PEDIATRIC INFECTIOUS DISEASE EMERGENCIES

S Michael Marcy, MD
Clinical Professor of Pediatrics
University of Southern California
University of California Los Angeles
Schools of Medicine

Department of Pediatrics
Kaiser Foundation Hospital
WLA & Panorama City, California

CONCERNS, CONFLICTS, CAVEATS

• I unfortunately have no financial relationship with any of the commercial entities whose products may be discussed in course of this presentation

Objectives

• At the conclusion of this lecture, the attendee who has been paying attention will be able to
  – Identify some emergent pediatric infectious disease conditions which can present in different age groups,
  – apply appropriate use of lab and imaging studies and,
  – formulate a treatment plan for those conditions
Case #1

Case #1: History and PE

- A 15-day old girl is brought in for evaluation of redness and swelling of her left breast. No Hx illness, trauma. Baby feeding and acting normally; no fever.
- ROS: normal
- PMH: unremarkable
- Family Hx: parents, 2 yr old sib are well
- PE: VS normal. Enlarged, erythematous, firm, tender left breast. Otherwise vigorous baby, normal exam

Most likely diagnosis? Further tests? Rx?
Case #1: Differential Dx & Tests

- Differential Diagnosis
  - Breast cellulitis
  - Breast abscess
  - Friction trauma
- WBC: 18,500 with 68%P, 8%Bands, 18%L, 5%M, 1%E; Hgb 13.5
- Blood and expressed milk cultures sent
- Gram stain expressed milk performed
- Sonogram ordered.

Case #1
Transverse (A) and sagittal (B) ultrasound of breast

Case #1: Neonatal Breast Abscess

- Usually occurs in first 6 weeks; 85% in first 3 weeks
- Only one-third of pts ill or febrile
- **S. aureus** (incl MRSA) major cause; less commonly
  group B strept, Gram-negative enterics (*E. coli, Proteus mirabilis, Pseudomonas, Salmonella spp, anaerobes*
- When caused by **S. aureus**, skin pustules common
- Caused by ascending infection of ducts of the breast;
  “milking” the breast repeatedly a predisposing factor.
- Rare in preemies with less developed breast tissue

Gram stain of breast “milk”
Case #1: Neonatal Breast Abscess

- **Treatment**
  - Drainage: needle (sonogram-guided) and/or I & D
    - *Do not incise across ducts*
  - Antibiotics: clindamycin (+ cefazolin) or vanco IV.
    - Adjust on basis of culture, susceptibility
- If *S aureus*, warn of possible spread within family, maternal mastitis, recurrent “ping-pong” infections
- Can affect breast development and cause decreased adult breast size in up to a third of patients

Case #1: Neonatal Breast Abscess

- Treatment
  - Drainage: needle (sonogram-guided) and/or I & D
    Do not incise across ducts
  - Antibiotics: clindamycin (+ cefazolin) or vanco IV.
    Adjust on basis of culture, susceptibility
- If *S. aureus*, warn of possible spread within family, maternal mastitis, recurrent “ping-pong” infections
- Can affect breast development and cause decreased adult breast size in up to a third of patients


ULTRASOUND IN Dx OF SOFT-TISSUE INFECTION

CA-MRSA Skin infection (abscess + cellulitis)

ULTRASOUND IN Dx OF SOFT-TISSUE INFECTION

CA-MRSA Skin infection (cellulitis & ? abscess)
Case #2

Case #2: History and PE

- 9 month old boy is brought in after 3 bowel movements over an hour that “appeared to be more blood than stool”. No fever, vomiting, travel, ill contacts. On iron-containing formula, no recent red liquids or foods.
- ROS: otherwise normal
- PMH: Seen 7 days ago with URI and AOM, given antibiotic Rx and acetaminophen.
- Family: parents, two sibs 3 and 5 all well

Most likely diagnosis? Further tests? Rx?
Case #2: Differential Dx & Tests

- Milk Allergy
- Intussusception
- Meckel diverticulum
- Bleeding diathesis
- Polyp
- Anal fissure
- Vascular malformation
- Infectious enterocolitis
- Red food dye
- Antibiotic

- WBC 7,800 with 45%P, 46%L, 4M, 3E; Hgb 11.3; platelets 274,000
- Fecal occult blood: negative
Case #2: Cefdinir Stool

- Antibiotic (cefdinir, Omnicef®) stool
  - Red color caused by formation of non-absorbable complex between cefdinir and iron in the GI tract
  - Reported shortly after widespread use began
  - Many, but not all, patients were also taking iron-containing supplements
  - Problem ceases when antibiotic discontinued


Case #3

Case #3: History and PE

- A 14 year old boy is comes in because he has had persistent frontal headache for 9 days. This morning he noted a swelling of his forehead and eyes. He has had a cold and stuffy nose for 10-14 days, low-grade fever (101°F po) for a day or so.
- ROS: Hay fever in spring, otherwise normal
- PMH, Family Hx: Non-contributory
- PE: 102°F. Tender, fluctuant swelling mid- and left forehead, edema upper lid OS. Purulent discharge in nose. Gloves, EOM normal. Fundi normal

Most likely diagnosis? Further tests? Rx?
Case #3: Differential Dx & Tests

- Differential Dx
  - Trauma with infected subq hematoma
  - Periorbital (preseptal) cellulitis
  - Acute sinusitis, periorbital cellulitis
  - Acute sinusitis, periorbital cellulitis, frontal osteo

- WBC 17,350 with 53%P, 10% bands, 34%L, 3%M; Hgb 14.4; platelets normal

- Sinus series ordered
- CT scan: Pending
Case #3: Pott Puffy Tumor

- Extension of frontal sinusitis into subperiosteal and/or epidural and/or subdural spaces
- Unusual before significant pneumatization of frontal sinuses at 10-11 years of age
- Mainly due to "Strep viridans", S. aureus, anaerobes
- Percivall Pott (1714-1788) a leading surgeon in London in the 18th century. Remembered through Pott puffy tumor, Pott fracture, Pott disease

Case #3: Pott Puffy Tumor

- Treatment
  - Potential surgical emergency, particularly if intracranial extension
  - ENT, neurosurgical consultation for drainage
  - Antibiotics: vancomycin + metronidazole + ceftriaxone; adjust based on culture and susceptibility studies
  - Observe closely for increased ICP, seizures

Case #4: History and PE

- A 5 year old girl was bitten on her upper arm by a cousin 3 days ago. The wound is now inflamed, draining serosanguinous fluid, painful and tender.
- ROS, PMH, Family Hx: non-contributory. No prior bite history
- PE: T 101.8 po; P 110. Whiny, sick-looking child. The right upper arm is discolored, swollen and indurated from antecubital fossa to upper chest. There are vesicles and bullae on the biceps surface, no crepitus. The indurated area is exquisitely tender.

Most likely diagnosis? Further tests? Rx?
Case #4: Differential Dx & Tests

- Differential Dx
  - Cellulitis (Eikenella corrodens, S aureus, GABHS)
  - Necrotizing fasciitis
- WBC 17,500; 58% P, 14% bands, 25% L, 3% M
- Gram-stain of discharge: Gram (+) cocci in chains. Culture: pending
- Blood culture: pending
- C-reactive protein, creatine phosphokinase: pending
- Radiograph upper arm: normal
- MRI: Pending
Case #4: Necrotizing fasciitis (NF)

• Infection involving superficial fascia, subq fat, nerves, vessels, and deep fascia, often with myonecrosis

• Two types
  – Type I: mixed anaerobic, aerobic, facultative bacteria (e.g. E coli + non-group A strep, Bacteroides), S pneumo
  – Type II: Group A strep and/or S aureus

• Systemic toxicity, severe tenderness out of proportion to local findings (+ crepitus ± bullae ± patchy hypoesthesia)
  + increased CRP and CPK help separate cellulitis from NF

• Dx clinical &/or imaging &/or frozen tissue biopsy
• Percutaneous needle aspiration with Gram stain, culture
Case #4: Necrotizing fasciitis (NF)

- Infection involving superficial fascia, subq fat, nerves, vessels, and deep fascia, often with myonecrosis
- Two types
  - Type I: mixed anaerobic, aerobic, facultative bacteria (e.g. E coli + non-group A strep, Bacteroides), S pneumo
  - Type II: Group A strep only, occas with S aureus
- Systemic toxicity, severe tenderness out of proportion to local findings (+ crepitus + bullae + patchy hypoesthesia)
  + increased C-RP and CPK help separate cellulitis from NF
- Dx clinical &/or imaging &/or frozen tissue biopsy
- Percutaneous needle aspiration with Gram stain, culture

Case #4: Necrotizing fasciitis (NF)

Treatment:

- Necrotizing fasciitis is a surgical emergency. Delay in treatment by hours can significantly increase mortality
- Immediate surgical debridement if NF diagnosed or if strongly suspected; 24 hr “second-look” may be indicated to ensure adequacy of initial debridement
- Antibiotics: vanco + cefotaxime + metronidazole; vanco + meropenem: vanco + piperacillin-tazobactam
- IVIG, hyperbaric oxygen of unproven efficacy
- Watch for impaired renal function, DIC, hypocaloemia

Simonart T. Dermatology 2004; 208:5-9
Case #5: History and PE

- 2 year old boy comes in with increasing “puffing out under his jaw” for a day. He has complained vaguely of pain in his mouth for 3-4 days. Low-grade tactile fever, snorting respirations, drooling also noted.
- ROS: “milk bottle caries” was Dx last month
- PMH, Family Hx: non-contributory
- PE: T 100.8, P 110, R 45. O2 sat: 92%. Sick-looking boy with fetid breath; snorting respirations; drooling; non-pitting taut, tender, warm indurated swelling under jaw. Unable to open mouth. Tongue elevated.

Most likely diagnosis? Further tests? Rx?
Case #5: Differential Dx & Tests

- Differential Diagnosis
  - Submandibular trauma / hematoma
  - Submandibular mumps
  - Submandibular lymphadenitis
  - Submandibular cellulitis
- CBC: 16,450, 65%P, 15% bands, 15%L, 5% M; Hgb 10.2; platelets normal
- Amylase pending
- Sonogram: no evidence of abscess formation
- CT: Pending
Case #5: Ludwig’s Angina

- Potentially life-threatening infection
- Bilateral submaxillary and/or sublingual space infection beginning in the floor of the mouth
- Usually an indurated non-pitting cellulitis, but may form abscess(es)
- Rapid progression of edema of the neck (“bull neck”) and glottis can cause death through asphyxiation (aka: Morbus strangularis)
- Dental abscess, particularly 2nd or 3rd molars, a common source (>50%)
- Can spread by continuity along fascial planes into parapharyngeal, retro-pharyngeal, superior mediastinal spaces.


Case #5: Spread of Dental Abscesses

- a. to sublingual space
- b. to submandibular space

Case #5: Ludwig's Angina

• Bacteriology reflects mouth flora:
  – Streptococcal species (“S viridans”) (40%)
  – Gram-negative rods (25%)
  – Anaerobes (20%)

• 35% of blood cultures positive


Case #5: Ludwig’s Angina

• Treatment:
  – Airway management critical – Admit to ICU
    • Fiberoptic nasotracheal intubation
    • Tracheostomy under local (if edema permits)
    • IV dexamethasone x 48 hrs decreases edema
  – Ampicillin-sulbactam (IV) or clindamycin (IV). Some experts recommend adding cefotaxime or gentamicin. Adjust therapy based on culture, susceptibilities
  – Dental extraction may be necessary
  – Follow with ultrasonography to check for development of abscess(es) requiring drainage (up to 2/3 of cases)

Soft tissue inflammation and edema (arrow) and abscess formation (*)
Case #6: History and PE

• A 16-year old boy comes to your office with his father who is concerned because the boy has had a low-grade fever for several days, but today woke up with a fever to 104°F, flushed face, chills, headache, vomited once, and even seemed a bit delirious about an hour before. He has been well otherwise except for an aching knee since he tripped and fell about a week ago.
• ROS: Otherwise non-contributory
• PMH: Non-contributory. Immunizations “all up to date”, including meningococcal vaccine x 2
• Family Hx: All well, non-contributory

Case #6: Hx and PE (Cont’d)

• PE: On examination you confirm fever T 102°; P 132; R 34; BP 95/65; SatO2: 89%. Septic-looking young man with flushed, red, sweaty face. Grade 2/6 mid-systolic hemic murmur. Right knee mildly swollen and faintly pink. Otherwise, PE normal with scattered small petechiae on trunk, but no ecchymoses, urticaria, or mucous membrane involvement.

Most likely diagnosis? Further tests? Rx?
Case #6: Differential Dx and Tests

- Labs
  - WBC: 9700, 43% N, 28% B, 20% L, 9% M, toxic granulations noted; Hgb 15.3; Plt 120,000
  - ESR: 85 mm/hr; CRP: 57 mg/L
  - UA: 8-10 RBC / HPF; Creatinine 2.0; BUN 20
  - Na: 125
  - ALT: 52, AST: 38; albumin: 2.43 g/dL
  - D dimers (+), fibrin split products (+)
  - Blood, urine cultures: pending
  - Imaging: chest: bilateral nodular densities
    knee: no osteo, small joint effusion
Bilateral nodular densities throughout lung fields

Plain film, lateral and A-P of knee = small joint effusion, no evidence osteomyelitis

Cells: 125,000
Gram(+) cocci in clusters
Culture: Pending (MRSA)
MRI: multiple pockets of fluid within distal femur with surrounding abnormal medullary cavity signal. Mild enhancement of endosteum and periosteum also noted.

Case #6: ? Sepsis ?

- Systemic Inflammatory Response Syndrome (SIRS)
  Two or more of:
  - Temperature > 38°C or <36°C
  - Tachycardia > 90 beats/minute
  - Respiratory rate >20/minute or PaCO2 <4.3 kPa
  - WBC >12,000 or <4,000 or > 10% bands
- Sepsis: SIRS due to infection
- Severe sepsis: Sepsis + evidence of organ hypoperfusion
- Septic shock: Severe sepsis + hypotension (BP <90 syst) despite adequate fluid resuscitation or the requirement for vasopressors/inotropes to maintain blood pressure
Case #6: Differential Dx and Tests

- Infectious causes of SIRS ("sepsis")
  - Neisseria meningitidis
  - Group A streptococcus
  - Staphylococcus aureus
  - Salmonella typhosa
  - Rickettsia rickettsii (RMSF)
  - Ehrlichia chaffeensis
  - Leptospira sp….

SEROTYPES RESPONSIBLE FOR MENINGOCOCCAL DISEASE IN U.S.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>0-2</th>
<th>2-5</th>
<th>6-11</th>
<th>12-17</th>
<th>18-23</th>
<th>24-64</th>
<th>≥255</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>255</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>215</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W-135</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Serogroup distribution by age group, United States, 1996-1998

CASE #6: Severe Staphylococcal Sepsis in an Adolescent

- 90% with bone and/or joint infection
- 90% with pulmonary septic emboli, pneumatoceles, &/or effusions
- 30% bacterial venous thrombophlebitis
- 50% Renal failure
- DIC
- Skin lesions: petechial, papular-pustular, urticarial, erythema multiforme,


CASE #6: Severe Staphylococcal Sepsis in an Adolescent

- Treatment
  - Support fluids, BP, hypoxia, DIC, renal
  - Vancomycin + ceftriaxone ± gentamicin
  - IVIG anecdotally helpful in nonresponsive patients or if toxic shock syndrome
- Clinical course
  - Prolonged bacteremia (mean 4 d; 1-11 d)
  - Prolonged fever (mean 13 d; 2-35 d)
  - Prolonged course antibiotics (≥ 6 weeks)
  - Death (20%)
Case #7: History and PE

• A 15 year old boy has had sore throat x 3 days, fever (tactile), intense headache, muscle aches, x 2 days. Today, fever 103.6°po, he vomited twice, and a rash was noted on his face, trunk, extremities.

• ROS, PMH: noncontributory. Has had all his shots, including one meningococcal vaccine at age 9

• Family Hx: Parents, 12 yr and 17 year old sibs well

• PE: T 102.6°po, P 96, R 28, BP 90/72. Mildly ill with petechial rash extremities > trunk > face. Petechiae 1-2 mm diameter without purpura or necrotic centers. Slight erythema of tonsillar pillars. Otherwise normal exam

Most likely diagnosis? Further tests? Rx?
### Case #7: Differential Dx and Tests

**Differential Diagnosis petechial rash**

<table>
<thead>
<tr>
<th>Bacterial Pathogen</th>
<th>Viral Pathogen</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>N meningitidis</em></td>
<td>Echo-, Coxsackie-virus</td>
</tr>
<tr>
<td><em>N gonorrhoeae</em></td>
<td>Parvovirus B19</td>
</tr>
<tr>
<td><em>S aureus</em></td>
<td>Epstein Barr virus</td>
</tr>
<tr>
<td><em>S pneumoniae</em></td>
<td><em>R rickettsii</em> (RMSF)</td>
</tr>
<tr>
<td><em>H influenzae type b</em></td>
<td>Endocarditis</td>
</tr>
<tr>
<td>Group A streptococcus</td>
<td>Vomiting (&gt;SVC)</td>
</tr>
<tr>
<td><em>Salmonella spp</em></td>
<td>Trauma</td>
</tr>
<tr>
<td>Gram-negative enterics</td>
<td>Thrombocytopenia</td>
</tr>
<tr>
<td><em>S moniliformis</em></td>
<td>Vasculitis (e.g. HSP)</td>
</tr>
<tr>
<td><em>M pneumoniae</em></td>
<td></td>
</tr>
</tbody>
</table>
Case #7: Differential Dx and Tests

- WBC: 11,500 with 45%P, 5% bands, 45%L, 3M, 2E; Hgb 14.5; platelets 275,000
- UA: normal
- Blood culture: pending
- Throat ADT: neg for GABHS
- Throat swab PCR: pending
- CSF: 5 RBC, 7 Monos, Protein 45, Sugar 80, Gram-stain negative, culture and PCRs pending
- Gram-stain petechia scraping: RBCs, no organisms

Case #7: Enterovirus Infection

- Studies of fever + petechial rash in the ’80s revealed only 10% - 20% bacterial etiology…roughly half meningococcal…this before advent of Hib and pneumococcal vaccines for infants and meningococcal vaccine for adolescents.
- Recent studies indicate that in febrile but well-appearing 3 - 36 mo old children, occult bacteremias (and presumably petechiae) occur in as few as 0.25%, most due to S pneumoniae.*
- Meningococemia can present with petechial rash (50%-60%), or macular rash, mac-pap rash (15%), urticaria, purpura, or no rash at all (1%-2%).
- Bacterial petechiae are usually raised, often purulent or with necrotic centers or purpuric, enteroviral petechiae are “in” the skin, not “on” the skin;


Meningococcemia

Case #7: Enterovirus Infection

- Clinical findings vs meningococcal infection: negative predictive values (NPV) in 24 children with petechial or purpuric rash

<table>
<thead>
<tr>
<th>CLINICAL FINDING</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not ill appearing</td>
<td>97% (91-100)</td>
</tr>
<tr>
<td>No purpura</td>
<td>98% (87-100)</td>
</tr>
<tr>
<td>No rash below superior v c</td>
<td>100% (91-100)</td>
</tr>
<tr>
<td>No fever ≥38.5°C</td>
<td>94% (88-100)</td>
</tr>
<tr>
<td>No fever ≥37.5°C</td>
<td>95% (88-100)</td>
</tr>
<tr>
<td>No capillary refill ≥2 secs</td>
<td>98% (92-100)</td>
</tr>
<tr>
<td>No hypotension</td>
<td>84% (75-92)</td>
</tr>
<tr>
<td>No CRP ≥6 mg/L</td>
<td>100% (92-100)</td>
</tr>
</tbody>
</table>

Case #7: Enterovirus Infection

- Treatment:
  - Admitted for observation, ceftriaxone 2 gm bid IV
  - Next day rash worse....
  - Day 2: blood and CSF cultures gave no growth
  - Day 3: throat swab PCR positive for enterovirus
- Petechiae commonly accompany infection due to Coxsackie A, B and echoviruses, particularly echo 9

Case #8

- 3-month infant arrives with a history of “not himself”. He was well until yesterday evening, when he became irritable, appetite diminished, and he felt warm. No URI, GI, GU signs or symptoms.
- PMH, ROS: NFTPL&D, 8-2. Has been breast-feeding well. Had first immunization series
- Family, Social Hx: Parents and 3 y o sib at summer camp have been well
- PE: T: 102.2 pr, P: 120, R 40. w/n, w/d, in no distress. Except for feeling warm and irritability, no positive physical findings. Fontanelle is flat and si pulsatile. Normal uncircised male, testicles down. No rash, no enanthem.

Most likely Diagnosis? Further tests? Rx?
Case #8: Differential Dx and Labs

- Differential Dx:
  - (Entero)viral infection
  - UTI
  - Sepsis
  - Meningitis

- Labs:
  - WBC 12,500 with 46%P, 5%B, 45%L, 1%E, 3%M; Hgb 10.4
  - Cup urine was obtained and discarded……..
  - Cath urine LE(+), nitrite (-). UA “loaded” with WBC, Gram stain neg
  - CSF: clear with 15 RBC, 24 WBC/mm³, 30%P. Protein 45 and sugar 54 mg/dL. Gram stain neg
  - Blood, urine, CSF cultures sent

- Sonogram of kidneys: no evidence obstruction
Case #8: Aseptic Meningitis with UTI

- Occurs in ~12% of infants <6 months of age who have UTI and who have an LP performed
- Ages: Uncommon <31 d, ~15% of 1-6 mo olds
- Girls with UTI more likely to have this than boys
- Median WBC in CSF: 23 WBC and 5 PMNs/mm³. Glucose normal, protein 15 – 109 mg/dL
- Most common urinary pathogen: E coli (80%)
- Not related to presence or absence of bacteremia
- ? caused by lipopolysaccharides inducing cytokine cascade, particularly elevated IL-6 and IL-8

Case #9: History and PE

- 11 year old boy was playing with a cat at a friend’s house when it turned and bit him on the hand. He was brought in for evaluation of the bite, but parents refused antibiotic prophylaxis. He comes in now at 24 hours with a painful, swollen, reddened hand
- ROS, PMH, Family Hx: non-contributory
- PE: VS normal. Thenar eminence swollen, discolored, very tender, with puncture wound showing tiny amount of purulent discharge. Flexion/extension of thumb and index finger pain-free. Otherwise normal exam.

Most likely diagnosis? Further tests? Rx?
Case #9: Differential Dx and Tests

- **Differential Diagnosis**
  - Bacterial infection soft tissue
  - Bacterial tenosynovitis
  - Incubating tetanus or rabies
  - Bacteremia

- **Lab:**
  - WBC 9,800 wit 45%P, 2 bands, 45%L, 5M, 2B, 1E; Hgb 14.0; platelets adequate
  - Culture of discharge: pending
  - Gram stain: Many WBC, Gram-neg coccobacillary organisms and some Gram-pos cocci
Case #9: Infected Animal Bite

- Treatment
  - Cleanse, debride wounds...under anesthesia prn
  - Close adequately-cleansed face wounds primarily, other wounds approximate edges, close secondarily
  - Consult hand and/or plastic specialists prn
  - Immobilize (sling for hand bites) and elevate
  - Head wound precautions in infants
- Tetanus and rabies prophylaxis prn
- Antimicrobial prophylaxis prn (x 48-72 hrs)
- 24-hour follow-up
- Psychologic evaluation and support

Case #9: Infected Animal Bite

- Treatment
  - Cleanse, debride wounds...under anesthesia prn
  - Close adequately-cleansed face wounds primarily, other wounds approximate edges, close secondarily
  - Consult hand and/or plastic specialists prn
  - Immobilize (sling for hand bites) and elevate
  - Head wound precautions in infants
- Tetanus and rabies prophylaxis prn
- Antimicrobial prophylaxis prn (x 48-72 hrs)
- 24-hour follow-up
- Psychologic evaluation and support

Goldstein E J C: Bites. in Mandell, Bennett, Dolin (Eds) Principles and Practice of Infectious Diseases, 6th Ed. Elsevier Philadelphia, 2005
Case #9: Animal Bite

• Indications for antimicrobial prophylaxis
  – Puncture wounds
  – Moderate to severe injury
  – Bites over tendons, joints, bone
  – Bites on face, hand, foot or genital area
  – Bites on immunocompromised host

• Microbiology (animal mouth flora, not skin flora)
  – Pasteurella multocida & canis (50%-75%)
  – Streptococcal sp (50%)
  – Staphylococcal sp (20%-40%)
  – Anaerobic bacteria (70%)
  – Gram-negative enterics, other animal mouth flora

• Antimicrobial prophylaxis (and therapy)
  – Oral outpatient: Amoxicillin-clavulanate or if β-lactam allergy, clindamycin + trimethoprim-sulfa
  – IV inpatient: Ampicillin-sulbactam or clinda + trimethoprim-sulfa

• Beware bite by large dog on head of small child!
Large dog, small child bitten on head
FACIAL FRACTURES (RARE)

CRANIOCEREBRAL INJURY: BRAIN ABSCESS (P. MULTOCIDA)

Case #10: History and PE

- A 6-mo old girl comes in with 1-day Hx fever, irritability, decreased appetite, spreading and enlarging purpuric rash
- PMH, ROS: non-contributory. Two series infantile immunizations
- PE: w/n, w/d, alert, hydrated, afebrile. Rash on face, ears, extremities. Otherwise normal

Most likely diagnosis? Further tests? Rx?.
Case #10: Differential Dx and Tests

- Differential Dx Fever and Purpuric Rash
  - Meningococcal
  - Pneumococcal
  - Gonococcal
  - Streptococcal
  - DIC
  - RMSF
  - Ehrlichiosis
  - Hepatitis B
  - HIV
  - Influenza
  - Cytomegalovirus
  - SLE
  - Polymyositis nodosa
  - Wegener’s granulomatosis
  - Hypersensitivity vasculitis

- Lab: WBC 14,300; 39%P/10%bands, 35%L, 15%M, 1%E;
  - Hgb 11.0;
  - Pt 842,000;
  - PT, PTT, electrolytes, BUN, UA, stool guaiac, CSF all normal
Case #10

Case #10: Acute Hemorrhagic Edema of Infancy
(Finkelstein-Seidlmayer Syndrome)
(Infantile Henoch-Schonlein Purpura)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Infants AHEI</th>
<th>Older Children HSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4-24 mo</td>
<td>3-10 yrs</td>
</tr>
<tr>
<td>Purpura</td>
<td>Face, ears, arms</td>
<td>Legs, buttocks</td>
</tr>
<tr>
<td>Subq edema</td>
<td>Common</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Dermal vessel deposits</td>
<td>IgM</td>
<td>IgA</td>
</tr>
<tr>
<td>Duration of illness</td>
<td>1-3 wks</td>
<td>3-6 wks</td>
</tr>
<tr>
<td>Relapse</td>
<td>Infrequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Long-term sequela</td>
<td>None</td>
<td>Renal failure 2%-5%</td>
</tr>
</tbody>
</table>

Case #10: Acute Hemorrhagic Edema of Infancy

• Rapid onset palpable purpura, ecchymoses, tender edema of limbs and face, occas low fever
• GI bleeding, arthritis, nephritis rare
• Leukocytoclastic vasculitis with circulating immune complexes, IgM capillary deposits
• Etiology unknown: drug allergy, group A strep, HSV, Mycoplasma pneumoniae, adenovirus, CMV, VZV...
• Dx via clinical picture ± skin Bx
• Self-limited, steroids do not alter course of illness

Case #11: History and PE

- A 17 year old boy comes to you with a 10-day facial rash that “just keeps getting worse” despite Rx with amox-clav x 8 days and trimethoprim-sulfa x 2 days. Began as pimples on R forehead and cheek and kept spreading. Otherwise good health, active in sports, including football, baseball and wrestling.
- ROS, PMH, Family, Social Hx: non-contributory
- PE: normal VS and general exam except for multiple vesicular and crusty lesions as noted and bilateral submandibular lymphadenitis 2+/4.

Most likely diagnosis. Further tests? Rx?
Case #11: Differential Dx & Tests

• Differential Diagnosis
  Impetigo  Acne
  Herpes simplex dermatitis  Atopic dermatitis
  Zoster (shingles)  Scabies
  Tinea facialis

• Lab tests: CBC normal. Bacterial skin culture, Herpes simplex DFA and PCR all pending

Tzanck smear with multinucleated giant cells
Case #11: Herpes simplex dermatitis

- Close skin contact sports such as wrestling (herpes gladiatorum, “mat herpes”), rugby (herpes rugbiaforum); NCAA estimates occurs in up to 40% of wrestlers
- Head > face > neck > chest > shoulders
- Dx clinically and/or by Tzanck smear, fluorescent antibody stain, PCR


Case #11: Herpes simplex dermatitis

- Treatment:
  - Acyclovir, valacyclovir or famciclovir x 7-10 days
  - Return to sports ok if: no new lesions x 3 days; all old lesions dry and crusted; antiviral Rx for at least 120 hrs
  - Prevention with valacyclovir during competition season

THANK YOU.....