

A FIVE-YEAR REVIEW OF AMPUTEES AND PROBLEMS IN REHABILITATION IN SINGAPORE

By Tan Eng Seng

SYNOPSIS

This is a five year retrospective study (from 1970 to 1974) on amputees above the level of the wrist and ankle seen in the three main Government Hospitals. Some of the problems in rehabilitating them are noted. During this period of study Singapore had an average population of 2.15 million. Upper limb amputations were rare (3.1%) and the commonest level of lower limb amputation was the below-knee type (54.3%). The racial distribution of the amputees corresponded closely to the actual ratio of the racial groups in Singapore. The commonest indication for amputation was occlusive peripheral vascular disease.

INTRODUCTION

A retrospective study of all major limb amputations performed in the three main Singapore Government Hospitals (namely the Singapore General Hospital, the Toa Payoh Hospital and the Alexandra Hospital) from the year 1970 to 1974 was carried out. Some of the problems encountered at the Amputee Clinics in the Singapore General Hospital and the Department of Rehabilitation Medicine at the Tan Tock Seng Hospital have been reviewed.

MATERIALS AND METHOD

As most major limb amputations were carried out in these three Singapore hospitals, it may be said that this review is one that covers the whole Republic. Minor amputations below the level of the wrist and ankle are excluded in this study as they seldom pose problems in prosthetic fitting and rehabilitation. Informations on amputees were obtained from operation records and case notes of the two Orthopaedic Departments in the Singapore General Hospital and of the Surgical Units in the Toa Payoh and the Alexandra Hospitals.

DISCUSSION

Frequency of Amputation

There were a total of 668 such amputations performed during this five year period. This gives an average of 134 amputations per year, an incidence of

6 per 100,000. This figure is on the increase as is shown by the fact that in 1970 there were only 105 cases but in 1974 this figure went up to 177 (see Table I).

Site of Amputation

As shown in Table II, upper limb amputations were rare and accounted for only 3.1% of the total. Among the lower limb amputees the commonest level of amputation was below-knee (54.3%) followed by above-knee (30%). No hind-quarter amputation was performed during this period though this operation has been successfully carried out on two patients prior to 1970.

Race and Sex Distribution of Amputees

The race distribution of amputees corresponds closely to the ratio of the various ethnic groups in Singapore. (See Table III). Male amputees accounted for 60% of the total.

Age Distribution of Amputees

In Fig. 1 which shows two graphs on age distribution of amputees, we will notice that for the lower limb graph there are two peaks; the lower peak indicates highest incidence of amputation amongst the young occurs between 11 to 20 years and the taller peak shows the commonest age group among the older amputees is between 61 and 65. 43.1% of all the amputees were above the age of 60. This is because the diseases that afflicted this age group often lead to peripheral vascular occlusion which is the major indication for limb amputation in this study.

Indications for Amputation

Tables VA and VB show the indications for amputation. 82.2% of the cases reviewed suffered from organic diseases which invariably lead to peripheral vascular occlusion. Amongst the organic

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This article was presented at the Fifth Pan Pacific Conference of the International Society for the Rehabilitation of the Disabled held in Singapore in November, 1975.

TABLE I
ANNUAL TOTAL NUMBER OF AMPUTATIONS

Year	Total No. of Amputations
1970	105
1971	135
1972	120
1973	130
1974	177

TABLE II
SITE OF AMPUTATION

Level of Amputation	No.	Percentage
Upper Limb		
Forequarter	2	0.3
Shoulder Disarticulation	4	0.6
Above Elbow	8	1.2
Through Elbow	2	0.3
Below Elbow	5	0.7
Through Wrist	1	0.1
Lower Limb		
Hind Quarter	—	—
Hip Disarticulation	15	2.3
Above Knee	200	30.0
Through Knee	51	7.6
Below Knee	363	54.3
Symes	17	2.6

TABLE III
RACE DISTRIBUTION OF AMPUTEES

Ethnic Groups	No.	Percentage
Chinese	485	72.6
Malays	86	12.8
Indians	85	12.8
Eurasians	12	1.8

(Malays include Indonesians; Indians include Pakistanis and Ceylonese).

diseases listed in Table VB Diabetes Mellitus was present in 50.45% of all the amputees, and this fact makes one wonder whether the present regimes of treatment of this disease ever help in delaying the degenerative process or arteriosclerosis occurring in blood vessels. Moreover, out of the eleven cases with bilateral amputations, seven suffered from Diabetes Mellitus which indicates that this degenerative process occurring in blood vessels is generalised rather than localised. Once the blood supply to the limbs is disturbed, gangrene or indolent ulcers develop quickly from the slightest injury to the skin and ablative surgery has to be resorted to in most cases.

Surprisingly, trauma through industrial or road traffic accidents was low (8.2%) as compared to other developed countries.

AGE DISTRIBUTION OF AMPUTEES (1970 -1974)

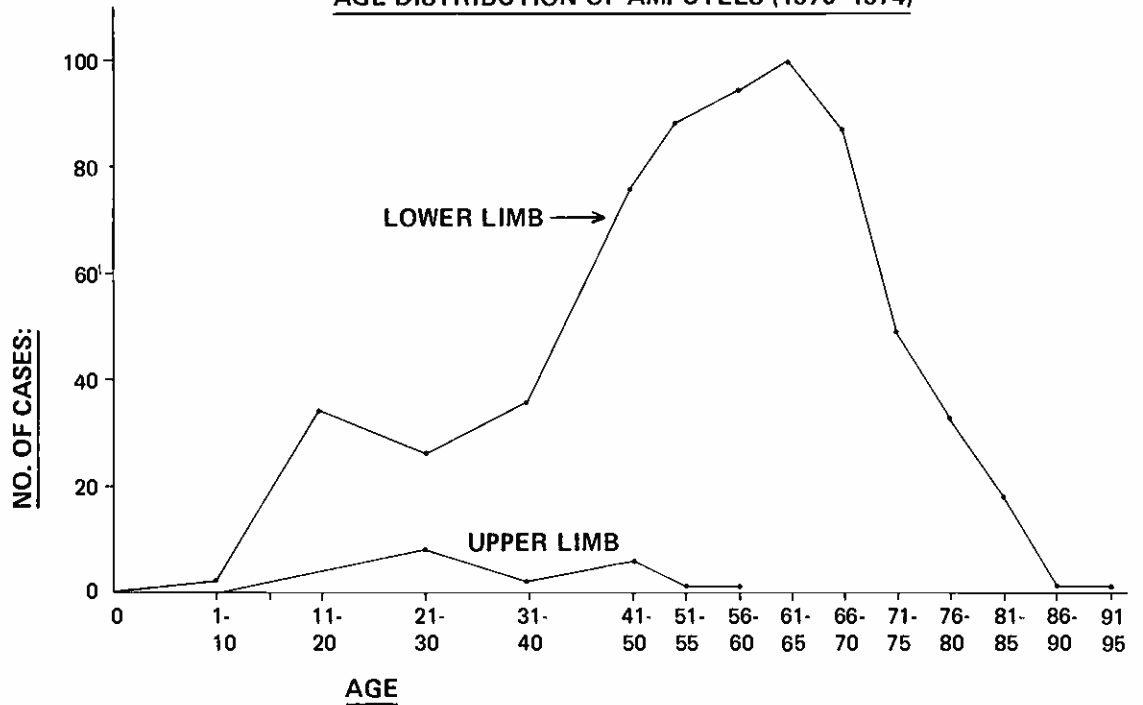


Fig. 1.

PROBLEMS IN REHABILITATION

Most amputees are followed up weekly at the amputee clinics of the two orthopaedic departments at the Singapore General Hospital, and since the opening of the Department of Rehabilitation Medicine at the Tan Tock Seng Hospital, problem cases are being referred there for proper gait training. For the past two years (March 1973 to March 1975) only 36 cases have undergone training at this Department. Some of the problems encountered in amputee training and rehabilitation are listed below:

1. The absence of a qualified, experienced prosthetist in the Government Service: In the past we had one prosthetist who left for private practice more than five years ago and since then there has been no replacement.
2. Overloading of work at the Artificial Limb Centre (Table VI): This centre, situated at the Singapore General Hospital at Outram Road, not only caters for limb making but also serves as a centre for making orthopaedic appliances such as corsets, jackets, collars and splints, in addition to lending out and repairing wheelchairs. Yet there are only three limb makers, three metal workers, two leather workers, and two plastic and corset makers. The average monthly orders received for the various appliances are 17 artificial limbs, 53 splints, 60 corsets, jackets and collars and 48 pairs of surgical boots and in-sole supports. Because of this work-
- load, delivery of orders is usually delayed and quality of products often below standard.
3. Age of amputees: As mentioned before, 43.1% of our amputees were above the age of sixty, and because most of them suffered from Diabetes Mellitus, the added problems of wound healing of the stumps and general debility due to advancing age, contribute to the delay in limb fitting and prolong the period of gait training of these amputees.
4. Lack of expertise in stump bandaging among the nursing staff often fails to reduce the oedema of stumps and this leads to delay in limb measurement and fitting. Efforts have been made to teach the staff the correct method of stump bandaging.
5. The referral of amputees for prosthetic measurement before the stumps have adequately shrunk and before any contractures, if present, have been corrected often leads to unsatisfactory fittings later on.
6. Bed shortage at the Department of Rehabilitation Medicine prevents the ideal situation whereby all amputees can be transferred to it for training as early as possible. Outpatient training of amputees in Singapore is not possible in most cases partly because of transport problems and partly because most

TABLE VA
INDICATIONS FOR AMPUTATION
(1970 - 1974)

Indications	Number of Cases	Percentage
Trauma	55	8.2
Diseases	548	82.2
Tumours	63	9.5
Congenital Malformation	2	0.3

TABLE VB
TYPES OF DISEASES

Diseases	Number of Cases	Percentage
Diabetes Mellitus	337	50.45
Hansen's Disease	15	2.25
Burger's Disease	11	1.65
Other Occlusive Peripheral Vascular Diseases	185	27.69

TABLE VI
(A) ANNUAL FIGURES OF CASES REFERRED TO
ARTIFICIAL LIMB CENTRE FOR PYLONS/PROSTHESES

Level	1970		1971		1972		1973		1974	
	Pylon	Prosthesis	Pylon	Prosthesis	Pylon	Prosthesis	Pylon	Prosthesis	Pylon	Prosthesis
Above Elbow	—	3	—	5	—	3	—	2	—	4
Below Elbow	—	8	—	6	—	3	—	6	—	2
Above Knee	45	11	58	9	16	4	16	13	34	13
Through Knee	5	3	6	4	8	9	5	2	5	3
Below Knee	102	25	98	22	52	21	56	28	91	54
Syme's	8	6	11	8	4	5	5	3	5	5

TABLE VI
 (B) ANALYSIS OF TOTAL NO. OF AMPUTEES
 FITTED WITH PYLON/PROSTHESIS
 (1970 - 1974)

Level	Pylon	Prosthesis
Above Elbow	—	17
Below Elbow	—	25
Above Knee	169	50
Through Knee	29	21
Below Knee	399	150
Syme's	33	27
Total	630	290

of them live in highrise flats where the lifts seldom stop at every floor.

7. Lastly the lack of motivation and the indifferent attitude of the older patients to having artificial limbs often hampers the training of amputees.

ACKNOWLEDGEMENTS

The author wished to thank Mr. N. Balachandran for his help and encouragement, and the heads of the Orthopaedic Departments, S.G.H., the Surgical Departments, Alexandra Hospital, and Toa Payoh Hospital for their assistance.