

Prosthesis For A Trans-Carpal Disarticulation

by

CLINTON L. COMPERE, M.D.
ROBERT G. THOMPSON, M.D.

When confronted with the problem of an upper extremity amputation, modern surgeons are advised to save as much extremity length as is consistent for primary healing, with adequate skin coverage. It is thus preferable, when possible, to perform an amputation through the carpal-metacarpal level, or trans-carpal level, than to amputate through a "site of election" in the distal third of the forearm. It is true that an amputation at the more proximal level makes an easier stump for a prosthetist to fit, but if one can save the wrist joint and its motion, this motion will have definite value for the amputee. However, when leaving a short small movable stump on the end of a long forearm, the ingenuity of the prosthetist to manufacture a functional artificial arm will be tested severely. In most instances, when a plastic or leather socket has been made for the mobile stump, it has not been stable. The stump tends to slip out of the socket when any pulling or lifting force is applied to the hook; useful motion in the wrist joint is greatly impaired when the socket is rigidly stabilized with metal hinges.

Such a case was presented to us at the Veterans Administration Chicago Regional Office Amputation Clinic. The patient has an excellent amputation stump at the carpal-metacarpal level. The incision is well-healed—the stump is non-tender with a useful range of motion from neutral extension to about 60° of flexion (*Figure 1*). He had been fitted unsuccessfully with a prosthesis with metal hinge type of wrist joint. Utilizing some of the newer techniques in upper extremity prosthesis fabrica-

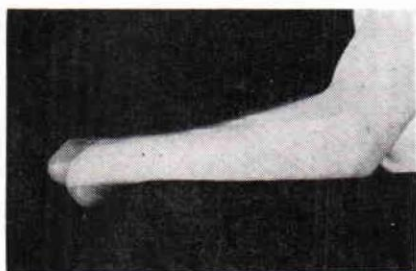


Fig. 1

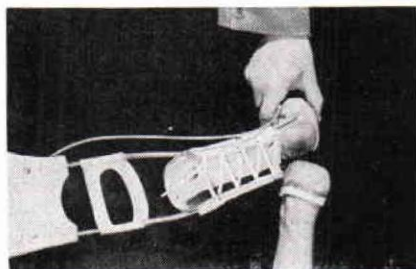


Fig. 2

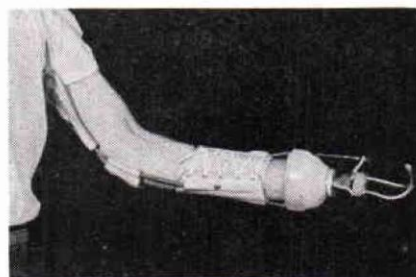


Fig. 3

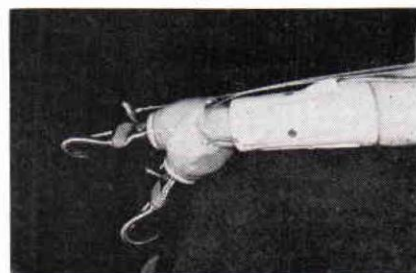


Fig. 4

tion, an excellent and ingenious arm was prepared for this patient. The primary problem required a satisfactory socket which would not allow the short stump to pull out of the socket and, at the same time, not severely restrict motion with binding hinges. This was solved by making a molded sponge rubber slip socket (lined with leather) that closely adhered to the short movable stump. (Figure 2). This, then, fitted snugly inside a plastic socket, a slight suction being produced when one tried to separate the two sockets, thereby providing a stable grip on the distal two inches of the stump. A figure-of-eight vinyon tape harness, an open leather arm cuff, which was fastened to an olecranon pad by means of long Robin Aid elbow hinges, which, in turn were fastened to a molded leather arm sleeve, completed the upper portion of the prosthesis and harness. From the sleeve to the plastic socket are two short Robin Aid flexible hinges (Figures 3 and 4). These Robin Aid hinges are of adequate strength and stability, and give good support to the socket and terminal device. The hinges also allow the patient to retain and use maximum wrist flexion. A Dorrance No. 5 hook (which the patient preferred) with part of the shank cut short, leaving a stud about $\frac{3}{8}$ of an inch long, com-



Fig. 5

pletes the ensemble. As can be noted from the accompanying photographs, the slip socket is quite stable in the plastic end socket and securely retains the stump. The prosthesis is of acceptable length, and does not protrude a great deal more than a standard, normal, below elbow prosthesis. (Figure 5)

Footnotes This prosthesis was fabricated by Mr. C. C. Scott of Edward Koeber & Sons, Chicago, Illinois.

— WHAT'S NEWS —

- As of January 1, 1956, the name of the Chester Artificial Limb and Brace Shop will be changed to *Brownfield's Artificial Limb and Brace Shop*. The address remains the same: 600 Main Street, Boise, Idaho.
- The Atlanta facility operated by the *J. E. Hanger Company of Georgia* has been awarded President Eisenhower's Citation for outstanding work and interest in promoting the "Hire the Handicapped" program. Thirteen of the 20 employees in Atlanta office

have some type of physical handicap which they have overcome.

- *The Artificial Limb and Truss Company* of 318 S. W. Third Avenue, Portland, Oregon, reports a change in membership. Mr. E. R. Leaf, C.P., is retiring from business. The new owners are Messrs. Earl Odell, Willard Parlette and O. N. Fuoco. All three are Certified as orthotist-prosthetists. The *Journal* wishes Mr. Leaf a happy retirement, and a most successful future to the new management.