infections is combined excision and prolonged antibiotic therapy.



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