



# Newsletter



## Prosthetics and Orthotics Clinic

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We apologize for the delay in the publication of the Newsletter which was a result of the disruption caused by the move of the National Office and the complete changeover of the personnel in the Publications Office.

## Irreversible Contractures: An Impediment to Prosthetic Rehabilitation

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Prosthetic rehabilitation of patients with severe contractures of the remaining joints of the affected lower extremity has been generally viewed as being difficult due to biomechanical problems in fitting, increased energy costs of ambulation and poor cosmesis of the prosthesis. As a result, attempts are often made to "stretch out the contracture" with minimal success, or suggestions are made to the patient to remain in the wheelchair. Our experiences with a number of patients who presented with "irreversible" contractures, indicate that another choice may be available.

In 1965(1) we reported our experience in the management of a 59 year old man who had undergone bilateral amputations (BK and AK). Following a herniorrhaphy, he developed occlusions of both iliac arteries and despite attempts to reconstruct the vascular supply, he developed gangrene necessitating the amputations. When he was examined by us, he presented with bilateral hip flexion contractures of about 60° and a knee flexion contracture on the BK side of 90°. In addition, there was limited mobility of the lumbar spine. Primarily because the patient refused our recommendation for wheelchair independence, pylons were constructed. For the left, a bent knee pylon was fabricated and for the right the device was built to hold the stump in about 50° hip flexion with weight bearing on the posterior thigh. Since the patient demonstrated that this solution was a realistic one, prosthetic devices incorporating the features of the pylons were made. When the patient was discharged, he was able to ambulate with the aid of Lofstrand crutches.

The patient was re-examined periodically, and *after about 2 years* it was noted that the contractures had decreased to a point where he was able to wear a PTB prosthesis on the left and a conventionally aligned AK quadrilateral socket prosthesis on the right.

Lippman(2) described his observations of a 72 year old man who lost his right leg as a result of trauma, complicated by a long history of arteriosclerosis obliterans. Because of a 40° hip flexion contracture, his prosthetic treatment followed the course outlined above.

In our prosthetics clinic (Bronx Municipal Hospital Center), we have seen a number of patients who had undergone below knee amputations and presented with severe knee flexion-hip flexion contractures to a degree which precluded fitting with a standard PTB or condylar bearing prosthesis. We have frequently fitted them with bent knee pylons followed by a similar prosthetic device after they had demonstrated their ability to function with the temporary device. On follow-up we again noted reduction of the "irreversible" contractures to the point where a more conventionally aligned prosthesis could be prescribed.

### Discussion

Delagi and co-workers(3) (1955) as well as Blau, *et. al*(4) (1951) reported their impressions of the benefits of ambulation with a temporary device. Both emphasized the stretching effect of early ambulation. In the devices described in this article, however, stretching has been purposely minimized because the contractures were believed to be "irreversible." Despite the lack of

active stretching, the contractures were relieved to a considerable degree.

Partridge and Duthie (1963)(5) reviewed the literature describing the effect of immobilization on acutely inflamed rheumatoid joints and cite Hunter (1835) "nothing can promote contraction(s) of a joint so much as motion before the disease is removed." Hunter's observations were confirmed by Thomas (1878), Duthie (1951, 1952) and Partridge and Duthie. Harris and Copp(6) (1962) immobilized acutely inflamed knee joints, keeping one completely immobilized and the other being exercised intermittently. They noted that when the fixed knee lost more than 15° of motion, the mobile knee also lost range, thereby suggesting that some factors other than immobility might be a contributing factor. In their opinion immobilization produced a decrease in muscle spasm, thus permitting restoration of motion.

Fried (1969)(7) concurs "complete immobilization is not only *not* harmful but frequently beneficial, provided that splinting is done judiciously, especially when a joint is inflamed and painful." Under those conditions when patients are likely to dread motion, immobilization leads to decreased pain and inflammation and "it is not unusual for immobilization to result in increase in motion."

It seems that those amputees who experience considerable pain pre-operatively or in the immediate post-operative period, might react with a response similar to that described above and when pain is relieved, inhibition, spasm or another mechanism is decreased and motion can be restored.

In addition, it appears that the judgment of "irreversible contractures" may be applied too quickly. Patients are treated for a finite period of time and if during that period no appreciable change is observed, a decision must be made based on demonstrable facts.

It can, therefore, be concluded that for some patients

interim solutions as outlined may be appropriate and that the clinic staff must accept the responsibility for regular, periodic and long term follow-up of patients in order to facilitate accommodation to changes in the patient's condition.

#### References

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2. Lippmann, Heinz I., "Rehabilitation of the Lower Extremity Amputee with Marked Flexion Contractures: Report of Two Cases." *Archives of Physical Medicine and Rehabilitation*, Vol. 48:3, 147-149, March, 1967.
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4. Blau, Leslie, Phillips, Joseph J. and Rose, Donald M., "Value of the Pylon in Pre-prosthetic Management of the Lower Extremity Amputee." *Archives of Physical Medicine and Rehabilitation*, Vol. 32: 585-589, 1951.
5. Partridge, R. E. H. and Duthie, J. J. R., "Controlled Trial of the Effect of Complete Immobilization of the Joints in Rheumatoid Arthritis." *Ann. Rheum. Dis.*, 22: 91, 1963.
6. Harris, R. and Copp, E. P., "Immobilization of the Knee Joint in Rheumatoid Arthritis." *Ann. Rheum. Dis.*, 21: 353, 1962.
7. Fried, David M., "Splints for Arthritis." *Arthritis and Physical Medicine*, S. Licht (edit.), 1969, pp 285-314.

## Meetings and Seminars

1981, January 27-February 1, AAOP Round Up Seminar, Fontainebleau Hilton, Miami, Florida.

1981, April 23-25, Region IV Annual Meeting, Hyatt Regency, Lexington, Kentucky.

1981, June 5-7, AOPA Region IX and the California Orthotics and Prosthetics Combined Annual Meeting, Doubletree Inn, Monterey, California.

1981, June 12-14, AOPA Region II and III Meeting, Host Farms, Pennsylvania.

1981, June 16-21, AOPA Regions VII, VIII, X, XI Combined Meeting, Four Seasons Motor Inn, Colorado Springs, Colorado.

1981, June 25-27, AOPA Region VI and Midwest Chapter of AAOP Annual Meeting, at the Holiday Inn of Merrillville, Indiana.

1981, October 27-November 1, AOPA National Assembly, Sahara Hotel, Las Vegas, Nevada.

1982, May 6-9, Region IV Meeting, Radisson Plaza Hotel, Nashville, Tennessee.

1982, May 13-16, Region II and III Meeting, Caesar's World, Atlantic City, N.J.

1982, April 29-May 2, AOPA Regions VII and VIII, Combined Meeting, Alamada Plaza, Kansas City (Tentative).

