

IMMEDIATE POSTOPERATIVE APPLICATION OF UPPER-LIMB ORTHOSES

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At the Richmond Veterans Administration Hospital in Virginia, considerable efforts have been directed by our upper-limb treatment group toward rehabilitation of spinal-cord-injured patients. Our group combines the skills of orthotists, physical therapists, occupational therapists, physiatrists, and hand surgeons as well as the salutary effect of students from each of these disciplines.

In 1971 we received funds for the purpose of developing orthoses which might be useful in speeding the treatment process and improving the results of treatment in our tetraplegic patients. Eventually the techniques learned and the need for a similar approach to patients with other diagnoses have led us to study other applications of the principle of immediate postoperative application of upper-limb orthoses.

Briefly, our rationale for immediate postoperative application of upper-limb orthoses is based upon the following assumptions:

1. A proper orthosis can be a more discriminatory method of immobilization than a postoperative cast.
2. An orthosis can be designed so as to allow motion at joints within a given plane of motion and within a given range of motion.
3. An orthosis can be adjusted more precisely and perhaps more easily than a postoperative cast.

Using a combination of available materials, other people's ideas, and our own ideas, we have been successful in demonstrating that our original assumptions were correct. Not only are they correct, but they can be usefully applied where the orthotist is skilled and the goals of design for the orthosis are understood by other members of the team who are treating the patient.

Since we began the development phase of our work, 24 entirely different developmental orthoses have been applied to 24 upper limbs. Each patient presented to the team a problem or a combination of problems requiring specific but differing design requirements from others we had treated. The tetraplegic or rheumatoid patient, as examples, display variable postural and mechanical problems which almost defy classification.

Our plan for care is as follows:

1. The patient is evaluated at a multidisciplinary clinic. If an orthosis is required for treatment, the prescription is written. If surgical reconstruction is decided upon and we feel that bracing will be useful, a prescription for an immediate application-type orthosis is considered. If the immediate fitting orthosis has application in this patient the next stage is entered.

2. Fabrication of the orthosis with the usual felt padding is accomplished, and the necessary fitting and adjustments are done. Then the felt is removed so that the orthosis can be applied over dressings after surgery and will not be too bulky.

3. The orthosis itself is taken to surgery where it may or may not be autoclaved. Sterilization is done where the orthosis is applied as an integral part of the dressing.

4. Dressing changes after surgery are facilitated in many cases where an orthosis is included. Also, the patient is allowed early motion within the design capabilities of the orthosis as dictated by the goals of surgery.

5. Finally, at the time when dressings are completely removed, the felt padding for the orthosis is applied and therapeutic exercises can continue without interruption.

We have not had enough patient experience to allow us to conclude that the total rehabilitation time requirement has been reduced.

There are some positive benefits that we have observed and are worthy of listing.

1. Patients have accepted this approach, and the enthusiasm and attention of the team has been useful in rehabilitation.

2. More precise control of joints has been accomplished. Where immobilization, support, or mobilization of specific joints has been the design goal, the results have been better than with casts.

3. Wound healing has not been interfered with.

4. Joint stiffness has been less of a problem where early controlled motion is made possible by the orthosis or where specific joint immobilization is accomplished and uninvolved joints can be given freedom to move or be exercised.

Some of the indications where we have applied the principle of immediate postoperative fitting of an orthosis include: tendon repair, tendon transfers, tendon tenodesis, joint fusion, arthroplasty, arthrodesis, synovectomy, capsulotomy, and burn reconstruction (BPR's 10-16, p. 246; 10-17, p. 244; 10-18, pp. 267-269; and 10-20, p. 239).