

SPECIAL THERAPEUTIC FOOTWEAR ALTERNATIVES FOR CHARCOT FOOT USING COMPUTERISED PLANTAR PRESSURE DATA - a case study

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INTRODUCTION.

Total contact casts have been shown to be effective in treating plantar neuropathic ulceration. A primary healing aim is to control (reduce) local pressure. Traditionally this was done by modifying weight bearing activities and/or shoe modifications. Currently total contact casts are recommended for primary management.

Footwear based approaches are generally considered less effective. However there are significantly different forms of functional Medical-Grade(M-G) footwear that can offer advantages over casts.

The authors have used evaluative instrumentation that is currently used to substantiate non footwear-based treatments. The data supports other objective and subjective feedback on the efficacy of special M-G footwear. A single case is presented that challenges the current assumptions about superior pressure relief qualities of casts.

METHOD

Using the case of a 51 year old, long-term diabetic male with a charcot foot, the effectiveness of medical grade footwear in terms of localised pressure relief was compared with a total contact cast.

The subject had developed a left classic Charcot foot deformity and subsequent mid-plantar ulceration. Initially he was treated with a total contact cast until the ulcer closed. A specialised M-G work boot was prescribed.

The F-scan system was used to determine the pressure levels on the plantar surface of the foot that promoted healing. These readings were used as the reference point for designing and producing the M-G boot. Critical pressures were found to be lower in the M-G boot than the therapeutic cast. Other benefits included mobility, appearance, bulk. and heat.

METHOD

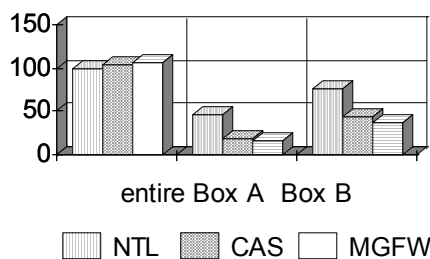
As a result of this observation, a more detailed examination of plantar pressures was undertaken.

Computerised plantar pressure reading were

made using the F-Scan system. A “neutral” shoe was used to provide comparable “barefoot” benchmark. The sole was EVA (“Nora LunaSoft”A, durometer 50⁰ Shore A). Forces on the entire foot and two defined problematical areas of the foot during ambulation in a neutral shoe, the total contact cast and medical grade footwear were taken and analysed.

RESULTS

Even though an increase in total values over the (entire) plantar foot area of + 4% total, + 7% compared to the neutral shoe was observed, the actual areas of concern (Boxes A,B) have reduction of up to 65% .



NTL = neutral shoe; CAST = Total contact cast; MGF = medical grade footwear (special design)
Vertical values in kilograms

DISCUSSION:

The results raises questions about the common perspective that total contact casts must be superior to footwear. In specific types of M-G footwear high levels of force manipulation and control can be achieved. These control techniques are to be presented. In high risk patients M-G footwear alternatives may be considered for primary healing as well as prevention. F-Scan-type data can help defend clinical management.

REFERENCES

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