

## HEMIPELVECTOMY

### *Postoperative Rehabilitation Assessed on the Basis of 41 Cases*

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Rehabilitation was evaluated on the basis of 41 consecutive hemipelvectomies for malignant tumours. Owing to early metastasization and death, 11 patients were not supplied with prostheses, while prosthetic fitting was attempted in the remaining 30. Of this number, 27 completed prosthetic training, with the result that 15 used their prosthesis, while 12 discarded it after some time, six because of poor general health owing to recurrence of the tumours and six because they felt that the prosthesis was too heavy and difficult to wear. Twenty-three returned to work. After elimination of the most severely tumour-affected patients, there were 19 one-year survivors without recurrence. Thirteen of them were using their prosthesis every day, and thirteen had gone back to work. Serious mental sequelae were found in five patients, including four with long-lasting exogenous depressions and one with anxiety neurosis.

*Key words:* hemipelvectomy; malignant tumours; prosthesis fitting; rehabilitation

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Hemipelvectomy has been well described with respect to indications, surgical technique, and survival (Gordon-Taylor et al. 1952, Pack & Miller 1964, Ravitch & Wilson 1964, Higinbothom et al. 1966, Miller 1974). On the other hand, the literature published so far has done little to elucidate the course of postoperative rehabilitation, and the results given have not been consistent. Rather poor results were obtained by Lewis & Bickel (1957) who could report only two users of the prosthesis among 25 survivors, by Higinbothom et al. (1966) with 24 users among 60 survivors, and by Douglas et al. (1975) who concluded, on the basis of 50 hemipelvectomies, that the prosthesis was cosmetic rather than functional and that it

was accepted by only a few patients. Better results were found by Miller (1959) who had 22 users out of 32 hemipelvectomized patients and the same number working, and by Watkins (1962) who had 8 users among 10 survivors and 6 back in employment.

On this basis we felt it would be of interest to investigate the rehabilitation of hemipelvectomized patients, including especially their use of the prosthesis and their occupational rehabilitation.

### PATIENTS

In the Department of Orthopaedic Surgery U, Rigshospitalet, and Department I, Orthopaedic Hospital, Copenhagen, 41 patients were subjected

Table 1. *Histological classification*

Type of tumour	No. of cases
Osteogenic sarcoma	12
Chondrosarcoma	8
Osteoclastoma	3
Fibrosarcoma	6
Neurofibrosarcoma	3
Rhabdomyosarcoma	2
Synovial sarcoma	2
Myxosarcoma	3
Anaplastic sarcoma	1
Metastasis from cervical adenocarcinoma	1
Total	41

to hemipelvectomy during the period 1952 to 1976. Twenty-five of these operations were carried out during the period 1967–1976, a decade during which this treatment was centralized in these hospitals and they served an area with a population of about 2.5 million. This corresponds to a frequency of hemipelvectomy of 1 in 1 million of the population *per annum*. The sex ratio was 19 males and 22 females, age range 7 weeks to 79 years, mean 42 years. The indication was pelvic or juxtapelvic malignant tumours, including tumours of the upper part of the thigh. Table 1 lists the histological classification of the tumours.

The surgical technique was that recommended by King & Steelquist (1943), but often had to be modified in accordance with the regional extent of the tumour. In 29 patients it was possible to preserve the gluteal muscles. At the time of surgery 35 operations were considered radical, while in 6 macroscopic tumour tissue had to be left behind. No patient died during the operation or during the first postoperative month.

As for primary postoperative complications there were 13 cases of wound infection, 11 of cutaneous necrosis, 3 of transient sphincter disturbances, and 21 patients had phantom pain requiring analgesic medication. In 18, however, the pain disappeared, completely or partially, within 3 months, but 3 patients went on having pain of a more permanent nature.

After the operation all patients were followed regularly until death or until the present status (March 1977). For the survivors the follow-up period from the time of the operation averaged 6½ years, ranging from 6 months to 19 years 6 months; for the deceased patients 20 months, ranging from 2 months to 7 years. Local recurrence occurred in 9 patients 2 months to 3 years 6 months (mean 13 months) after the operation, and pulmonary metastases developed in 11

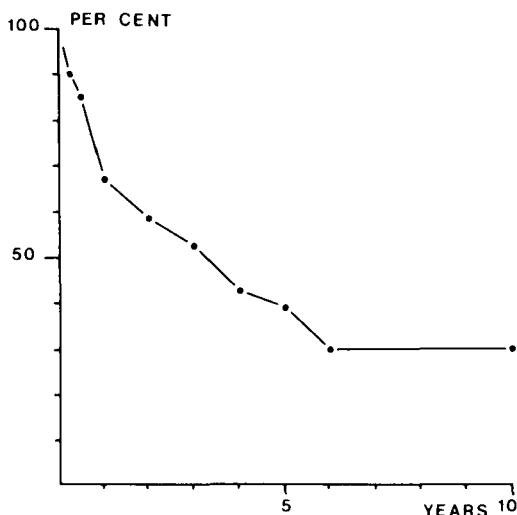


Figure 1. *Survival among the 41 hemipelvectomy patients during the first decade, calculated from the operation. Survival computed according to the standard life table method.*

patients from 0 months to 3 years 6 months (mean 9 months) after the operation. At the time of the present analysis 16 were alive and 25 had died – 22 from the tumour and 3 from other causes. Figure 1 illustrates the survival.

## REHABILITATION

In principle, an attempt was made to fit all the patients with a prosthesis. However, the course after operation was to a great extent influenced by the underlying malignant disease, many patients developing metastases and succumbing within the first year (Figure 1). Therefore, no prosthesis was made for 11 patients. The first 6 of the remaining 30 patients were primarily supplied with a hemipelvectomy prosthesis with leather bucket-type socket and hip lock, whereas the remaining 24 were primarily supplied with the Canadian hip exarticulation prosthesis modified for hemipelvectomy (Hampton 1964, McQuirk 1969). Three of the 30 patients for whom a prosthesis had been made were unable to carry through the training programme, two of them because of early metastasization and one because of severe

depression. Of the remaining 27 fitted with a prosthesis, 12 later discarded it, 6 because of poor general health due to recurrence and 6 because of fitting problems or because they felt the prosthesis was too heavy and difficult to wear. Thus, only 15 patients wore their prostheses regularly up until the time of analysis or until they died.

Occupational rehabilitation too was influenced by the underlying malignant disease. Nine died before rehabilitation, 23 went back to work, and 9 were awarded disablement pension.

Eight patients had mental problems in the form of anxiety neurosis or depression. In five

of them the mental trouble was long-lasting. Thus, four women aged 50–53 had episodes of depression requiring treatment and lasting for 1 year or longer. One of them committed suicide 6 years 6 months after the operation. A 35-year-old man had long-lasting anxiety neurosis which led to morphine addiction.

By considering only patients who survived without recurrence for 1 year or longer, thus leaving out the most malignant cases, a better basis for assessing the consequences of hemipelvectomy as such is obtained. For this assessment we have 19 patients whose use of the prosthesis and occupational rehabilitation are shown in Table 2. It will be seen that 13

*Table 2. Prosthetic and rehabilitation status of patients surviving without recurrence for 1 year or longer after hemipelvectomy*

Case no.	Sex	Age at op.	Occupation before	Occupation after	Using prosthesis
1	F	23	clerk	clerk (part-time)	daily
2	F	49	shop assistant	shop assistant (part-time)	daily
3	M	42	teacher	teacher (full-time)	never
4	M	12	schoolboy	bicycle mechanic (full-time)	daily
5	M	26	electrician	radio mechanic (full-time)	daily
6	M	35	shopkeeper	shop assistant (full-time)	daily
10	M	19	bricklayer's apprentice	engineer (full-time)	daily
13	F	68	old-age pensioner	old-age pensioner	daily
14	F	53	shop assistant	clerk (part-time)	daily
15	M	7 wks.	—	—	daily
17	F	50	housewife	disablement pensioner	never
23	F	52	housewife	disablement pensioner	never
27	F	53	housekeeper	disablement pensioner	never
30	M	57	civil servant	disablement pensioner	never
35	M	30	ship builder	optical draughtsman (full-time)	never
36	F	55	music teacher	music teacher (full-time)	daily
37	M	37	counterman	clerk (full-time)	daily
38	M	39	clerk	clerk (full-time)	daily
40	F	49	housewife	housewife (full-time)	daily

were using their prosthesis daily and 6 not at all. It is apparent also that out of 17 who had been working prior to the operation only 9 had been able to go back to full-time work, while 4 were working part-time and 4 had been awarded disablement pension. One of these 19 patients (Case 1 in Table 2) had been through a normal pregnancy and had a normal delivery 18 months after the operation.

## DISCUSSION

Like Murdoch (1969), we found a frequency of hemipelvectomy of 1 in 1 million of the population *per annum*. The operation is indicated almost exclusively for malignant tumours, most often sarcomas. Therefore, the postoperative course is in general characterized far more by the underlying malignant disease than by the surgical procedure as such. This makes it difficult to assess the consequences of hemipelvectomy for the patients' rehabilitation and explains the large number of patients not supplied with prostheses and not rehabilitated, also in recent publications (Higinbotham et al. 1966, Hogshead 1971, Wittig & Wirbatz 1971, Jones 1974). It also explains the tendency of many surgeons to consider the problems relating to the rehabilitation of hemipelvectomy patients as being fairly subordinate and in all essentials solved.

However, our findings — that among tumour-free 1-year survivors about one-third of those supplied with a prosthesis later give up using it (Table 2) — reflects the appreciable difficulties involved in the wearing of a hemipelvectomy prosthesis, as a rule because the patients feel it is too heavy and unwieldy and occasionally because of fitting problems. The latter applies particularly to patients whose body weight fluctuates.

Our material also illustrates the problems in occupational rehabilitation. Half the tumour-free survivors had been unable to go back to full-time work (Table 2). Mental

sequelae were somewhat more common and more severe in women. Like Enneking (1966), we believe that the cosmetic result of the mutilating procedure is of more concern to women than to men.

Thus, rehabilitation of hemipelvectomy patients is still a process in which there are many losers, and thereby a process which constitutes a challenge, not only to the patients and their relatives, but also to the therapeutic team in charge of prosthesis fitting, training, and occupational rehabilitation.

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