

## DIABETIC FOOT

### Facts

- 5% of the population is diabetic
- 12% of diabetic admissions are with foot problems
- 1/3rd of diabetic foot ulcerations are neuropathic, 1/3rd are ischaemic and 1/3 are of a mixed in nature
- 10-30% peripheral neuropathy
- 20% bilateral affection
- 2.5% Neuroarthopathic changes [Charcot's joint]

### Aetiology

1. Vascular changes: Macroangiopathy occurs mainly distally ie Popliteal artery  
There is arterial wall calcification  
Microangiopathy is less common
  2. Neurology: Sensory system: Glove and stocking. sensory loss  
Autonomic system: Reduce sweat, can cause fissure  
Motor system: Clawing from intrinsic paralysis of the foot
- Tissues                      Collagen is glycosylated  
Cross linked collagen are stiffer than normal

### Assessment

- Diabetic control              Diabetes control: HbA1c <10
- Vascular status              Doppler Ankle/brachial index: Normal = 1  
Should be at least: 0.45 for Below knee amputation
- Angiography: macrovascular
- TCPO<sub>2</sub> [Transcutaneous Partial O<sub>2</sub>] Normal: 60-90  
   wound healing less likely <30
- Neurological status        Semmes-Weinstein 5.07/W monofilament:  
Biothesiometer; Measures vibration perception threshold.  
Nerve conduction studies

### Classification of ulcer [Wagner's Classification]

0	Impending ulcer	Proper footwear
I	Superficial ulcer [Skin]	Local treatment and foot wear
II	Exposes tendon and muscle	Ulcer involving epidermis and dermis Debride, Total contact cast [90% success]
III	Periosteal reaction	Debridement and Antibiotics
IV	Local gangrene of forefoot	Amputation and antibiotics
V	Gangrene of entire foot	Regional amputation, antibiotics*

Antibiotics\*: Antibiotic: Clindamycin [Gram +ve and anaerobes and Or Ciproflox [Gram -ve] or Augmentin

### Ulcer assessment

Active or inactive (Cellulitis present or not)

Classify neuropathic or vascular

Probe the ulcer: if probe is up to the bone , it strongly suspect osteomyelitis

### Ulcer

	Neuropathic	Vascular
<b>Site</b>	Under the ball of the foot	Can occur anywhere
<b>Callosity</b>	Thick keratosis	No hyperkeratosis
<b>Ulcer base</b>	Bleeds	Unhealthy base, No bleed
<b>Pain</b>	Painless	Painful
<b>Foot</b>	Warm foot	Cold feet
<b>Pulses</b>	present	Pulses absent

## Assessment for diabetic ulcers

Blood: WCC, ESR, CRP

Swab is not helpful

Plain X ray for chronic osteomyelitis

Bone scan: Technetium and indium labelled white cell scans

MRI Extremely sensitive.

Bone and soft tissue edema in T1.

But difficulty to distinguish from infection from inflammation

## CHARCOT'S ARTHROPATHY

### Facts

Described by: Jean Martin Charcot, a French surgeon in 1868

Occurs in 0.4% of diabetics; mainly Insulin dependent diabetes

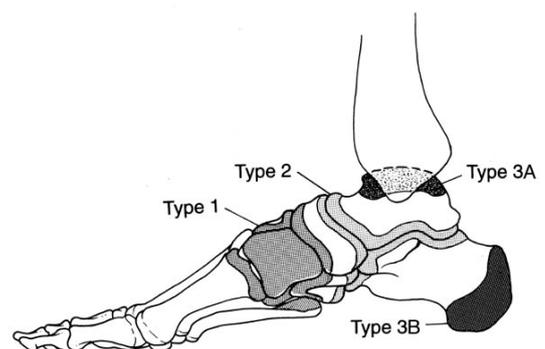
In 80%, it is unilateral

### Aetiology

1. Diabetes
2. Renal dialysis
3. Syphilis [Tabes Dorsalis]
4. Leprosy: Foot
5. Congenital insensitivity to pain: Ankle
6. Myelomeningocele: Foot
7. Alcohol abuse
8. Syringomyelia: Shoulder

### Types

- |                 |                                    |
|-----------------|------------------------------------|
| I .Midfoot      | TMT<br>Naviculocuneiform joints    |
| II. Hindfoot    | Subtalar and Midtarsal [Ca-cu, T1] |
| IIIa. Ankle     | Tibiotalar joint                   |
| IIIb. Os calcis | Pathologic # of the calcaneal tube |



**Type I** Common 60%

Bony prominence

Rocker bottom feet, valgus midfoot

More hypertrophy and less erosion

The ulcers are difficult to treat



**Type II** 30%

"Bag of bones"

Less ulceration

Persisting deformity difficult to fit shoes

Midtarsal and subtalar joint



**III a** Ankle joint

Both instability and prominence

Long immobilisation is required

Persisting deformity with ulceration

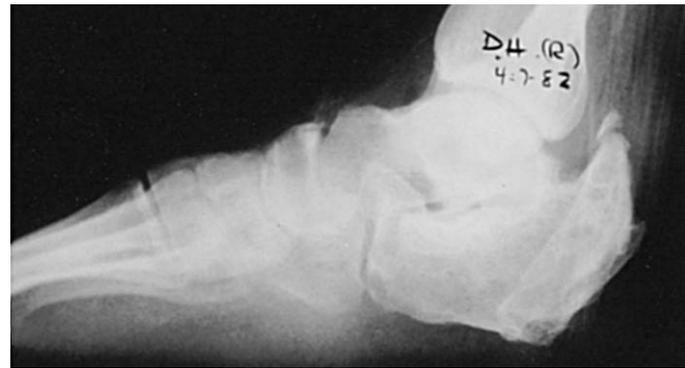


IIIb Calcaneum

Type 3b changes not in joint

It occurs through fracture calcaneum

Short immobilisation and modified footwear



**Eichenholtz 3 stages**

	<b>I Acute</b>	<b>II Proliferative</b>	<b>III Consolidation</b>
<b>Warm; Swollen; Red</b>	+;+;+	Less	Much less
<b>Scan</b>	+++	++	+
<b>X ray</b>	Destructive	Rounding off; Collapse of arch New bone formation	Consolidation
<b>Treatment</b>	Total contact cast	Thermoplastic design	Accommodative footwear Reconstruction surgery

**4 Factors for Charcot's joints**

- Peripheral neuropathy,
- Unrecognized injury
- Continued repetitive stress on injured structures
- Increased local blood flow.

**X ray: 5 D: Joint Distension**

- Dislocation
- Debris
- Disorganisation
- Density: increased



## FLOWCHART FOR THE TREATMENT OF CHARCOT FOOT

