Immediate Postsurgical Prosthetics Fitting in the Management of Upper-Extremity Amputees

AUGUSTO SARMIENTO, M.D.,[1]
NEWTON C. McCOLLOUGH, III, M.D.,[1]
EDWARD M. WILLIAMS, M.D.,[1] AND
WILLIAM F. SINCLAIR, C.P.[1]

In the experience of the authors of this article, immediate postsurgical prosthetics fitting has been the most satisfactory means of managing lower-extremity amputees *(1,2,3,4,5).* The procedure has allowed better control of postsurgical edema, reduced postoperative pain, permitted more rapid conditioning of the stump, and shortened the time between amputation surgery and definitive prosthetic fitting. These conclusions are based on the experiences gained with 200 below-knee amputations followed by immediate postsurgical fittings at Jackson Memorial Hospital, the main teaching hospital of the University of Miami School of Medicine. The underlying cause of amputation in 85 per cent of these patients was peripheral vascular disease, usually with diabetes

FOUR UPPER-EXTREMITY CASES

On four occasions there have been opportunities to apply temporary prostheses to upper-extremity amputees immediately after surgery. The patients in this small series showed a considerable reduction in postoperative pain, rapidly began to use their prosthetic appliances, and were impressive in their psychological adjustment to their disabilities.

Brief clinical and prosthetics histories of these four patients follow.

1. L.M. is a 32-year-old male who was struck in the right hand by a rattlesnake in November 1966. Despite a vigorous therapeutic regimen, extensive damage was sustained. The patient underwent several surgical procedures in attempts to restore function to his hand. One year later, because of a functionless, partially anaesthetic, two-digit hand, a wrist disarticulation was performed, with immediate fitting of prosthesis (Fig. 1). Seventeen hours after surgery, with no instruction other than the preoperative demonstration of the harness and hook control, the patient was capable of operating the terminal device sufficiently well to feed and dress himself (Fig. 2). The patient was fitted with a permanent prosthesis three weeks after amputation. The surgical wound had healed *per primam* when the stump

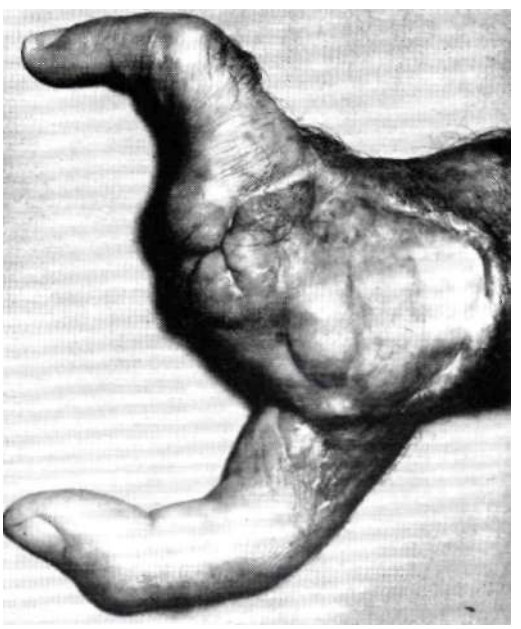

Fig. 1. Preoperative view of a functionless and partially anaesthetic hand resulting from the bite of a rattlesnake.

[1] School of Medicine, University of Miami, Jackson Memorial Hospital, Miami, Fla. 33152.

Fig. 2. Photograph taken 24 hours after wrist disarticulation and immediate postsurgical fitting of prosthesis.

was first inspected two weeks after the surgical procedure.

2. A.S. is a 57-year-old male who severely injured his hand in a meat grinder, requiring a wrist disarticulation. Because of the nature of the injury, it was elected not to close the wound but to perform an open carpal disarticulation. One week later, in the absence of infection or other complications, a wrist disarticulation was performed by conventional means. The patient was fitted immediately postoperative with a below-elbow temporary prosthesis, complete with harness and controls. The patient left the hospital four days after surgery; when seen as an outpatient one week after surgery, he was capable of using the terminal device satisfactorily. He was fitted with the final prosthesis four weeks after surgical procedure.

3. L.D. is a 57-year-old male who underwent a right below-elbow amputation in December 1967 because of extensive metastases to the right radius from a hypernephroma (Fig. 3). The operation was performed by conventional methods and a temporary prosthesis, with harness and controls, was applied immediately after surgery. Convalescence was uneventful and the patient was discharged 22 days after surgery, at which time he was capable of controlling the elbow

Fig. 3. Metastatic lesion of right radius resulting from hypernephroma.

and terminal device in a relatively satisfactory manner. He was fitted with a permanent prosthesis 60 days after the surgical procedure.

4. F.M. is a 57-year-old male who sustained a severe sideswipe injury to the left upper extremity,

with multiple fractures and extensive arterial and nerve injuries. After approximately nine months and many surgical procedures, the patient was left with a functionless and nearly anaesthetic extremity. An above-elbow amputation was carried out by conventional means, with immediate fitting of the temporary socket. The postoperative course was uneventful. Harness and controls were added one week postoperative. Upon discharge four weeks after surgery, the patient was using the terminal device and elbow lock in a satisfactory manner.

DISCUSSION

The absence of severe peripheral vascular disease in the upper extremities appears to increase the possibility of successful immediate postsurgical prosthetics fitting even above that seen in the lower extremities. Since weight-bearing is not a factor, the possibility of stump damage as a result of excessive pressures is minimized. In all four cases reported in this article, primary healing took place and there were no complications. Phantom pain was not encountered in any instance. The four patients were fitted with plaster temporary prostheses with conventional harness and controls and were instructed to operate the terminal device as early as the first postoperative day. The two wrist-disarticulation patients were allowed to move their elbows freely, and the two above-elbow patients were encouraged to move their shoulders as freely as possible. The psychological advantage of early rehabilitation has been apparent. Immediate postsurgical prosthetics fitting of the upper-extremity amputee appears to have significant advantages.

LITERATURE CITED

1. Berlemont, M., Notre experience de I'appareillage precoce des ampules des membres inferieurs aux Etablissements Helio-Marins de Berck, Annales de Medecine Physique, Tome IV, No. 4, Oct.-Nov.-Dec, 1961.
2. Berlemont, M., L'appareillage des ampulis des membres inferieurs sur le table d'operations, paper given at the International Congress of Physical Medicine, Paris, 1964.
3. Burgess, Ernest M., Joseph E. Traub, and A. Bennett Wilson, Jr., Management of lower-extremity amputees using immediate postsurgical Jilting techniques. Prosthetic and Sensory Aids Service, U.S. Veterans Administration. 1967.
4. Weiss, Marian, Neurological implications of fitting artificial limbs immediately after amputation surgery, Report of Workshop Panel on Lower-Extremity Prosthetics Fitting, Committee on Prosthetics Research and Development, National Academy of Sciences, February 1966.
5. Wilson, A. Bennett, Jr., New concepts in the management of lower-extremity amputees, Artif. Limbs, Spring 1967, pp. 47-50.