Soft Tissue Calcification and Ossification
Exclude underlying bone disease
Exclude
OSSIFICATION
Ossification

Look for:

• Trabeculation
• Cortico-medullary differentiation
• Fat on T1
Soft Tissue Ossification

- Trauma
- Neoplastic
- Congenital
ST Ossification

Traumatic

- Post Operative
- Within scars
- Myositis Ossificans
- Burns
- Paraplegia
- Head Injury
Ossification
Traumatic

Post operative

• Following joint arthroplasty-heterotopic
  – Rx-Radiation, NSAIDs and Etindronate
Ossification
Traumatic

Myositis Ossificans

• Direct blow
• Adductor longus-Rider’s bone
• Brachialis-Fencer’s bone
• Soleus-Dancer’s bone
Myositis Ossificans

• 4/52 Faint peripheral Cal
  – Central lacy pattern
• 5/12 Maturity
• >6/12 Regression
  – Separate from bone
• 1 year Usually disappears
  – Periosteal reaction remains
Post Traumatic Myositis Ossificans

Centrifugal Ossification

Neoplastic Soft Tissue Ossification

Centripetal Ossification
Ossification
Traumatic

Tendons and Ligaments

- Calcification common, Ossification rare

- MCL knee - Pellegrini-Stieda
- Coracoclavicular
- Achilles tendon
- Supraspinatus
- Stylohyoid ligament XS - Eagle syn.
Ossification
Traumatic

Burns

• Commonly elbow
• Occurs distal to burn
Ossification
Traumatic
Paraplegia

- Approx. 40%
- Usually in paralyzed parts
- Muscles, tendons and ligaments
- Large joints
- Often causes ankylosis
Ossification

Neoplastic

- Parosteal osteosarcoma
- Liposarcoma
- Florid reactive periostitis
- Pseudomalignant osseous tumour of soft tissues
- Cortical desmoid
- Extra skeletal osteosarcoma
- Juxta cortical chondroma
Ossification

Congenital

• Fibrodysplasia ossificans progressiva
  – (Myositis OP)
  – (Fibrositis OP)

• Melorheostosis

• Osteoma cutis
CALCIFICATION
Calcification

- By cause
- By shape / morphology
- By site
- By distribution
- By age
- By Aunt Mini
Soft Tissue Calcification

By Cause

- **Metastatic**
  - Disturbance in Calcium or Phosphate

- **Generalized Calcinosis**
  - Normal Calcium or Phosphate

- **Dystrophic**
  - Damaged or devitalized tissue
Soft Tissue Calcification

By Cause

**Metastatic Calcification**
- Hyperparathyroidism
- Hypoparathyroidism
- Renal Osteodystrophy
- Hypervitaminosis D
- Milk Alkali
- Sarcoidosis
- Massive bone destruction
  - Mets., Myeloma, Leukaemia
Soft Tissue Calcification

By Cause

Generalized Calcinosis

- Collagen disorders
- Idiopathic tumoral calcinosis
- Idiopathic calcinosis (interstitialis) universalis
Soft Tissue Calcification

By Cause

Generalized Calcinosis

Collagen Disorders

- Systemic Lupus Erythematosus
- Dermatomyositis
- Scleroderma
- Raynauds
- CREST
- Ehlers Danlos
Soft Tissue Calcification

By Cause

Generalized Calcinosis

Collagen Disorders

• Great variety of appearances
• Overlap in diseases and patterns MCTD
• May be local or generalized
• Linear, lacy, tumoral
• Deep or superficial
Soft Tissue Calcification
By Cause

Generalized Calcinosiss

Idiopathic Tumoral Calcinosis

- 10-30Yrs, black
- Elevated phosphate
- Single or multiple firm tumour like painless
- Hips, Shoulders, Elbows, Ankles
- Dense, Flocculent, Amorphous,
- 1-20cm, fluid levels
- Dx of exclusion
Soft Tissue Calcification
By Cause

Generalized Calcinosis

**Idiopathic Calcinosis Universalis**

- Infants and children, rare
- Initially subcutaneous fat of extremities
- Longitudinal bands
- **DDx**
  - Hyperparathyroidism
  - Dermatomyositis
  - Fat necrosis
  - Extravasation of Ca gluconate
Soft Tissue Calcification

By Cause

Dystrophic Calcification

- Neoplastic
- Trauma
- Inflammatory
Soft Tissue Calcification

By Cause

Dystrophic Calcification

Neoplastic

- Synovial sarcoma
- Liposarcoma
- Any less commonly
Calcification

By Shape

Morphologic descriptive terms

• Calcinosis universalis
  – Widespread
• Calcinosis circumscripta
  – Localized
• Tumoral calcinosis
  – Mass like

• Add idiopathic prefix for a single disease entity
Calcification

By Shape

Morphology

• Linear and Curvilinear
• Conglomerate (Tumoral)
• Sheets
Calcification

By Shape

**Linear and Curvilinear**

- **Arterial**
  - Atheroma, Aneurysm, Diabetes, HPT, Progeria, Werner’s

- **Nerve**
  - Leprosy, Neurofibromatosis

- **Tendon and Ligament**
  - Tendinitis, AS, Ochronosis, Fluorosis, Diabetes

- **Injection**
  - Bismuth, Arsenic, Quinidine

- **Parasite**
  - Cysticercosis, Guinea worm, Loa Loa, Armillifer armillatus
Calcification

By Shape

Tumoral calcinosis

DDX

• Idiopathic
• Renal osteodystrophy
• Gout
• Hypervitaminosis D
• Hyperparathyroidism
• Collagen vascular Disease
Calcification
By shape

Sheets of Calcification

- Dermatomyositis
- Fibrodysplasia ossificans progressiva
- Venous stasis
Calcification
By shape

Some characteristic shapes

• Circle or oval, lucent centre
  – Phlebolith, Spherule, Cysterci

• Reticulated
  – Dermatomyositis
Calcification

By site

• Generalized

• Localized
  – Periarticular
  – Tendons and bursa
  – Finger tips
  – Articular cartilage
  – Disc
  – Pinna
Calcification

By site

Periarticular

- Hyperparathyroidism
- Renal osteodystrophy
- Milk alkali syndrome
- Hypervitaminosis D
- Collagen vascular disease

- Exclude intraarticular
Calcification

By site

Tendons and Bursa

• Calcium hydroxyapatite deposition disease
• Calcium pyrophosphate dihydrate deposition disease
Calcification

By site

<table>
<thead>
<tr>
<th>Tendons and Bursa</th>
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<table>
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<tr>
<th>CPPD</th>
<th>MCP/CDD</th>
<th>HADD</th>
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<td>Ass. arthritis</td>
<td>Rotator cuff</td>
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</table>
Calcification

By site

Finger Tips

• Scleroderma
• CREST
• Dermatomyositis
• Trauma
Calcification

By site

Articular cartilage

• Osteoarthrosis
• CPPD
• HADD
• Hyperparathyroidism
• Haemochromatosis
Calcification
By site

Pinna

• Thermal
• Endocrine
• Perichondritis
• CPPD
• Gout
• Dermatomyositis
• Alkaptonuria
Calcification

By site

Intervertebral disc

• Trauma
• CPPD
• Hyperparathyroidism
• Immobilization
• Alkaptonuria
Calcification
By site

Intervertebral Disc Calcification

- Nucleus pulposus
- Annulus fibrosis
  - Inner
  - Outer
Calcification

By site

Intervertebral Disc Calcification

**Nucleus Pulposus**

- Degenerative spondylosis (Dorsal)
- Ankylosing spondylitis
- Juvenile chronic arthritis
- DISH
- Gout
- Idiopathic
  - Children - transient
  - Adults - persistent
Calcification

By site

Intervertebral Disc Calcification

**Annulus Fibrosis**

- **Inner fibres**
  - Alkaptonuria (Ochronosis)

- **Outer fibres**
  - CPPD
  - Haemochromatosis
  - Following spinal fusion
Calcification
By site

Distribution of Collagen
Vascular disease

• Proximal
  – Dermatomyositis

• Distal
  – Ehlers Danlos
  – Scleroderma

• Lower limb
  – SLE
Calcification

By age

- Idiopathic calcinosis universalis
- Dermatomyositis
- Hyperparathyroidism
- Osteoma cutis
- Albright’s hereditary osteodystrophy
By Aunt Minnie