



What Happens When the Bomb has Exploded — Charcot Foot

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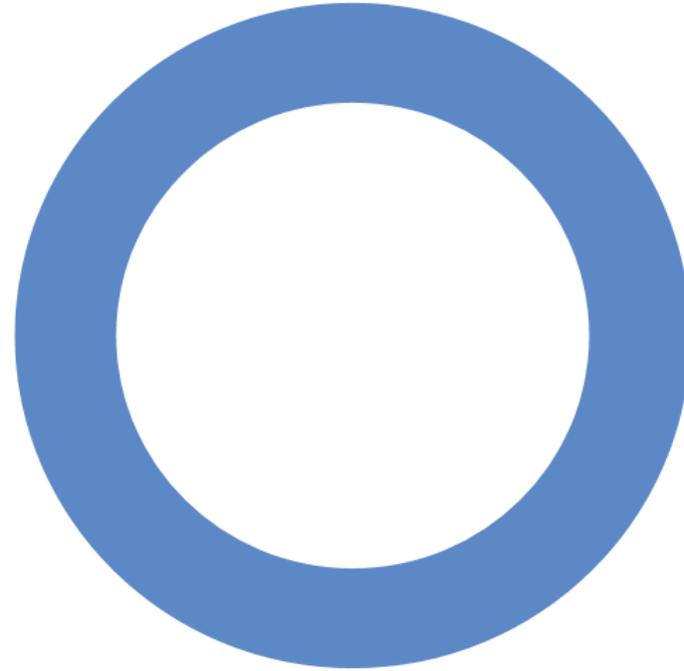
Consultant in Diabetes and Endocrinology
Norfolk and Norwich University Hospitals



Who is This Strange Man?

- I qualified in 1991
- I trained in D&E and GIM in South Thames
- I did general practice for 2 years
- I did ITU / anaesthetics for a year
- I did research at Mayo Clinic
- I have been in Norwich since 2004
- Currently my national roles are
 - Chair of the SCE in D&E
 - Secretary of the endocrine section of the RSM
 - JBDS – IP Group member (inpatient diabetes guidelines)
 - Peri-operative, DKA, Hypo, HHS, enteral feeding, self management, e-learning on safe use of IV insulin, etc, etc, etc

Yesterday



world diabetes day

14 November

Fred Banting – Born 14th November 1861



Search Google or type URL



Jean-Martin Charcot (1825-1893)

- A French neurologist and professor of anatomy
- Remembered as ‘the father of neurology’
- Has a number of conditions named after him
 - Charcot’s disease (ALS)
 - Charcot-Marie-Tooth disease (HSMN)
 - Charcot-Weiss-Baker syndrome
 - Charcot-Wilbrand syndrome
 - Erb-Charcot paralysis (spinal syphilis)
 - etc



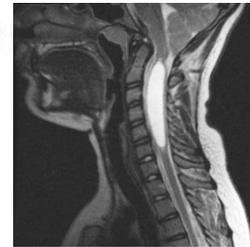
What is a Charcot Joint?

- A relatively painless, progressive & destructive arthropathy in a single or multiple joints due to underlying neuropathy
- It is a devastating complication of diabetes, which was first described in 1868, but it still remains a poorly understood and frequently over-looked condition
- It's reported in 1 in 200 people with diabetes



Causes?

- Diabetes
- Any other cause of peripheral neuropathy
 - Syphilis
 - Leprosy
 - Alcoholism
 - Spinal cord disorders
 - Parkinson's, HIV, RA
 - Drugs



Pedal Neuroarthropathy in a Nondiabetic Patient as a Result of Long-term Amiodarone Use

Ketan Dhatariya, MBBS, MSc, MD, MS, FRCP,¹ Catherine Gooday, BSc,²
Rachel Murchison, Dip Pod,² Benjamin Bullen, SRP,² and Rachael Hutchinson, MBBS, MD,
FRCS³

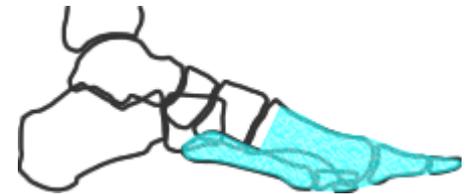
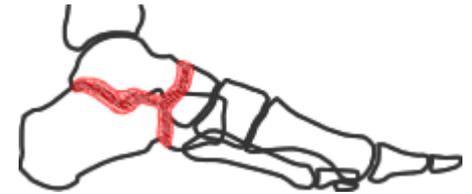
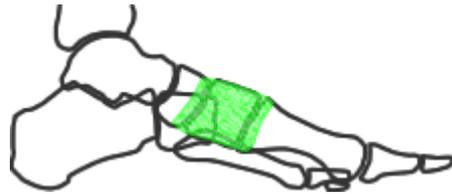
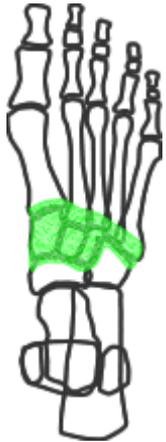
A Cycle of Trauma and Inflammation

Hypothesis

- ① The role of proinflammatory cytokines in the cause of neuropathic osteoarthropathy (acute Charcot foot) in diabetes

William J Jeffcoate, Fran Game, Peter R Cavanagh

Charcot Arthropathy



Diagnosing Charcot

- If you don't think of it you'll never diagnose it

NICE NG19 – Charcot Arthropathy

- If a person with diabetes fractures their foot or ankle, it may progress to Charcot arthropathy
- Suspect acute Charcot in a hot red swollen or deformed foot, especially in the presence of peripheral neuropathy or renal failure
- Think about acute Charcot arthropathy even when deformity is not present or pain is not reported

Diagnosing Charcot

- Red, hot, swollen foot
- Often painless
- Bounding foot pulses
- Often have elevated ABPI indicating calcified arteries
- Distended dorsal veins
- Recent injury – innocuous slip / trip / fall



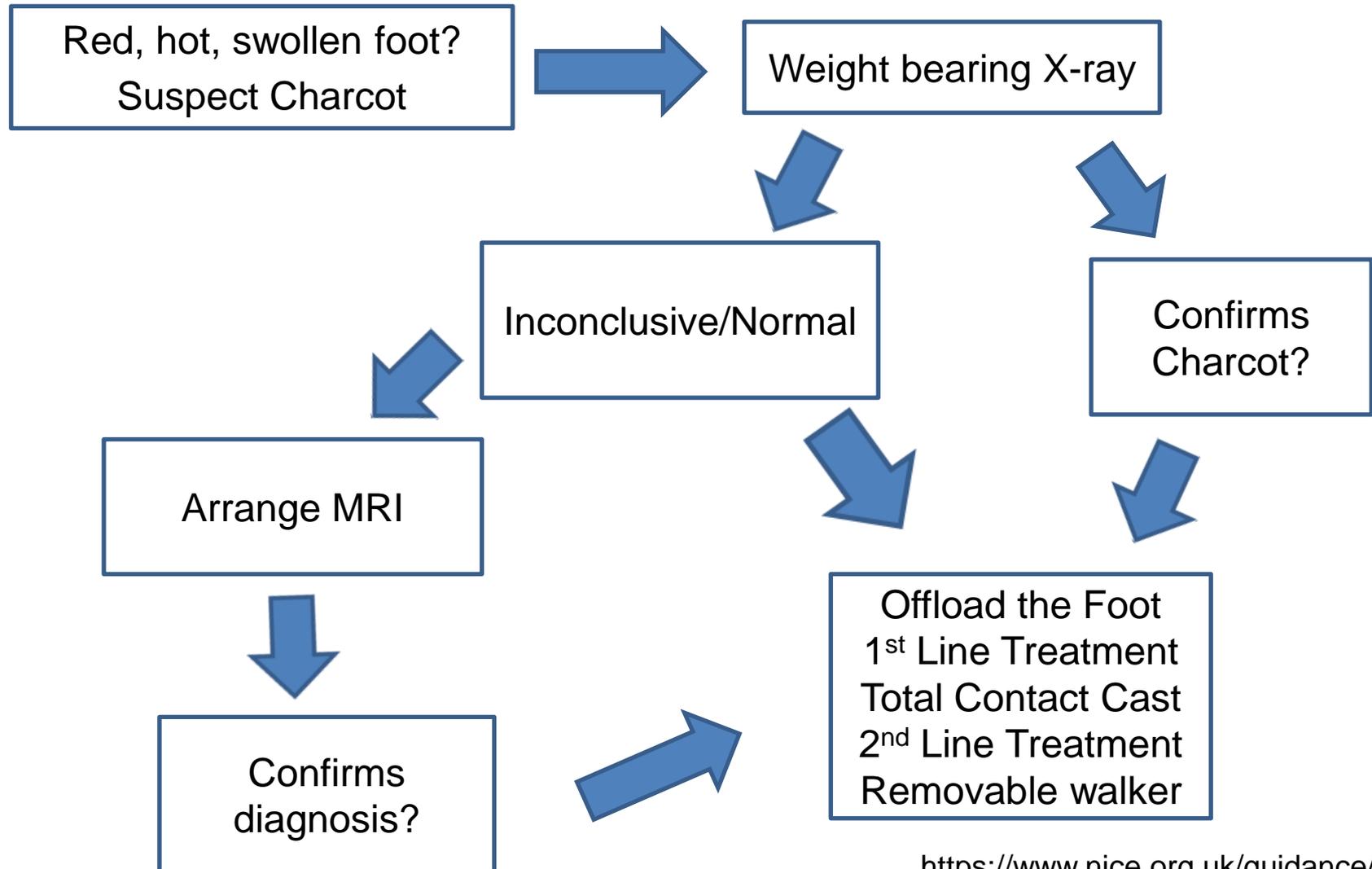
Differential Diagnosis

- Cellulitis
 - Is there a portal of entry?
 - What is the response to antibiotics?
- Soft tissue injury – from innocuous slip / trip / fall
- DVT
- Oedema
 - uni/bi-lateral?
- Gout
- Osteomyelitis
 - but osteomyelitis and Charcot may co-exist

Management

- If you suspect an acute Charcot, refer the person **within 1 working day** to the multidisciplinary foot care service
- They should then see the patient within another working day
- Non-weight-bearing treatment should be offered until definitive treatment can be started by the specialist foot team

NICE NG19 – Charcot Arthropathy



Charcot is a Podiatric Emergency

- ‘Time is bone’
- We’d normally treat the foot until we have the formal results of the imaging
- There is a difference between an ‘acute’ Charcot and a ‘chronic’ Charcot

It's Progressive - Fast



17th July 2015 – A St Bernard sat on his foot 2 weeks previously

1st October 2015



It's Progressive - Slow



26/5/11

Image taken for another reason



8/11/13

Image taken for 'sore foot' by GP



1/5/14

When she came to foot clinic



28/5/15

When it eventually settled down

Deformity Leads to Ulceration



But Casting Can Really Help



Don't Forget the Psychological Impact

- Charcot is associated with high levels of anxiety and depression related to
 - Potential limb / life loss
 - Immobility and social isolation
 - Impact on employment
 - The knowledge that this complication was potentially preventable?

The Acute Charcot

- Early diagnosis and immobilisation is associated with a lower incidence of foot fractures and deformity
- Patients with Charcot and ulceration are 12 times more likely to undergo an amputation compared to those with Charcot alone
- There is an annual amputation rate of 2.7% in people with Charcot related deformity
- In one UK centre Charcot was associated with a reduced life expectancy of 14.4 years compared with the general UK population

Treatment

- Immobilisation
 - TCC – but very few teams use them
 - Removable walking boot
- Good 'diabetes' control
 - Glucose
 - Lipids
 - BP
- Treat any wounds / infections
- (Not bisphosphonates)

Surgery

- Includes
 - Tendo-Achilles lengthening
 - Arthrodesis
 - Debridement
 - Drainage
 - Exostectomy
 - Amputation
- Fairly low quality data until recently – no good quality trails on what to do or when to do it

Resolution

- Clinical
 - Temperature difference $<2^{\circ}\text{C}$ for 3 consecutive visits (each at least 2 weeks apart)
 - No further changes on imaging
- Step down to removable walking boot
 - Initially no / minimal walking
 - Then start at a maximum of 30 minutes of walking per day in the boot for 1 week
 - Increase the total amount of walking per week by 30 minutes per day

Resolution

- Once they are walking for 3 hours per day (!!)
and their temperatures stay normal
- Depending on the architecture of their foot
 - Shop bought footwear
 - Bespoke footwear
- Make sure they are kept under regular review by
the Foot Protection Service



Summary

- Charcot is a rare, but potentially devastating and life changing complication of diabetes
- Presents as a hot, red, swollen foot
- If you don't think of it you'll never diagnose it
- Refer urgently to your local specialist centre for immobilisation



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