Rheumatic Manifestations of Diabetes
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A Growing Epidemic

Rheumatic Manifestations of Endocrine diseases: Overview

- Endocrine disorders can commonly cause musculo-skeletal symptoms
- Sometimes these symptoms may present before endocrine disorder becomes clinically apparent
- Symptoms can sometimes mimic actual autoimmune rheumatic diseases
- Recognition of these symptoms helps avoid diagnostic error and make timely diagnosis of underlying endocrine disorder
Soft Tissue complications of Diabetes

• Limited Joint Mobility Syndrome (Cheiropathy – shown)
• DISH (type II DM)
• Adhesive Capsulitis
• Neuropathic (Charcot) Arthropathy – DJD X 10, including unusual DJD in joints like ankle
• Flexor tenosynovitis, tendon nodules (trigger finger), and dupuytren’s stenosing tenosynovitis
• Carpal Tunnel Syndrome
• Diabetic muscle infarction
• Osteoporosis (type I DM, weaker association)

Diabetes: Proposed Effects of hyperglycemia on the musculo-skeletal system

• Stimulation of fibrous tissue proliferation
• Small vessel vasculopathy and tissue ischemia
• Neuropathy: Direct toxic effect

(Really a bunch of hand waving!)

Vignette #1

• 45 Year old male with progressive skin tightening of his hands, no history of GERD or Raynaud’s phenomenon, and negative ANA.
Vignette #1

- The most likely positive test result in this patient would be:

  A. Rheumatoid Factor (rheumatoid arthritis)
  B. Anti Scl-70 (scleroderma antibody)
  C. Anti-Centomere Antibody (CREST)
  D. Elevated HgA1C

Limited Joint Mobility Syndrome: Diabetic Cheiropathy

- Incidence correlates
  - Disease duration (usually >10 yrs)
  - Suboptimal glycemic control
- Most commonly involves the hands
  - Can also involve shoulders, knees, and feet
- Etiology: Palmar fasciitis leads to progressive thickening and tightening of skin
- Excellent mimic of scleroderma and sclerodactyly
- Can become quite disabling
- Glycemic control and physical/occupational therapy may slow progression

Progressively thickened, waxy, and shiny skin
Prayer Sign

- The patient places his or her hands together as if in prayer
- Patients with limited mobility syndrome are unable to make complete contact between the palmar surfaces of their fingers

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Vignette #2

75 year old male presents with 2 years of increasing dysphagia, neck, and back pain. His past medical history is significant for type II DM. MRI of his neck reveals the following:
Vignette #2

Which of the following statements about this patient's condition is LEAST correct?

A. He likely has involvement of the thoracic spine as well
B. Type II diabetes is associated with this condition
C. Patients are predisposed to developing esophageal cancer
D. It is more commonly reported in males

DISH: Diffuse idiopathic skeletal hyperostosis

• Excess calcification along spinal ligaments and bone formation at insertion sites of tendons and ligaments

• Higher prevalence in pts with DMII (up to 25%) but can be seen on its own

• Most commonly affects mid-thoracic spine:
  - Flowing ligamentous calcifications of at least 4 contiguous vertebrae
  - Minimal loss of disc space
  - Absence of sacroiliitis
DISH

- Usually asymptomatic (curious predilection for right side of spine)
- Osteophytes can rarely cause impingement
  - Dysphagia
  - Back pain
- In rare instances, surgical removal necessary
- Important to recognize that this is not ankylosing spondylitis

Can you tell the difference?

DISH (type II DM)
Adhesive Capsulitis
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Vignette #3

- 52 year old Hispanic female with a history of type II diabetes and HTN complains of progressively increasing pain in her previously normal left shoulder after falling.
- Physical examination demonstrates pain and near total loss of motion with abduction/adduction/external and internal rotation of her L. shoulder. The R. is normal.
- Plain films are shown to the right
- MRI reveals no tearing of the rotator cuff

Vignette #3

Which of the following is NOT true of this patient’s most likely diagnosis?

A. Prompt surgical intervention is indicated for most patients in order to prevent permanent loss of range of motion in the shoulder
B. Commonly associated with diabetes
C. Usually a self-limited disorder that resolves or significantly improves over 1-2 years
D. Most patients respond to supervised physical therapy program and stretching exercises
E. Post-traumatic fractures of the humeral head are NOT responsible for this patient’s condition
Adhesive capsulitis: frozen shoulder

- May affect up to 12% of patients with types I and II diabetes cumulatively
- Usually benign, self limited
- Thought due to thickening and shrinkage of the shoulder joint capsule (not stress fractures or other pathology)
- Clinical diagnosis: plain films and MRI to rule out other internal derangements

Adhesive capsulitis: frozen shoulder

- May/may not co-exist with rotator cuff pathology
- May/may not be preceded by minor trauma of which patient is unaware
- Pain and limited range of motion are common and can rapidly progress
- Most patients respond to physical therapy as first line: Other invasive procedures only for refractory cases

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Vignette #4

• 51 year old male with type II diabetes presents complaining of painless swelling in his right ankle and foot

• Exam shown to right: Afebrile with diffuse swelling, mild tenderness, and mild erythema over dorsum of foot extending to ankle

Vignette #4

• Xray shown to right reveals extreme bony destruction, fracture, and osteolysis worrisome for osteomyelitis

Vignette #4

• Which of the following is the most likely, most proximal inciting event?

A. Infection
B. Severe trauma to foot
C. Neuropathy
D. Inflammation and synovitis
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Charcot Arthropathy

- Diabetes is the leading cause of neuropathic arthropathy
- Often painless
- Progressive sensory neuropathy (sometimes subclinical)
- Preferentially affects axons of greatest length (stocking-glove)
- Impairment of normal joint protection
- Microtraumas
- Microfractures
- Exuberant "healing" osteolysis and hyperostosis

Neuropathic (Charcot) Arthropathy

Key signs:
- DJD X10 (degenerative joint disease)
- OA in a privileged joint (ankle)
- Involvement of the metatarsal, tarsal, and talar joints most common
- Can involve knees, shoulders, etc...

Treatment: limiting weight bearing and orthotic protective devices
- Total contact casting 3-6 months until stable
- Orthotic ambulation devices
- Possible surgical fixation and stabilization if medical therapy fails
Non-Surgical Treatment Options

Vignette #4: Comments

- This is a teaching (not a board-style) question – it's a good thing to think about infection!
- The bony destruction, disorganization, and osteolysis can be so severe as to raise concern for infection – especially in presence of diabetic ulcer
- Frequently, MRI and sterile bone biopsy attempted to try to rule out infection, but this can still be difficult to distinguish

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Vignette #5

64 year old male with type II diabetes presents with worsening contractures of his left 4th and 5th fingers. Examination reveals MCP contractures of 20 degrees and PIP contractures of 10 degrees in those digits. Your next best approach is to do which one of the following?

A. Recommend conservative treatment with physical therapy and range of motion exercises
B. Recommend surgical consultation
C. Recommend therapeutic corticosteroid injection
D. Recommend nothing

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Flexor Tendon Nodules and Dupuytren’s Contractures

- Flexor tenosynovitis reported to affect between 12-15% of all Diabetic patients
- Also seen in alcoholic, HIV, epilepsy, previous trauma, “normals”
- Early in course, presents with isolated nodule(s) on flexor tendons of hand
- Symptoms develop from nodule impeding tendon motion through (A1) pulley
- Local glucocorticoid injections into tendon sheath are of benefit

Flexor Tendon Nodules and Dupuytren’s Contractures

- Chronic tenosynovitis of flexor tendons can progress to flexor contractures
- 4th, 5th digits most commonly involved
- Local GC injection of little benefit
- The condition is multifocal
  - Removing one lesion does not prevent others
  - Recurrence may occur after surgery
- Surgery is indicated with MCP joint contracture of 30° or more. Even long-standing and severe contractures of the MCP joint usually are corrected readily at surgery and may or may not recur.
- PIP joint contractures do not have the same prognosis (high recurrence rate as well.) Proceed with surgery as soon as PIP joint contractures are observed.

Vignette #6

- 42 year old male previously diagnosed with type II diabetes presents with increasingly bothersome tingling in his bilateral hands that has now progressed to wake him up at night. His medical history is also notable for chronic back pain.
Vignette #6

On exam, his hand is shown to the right. Tinel’s test reveals reproducible tingling in the first three fingers.

Vignette #6: Radiographs

Vignette #6

Which of the following is the next step in managing this patient’s symptoms?

A. Surgical decompression of carpal tunnel
B. Carpal Tunnel Splinting
C. Order an MRI for the patient
D. Corticosteroid injection carpal tunnel
E. Order nerve conduction studies
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Vignette #6: Apology for sneakily-worded answer
• This is supposed to be a talk on diabetes
• This patient actually has acromegaly and secondarily associated hyperglycemia
• Diabetes & acromegaly, EACH, can predispose to carpal tunnel syndrome – so this patient was at extra risk!
• MRI request for patient should be of the pituitary, not the hand! (sneakily-worded answer)
• Treat the source
Diabetes and Carpal Tunnel Syndrome (CTS)

• Both DM and CTS are prevalent in western society but seem to co-exist more than would be expected by chance, alone

• Up to 20% of DM patients develop CTS
  – Up to 75% of those with limited joint mobility

• Some studies suggest it can precede formal diagnosis of DM by up to 10 years\(^1\)


CTS: Clinical Features

• Numbness or paresthesias in a distribution consistent with that innervated by the median nerve

• Symptoms are often exacerbated at night and may awaken a patient from sleep. Symptoms can progress from an irritating sensory neuropathy to weakness and wasting of the intrinsic hand muscles

• Provocation of paresthesias in a median nerve distribution by either a Phalen maneuver or Tinel sign can help confirm the diagnosis.

• Nerve conduction studies localize the site of the nerve compression to the wrist and differentiate carpal tunnel syndrome from other types of neuropathy.

CTS: Treatment

• Start with conservative measures
  – Wrist splinting, particularly at night
  – Refraining from exacerbating activities
  – Local corticosteroid injection into the carpal tunnel if symptoms persist or motor signs develop. Sometimes repeat injections needed
  – Surgical decompression when injections fail
**Vignette #7**

42 year old long-standing, poorly controlled diabetic presents complaining of the abrupt onset of lateral thigh pain. On exam, a palpable tender mass is noted over the lateral thigh. Temperature and CBC are WNL. CK levels are mildly elevated at 250, blood cultures are negative. The symptoms are self-limiting and gradually subside over several weeks with conservative therapy.

**Vignette #4**

MRI is shown to right:

The most likely etiology for this patient's symptoms involves which of the following?

- A. Deep venous thrombosis
- B. Arteriolar infarction
- C. Necrotizing fasciitis
- D. Autoimmune inflammatory myositis

T1 weighted MRI with Fat Suppression of Adductor Magnus
Diabetic Muscle Infarction

• Abrupt onset of pain in affected muscle
• Frequently with localized swelling
• Most commonly affects thigh, less involvement of the calf, almost exclusively lower extremity
• Clinical history and localized MRI findings (occasionally bx) help make diagnosis (vs. myopathy/myositis)
• Managed conservatively with rest, analgesics, and tighter metabolic control of diabetes (?anticoagulation)

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