

Prosthetic Rehabilitation After Hemipelvectomy

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In a recent follow-up study of ten years experience in rehabilitation of patients who had had an hemipelvectomy, it was pointed out that in our experience the Canadian type prosthesis was most successful.¹ As this report dealt primarily with end results of surgery, it was thought worthwhile to elaborate a little on prosthetic rehabilitation and report a few additional cases.

First of all let us review the end results of the reported cases. It was found that the first case had survived ten years since her operation at age 27 without evidence of recurrence. This was the longest follow-up in the series. The pathological diagnosis was chondrosarcoma. The same diagnosis was found in six other patients.

There were three patients who had fibrosarcomas without recurrences. Two of the patients who had chondrosarcoma had metastases which were under treatment either by surgery or chemicals. These metastases occurred in the first two years after surgery.

The first four patients of our series who came to the Clinic between the years 1952 and 1956 were first fitted to a tilting-table type of prosthesis which was the only one available to us for prescription as that time. From that date on during the next seven years all patients received a prosthesis which is known as a Canadian type hemipelvectomy prosthesis. Three of the patients who first received the tilting-table prosthesis were later changed to the Canadian type. Each one of these benefited greatly by the use of this newer type of artificial limb.

The following points were commonly observed. First of all the limb was lighter weight and was more comfortable both to sit in as well as to use when walking. Secondly, we have noted that it is easier to keep clean and cooler in the summertime. Our poorest results have been in treating ladies whose occupation is sedentary in type and who do not like to use the limb to sit in all day. For example, one librarian fails to use her limb although this particular individual never had a Canadian type prosthesis. Another individual works as a seamstress but doesn't use her prosthesis when working. She also has a tilting-table type of limb.

The occupations of those using the limb include a barber who uses his limb only to move about from place to place but sits without his limb on a special chair while cutting hair. Other men using the limb at work include a night watchman and a shoe factory worker. One young man is going to college and uses his limb constantly. Another man uses his limb occasionally, not wearing it at his job as a traveling salesman. Another wearer is still looking for work with the help of the Massachusetts Rehabilitation Commission. One is still in vocational training and using his limb.

¹ Watkins, A. L.; Rehabilitation after Hemipelvectomy, J.A.M.A., 181: 793, 1962.

Three additional patients have recently been seen, all of whom are learning to use their limb except one who has had a recurrence of infection, the operation being for osteomyelitis. He is temporarily in the hospital.

A single case received a saucer type prosthesis for hip disarticulation. She learned to walk with crutches and returned to school, but had an awkward gait.

The amount of training required is dependent upon natural ability, coordination and balance. The extremes vary from a single day of instruction to as long as three to four weeks in a Rehabilitation Clinic. The factor of utmost importance in the use of the limb is the proper manufacture and fitting of the prosthesis for comfort.

Manufacture of the Limb

After consultation with local limb manufacturers it was found that the publication used for reference by the manufacturers is the Autumn 1957 issue of *Artificial Limbs*, sponsored by the Prosthetics Research Board of the National Academy of Sciences, National Research Council. The various details of biomechanics and construction are utilized as indicated in these detailed and illustrated articles, with the prosthetist using his judgment as to the height and extent of the corset around the waist.

As the limb is made from a direct mold of the subject, an excellent fit is possible using a plastic laminated socket and waist band with minimal soft padding as necessary. In general, special alterations have not been necessary nor have we had particular difficulty with sensitive wound areas once healing has been complete. We accordingly do not recommend fitting of the limb until there is sound healing of all soft structures involved in the stump.

An occasional case has felt the need of a manual hip and knee lock although this is most unusual and represents an idiosyncrasy on the part of the patient rather than a necessity or limitation of the prosthesis. The proper alignment of the hip and knee joint is posterior, thus allowing automatic locking after a few periods of training. A shoulder harness is occasionally added for support.

There has been considerable variability as to the amount of padding which is used by individuals. Some require specially woven woolen stump socks for protection of the weight bearing areas of the stump. Most patients have sufficient protection simply by sewing up a short leg of the underpants.

Summary and Conclusions

Experience has shown that the Canadian type prosthesis for hemipelvectomy, when constructed as recommended by the Committee on Prosthetics Research and Development of the National Academy of Sciences, is the best available. Most patients after a short period of training are able to wear the limb all day and do so except for prolonged sedentary occupations. End results are reported.