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PROCEDURES FOR OBTAINING CASTS FOR ANKLE-FOOT ORTHOSES

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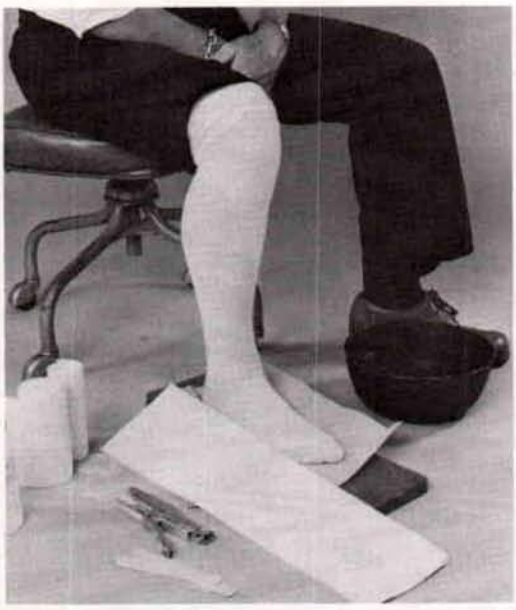
Over the past several years the use of molded thermoplastic ankle-foot orthoses has become an accepted tool for orthotic management. A number of articles and publications have dealt with the types of plastics used and the various molding techniques. Some attention has been paid to trimlines and how they affect the performance of the orthoses-patient combination.

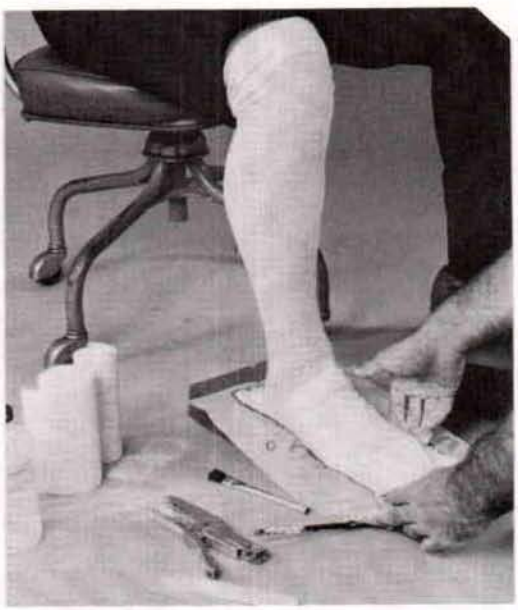
In the majority of articles presented to date, however, little has been done to update casting procedures. While wrap casting can prove adequate if the user is skilled, it is quite easy to distort soft tissue and lose sight of the landmarks of the foot and shank.

The principle problems with the wrap cast technique are the tendency of the soft tissue to assume a cylindrical shape under circumferential pressure and the difficulty of removing the mold from the patient without distortion. A wrap cast also increases pressure over bony prominences and can create hollows or depressions between these prominences.

To eliminate these problems a technique has been developed that allows control of the foot and shank at different intervals of the procedure, allows for an accurate reproduction of the extremity, and is easily removed with a minimum of distortion.

Materials necessary for this procedure are a foot board or shaped foam block, stockinet sewn closed at one end, mineral oil or Vaseline, two rolls of six-inch wide extra fast plaster-of-Paris bandages, tongue depressors, cast pencil, and bandage scissors.



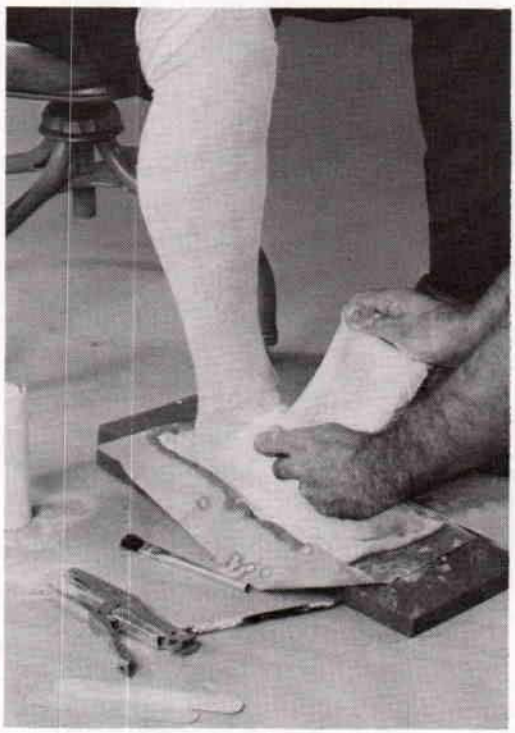


After examination, the patient's limb is covered with stockinet and necessary landmarks are indicated with a cast pencil. To facilitate this portion of the procedure the stockinet may be wetted prior to its application.

Although the stockinet will usually stay in place by itself, the patient is asked to hold the proximal edge of the stockinet since this reduces tendency for the patient to make unwanted movements.

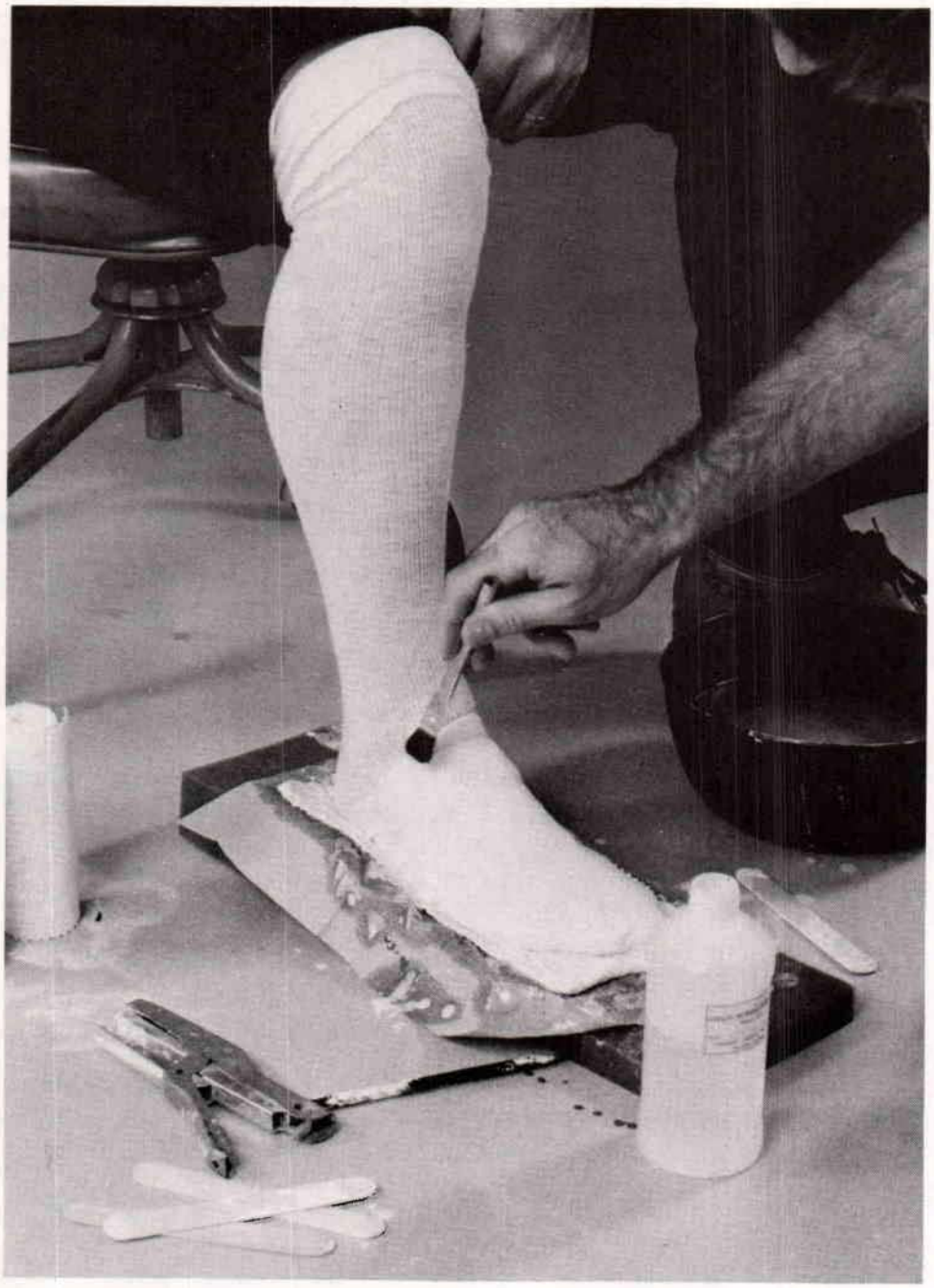
The position of the foot and lower leg is explained to the patient. During this explanation the foot is physically located in the proper position on the foot block. While the patient is in the proper position the first section of the plaster is measured and cut. This is a four layer splint twice the length of the foot from heel to toe.

The patient's foot is removed from the cast block, the splint is soaked and located to the position formerly occupied by the foot. At this time care should be taken to remove any wrinkles. The excess length is allowed to fall anterior to the toes. As soon as the foot is relocated on the cast block the excess plaster bandage is placed over the dorsum of the foot and smoothed out.

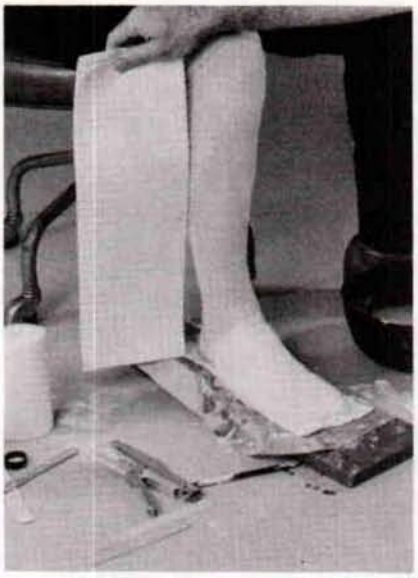


An additional splint is located over the dorsum of the foot to increase the proximal bulk of the cast and to make sure the lateral and medial edges of the foot are covered.

At this time the tongue depressor is used to push the bandage tightly around the foot. While this portion of the mold is drying the foot is held in a corrected position. Whenever possible this is done without putting pressure of the mold itself thus avoiding distortion and subsequent modification problems.

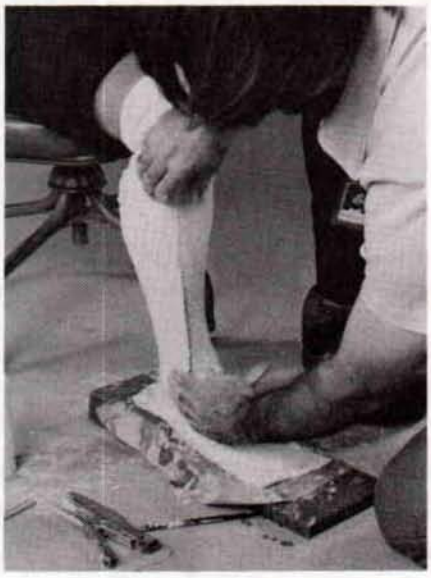


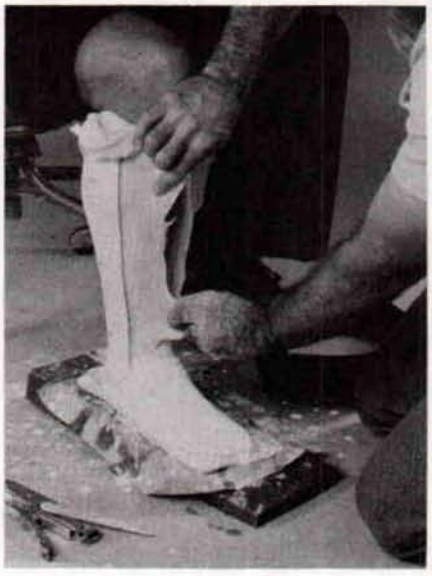
After this portion of the mold is dry it is coated with mineral oil or Vaseline over the dorsum and posterior aspects.



The second splint is located over the posterior shank. The length is determined by adding approximately three inches to the length of the leg from the posterior crease of the knee to the base of the calcaneous. The splint is three layers thick.

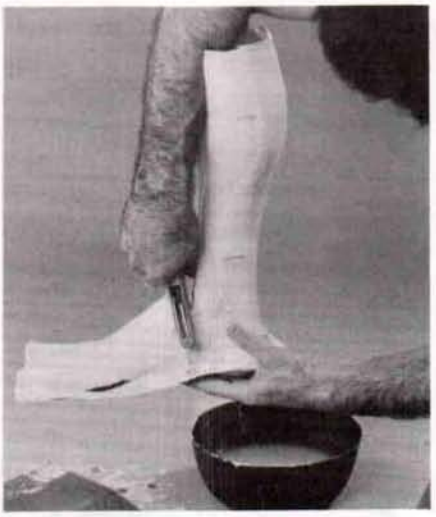
This part of the splint is started at its most proximal aspect and smoothed distally. The bandage should be as wet as possible to insure adhesion to the stockinet.





Additional splints are placed as necessary to cover the area of the extremity that will be covered with the AFO.

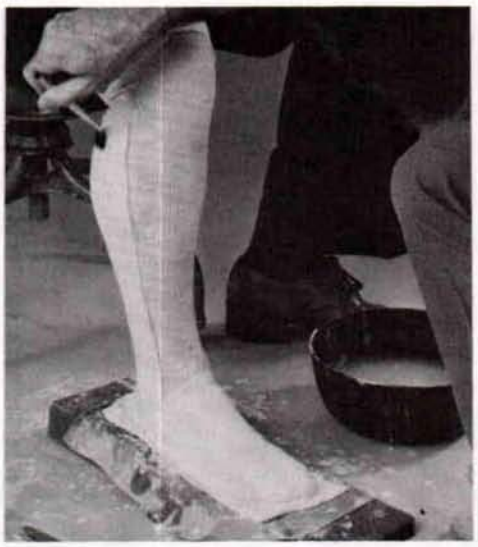
After the entire cast has hardened it is removed in sections. The new anterior portion of the stockinet is cut and pulled free of the plaster.

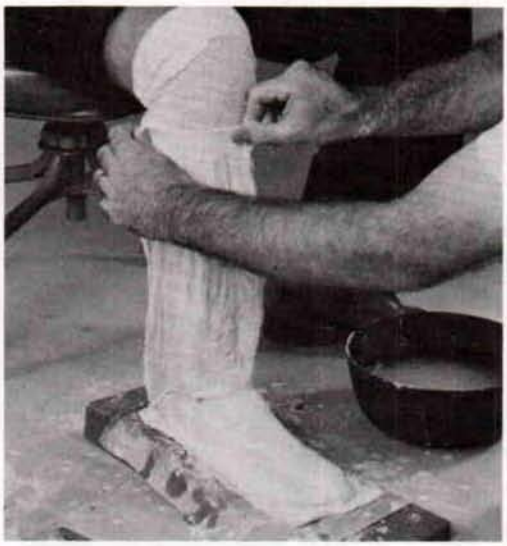


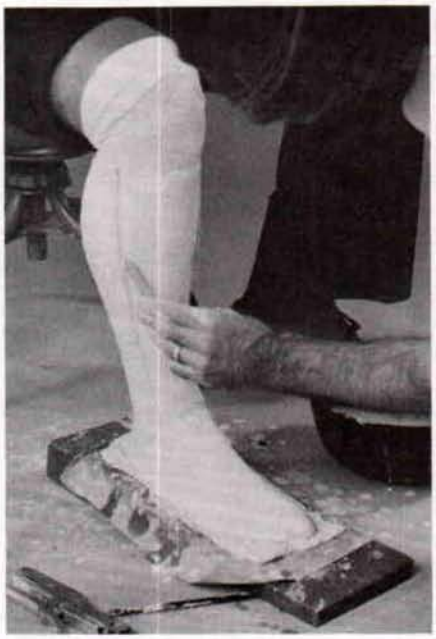
The entire foot is lifted free of the foot block and the knee is extended. The foot is manually plantarflexed and dorsiflexed. This should be done gently to avoid injuries to both the patient and the cast.

At this time the shank portion of the cast can be pulled away, the stockinet is cut down to the posterior base of the calcaneous and the foot portion can be removed with gentle traction.

The stockinet is pulled free of the plaster, the cast is reassembled, stapled and allowed to dry.

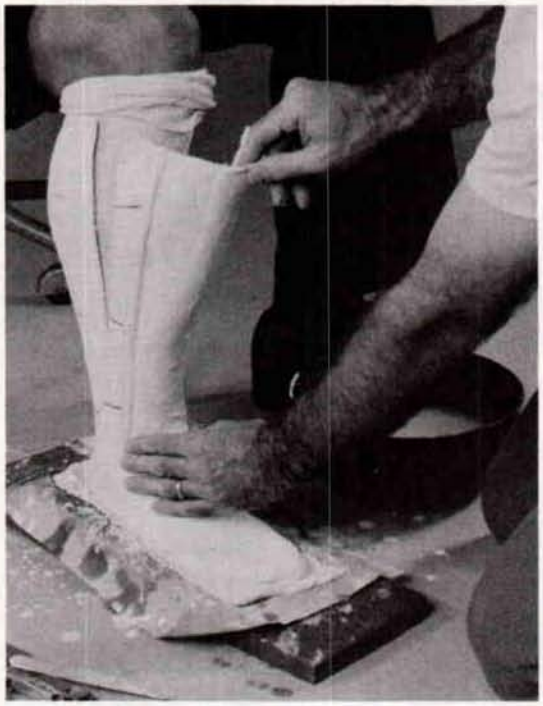






In cases where a mold of the entire circumference of the extremity is necessary, the procedure can be extended as shown above and in the rest of the photographs in this article. As indicated previously the edges of the already dry portion of the mold are lubricated and splints are applied. This last section is allowed to dry and can be removed easily by just pulling upward on the proximal anterior stockinet. The rest of the procedure remains unaltered.

Application of a splint to the anterior portion of the shank.
Establishing total contact.
Completed cast.



Removal of anterior section.

The anterior section is replaced and ready for pouring the positive model.

Footnotes

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