

**Core Content: Toxic Shock, Necrotizing Fasciitis, Erysipelas, Cellulitis, Tetanus**

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❖ **Tetanus**

- 78-year old Russian man, speaks fair English, smoker, no past medical history, no meds or allergies, presents with seven days, gradual onset, tingling in the left lower extremity—now with “tremors” and bad cramps in the leg. Slightly hoarse, slight sore throat. No other neuro sx. No headache, stiff neck, injury, rash. Except for cramps in the leg, and some onychomycosis, leg exam unremarkable otherwise except some slight redness next to the left big toe. Labs normal, CT head normal.
- Tetanus treatment:
  - Tetanus Antitoxin (“TIG”, “Hypertet” 500-6000 Units IM)
  - Tetanus Toxoid
  - Supportive: benzos, watch for need for intubation.
  - Antibiotics: Pen G 10-24 million units/day (continuous or bolus), or doxycycline; Flagyl also good
  - ? Podiatry consult—but delay any possible surgery to avoid releasing tetanospasmin
  - If needed, paralytics ? Dantrolene

- Differential of severe tetanus is same as “agitated delirium” including
    - ◆ CVA, brain tumor or abscess
    - ◆ Rabies
    - ◆ Black widow spider bite
    - ◆ Serotonin syndrome
    - ◆ Dystonic reaction
    - ◆ Sepsis/meningitis/encephalitis
    - ◆ Cocaine toxicity
    - ◆ Strychnine
    - ◆ Shock
    - ◆ Hypoxia
    - ◆ Heatstroke
    - ◆ Neuroleptic malignant syndrome
  - ◆ Status epilepticus
  - ◆ Centruroides scorpion bites
  - ◆ DTs
  - ◆ Quinolone antibiotic toxicity
- 27 year old man (from “the ‘burgh”, not from Ukraine), no PMH, last dT six years ago, stepped on a rusty nail.
- Does he need Hypertet/TIG? No.
  - Does he need dT? Yes. What if his last dT had been two years ago? Then no. Is there anything bad about giving too much dT? Yes, worse and more common allergic reactions.

- 32 year old woman (also from “the ‘burgh”, not from Ukraine), 6 months pregnant, last dT 12 years ago, no other PMH or meds or allergies, stepped on a rusty nail. **Can** you give her a dT? Yes; safe in pregnancy. **Should** you give her a dT? Yes, needs one. Does she need Hypertet/TIG? No; anyone who’s had a primary immunization series, i.e., anyone born and raised in the USA, never needs Hypertet/TIG unless they actually have tetanus. (Though TIG is safe in pregnancy.) When does she need another dT and why? Right after she delivers, she needs another dT, because although dT is safe in pregnancy, pregnant patients are immunosuppressed and don’t develop good responses from dT.
- 44 year old woman who had a minor cut on her finger five days ago, got a dT in the left deltoid; now the left deltoid is hot, red, and swollen, and has some slight blistering. No fever, chills, weakness or numbness or tingling, no hoarseness, shortness of breath, lip swelling. Can this woman ever get a dT again? Yes, but might want to try a T without the d. Probably a thimerosal allergy.

## ❖ Rashes

- Four-year old boy presents with sudden onset of fever, sore throat, and a sandpapery fine slightly red rash all over his body.
  - The rash is? Scarletina.
- Three year old girl with an abrasion on her face from four days ago, now with increasing redness around it and golden crusting, and a low-grade fever. Developed a sandpapery fine slightly red rash all over her body.
  - The abrasion is? "Impetigenized": impetigo (ecthyma is impetigo with deep involvement and swelling— usually mostly from strep rather than staph.)
  - The rash is? Scarletina again.
- The above three-year-old, now on Keflex and Bacitracin ointment, comes back with worsening of the rash all over her body. Now has redness in the skin lines of the antecubital fossae and the hands, conjunctivitis, and some cracking and fissuring of the lips.
  - This rash is now: Staph scarlatina. The strep has shared its phage with the staph.
- 22-year old woman, seen yesterday for an impacted tampon that had been for about a week and was removed, now

presents low-grade fever, myalgias, malaise, and a rash all over her body. There is some diffuse sandpapery rash, but there is also a lot of diffuse redness, and mucosal involvement with perioral fissuring, conjunctivitis with crusting.

- This is? Staph Scarlatina.
- The next day, she returns again, in the perineum and axilla there are erosions with golden crusting. Rubbing the skin around the axillae or perineum makes blisters. Physical exam otherwise unremarkable, vital signs normal.
- This is? SSSS (Staph Scalded Skin Syndrome, AKA Ritter's Syndrome, dermatitis exfoliativa neonatorum, and a + Nikolsky sign.)
- Only the stratum corneum sloughs.
- Treatment: supportive care, anti-Staph antibiotics though they don't seem to help the course of the disease.

➤ Twin sister of the above woman presents today by ambulance; also has had an impacted tampon that had been in for a week; had a precisely similar rash yesterday. Today, developed high fever and shaking chills, vomiting and diarrhea, and medics found her to be lethargic with SPB=70, better after a

leader of IV fluid but SPB still only 90. No stiff neck, no neuro sx, no abdominal pain.

- She has? TSS (Toxic Shock Syndrome) where either staph or strep (some insist they look different, some insist they don't) produces exotoxins (they are promiscuous about sharing phages).
- Treatment: fluids, pressors, IV antibiotics (clinda has a better reputation than PCN for TSS), steroids. Watch for liver/renal failure (common). Mortality 30%.
- The husband of one the two above women, a 24 year old man with no PMH, presents with a blistering rash. He just got over a sinusitis (took Bactrim). Started having an itchy rash on his face, arms and torso yesterday, but today has blisters, particularly on the face—"every time I scratch I get a blister."
  - Differential Diagnosis? Admit! Stat Derm consult!
    - ◆ Bullous Impetigo? Kids/infants. Mixed staph/strep, very contagious, superficial blisters, usually in clusters with satellite lesions. No or minimal redness. Keflex + Bacitracin oint. OR Bactroban (mupirocin) oint.

◆ Pemphigus? People in 30's-60's. Sudden onset. ? Autoimmune. Superficial bullae (skin color stays on). Very responsive to steroids. Used to be 95% mortality, now very small with steroids.

◆ Pemphigoid? Older people, deeper bullae with bleeding, skin color comes off. Itching. Insidious onset. Tense blisters.

◆ TEN? (Toxic Epidermal Necrolysis). Almost always in adults (SSSS usually just in kids). Deeper bullae (skin color comes off). Reaction to medication, immunizations. Similar to Erythema Multiforme Major (Stevens Johnson Syndrome) but worse. Rx: admit to burn center. Nothing else works.

➤ The brother of the two sisters (come on, where's your "willing suspension of disbelief"?), a 28 year old man with Type II diabetes, presents with a chief complaint of right leg swelling. Two days ago, he dropped a piece of firewood on his right proximal thigh—didn't hurt that bad, didn't bother to come to the ED, didn't think it was broken. But yesterday, the area swelled, got just a bit red. Today, the leg and groin were worse, and

he developed fever and chills, moderate redness and swelling of the area, with severe pain. The vascular ultrasound tech happened to be in the ED, and was eager to leave, so was already doing a Doppler venous ultrasound of the leg, so you look over his shoulder. There's no DVT, and there is pulsatile venous flow (? from infection) with some nodes in the groin, and what looks like air in the soft tissues of the thigh.

- Is this "gas gangrene"? Yes.
- Is this "necrotizing fasciitis"? Yes.
- Is this probably caused by a combination of beta-hemolytic strep and anaerobes like various Clostridium species? Yes.
- Is this clostridial myonecrosis? If you see air in the muscle, it is. If not, it's just necrotizing fasciitis. ("Gas gangrene" is a great old term that can be applied to either.)
- Is this patient a setup for the streptococcal-variant Toxic Shock Syndrome? Yes.
- Is this *Fournier's syndrome*? No, that is when you have "gas gangrene" in the perineal area, usually in men.
- Is this *Meleney's synergistic gangrene* (progressive bacterial synergistic gangrene)? Maybe yes,

maybe no, mostly related to whether there's clotting in the small veins or not. Do you really care?

- How do you tell it's necrotizing fasciitis/clostridial myonecrosis if you don't have an ultrasound right handy?
  - ◆ Feel for crepitation and deep swelling/tenderness.
  - ◆ Look for grayish or bluish discoloration suggestive of necrosis hiding under the skin.
  - ◆ X-ray for air in tissue.
  - ◆ Cut it open, preferably in the OR.
- If you cut this open in the OR, do you expect to find that the necrosis has spread widely under otherwise intact-looking skin? Yes.