

We are now using a temporary below knee pylon, to be described in the following article, which we feel meets the above requirements. At the present time we are fitting the below knee amputee with the pylon three to four weeks after surgery. Despite optimistic reports from other sources on fitting at the time of surgery we feel that by allowing three weeks for wound healing the necessity for specialized supervision is eliminated, the patient can be treated in a usual fashion without upsetting hospital routine, and, most important, possible damage to fresh and precarious skin flaps in a below knee amputation is avoided. During this time the patient is started on exercises, there is little loss of continuity and the patient remains motivated. This pylon has proved satisfactory in trials to date with patients ranging in age from fifty-six to eighty. Clinical experience indicates that the socket will allow for changes in the size of the stump as it matures and there have been no significant problems with skin tolerance. A period of several years will be necessary, of course, to evaluate the ultimate success of this program.

The elderly amputee has many things working against him. He is less readily adaptable to changes in his environment, and less adept in mastering new physical skills. He is easily discouraged by failure and often lacks motivation to persist with tedious training. He lacks financial resources for obtaining an expensive prosthesis and by virtue of age may not qualify for certain types of assistance. Concurrent medical problems often cause delays in prescribing a prosthesis. The combination of these factors results in many prostheses gathering dust in a closet and many capable amputees gathering dust in a wheelchair. If an inexpensive temporary pylon can make any significant improvement in the present situation, it will be well worth the extra time and effort involved.

Temporary B.K. Prosthesis

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The following is a discussion of the temporary prosthesis that was used for the group of geriatric patients discussed in the preceding article by Dr. David G. Murray.

This team is attempting to provide an inexpensive, temporary walking leg, that will not only give the elderly below knee amputee an adequate socket for the purpose of stump shrinkage and shaping, but will also get the geriatric patient back on his feet within three to four weeks after operation. This temporary prosthesis is being used to some extent to determine the advisability of further prosthetic rehabilitation.

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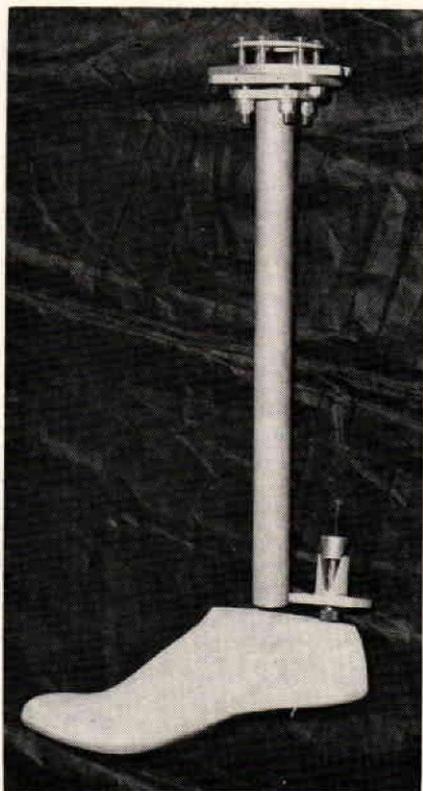


FIGURE 1—Components utilizing Northwestern B.K. pylon.

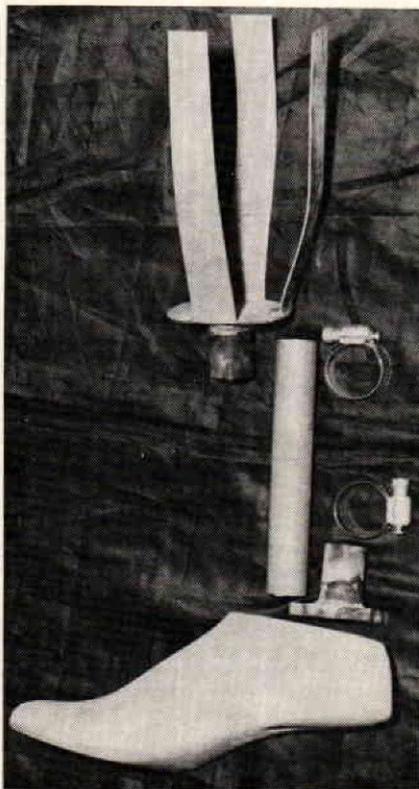


FIGURE 2—Components for original pylon.

When choosing a material for socket fabrication, it was realized that a plaster socket cannot be as extremely well-fitted as a P.T.B. socket, nor can it incorporate all the biomechanical advantages of one. However, it does provide some of the characteristics of a P.T.B. prosthesis. Also, it has proven quite satisfactory for weight bearing, stump shrinkage, and stump shaping during shrinkage.

Two types of pylons were used in this study. Originally a simple and inexpensive pylon was fabricated in our own facilities, subsequently we have used the Northwestern B.K. pylon (fig. 1) from A. J. Hosmer Corporation for comparative purposes.

The original pylon (figs. 2 and 3) lacks the features of alignment adjustments incorporated in the Northwestern unit, but it is much less expensive and did appear to be sufficient for this study; and minimal expenses were mandatory. The pictures of the pylon are self-explanatory, but in brief, the straps (medial, lateral and posterior) and the plate (approx. 2½-3 inches in diameter) are cut as one piece from a soft, light metal. The proximal and distal plugs are steel pipe, welded to bases, with an aluminum tube of the proper size to fit over the plugs, and clamped with hose clamps.

The following is the method which is used by this group for fabricating a temporary prosthesis to meet the specified requirements.

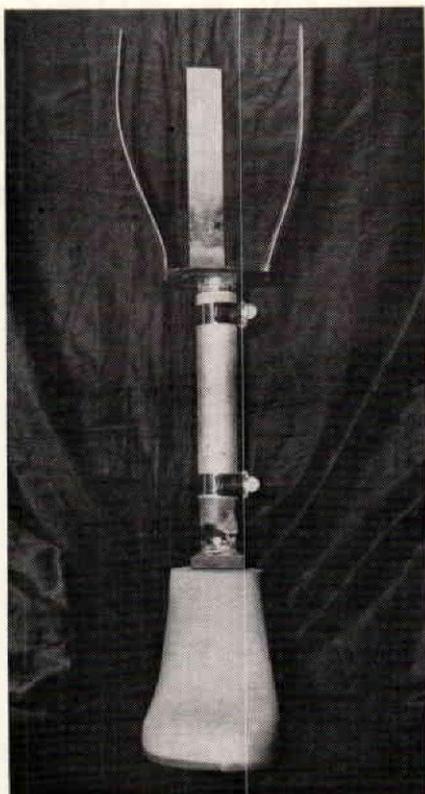


FIGURE 3—Assembled components.



FIGURE 5—Finished pylon marked for cutting the anterior opening

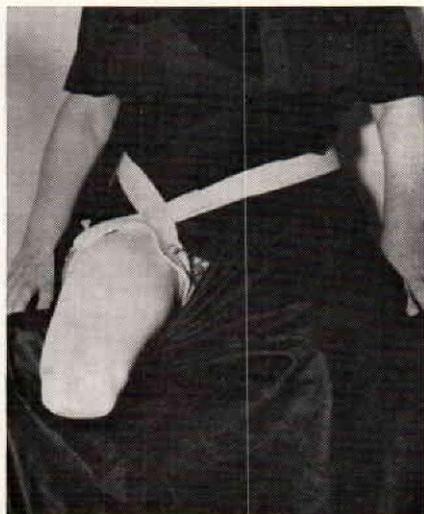


FIGURE 4—Stump prepared for casting. Foam rubber in place over end of stump.



FIGURE 6—Side view of finished pylon.

Materials

One regular 5-ply stump sock, light foam rubber, 1 cast sock, 1 piece of separating material, 1 elastic plaster bandage, 2 regular plaster of paris bandages, pylon.

Fabricating Procedures

We will discuss only the procedure used with the original pylon as many other articles have been written about the Northwestern type which is shown in the illustration. Figure 4 shows the stump prepared for casting with a clean, new 5-ply wool stump sock which is pulled over the patient's stump. A small pad of foam rubber is placed inside, between the stump and sock, to create a soft contact between the yet tender area of stump and plaster socket. A piece of Saran Wrap, acting as a separator, is pulled over the stump sock and held in place with a thin cast sock. Both socks and separator are held in place with two clamps and elastic webbing around the pelvic region. Elastic plaster bandage is applied to the stump in the same manner as for a P.T.B. cast, and patellar tendon and popliteal areas are depressed in the same fashion. The cast is later further depressed across the patellar tendon area after removal and is reinforced for weight bearing.

After the bandage has hardened, the base plate with the three uprights is roughly formed to the cast, placing the uprights medially, laterally, and posteriorly. The pylon tube is then cut to length, attached to the plug and secured with a hose clamp. A used Sach foot was employed in this study and fastened to the pylon tube with foot plug and clamp. At this stage, the patient is put in a standing position and static alignment is completed. After marking the placement of the baseplate and uprights with indelible pencil, the cast is then taken off the patient's stump and reinforced with ordinary plaster of paris bandages, taking care to cover the upright straps well. After adequate hardening of the cast, an opening (as marked in fig. 5) is cut into the anterior distal portion of the socket to facilitate re-introduction of the stump, with a pull-on sock, and to eliminate pressure on the tibia in this area. P.T.B. buttons are installed at the medial and lateral uprights, and a cuff suspension strap added. A light waist belt is necessary for suspension. The patient is given the finished product and can begin training the following day.

We have not attempted to use this temporary prosthesis for walking without additional support, nor is it meant for such use. It is intended only to furnish an inexpensive device for the purposes expressed previously: to allow the geriatric amputee to become mobile at a time somewhat earlier than is normally practiced; to shrink and shape the stump; and to require minimum attention. It should also assist in evaluating the geriatric amputee for a permanent prosthesis. We realize that this procedure is neither new nor earthshaking, but it appears to have promise as a means of dealing with the geriatric group of our new amputee population.