

Clinical Guideline for: Diagnosis and Management of Charcot Foot

SUMMARY

This guideline outlines the clinical features of Charcot foot (Charcot Neuroarthropathy). It also explains the process of diagnosis and management of the condition in the diabetic foot clinic, followed by the onward referral to Orthopaedics.

KEY POINTS

- The diagnosis of Charcot foot is not straightforward as it can mimic other pathologies – for example, infection, fracture, gout.
- Where there is suspicion of Charcot, all patients should be referred to the diabetic foot clinic for further investigation and management.
- Orthopaedic Foot & Ankle Team should be aware of all confirmed cases of Charcot foot, and can be contacted for advice on suspected Charcot

Review clinical features and history and consider differential diagnosis

Refer to Diabetes Foot Care Team

Investigations

Immediate Management

Medium Term Management

Long term Management

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1. INTRODUCTION

- 1.1 Charcot foot (hereafter “Charcot”) is an acute inflammatory condition of the foot. Untreated it leads to dislocations and/or fractures and disorganisation of foot architecture. The condition is associated with osteopenia. (SIGN 2001). It is commonly misdiagnosed as a sprain or as cellulitis.

2. BACKGROUND

- 2.1 The cause is not known but most cases are preceded by some minor injury. It has been suggested that inflammation is the pivotal trigger (Jeffcoate 2005). Differentiation from osteomyelitis may be impossible in people in whom the overlying skin is ulcerated. Acute Charcot and osteomyelitis may coexist but is very rare. (Frykberg et al 2000; Jeffcoate et al 2000).
- 2.2 Charcot most commonly occurs in people with diabetic neuropathy, but can occur in any severe peripheral neuropathy
- 2.3 Suspect acute Charcot if there is unexplained redness, warmth, swelling or deformity (in particular, when the skin is intact), especially in the presence of peripheral neuropathy and renal failure. Think about Charcot even when deformity is not present or pain is not reported (NICE CG19). Ensure ischaemia and infection are ruled out.
- 2.4 Any person with suspected Charcot should be referred for urgent assessment by a specialised foot care team. Suspected and confirmed cases should be managed by offloading of the affected foot. Offloading consists of immobilisation of the foot in total contact cast, or similar, and weight bearing restrictions, in order to minimise the extent of bone damage.

3. MAIN BODY OF GUIDELINE

3.1 Clinical features and history

- Red, oedematous, warm foot with or without pain.
- Recent change in shape of foot, particularly a flattening of the arch
- History of trauma to limb may be present, but not essential
- Neuropathy should be present
- Exclude critical limb ischaemia and infection

3.2 Differential diagnosis

Infection, ischaemia, gout, soft tissue injury, fracture, DVT or any other cause of foot inflammation e.g. arthritis.

3.3 Referral to Diabetes Foot Care Team

- All patients with suspected Charcot should be advised to stop walking (as much as is practicable) and keep the foot elevated and rested.

- Patients with suspected Charcot must be immediately referred, by email or phone, to the Macleod Diabetes and Endocrine Centre (RD+E Wonford)

3.4 Investigations: to include

- Neurological and vascular assessment.
- Confirm or exclude infection, if possible.
- Note any skin changes or changes in foot shape.
- Assess and record temperature difference between feet (significant if affected limb is greater than 2 degrees warmer than contralateral foot).
- Blood tests – HbA1c, CRP.
- Arrange for 3-directional weight-bearing **weight bearing** X-rays of affected foot (AP, lateral and oblique) and/or 2-directional weight-bearing X-rays of ankle (AP and lateral). Initial X-ray may be normal but can be used as a baseline and to exclude neuropathic fracture.
- Repeat X-ray in 2 weeks if initially normal but still clinical suspicion of Charcot (continue limiting weight bearing)
- If X-ray remains inconclusive, consider MRI

3.5 Immediate management

3.5.1 Immobilisation of foot is urgently required. Non-removable below-knee total contact cast (TCC) is the method of choice. TCC should be applied as soon as possible, but within 5 days. Supply Aircast (or equivalent) boot until TCC is applied. For some patients, TCC is not appropriate, and Aircast boot or removable TCC should be considered. Casting should continue until all signs of inflammation regress – which may not be for many months (SIGN 2001).

If patient refuses offloading devices, advise and document future risk of future deformity, ulceration and amputation

3.5.2 Advise patient to minimize weight bearing (use mobility aids if needed)

3.5.3 Educate on causes and management of Charcot and prevention of complications

3.5.4 Optimize glucose control

3.5.5 For confirmed Charcot or if advice required for suspected Charcot, contact orthopaedics (Mr Czipri or any foot and ankle consultant)

3.5.6 Consider admitting under the medical ward, in rare situations

For example

- Unstable foot with clear neuropathic fractures, where any weight-bearing poses a risk
- In patients where immobilisation is difficult and requires urgent input from physio and OTs to enable suitable offloading at home

3.6 Medium-term management

- 3.6.1 The activity of the disease may be monitored by comparing skin temperature with the non-affected side.
- 3.6.2 Regular change of TCC in plaster clinic, approximately weekly.
- 3.6.3 Refer to orthotics to secure appointment 4-5 months after treatment started.
- 3.6.4 Regular clinical examination and imaging to monitor progress at diabetic orthopaedic foot and ankle clinic (clinic code NZTMC)
- 3.6.5 Consider Achilles tendon lengthening or reconstructive surgery based on clinical picture.
- 3.6.6 After acute phase, consider use of Aircast boot or removable below knee cast.
- 3.6.7 Begin staged return to weight bearing, in cast, when active inflammation settled and imaging indicates condition has reached non-destructive phase.
- 3.6.8 If foot remains stable and whilst still using cast, follow with staged introduction of appropriate orthotic device (e.g. boots and foot orthoses).

3.7 Long-term management (settled Charcot foot)

- 3.7.1 Regular review by orthotist to provide optimum footwear and orthotic therapy as appropriate.
- 3.7.2 Classify patient as high diabetic foot status and ensure regular review in community podiatry for signs of long term complications (NICE 2004)
- 3.7.3 Orthopaedics to consider ostectomy if plantar prominence present

4. ASSOCIATED CLINICAL GUIDELINES OR POLICIES/PROCEDURES

Fryberg RG and Mendeleeson E (2000).Management of the Diabetic Charcot foot. Diabetes Metab Res Rev, 16, S59-65.

Jeffcoate W.J, Lima J., Nobrega L. (2000).The Charcot foot. Diab Med; 17: 253-8

Jeffcoate WJ (2005). The role of pro-inflammatory cytokines in the cause of neuropathic osteoarthopathy (acute Charcot foot) in diabetes. The Lancet

National Institute of Clinical Excellence(NICE) (2004).Type 2 Diabetes: prevention and management of foot problems.

Scottish Intercollegiate Guideline Network (SIGN) (2001) Guideline 55 section 7: Management of diabetes foot disease

APPENDIX 1: Diabetic Foot Clinic – Charcot Diagnosis Pathway (quick guide)

ASSESSMENT
IN
DIABETIC
FOOT CLINIC

- **Weightbearing x-rays - AP, lateral and oblique**
- >>> CHARCOT diagnosed
- >>> CHARCOT suspected

DIAGNOSED
CHARCOT

- Maximise non-weightbearing
- Immediate immobilisation in Total Contact Cast (TCC) via plaster room or Diabetic Aircast boot
- Arrange TCC and regular input from Plaster Team
- Inform foot and ankle orthopaedic team (MC) to confirm diagnosis
- Hospital admission in rare cases (examples given in policy)
- Arrange follow-up at next Orthopaedic Diabetic Foot and Ankle clinic (clinc code NZTMC) or Diabetic Foot Offloading Clinic (MDEC)
- Further X-rays by orthopaedic team

SUSPECTED
CHARCOT

- Immediate immobilisation in Diabetic Aircast boot
- Partial weightbearing
- Inform foot and ankle orthopaedic team (MC) to discuss diagnosis
- Repeat weight bearing x-rays within 4 weeks
- MRI scan if diagnosis remains uncertain, or if further delay is to be avoided
- Arrange orthopaedic clinical review within 4 weeks either at Diabetic Offloading Clinic (MDEC) or at Orthopaedic Diabetic Foot and Ankle Clinic (NZTMC)

USEFUL
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