

A Plastic Tenodesis Splint*

Preliminary Evaluation of a Functional Brace for a Paralyzed Hand With Effective Wrist Extensors

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A paralyzed hand with some power in the wrist can be made functional by stabilizing the proximal and distal interphalangeal joints of the index and long fingers and the joints of the thumb in the position of function so that the fingers, when flexed at their metacarpophalangeal joints, meet the abducted and partially opposed thumb. The fingers, of course, must be

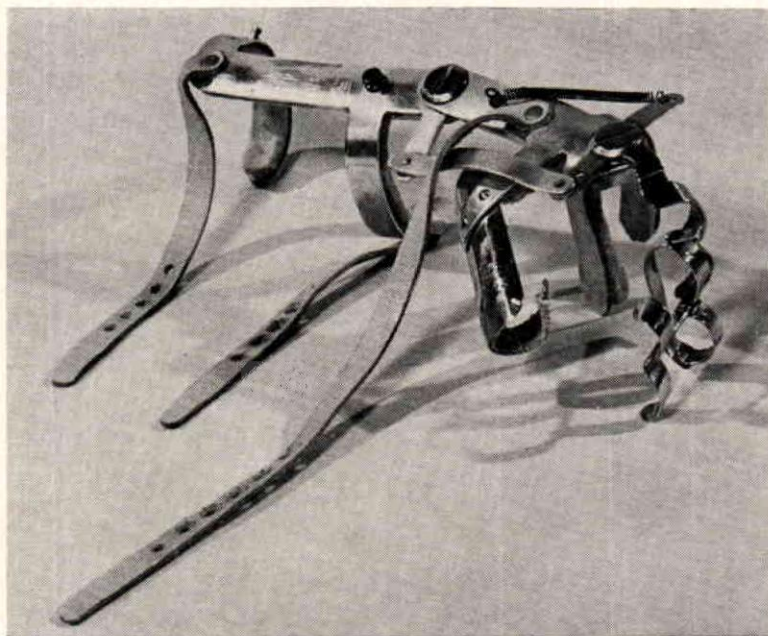


FIGURE 1

Flexor-hinge splint developed at Rancho Los Amigos, Downey, California.

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made to flex toward the thumb by some connecting device or tendon that extends from the fingers past the mobile wrist joint to some anchor point on the forearm.

In the conventional metal tenodesis brace, the flexor-hinge splint, the fingers are pulled toward the thumb by a connecting lever arm, which is attached to steel finger rings and extends past the wrist to be attached to the side of the forearm brace (Fig. 1). There are four joints in this type of device. When the patient extends his wrist, a three-jaw-chuck type of finger flexion occurs.² This brace must be custom-fitted by an experienced orthotist, since the fit of the finger rings is critical. For patients who have anesthetic hands, as in quadriplegia, the pressure of these rings can cause pressure sores when the patients attempt to wear the device for extended periods.

The weight of the splint, although only about four ounces, may tire the marginally functional wrist extensors of some quadriplegic patients and this, together with the resistance offered by the joints in the splint, may prevent movement. The splint is also difficult for patients to apply and, in our experience, its appearance is difficult for some patients to accept.

TABLE I
Patient's Reaction to Characteristics of the Splint

Characteristics	Satisfied (No. of Patients)	Indifferent or No Answer (No. of Patients)	Dissatisfied (No. of Patients)
Weight	25	5	0
Pinch or three-jaw-chuck grasp	24	5	1
Ease of application.....	23	5	2
Appearance	22	7	1
Fit	21	5	4
Washability	21	5	4
Size of finger opening.....	18	5	7

TABLE II
Results of Pinch-Meter Test on Seven Patients

Case No.	Muscle Grade	Three-Jaw Pinch with- out Splint (Ounces)	Three-Jaw Pinch with Splint (Ounces)	Gain (Ounces)
1	Fair plus	7	17	10
2	Fair plus	13	24	11
3	Fair plus	10	23	13
4	Good minus	5	22	17
5	Good minus	11	32	21
6	Good plus	8	128	120
7	Good plus	14	112	98

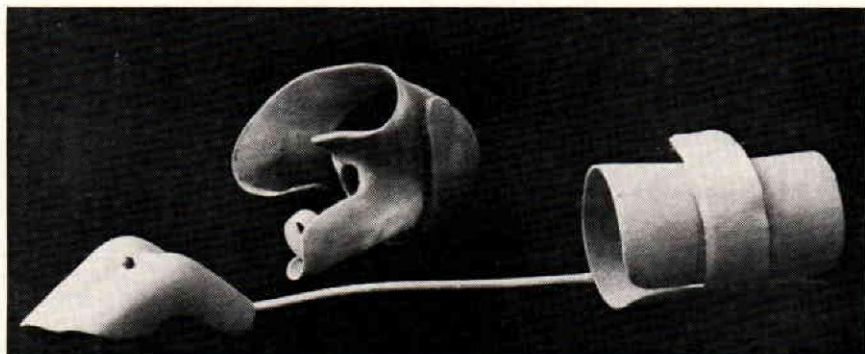


FIGURE 2

The R.I.C. plastic tenodesis splint showing the finger shell, thumb post, and wrist cuff.

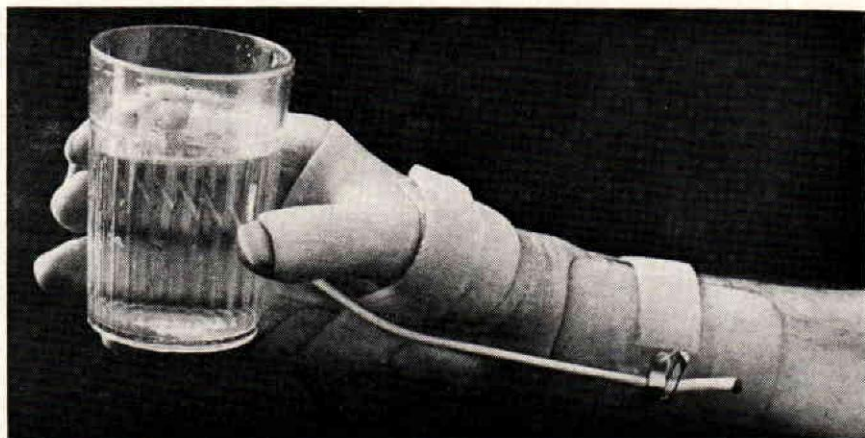


FIGURE 3

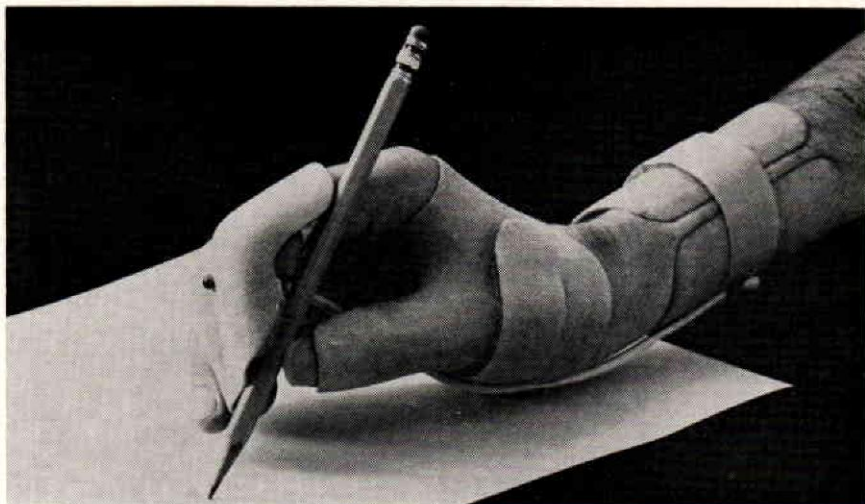


FIGURE 4

Figs. 3 and 4: Writing and holding a glass with the R.I.C. plastic tenodesis splint.

