The Manchester Martini Cast

- any time, any place, any where.

The Pennine Acute Hospitals NHS Trust

Manchester Community Health

Manchester NHS Primary Care Trust

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Introduction

The protean manifestations of diabetic foot pathology create huge challenges for all health care professionals involved in their management. A responsive range of devices is needed for patients which can effectively offload any aspect of the foot, rapidly at the point of need.

Whilst the classic total contact cast (TCC) remains the gold standard treatment for neuropathic foot ulceration, such an approach is in some circumstances not transferable to ischaemic and neuro-ischaemic foot ulceration.

We have broken new ground in using a focused rigidity technique, creating three novel devices which provide a TCC effect. This technique involves the use of Soft cast and Prima cast materials (3M, UK). Traditionally, casting is only available in the hospital setting, techniques being limited to technicians, podiatrists or nurses. Our technique is versatile and can be applied at the point of need regardless of location and underlying cause. These devices have transformed our clinical practice offering patients an equitable pressure relief service across community and hospital settings.

Patients

Details	Data	Clinical details
Patients	**70**	age 36 - 85 (mean 59 years): Type 1(6), Type 2 (64)50 Ischaemic / 20 neuropathic.
Charcot	**15**	10 Male 5 Female
Active	4	>3 C degrees difference in temperature.
Inactive	11	(<2 degrees C difference); 3 ischaemic (2 ulcerated).
Intra articular fracture	**1**	(72y, male,). Dropfoot,Talonavicular intra-articular fracture. Neuropathic.
Heel Ulcers	**15**	11 male 4 female
neuro-ischaemic	13	ABPI <0.8 or one or more impalpable foot pulse.
neuropathic	2	Insensitive to 10g mono/sharp blunt absent.
Foot Ulcers	**31**	24 Male 7 Female age 36 - 82 (mean 61 years).
neuropathic	12	
neuro-ischaemic ulcers	19	
Post surgical wounds	**8**	2 Male 6 Female 49 - 82y (67yrs)
neuro-ischaemic	5	Gangrenous toes / ray amp / forefoot amputation
neuropathic.	3	Infection leading to minor amputation.

Methods

Three devices are used: a **semi rigid cast** focusing rigidity around area needing pressure relief; a **heel protector** fitted over soft wool dressing; a **below knee cast** using baseline layer of soft cast reinforced with prima rigid base plate, stirrup and anterior piece (see samples). All casts are removed using cast scissors rather than a plaster saw.

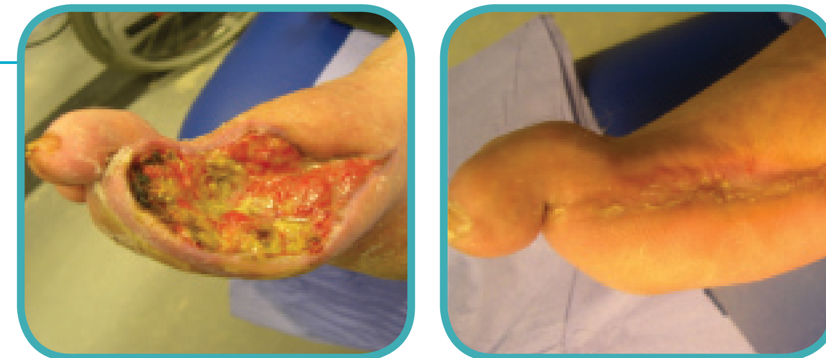
Results

Details	Numbers	Outcomes		
Patients	**70**	9 patients died. (Over 2 year period)		
Charcot	**15**	9/15 had below knee casts fitted	6/15 had_ or full slipper cast. All inactive.	2 patients died. Pain reduced in all 11/15 reporting pain pre cast.
Active	4	2 resolved no further deformity post cast, 2 remain active 14 months on still wearing BK cast.		
Inactive	11	2 ulcerated -1 ulcer healed, 3 weeks on (case 4),1 remains ulcerated with extensive deformity awaiting surgical intervention. (cast allows some mobility avoiding wheelchair for this patient).active 14 months on still wearing BK cast.		
Intra articular fracture	**1**	BK cast 6 months later foot re X-rayed, good alignment despite drop foot deformity.		
Heel ulcers	**15**	**All healed 2 - 27 weeks.**		
Neuro-ischaemic	13	All reported immediate reduction in pain post cast. All healed 2 (case 6) - 27 weeks (mean time to healing 11 weeks).		
Neuropathic	2	**Both healed 6 and 12 weeks.**		
Foot Ulcers	**31**	7 patients died. (22.5%)	2 recommended amputations avoided.	23/ 31 healed (74%)
neuropathic	12	9 healed (75%) , 2 remain ulcerated, both reduced in size, (cases 2 and 5). Healed 3 - 12 weeks.1 BKA.		
neuro-ischaemic ulcers	19	15 healed 6 - 27 weeks (mean 14 weeks). 4 remain ulcerated with reduction in ulcer size. 7 pts later died.		
Post surgical wounds	**8**			
neuro-ischaemic	5	**3/5 healed (case 1), 2 remaining reduced in size.**		
neuropathic.	3	**Healed 7 - 12 weeks**		

Case histories

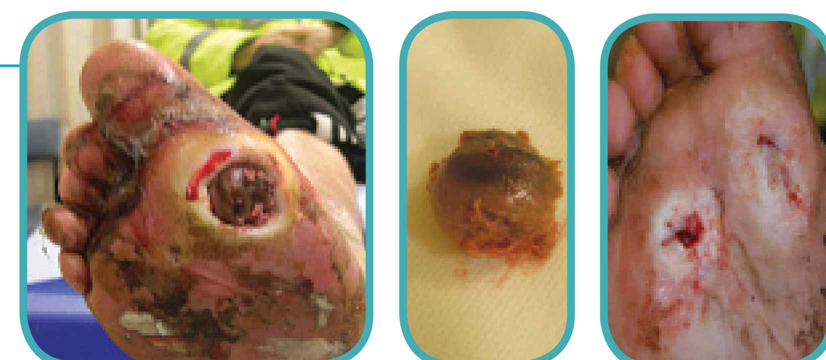
Case 1

53y male with post amputation wound. Healed in 9wk with full slipper cast. Still healed after 6m.



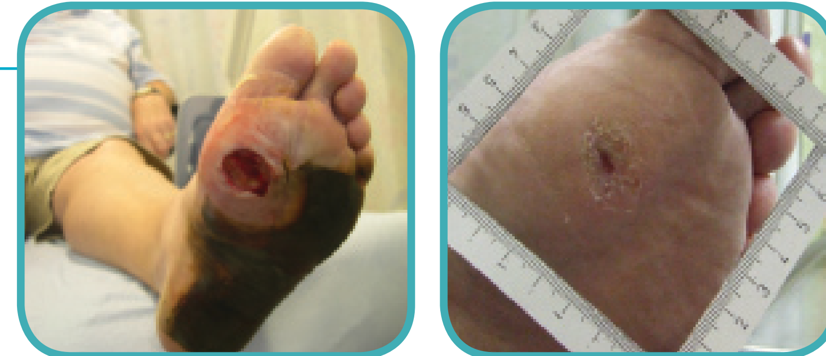
Case 2

a. 44y male, longstanding osteomyelitis, 1st met head removed, 8 wk xray showing good alignment post B/K Cast, **c.** 1 year later, almost healed. Non concordance.



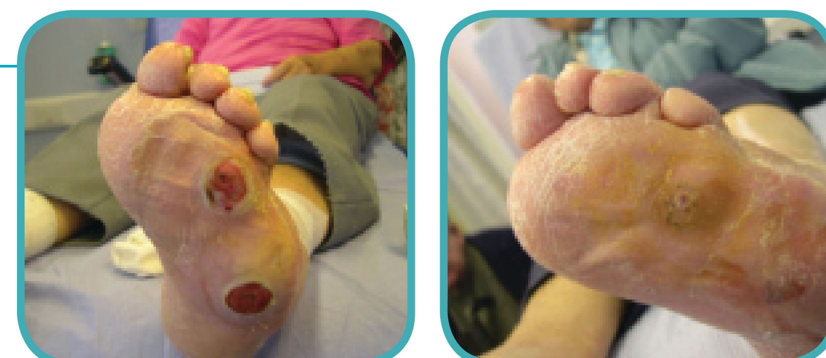
Case 3

58y male, plantar flexed 1st ray, ulcer present 9m, healed in 16 weeks, slipper cast.



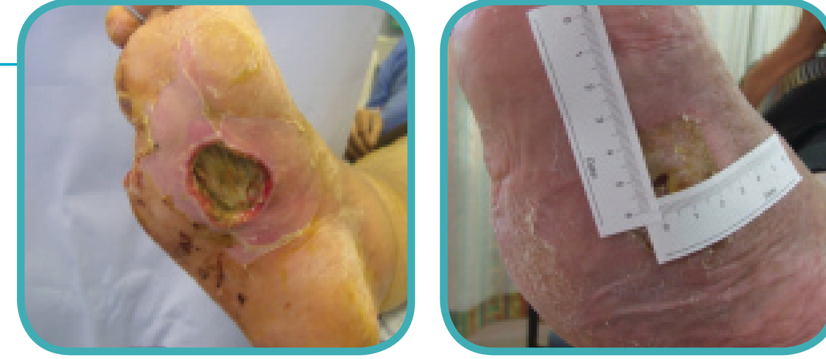
Case 4

2007,78y female, 2.5y ulceration, Charcot deformity, neuropathic. Healed in 3 wk. Remains healed 14 months on. 3/4 slipper.



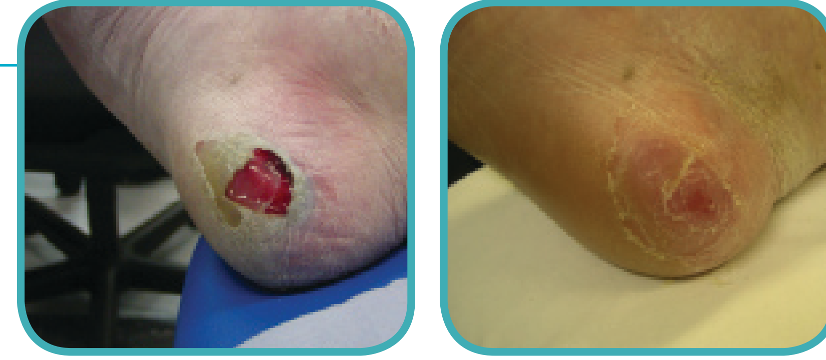
Case 5

a. Sept 2007, 50y male, **199kg**, ulcer. **b.** Sept 2008 2mm superficial, 3/4 slipper cast. 5m post cast. Pt worked throughout.



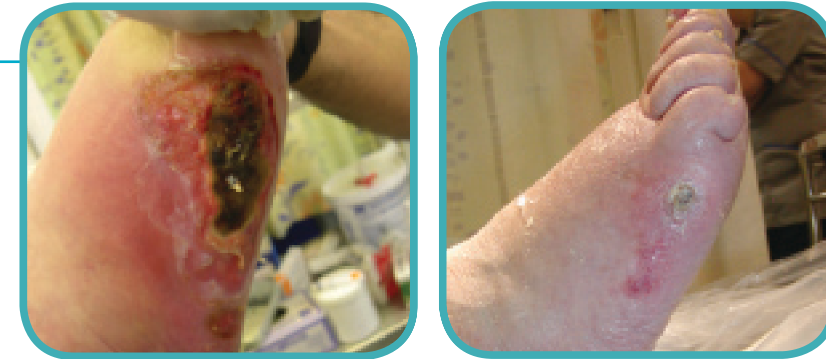
Case 6

52y female, **130kg**, painful neuro-ischaemic heel ulcer. Six weeks duration. Healed two weeks later - slipper cast. Pain resolved when cast applied. Remains healed 10 months on.



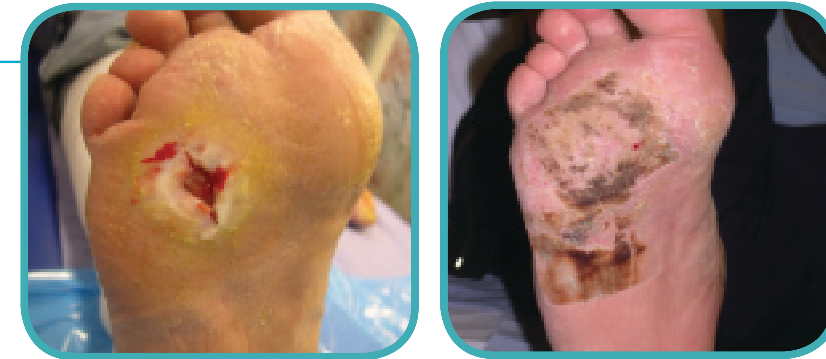
Case History 8

60y female, neuro-ischaemic foot, **176kg**. Soft Cast slipper. Healed in 8 weeks. Died 6mths on.



Case 9

44y male - neuropathic ulcer 18m - active, still in employment - healed 5wk. B/K cast. Able to return to uninterrupted employment. Remains healed 12 months on.



Discussion and conclusion

These techniques, producing outcomes which speak (if not shout) for themselves, have taken casting firmly into the community arena. All 3 casts are light weight, easily and swiftly applied techniques easily taught and can safely be used on any limbs, even those with ischaemia. They are totally flexible, providing rigidity when needed or simply a protective 'exoskeleton' where appropriate. These are truly the **any time** (even 'no time at all'), **any place** (foot, heel or below knee), **any where** (hospital, community or home) **casts**. They have revolutionised our practice, saved limbs and may have saved lives.

Acknowledgements. We would like to thank 3M for providing the material to pilot and undertake the RCT to evaluate the efficacy of the slipper cast against existing methods of pressure relief on foot clinic and Pennine Acute Trust Research committee for funding the RCT.