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CHOPART, PIROGOFF AND SYME AMPUTATIONS

A Survey of Twenty-one Cases

By

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The latest developments in the fields of biophysics and prosthetics, especially in the use of stump sockets of laminated plastics instead of leather, have revived interest in Chopart's, Pirogoff's and Syme's amputations, which have been in use for over a hundred years. Syme's amputation, in particular, has aroused attention in recent decades (1, 2, 3). These amputations, however, are performed relatively seldom to-day. Perhaps below-knee amputation is far too often preferred to surgery at ankle level, or foot injuries are treated conservatively, at the cost of repeated operations and long hospitalization, in order to preserve as much as possible.

The study concerns amputees fitted with new types of prostheses by the Prosthetic Shop at the Orthopaedic Hospital of the Invalid Foundation (Helsinki) since 1961.

MATERIAL

The material comprises 25 patients fitted with prostheses at the shop. A follow-up examination was made of the 19 patients who came when invited (Table 1). Since two of them were bilateral amputees, the number of stumps was 21.

It should be emphasized that the material was heterogeneous. The following facts varied: lesions prior to surgery, the patient's age at the time of amputation and of the follow-up examination (Table 2), the patients' experience in the use of prosthesis etc. As a result only a few general conclusions can be drawn from the results of the investigation.

Table 3 indicates the time, in years, from the amputation to the latest examination. Most of the Chopart, and Pirogoff amputees were veterans of World War II, and most of the Syme cases were of fairly recent date.

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Table 1.

Type of amputation	No. of cases	Bilateral	Male	Female
Syme	11	1	5	5
Pirogoff or Boyd	4		3	1
Chopart	6	1	4	1
Total	21	2	12	7

Table 2. Age at Time of Amputation.

Age Years	Syme No. of cases	Pirogoff or Boyd No. of cases	Chopart No. of cases
2	1		
20 – 30	2	3	4
31 – 40	4	1	1
41 – 60	3		1
over 61	1		
Total	11	4	6

Table 3. Time from Amputation to Last Follow-up Examinqtion.

Time Years	Syme No. of cases	Pirogoff or Boyd No. of cases	Chopart No. of cases
1	3		
1 – 2	2		1
2 – 3	3	1	1
3 – 4	3		
4 – 5		1	
19 – 25		2	4
Total	11	4	6

RESULTS

At the follow-up examination special attention was paid to two main aspects:

1. the condition of the stump,
2. the functioning of the prosthesis.

The location of scars, tender points, callosities, the consistency of

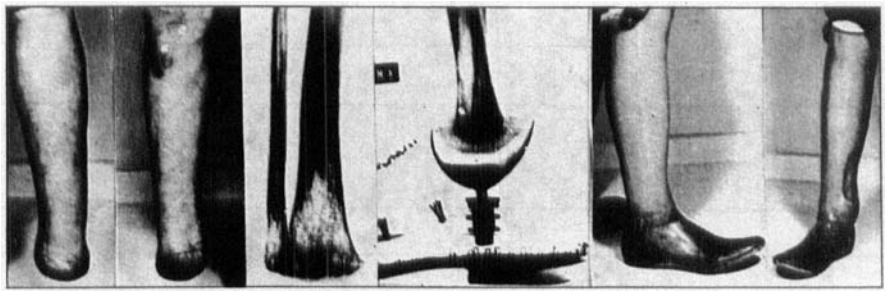

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Figure 1. Male, retired truckdriver, born 1903. Syme amputation performed in 1962 owing to arteriosclerotic gangrene. The stump is good, but somewhat sensitive to cold. Wears a prosthesis of laminated plastics; medial opening at the ankle and SACH foot. Function is good.

a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

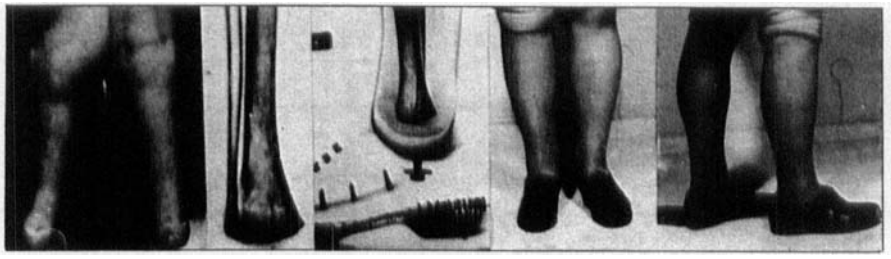

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Figure 2. Female, housewife, born 1927. Chopart amputation in childhood owing to foot gangrene after scarlet fever. A Syme stump was made in 1960 after persistent discomfort in the use of a prosthesis. Patient fully approves of the new prosthesis, the stump is perfect and the function good.

a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

the plantar skin and the shape of the stump were noted. The range of movement of the talocrural joint of the Chopart stumps was measured. X-rays were taken without the prosthesis and with the prosthesis bearing the patient's weight.

A stump was considered good if it was faultless in every respect, fair if it had only one major defect, and poor if several defects were found (Table 4).

The functioning of the stump and the prosthesis were estimated by means of interviews with the patients. They were asked about the

use of a prosthesis at home and at work, discomfort during weight-bearing, sensitiveness to cold, the care they took of the stump and their opinions on further improvements of their prostheses. In each case, the classification of the result as good, fair or poor was based

Table 4. Results of Surgery.

Amputation stump	Syme No. of cases	Pirogoff or Boyd No. of cases	Chopart No. of cases
Good	8	4	3
Fair	2		1
Poor	1		2
Total	11	4	6

Table 5. Functional Results.

Function of stump and prosthesis	Syme No. of cases	Pirogoff or Boyd No. of cases	Chopart No. of cases
Good	9	4	2
Fair	2		1
Poor			3
Total	11	4	6

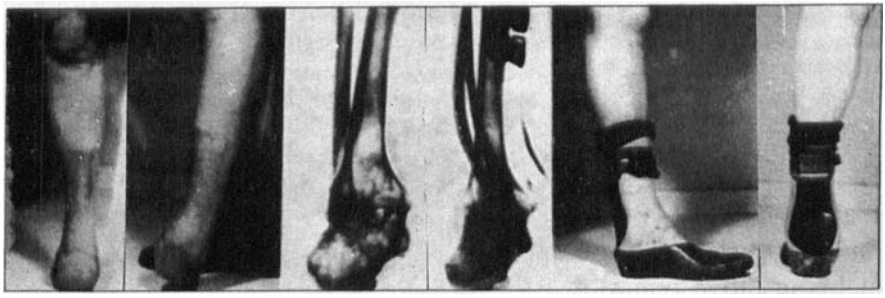

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Figure 3. Male, industrial draughtsman, born 1920. Stepped on a mine in 1941 and Chopart amputation was performed. A Pirogoff stump was made in 1959 because of persistent discomfort and difficulty in obtaining a proper prosthetic fit. The patient wears a prosthesis with a non-tibial condyle bearing socket of laminated plastics and with a SACH foot. Function is good.

a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

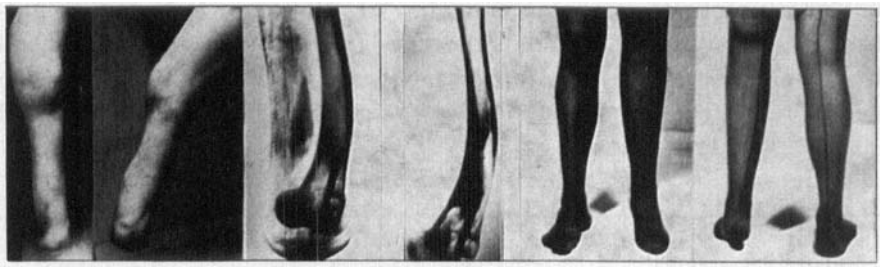

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Figure 4. Female, housewife, born 1941. Pirogoff amputation with Boyd features performed in 1961 owing to a congenital foot deformity (fibular hemimelia). The stump is perfect. She wears a Syme-type prosthesis. Function is excellent.
a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

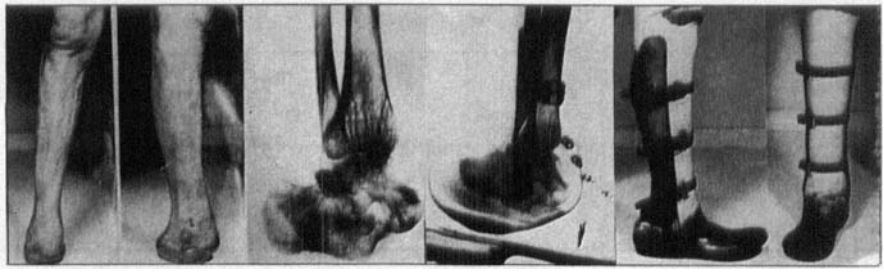

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Figure 5. Male, farmer, born 1896. Stepped on a mine in 1941. A Chopart amputation was performed. Fitted with first plastic prosthesis in 1962. The stump displays several scars and is tender. Its talocrural motion is restricted. The patient only uses his prosthesis away from home and experiences discomfort in weight-bearing. Function is poor. Consequently, the patient's capacity for work is minimal despite his good health.
a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

more on the patient's adaptation as an amputee than on a summary of his negative remarks.

The functional results were good in the case of the Pirogoff and Syme stumps, less so for the Chopart stumps (Table 5).

GENERAL OBSERVATIONS

The fitting of Syme and Pirogoff (and Boyd) stumps with prostheses of the latest makes was almost satisfactory. These appliances were

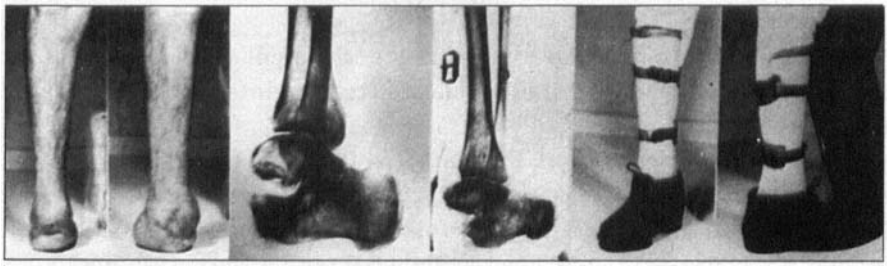

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Figure 6. Male, technician, born 1923. Stepped on a mine in 1944, and a Chopart amputation was performed. The stump has a good shape, the talocrural motion is restricted and the patient wears a prosthesis with a dorsally open (split) socket of laminated plastics, with a SACH foot. He is satisfied and the functional result is good.
a and b, stump. c, x-ray of the stump.
d, x-ray through the prosthesis. e and f, prosthesis.

more or less of the standard type. The patients with a Chopart stump had a great deal to complain of. Their prostheses had to be modified to varying degrees. There seems as yet to be no really efficient prosthesis for a stump of this kind.

All the Syme amputees had practically lost their ability to walk without a prosthesis. This applied also to the Pirogoff amputees. But only three out of the five Chopart amputees were totally dependent on their prosthesis and did not like walking without it. A modern Syme prosthesis, however, is easy to dress, so the patient's dependence on it is a minor disadvantage.

None of the Syme amputees and only one of the Pirogoff amputees reported phantom pains, but three of the Chopart amputees had at times suffered from this complaint.

CONCLUSIONS

1. Syme amputations generally result in reliable stumps, which are easy to fit with a functional prosthesis nowadays.

2. Pirogoff (and Boyd) amputations seem to leave stumps comparable to Syme's. Defective union between the os calcis and tibia, however, is a possible complication, though this was not evident in the cases examined.

3. Chopart amputations easily result in uncomfortable stumps, and are difficult to fit with prostheses.

RESUME

1. Les amputations selon Syme ont généralement comme résultat un moignon consolidé auquel il est facile de fixer maintenant une prothèse fonctionnelle.

2. Les amputations selon Pirogoff (& Boyd) semblent donner des moignons comparables à ceux de Syme. Une soudure défectueuse entre l'os calcanéum et le tibia est toutefois une complication possible bien qu'elle n'apparaissaint pas avec évidence dans les cas examinés.

3. Les amputations Chopart ont souvent comme résultat un moignon inconfortable auquel il est difficile de fixer une prothèse.

ZUSAMMENFASSUNG

1. Syme Amputationen ergeben im allgemeinen verlässliche Stümpfe, die nunmehr leicht mit einer funktionellen Prothese versehen werden können.

2. Pirogoff (und Boyd) Amputationen scheinen Stümpfe zu hinterlassen, die Symes Stümpfen vergleichbar sind. Mangelhafte Vereinigung zwischen Calcaneus und Tibia ist jedoch eine mögliche Komplikation, obwohl dies nicht in den untersuchten Fällen beobachtet wurde.

3. Chopart Amputationen ergeben oft unbequeme Stümpfe und sind schwierig mit Prothesen zu versorgen.

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