

Technical Note

Casting Technique for Below-Knee Prostheses

It is obvious to those of us in the field of Prosthetics that the accuracy of the socket fit is dependent largely upon the accuracy of the impression of the residual limb. This note describes a casting technique that has been found to achieve a greater degree of conformance to actual contours of the below-knee residual limb than those previously used.

In the past, casting has been carried out almost universally by means of a circular wrapping technique, a method that works fairly well for the firm, well tapered residual limb, but results in a cast

with considerable mediolateral distortion when used on the soft residual limb.

The circular wrap technique was set aside by many prosthetists in favor of the "two-part" technique which utilizes a panel of plaster-of-Paris splints molded over the anterior of the residual limb followed by a circular wrap after the anterior panel has hardened. This technique prevents mediolateral distortion but the panel is not easily held in place and ridges are formed in the finished cast.

The technique which has proven to be most accurate in my experience is a

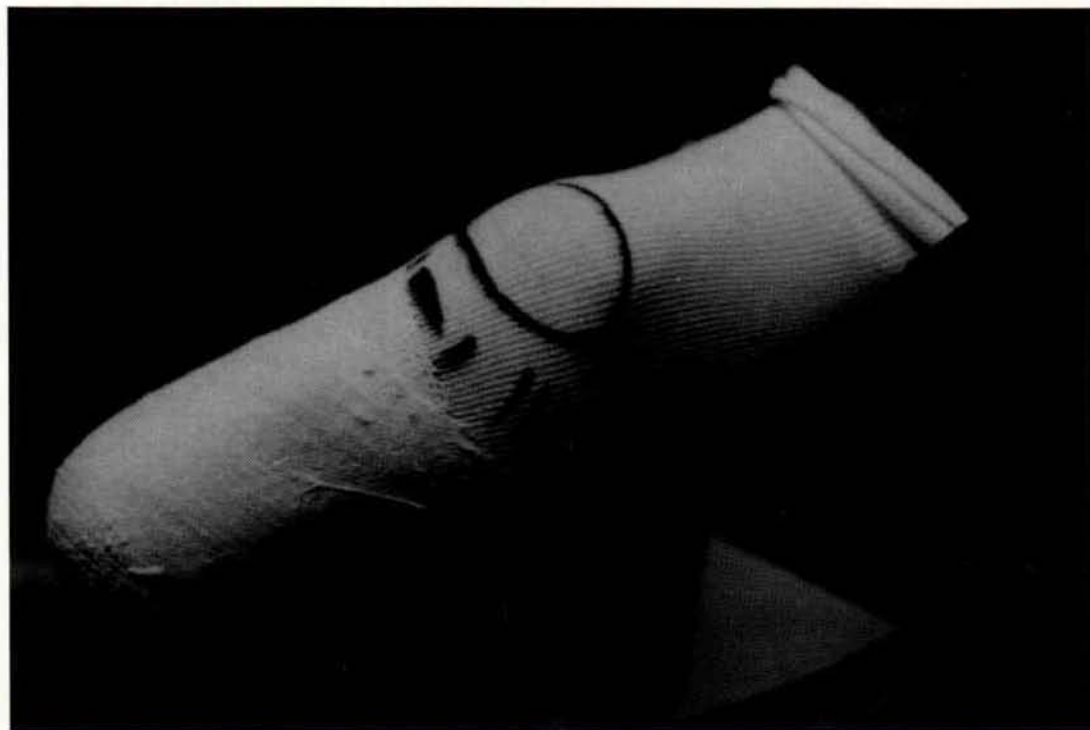


Fig. 1. The first (distal) wrap before molding.

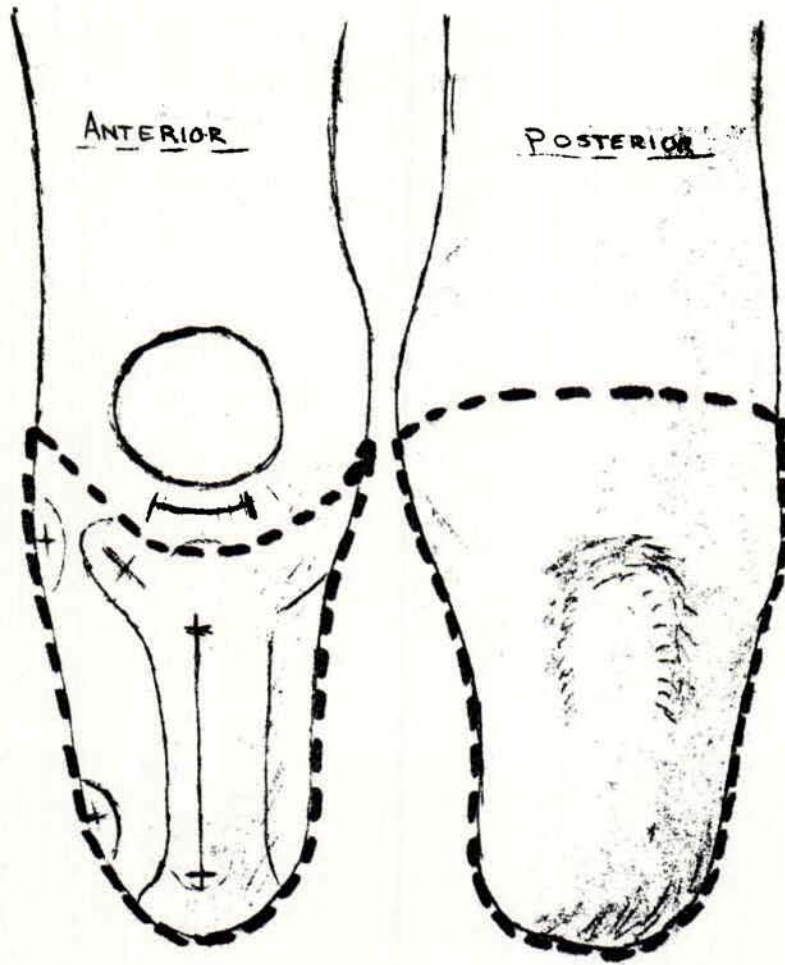


Fig. 2. Outline of the first (distal) wrap.

modification of the "two-part" procedure.

The casting is made over one cotton cast sock and one layer of nylon stockinet. The markings are made on the nylon stockinet which has been pulled on over the cotton cast sock, only to facilitate removal of the cast. The technique uses first a circular wrap of elastic plaster bandage (Figs. 1 and 2) to enclose the distal end, stopping just below the patellar tendon, but going high enough on the medial and lateral sides to cover the condyles.

This first wrap is molded into the popliteal and medial flare areas with one hand while the lateral side is molded into the pretibial area with the other hand (Fig. 3). Once this wrap has hardened sufficiently to prevent distortion, a second circular wrap follows (Fig. 4), to enclose the remainder of the residual limb. It is molded about the patellar tendon in the usual fashion (Fig. 5).

This technique results in a socket which usually fits when one or two nylon socks are used. For the very short residual limb the usual single circular wrap is

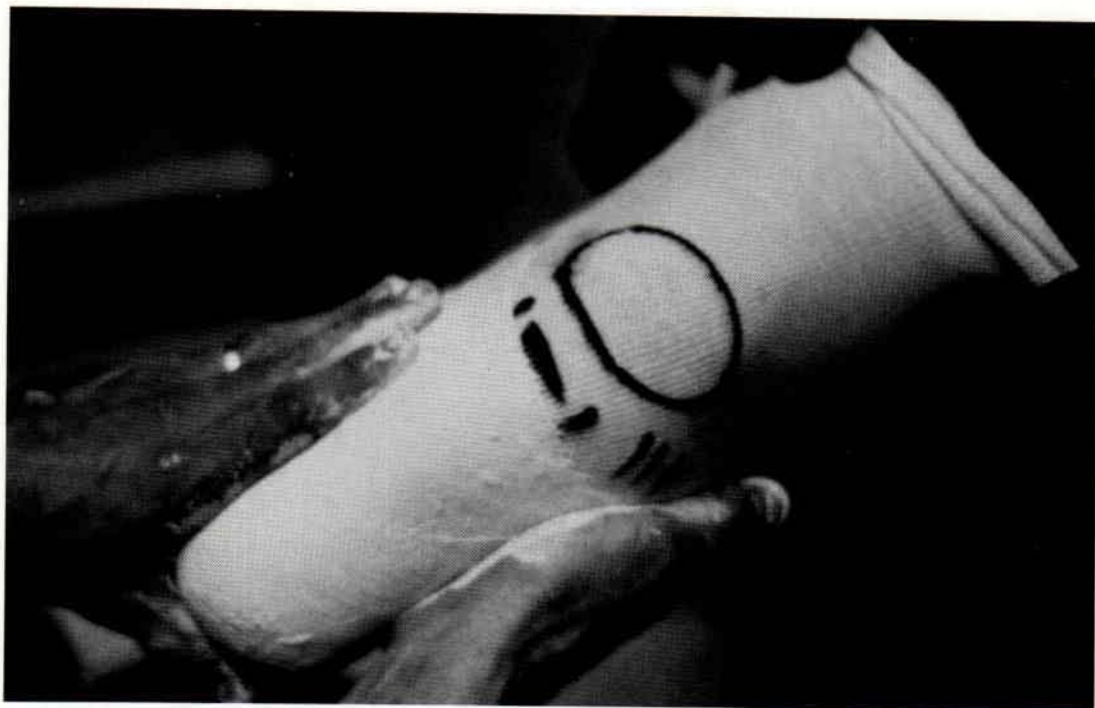


Fig. 3. Molding the first (distal) wrap.



Fig. 4. Molding the second (proximal) wrap.



Fig. 5. Molding the second (proximal) wrap.

used. For the PTS prosthesis, the above procedure is followed by a proximal panel of non-elastic splints as in the standard two-part procedure.

The theory involving this technique is that when the cast is formed closely about

the area of the medial tibia flare, a minimum amount of modification of the positive model is needed. It is important, then, that the first wrap be allowed to harden completely before application of the second wrap.

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