



Story of an Eaten Foot

Authors

Dr Vani Raj I¹, Dr Suresh Raghavan²

¹Junior Resident, ²Professor

Department of General Medicine, Govt. T.D Medical College, Alappuzha, Kerala, India

Corresponding Author

Dr Vani Raj I

Junior resident, Department of General Medicine, Govt. T.D Medical College, Alappuzha, Kerala, India

Introduction

Charcot neuropathic osteoarthropathy (CN) is a progressive disease affecting the bones, joints and soft tissue of the foot and ankle, most commonly associated with diabetic peripheral neuropathy. Delay in the diagnosis of CN can lead to disruption of the bony architecture of the foot, deformity, recurrent foot ulceration, cellulitis, osteomyelitis (OM) and, ultimately, amputation.

1 Furthermore, patients with diabetes complicated by Charcot foot have especially high morbidity, frequency of hospitalisation and therefore, significant utilisation of expensive medical resources.

2 Mortality has also been reported to be higher in patients presenting with acute Charcot neuropathic Osteoarthropathy than diabetes alone.

3 the prevalence in this risk group is very high, up to 35%. Patients with Charcot foot typically present in their fifties or sixties and most of them have had diabetes mellitus for at least 10 years.

A Case of Charcot Foot - Case summary

A 60year old male, known case of Type II Diabetes Mellitus, Newly detected CKD-DN, Diabetic foot presented with complaints of a small non healing ulcer over left foot with Bilateral extensive Pedal edema more on Left foot associated with deformity and abdominal distension along with decreased urine output. Physical examination revealed oedematous, hyperaemic leg and foot, with absent arch(mid-foot collapse), hyperpigmentation, and calluses at pressure points along with non-healing ulcer of 2x 3cm over plantar aspect of left foot.

Diagnosis and management

CBC-> Hb-7.2g %, TC- 9360cells/mm³, DLC-N-80% L-M-ESR-48

LFT-T.Bili-1.1 SGOT- SGPT-, TP-ALB-ALP-.SE-S. Na⁺-137mmol/L, S.K⁺-5.8mmol/L

• RFT S.urea-22mg/dl, 5.creat -6.5mg/dl .

Radiological Investigations USG Abdomen B/L Hyperechoic kidney with

Maintained CMD • X-ray -The radiographic changes are destruction of articular surfaces, opaque subchondral bones, joint debris, deformity (Rocker bottom)

MRI (L) Foot showing marrow oedema in the talus, and the navicular and cuneiform bones plus adjacent soft tissue oedema (bright I appearance)

Treated with IV Antibiotics,

- Hemodialysis in view of CKD and hyperkalemia,
- Blood transfusion, Inj erythropoietin, Diuretics,
- GM dressing.
- Antacids, antihyperkalemic measures,
 - Laxatives and
 - Other supportive measures

Conclusion

• Charcot foot is a rare and disabling disorder. It is a result of nerve damage in the feet (peripheral neuropathy).

Diabetes is the most common cause of this type of nerve damage

• When elevated sugar levels are present for a long time, both nerve and blood vessel damage occurs in the feet.

Nerve damage makes it harder to notice the amount of pressure on the foot or if it is being stressed.

The result is ongoing small injuries to the bones and ligaments that support the foot. You may

develop bone stress fractures in your feet, yet never know it.

• Continuing to walk on the fractured bone often leads to further bone and joint damage. Other factors leading to foot damage include:

Blood vessel damage from diabetes can increase or change blood flow to the feet. This can lead to bone loss. Weakened bones in the feet increase the risk of fracture. Injury to the foot signals the body to produce more inflammatory reactants. This contributes to swelling and bone loss. So, timely management of Diabetes mellitus and prevention of local trauma by lifestyle modifications like strict wearing of footwear etc can help in avoiding complications like charcot foot.



Rocker bottom deformity



Rocker bottom deformity



MRI Charcot Foot

References

1. Armstrong DG; Todd WF; Lavery LA; Harkless LB; Bushman TR; (n.d.). The natural history of Acute Charcot's arthropathy in a diabetic foot specialty clinic. *Diabetic medicine : a journal of the British Diabetic Association*. <https://pubmed.ncbi.nlm.nih.gov/9171250/>
2. B; C. A. R. (n.d.). Ostectomy for diabetic neuroarthropathy involving the Midfoot. *The Journal of foot and ankle surgery : official publication of the American College of Foot and Ankle Surgeons*. <https://pubmed.ncbi.nlm.nih.gov/11055020>
3. Jeffcoate WJ, Game F, Cavanagh PR. The role of proinflammatory cytokines in the cause of neuropathic osteoarthropathy (acute Charcot foot) in diabetes. *Lancet* 2005;366:2058–2061 [PubMed] [Google Scholar]
4. Boyce BF, Xing L. Functions of RANKL/RANK/OPG in bone modeling and remodeling. *Arch Biochem Biophys* 2008;473:139–146 [PMC free article] [PubMed] [Google Scholar]
5. Uccioli L, Sinistro A, Almerighi C, et al. Proinflammatory modulation of the surface and cytokine phenotype of monocytes in patients with acute Charcot foot. *Diabetes Care* 2010;33:350–355 [PMC free article] [PubMed] [Google Scholar]

6. Mabileau G, Petrova NL, Edmonds ME, Sabokbar A. Increased osteoclastic activity in acute Charcot's osteoarthropathy: the role of receptor activator of nuclear factor-kappaB ligand. *Diabetologia* 2008;51:1035–1040 [PMC free article] [PubMed] [Google Scholar]
7. Stevens MJ, Edmonds ME, Foster AV, Watkins PJ. Selective neuropathy and preserved vascular responses in the diabetic Charcot foot. *Diabetologia* 1992;35:148–154 [PubMed] [Google Scholar]
8. Young MJ, Marshall A, Adams JE, Selby PL, Boulton AJ. Osteopenia, neurological dysfunction, and the development of Charcot neuroarthropathy. *Diabetes Care* 1995;18:34–38 [PubMed] [Google Scholar]
9. Veves A, Akbari CM, Primavera J, et al. Endothelial dysfunction and the expression of endothelial nitric oxide synthetase in diabetic neuropathy, vascular disease, and foot ulceration. *Diabetes* 1998;47:457–463 [PubMed] [Google Scholar]
10. Shapiro SA, Stansberry KB, Hill MA, et al. Normal blood flow response and vasomotion in the diabetic Charcot foot. *J Diabetes Complications* 1998;12:147–153 [PubMed] [Google Scholar]
11. Baker N, Green A, Krishnan S, Rayman G. Microvascular and C-fiber function in diabetic Charcot neuroarthropathy and diabetic peripheral neuropathy. *Diabetes Care* 2007;30:3077–3079 [PubMed] [Google Scholar]
12. Jeffcoate WJ, Game FL. New theories on the causes of the Charcot foot in diabetes. In *The Diabetic Charcot Foot: Principles and Management*. Frykberg RG, Ed. Brooklandville, MD, Data Trace Publishing Company, 2010, p. 29–44 [Google Scholar]