About

Total contact casting (TCC) is a method used to treat diabetic foot ulcers by fitting a non-removable cast around the affected leg. The whole cast is in contact with the foot and part of the leg, hence the name. The cast is usually made with splinting, fiberglass and plaster and is designed to protect the ulcer and allow wound healing.

Recent studies indicate that compared with the cast shoe, a total contact cast significantly reduces peak pressure at the ulcer site by 44%, mean pressure by 47% and pressure-time integral by 37%. Plantar pressure across the entire foot and each region of the foot is also reduced with the total contact cast compared with the cast shoe.

Although numerous devices have been researched concerning their off-loading abilities, the total contact cast (TCC) remains the gold standard.

The TCC employs a well-molded, minimally padded cast that maintains contact with the entire plantar aspect of the foot and lower leg. By so doing, it functions to mechanically unload the ulcer site and reduce the vertical shear stresses, redistributing the pressure of walking over the entire foot and lower leg. The effectiveness of the total contact cast has been well documented clinically, with favorable results (91%) demonstrating an average healing time of 6 weeks, a considerable reduction from the average healing time of 9 weeks or more without its use but with other devices such as accommodative footwear and dressing changes.


Treatment

One of the primary reasons for treating diabetic foot ulcers with total contact casting is offloading, or limiting the use of the foot with the ulcer. Diabetic patients who already have diabetic neuropathy are at the greatest risk for ulcers since the loss of protective sensation in their limbs prevents early detection of any injuries to their feet. The peripheral neuropathy may also cause foot deformities by paralyzing the muscles of the foot, causing clawing of the toes and producing bony prominences that are subject to pressure. Fractures can develop without the patient’s awareness of them, resulting in a condition known as Charcot foot.

Total contact casting relieves pressure on the affected foot, which enhances healing by taking pressure off the ulcer and the other areas of the foot most prone to injury.
Procedure

Total contact casting is done by molding a cast over the entire surface of the foot and part of the leg. A soft layer of foam is placed on the ulcer, and the whole foot is wrapped in bandages prior to the application of the cast. The cast, which follows the contours of the foot, is designed to distribute the weight evenly over the entire weight-bearing surface of the foot. This results in offloading of pressure from the ulcer and the bony prominences of the foot.

Healing of ulcers using total contact casts takes approximately six to eight weeks, during which the cast is replaced on a weekly basis. The cast is removed when complete healing is achieved, after which it is recommended that the diabetic patient wear specially designed shoes.

Advantages over Other Treatments

Medical or surgical treatment may not be adequate for diabetic foot ulcers. Even if the best care is given, healing may be delayed if the ulcer is subjected to constant pressure while walking. Total contact casting provides optimal wound healing conditions by ensuring that the ulcer is not further traumatized and also prevents the development of new ulcers in the bony prominences of the foot.

A Modern Technique Approach:

Several enhanced TCC systems provided today are proving to provide excellent repeatability of load redistribution with TCC applications spaced 1 week apart and performed by using a standardized technique. These qualified findings are critically important for two reasons.

First, it is necessary to maintain consistent off-loading of the foot throughout the numerous cast changes (six to eight casts on average) required over the course of plantar ulcer healing. Second, a high level of repeatability with TCC applications is crucial in clinical research involving either a longitudinal examination of extrinsic or intrinsic factors associated with neuropathic ulcer healing, or any comparative analyses between TCC and other off-loading devices.