ARTRITIS

“INFLAMMATION OF A JOINT”

- Major cause of pain and disability
- Loss of work  
  2.5 days/month 
  early retirement
- 14 million physician visits per year
JOINT ANATOMY

- Articular cartilage
- Synovium
- Capsule/Ligaments
ARTICULAR CARTILAGE

• Acts as a shock absorber and spread the load onto subchondral bone
• Provides low friction for surface
• Avascular, aneural, alymphatic
• Composed of chondrocytes and extracellular matrix
ARTICULAR CARTILAGE
CHONDROCYTES

“sole living element in the articular cartilage”

ECM

proteoglycans
type II collagen

(5% wet weight)

Enzymes

matrix metalloproteinase (MMP)
SYNOVIUM

- Provides nutrients and lubricants
HYALURONIC ACID

- Building core for proteoglycans
- Aids in lubrication for joint
  (inflamed joints are less viscous)
CAPSULE AND LIGAMENTS

- Thick envelope around joints
- Ligaments – joint stability
  - Extra-articular
  - Intra-articular
NORMAL vs ARTHRITIS

Cartilage degradation
(OSTEOPHYTES)

Synovial hypertrophy
(SYNOVITIS)
(EFFUSION)

Thickened capsule
(LESS MOTION)
ORGANIZATION

- Osteoarthritis
- Rheumatoid Arthritis
- Seronegative Arthropathy
- Crystalline Arthropathy
OSTEOARTHRITIS

OTHER TERMS

- Osteoarthrosis/Osteoarthropathy
- Hypertrophic Arthritis
- Degenerative Joint Disease
OSTEOARTHRITIS

DEGENERATION OF ARTICULAR CARTILAGE

- Primary - no obvious cause
- Secondary – condition that accelerates degeneration (e.g. DDH in children)
- Traumatic – secondary type from trauma (e.g. intra-articular fractures)
- Common in increased age
OSTEOARTHRITIS

CLINICAL PRESENTATION

- Pain
- Swelling
- Loss of motion
- Deformity
  - genu varum
  - genu valgum
OSTEOARTHRITIS

NON-OPERATIVE TREATMENT

- Activity modification
- Physical therapy
- Unloader braces
- NSAIDs
- Glucosamine/Chondroitin Sulfate
- Cortisone injections
- HA injections
OSTEOARTHRITIS

SURGICAL TREATMENT

- Arthroscopic debridement/lavage
- Realignment procedures
- Joint Replacement
OSTEOTOMY

BONE REMOVED
JOINT REPLACEMENT
RHEUMATOID ARTHRITIS

- Autoimmune disease (HLA-R1/DR4)
  - T-cell interaction to synovium
- Rheumatoid Factor
- Unknown cause
- Inflammatory reaction that destroys articular cartilage
- Female:Male – 2.5:1
RHEUMATOID ARTHRITIS

ARA CRITERIA

- Morning stiffness at least 1 hour
- At least 3 joints
- Hand arthritis (PIP, MCP, wrist)
- Symmetric joint swelling
- Subcutaneous nodules
- Positive RF
- Radiographic changes typical of RA

Arthritis Rheum 31; 1988
RHEUMATOID ARTHRITIS

RADIOGRAPHIC FINDINGS

- Osteopenia
- Uniform narrowing of joint height
- Subchondral bone erosion/cysts
RHUMATOID ARTHRITIS

TREATMENT

- Patient education
- Protective splints/orthotics
- NSAIDs
- Prednisone
- Methotrexate
- Anti-TNF, Anti-IL1 medications
- Surgery – synovectomy/replacements/fusion of small joints
SERONEGATIVE ARTHROPATHIES

- Multi-system inflammatory disorders that involves tendon/ligament insertions and spine and SI joints
- Negative RF
- HLA-B27 positive
SERONEGATIVE ARTHROPATHIES

- Ankylosing Spondylitis
- Psoriatic Arthritis
- Reiter’s Syndrome
  - (Reactive arthritis, conjunctivitis, urethritis)
- Inflammatory Bowel Disease
  - (Crohn disease, ulcerative colitis)
CRYSTALLINE ARTHROPATHY

- Synovitis from deposits of crystals
- Gout
- Calcium pyrophosphate (CPPD)
## CRYSTALLINE ARTHROPATHY

### GOUT
- Uric acid
- Xanthine Oxidase (purine metabolism)
- Great toe
- Negative (yellow) crystals
- Colchicine, Allopurinol, Indocin

### PSEUDOGOUT
- Calcium pyrophosphate
- Genetic predisposition
- Knees and wrist joints
- Positive (blue) crystals
- Calcification seen on x-ray
- NSAIDs and activity modification
SEPTIC ARTHRITIS

- Common in children, young adults, and immunocompromised older adults
- *S. aureus* most common organism
- *H. influenzae* type B in children
- Bacteria proliferation to immune response to destructive enzymes to cartilage breakdown
CAUSES

- Typically single joint
- Hematogenous spread
- Direct inoculation (laceration, puncture)
- Extension for adjacent tissue (bursa, osteomyelitis)
SEPTIC ARTHRITIS

PRESENTATION

- Fever, chills, night sweats, malaise
- Acute onset of joint pain
- Joint swelling, loss of motion, pain
- Knee pain in children THINK hip
SEPTIC ARTHRITIS

TREATMENT

- Antibiotics (*N gonorrhoeae*)
- Serial aspirations (knee)
- Emergent surgical irrigation/debridement
OSTEOMYELITIS

- Infectious process that involves bone and medullary canal

- Traumatic
  - (open fractures, penetrating wounds)

- Operative
  - (joint replacement, ORIF, tumor resection)
OSTEOMYELITIS

- **Acute hematogenous**
  - Less than 2 weeks
  - Lower extremity > Upper extremity
  - Serum values (ESR, CRP, WBC)
  - Bone scans better than radiographs

- **Chronic hematogenous**
  - Weeks to months
  - Sinus tract development
  - Diabetes mellitus
  - Can be seen on plain radiographs
## SYNOVIAL FLUID SUMMARY

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<tr>
<th>Normal Infection</th>
<th>DJD</th>
<th>Gout</th>
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<tr>
<td>Clear 200 wbc</td>
<td>Cloudy 900 wbc</td>
<td>Cloudy 21K wbc</td>
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<tr>
<td>nl visc</td>
<td>&lt; visc</td>
<td>&lt; visc</td>
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<tr>
<td>No crystals</td>
<td>Crystals</td>
<td>Yellow (-)</td>
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THANK YOU