

GOUT & PSEUDOGOUT

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ACOI BOARD REVIEW 2017

GOUT

- Hyperuricemia is not gout
- Gout typically follows years of asymptomatic hyperuricemia
- Serum urate increased by alcohol, height, body weight, age, blood pressure, BUN, creatinine
- 13.6/1000 in men
- 6.4/1000 in women
- estrogen causes increased uric acid excretion

CLASSIFICATION CRITERIA

- Step 1: Entry Criteria – swelling pain and redness in a peripheral joint or bursa
- Step 2: Sufficient criterion (if met does not require other criteria) – MSU crystals in a symptomatic joint or bursa
- Step 3: Apply criteria if step 2 is not met

CLASSIFICATION CRITERIA

(Requires 9 points)

- Characteristics (1-3 points)
 - Erythema over joint
 - Can't bear touch
 - Inability to walk or use joint
- Time Course (one episode 1 point, recurrent 2 points)
 - <24 hours
 - Resolves in <14 days
 - Complete resolution between episodes
- Evidence of Tophus (4 points)
- Serum Urate
 - <4 (-4 points)
 - 6-8 (2 points)
 - 8 – 10 (3 points)
 - > 10 (4 points)
- MSU negative (-2 points)
- Imaging
 - Urate deposit evidence (4 points)
 - Typical damage evidence (4 points)

ASSOCIATED CONDITIONS

- Obesity
- Ethanol
- Diabetes Mellitus
- Hypertriglyceridemia
- Hypertension
- Hypothyroidism
- Atherosclerosis
- Metabolic Syndrome
- Pregnancy
- Acute Illness
- Dehydration
- Psoriasis

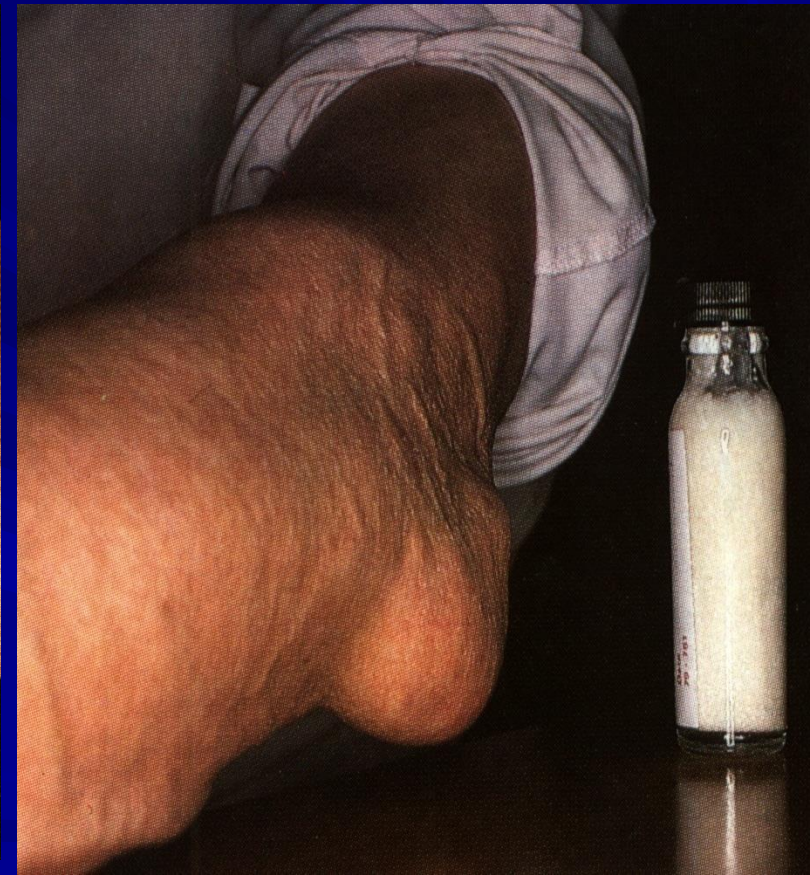
NEGATIVE ASSOCIATIONS

- Rheumatoid Arthritis
- SLE
- Ankylosing Spondylitis

CLINICAL

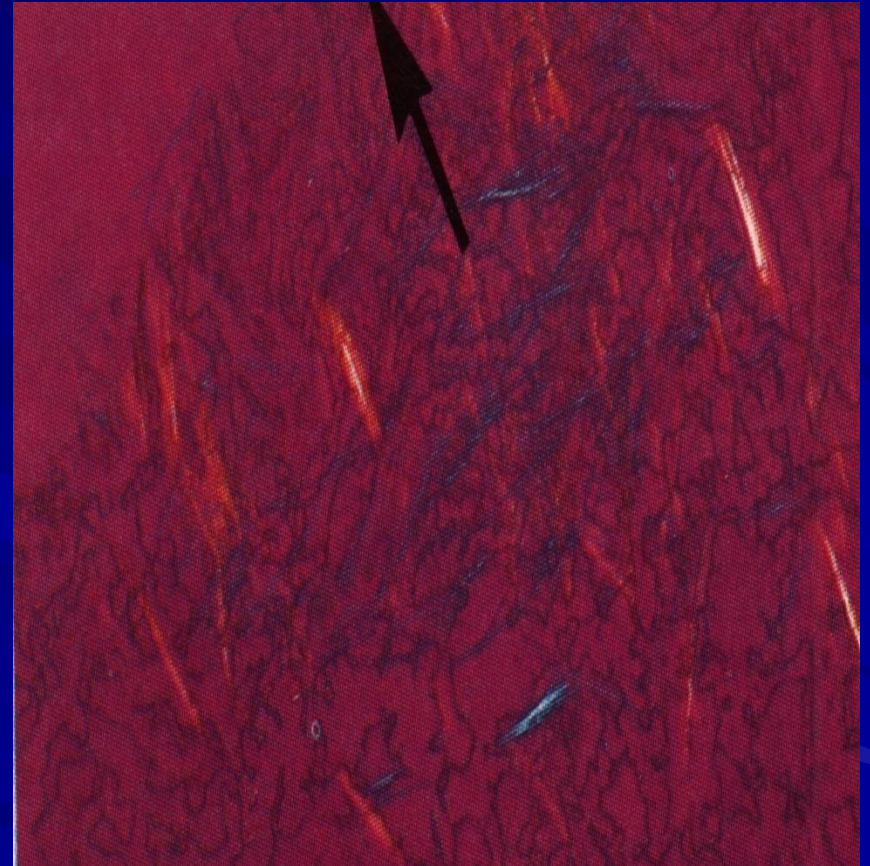
- Asymptomatic Hyperuricemia
- Acute Gout
- Intercurrent Period
- Acute Gout
- Chronic Gout

PRESENTATION



PATHOLOGY

- Monosodium Urate Crystals are formed when the bodies capacity to store uric acid is surpassed
- Uric acid is a byproduct of purine metabolism
- Serum saturation 6.7mg/dl



TOPHI



RADIOGRAPHIC FINDINGS



Hyperuricemia

- Primary Hyperuricemia
Hyperuricemia which is not caused by or secondary to another disorder.
- Idiopathic
- underexcretion - 90%
- overproduction - 10%

- Secondary Hyperuricemia
Hyperuricemia which occurs as a result of a drug effect or is secondary to another disease

OVERPRODUCTION PRIMARY HYPERURICEMIA

- **HGPRT Deficiency**
(Hypoxanthine Guanine Phosphoribosyltransferase Deficiency)
- **PRPP Synthetase Superactivity**
(Phosphoribosylpyrophosphate synthetase superactivity)
- **G-6-P-D Deficiency**
- **Fructose-1-Phosphate Aldolase Deficiency**

OVERPRODUCTION

SECONDARY HYPERURICEMIA

- Diet
- Myeloproliferative Disorders
- Lymphoproliferative Disorders
- Accelerated ATP Degradation
- Glycogen Storage Disease (type I, III, V, VII)
- Severe Muscle Exertion
- Hemolytic Disease
- Psoriasis
- G-6-PD Deficiency
- Fructose-1-Phosphate Aldolase Deficiency
- HGPRT Deficiency

Under Excretion

- 1° Hyperuricemia
 - Idiopathic
- 2° Hyperuricemia
 - inhibition of tubular urate secretion (DKA, lactic acidosis, Maple Syrup Urine Disease, Alcoholic Ketosis)
 - enhanced tubular reabsorption (dehydration, diuretics)
- Unknown Mechanism
 - Hypertension
 - Lead
 - Hyperparathyroid
 - Drugs
 - Cyclosporine
 - ASA
 - Ethambutol
 - Pyrazidamide
 - Ethanol
 - Nicotinic Acid

Combined Overproduction & Underexcretion

- Glucose - 6- Phosphatase Deficiency
- Fructose -1-phosphate aldolase deficiency

INDICATIONS FOR TREATMENT

- Acute Gout
- Tophi
- Uric Acid Stones
- Uric Acid Nephropathy
- Interstitial Nephritis

TREATMENT GOALS

- Stop acute attacks
- Resolve Tophi
- Prevent joint damage
- Decrease uric acid below 6.0

TREATMENT

■ Acute

- colchicine
- Indomethacin
- Other NSAID
- Steroid
- Pain Medication
- ACTH
- Joint Injection
- Anakinra (Kineret)
Interleukin-1 receptor
antagonist

■ Chronic

- Allopurinol
- Febuxostat
- Probenecid
- NSAID
- Colchicine
- Sulfipyrazone
- Pegloticase (Krystexxa)
- Anakinra ? (Kineret)

CALCIUM PYROPHOSPHATE

- Common name Pseudogout
- Occurs exclusively in and around joints
- May be asymptomatic or cause disease

CLINICAL PRESENTATIONS

■ Acute

- similar to gout
- may have fever, leukocytosis, elevated ESR

■ Chronic

- similar to OA
- symmetrical
- mainly in knees, wrists, hips
- isolated patellofemoral disease

CLINICAL PRESENTATIONS

- Polyarticular-may mimic Rheumatoid Arthritis
- Oligoarticular-usually elderly
- Pyrophosphate Arthropathy
 - Early-mimics Osteoarthritis
 - Late-Charcot Joint
- Precocious Osteoarthritis

CHONDROCALCINOSIS

- Rheumatoid 5%
 - 10% RF positive
 - Gout 25%
 - OA 50%
 - Asymptomatic 20%
- Present in
 - 4% of adult population
 - 50% over age 90

EPIDEMIOLOGY

- Hereditary - autosomal dominant
- Post Traumatic
- Sporadic-rare under age 40
- Osteochondrodysplasia
- 2° To Metabolic Disease
 - hemachromatosis
 - hyperparathyroid
 - hypothyroid
 - amyloid
 - hypomagnesemia
 - hypophosphatemia
 - Rickets
 - Familial hypocalcuric hypocalcemia

RADIOGRAPHIC FINDINGS

- Chondrocalcinosis
- Crowned Dens
 - neck pain due to crystal deposits surrounding dens
- Cord compression
- Wrap Around Patella
- Erosive OA



DIAGNOSIS

■ Definite

- crystals in joint

■ Probable

- other calcium crystals in joint

■ Possible

- X-Ray findings
- Typical joint distribution
- History

CALCIUM PYROPHOSPHATE



PATHOLOGY

- Normal serum phosphate
- Normal phosphate excretion
- Elevated levels of inorganic phosphate in synovial fluid
- **NTPPPHase = Cause**
(Nucleoside triphosphate pyrophosphohydrolase)

TREATMENT

- NSAID
- Colchicine
- Steroids
- Physical Therapy
- Surgery
- Joint Injections

APATITE -LIKE CRYSTALS

- Carbonate substituted apatite
- Octacalcium Phosphate (OCP)
- Tricalcium phosphate (TCP)
- Dicalcium phosphate dihydrate (brushite)

APATITE - LIKE DISEASE

- Bursitis
- Tendonitis
- Arthritis
- Renal Failure
- epiphyseal dysplasia
- destructive OA
- Crystals not visible on microscopy
- Alizaren Red-stain red
- von Kossa-stain black
- precise ID requires x-ray diffraction

Contact Information

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