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IMMEDIATE POSTOPERATIVE FITTING OF PROSTHESIS FOR LOWER LIMB

By

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According to conventional principles of treatment, amputees are not fitted with an artificial limb until after the oedema has subsided and the stump has healed and assumed a more definitive shape. This procedure implies a fairly long interval between amputation and measurement for a prosthesis—between 6–8 weeks in children and several months in elderly patients (see *e.g. Slocum*). To this must be added the time necessary for making the prosthesis before the patient can begin to learn to walk with it. Such a long period of inactivity results in impairment of the patient's general condition, vitality, muscle control and cerebral co-ordination, and tends to increase the mental reaction of the patient, who may then regard himself as a cripple for life and thereby delay rehabilitation. Professor *Weiss* of Poland has demonstrated a film illustrating amputees in whom an artificial limb was fitted under anaesthesia and who started to walk with it a few days after the operation. This treatment appealed to us since it promised considerable shortening of convalescence and a much earlier return of the patient to a gainful occupation.

During the last year the following therapeutic principles in cases of amputation have been adopted at the department of orthopaedics, Borås general hospital.

The length of the leg and the size of the foot are measured before operation. The limb is amputated in the usual way under general anaesthesia. Rubber tube drainage. Some hours after the patient has awakened from the anaesthesia he is allowed to sit up in a chair. The following morning the drain is removed, and, a plaster casting is made of the stump wrapped in as little gauze as possible. The casting is then filled. The narrower end of the mould thereby obtained is wrapped in a 1–1.5 cm thick layer of rubber sponge. A casting is then made of the

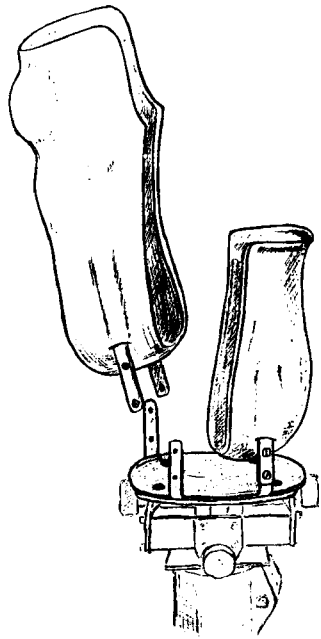

Fig. 1.

model with the rubber. Four steels are incorporated in the casting. When the casting has set, it is slit up and removed from the model. The 4 steels are afterwards fastened in Hosmer's adjustable leg, which is in turn fastened in the foot (Fig. 1). In the afternoon of the day after the operation the prosthesis is applied and the patient begins to walk with it.

For obvious reasons the procedure described will not allow the use of an open cylindrical prosthesis because the upward pull of the soft tissue during weight-bearing would prevent rapid healing. Therefore, a closed type of socket must be used with a soft, elastic bottom. The weight should not be taken solely on the end of the stump but be distributed as evenly as possible over the entire surface of the latter. A contact socket of this shape probably stimulates the local circulation by its pumping effect on the stump at every step, an effect that presumably accelerates healing. From the first day on the patient is given Tanderil Tablets. This together with training to walk with the prosthesis and regular bandaging of the stump at night results in rapid regression of the oedema. In fact, within as short a period as 3–4 days, the first socket may be too wide and must be replaced by a new one.

A second socket can usually be worn for about a week, a third socket for 2–3–4 weeks, after which the patient may be fitted with a permanent prosthesis. The change of temporary sockets provides a possibility of improving the shape of the stump from a functional point of view, particularly in cases of above knee amputation. Moreover, the patient is only too pleased to be fitted with a permanent prosthesis because it is much lighter than the temporary one. We have so far treated 15 patients in this way.

1. A male, aged 17. Laceration. BK amputation.
2. Male, aged 19. Osteogenic sarcoma. AK amputation.
3. Female, aged 29. Chronic osteitis with recurrent fistulae. Previous amputation of metatarsal. BK amputation.
4. Male, aged 82. Arteriosclerotic gangrene. BK amputation.
5. Male, aged 33. Laceration. BK amputation.
6. Female, aged 69. Embolism. AK amputation.
7. Male, aged 65. Arteriosclerotic gangrene. BK amputation.
8. Female, aged 16. Congenital defect. BK amputation.
9. Female, aged 70. Diabetic gangrene. AK amputation.
10. Male, aged 76. Diabetic gangrene. BK amputation.
11. Female, aged 66. Fibrosarcoma. BK amputation.
12. Male, aged 19. Laceration. BK amputation.
13. Male, aged 62. Tumor cutis. BK amputation.
14. Male, aged 76. Arteriosclerotic gangrene. AK amputation.
15. Male, aged 47. Synovialoma. BK amputation.

In all 15 cases the postoperative course was uneventful. The early ambulation caused no difficulties and the patients soon learned how to walk with the prosthesis. The stumps healed in a normal way and shrank very soon. This early mobilisation and training of the patients in the use of the prosthesis resulted in a shortening of the average number of hospital days—average 41.9 days from the amputation to the day when the patient leaves the hospital with the definite prosthesis —and also decreased the risk of complications due to long rest in bed. The patients were able to return to a gainful occupation sooner than otherwise, and the much feared long waiting time for the prosthesis was avoided. Moreover, since there is no period of inactivity between the operation and the application of a permanent prosthesis, there is only a limited weakening of physiological function. While patients treated by conventional principles are obliged to lie and sit idle at home with the risk of becoming fat and debilitated when waiting for their

Fig. 2. AK amputation.
2 days after the operation.

Fig. 3. BK. amputation.
3 days after the operation.

permanent prosthesis, those treated with an immediate temporary prosthesis become fitter and fitter from the very day after the operation. It is also easier for the patient to learn how to walk with an immediate prosthesis because he has not had time to "forget" how to walk. In addition, from the very beginning the patient has the feeling that something is being done for him. This has a favourable psychologic effect, which helps to prevent the idea of his being a cripple becoming so deep-rooted in his consciousness, as when he is forced to lie around idle waiting for a prosthesis and wondering what his artificial limb will be like and how it will function.

Immediate temporary prosthesis can of course only be applied to patients who are able to walk, at least with a stick, before the operation.

Judging from the observations made in the present series, the method is recommendable in properly selected cases. The only drawback of such treatment is that the changing of the temporary sockets can place an extra burden on an already overburdened workshop. But this disadvantage is more than outweighed by the obvious advantages offered by the method.

SUMMARY

The authors report a method of providing amputees with a temporary prosthesis directly following the amputation. Walking exercises *with prosthesis* begin as early as the day after operation. The first 15 cases are reported, all with good results. The procedure is recommended since the period of rehabilitation is considerably shortened.

RESUME

Les auteurs communiquent une méthode consistant à munir les malades amputés de jambes d'une prothèse provisoire, immédiatement après l'amputation. Les exercises de marche *avec la prothèse* commencent déjà le jour qui suit l'opération. Il est rendu compte des 15 premiers cas, tous ayant donné un bon résultat. Il est recommandé d'essayer ce procédé parce qu'il réduit essentièellement la durée de la réadaptation.

ZUSAMMENFASSUNG

Die Verfasser teilten eine Methode mit, die darin besteht dass man beinamputierte Patienten unmittelbar nach der Amputation mit einer Prothese versorgt. Gehübungen mit der Prothese beginnen bereits am Tage nach der Operation. Über die ersten 15 Fälle, die alle ein gutes Ergebnis aufwiesen, wird berichtet. Das Verfahren wird zur Überprüfung anbefohlen, da die Wiederherstellungszeit durch dasselbe bedeutend verkürzt wird.

REFERENCE

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