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SPONGE RUBBER PAD IN  
THE PROSTHESIS IN CASES OF CHRONIC DERMATITIS  
AND ULCERATION IN THE STUMP

*By*

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Among the complications affecting amputation stumps, chronic cyanosis, dermatitis, ulceration and pain due to stasis play an important part. These may render the use of a prosthesis impossible for a long period of time and lead to protracted incapacity.

For a long time, prostheses have been constructed so that the proximal sides of the stump are weight-supporting, since fibrous structures such as fascia and tendons tolerate pressure. Consequently, the distal portion of the stump has no proper function, it is pendent in the prosthesis without the leg being exposed to normal, physiological axial load. This leads to osteoporosis, which in itself may cause pain in the stump. Furthermore, when the proximal portion of the stump is firmly enclosed all around by the walls of the prosthesis, stasis and oedema are caused in the distal portion, which becomes cyanotic, discoloured and cold. Thus, dermatitis and ulceration result, which often defy treatment.

It goes without saying that the first measure to be taken in such cases is to examine the prosthesis. If the latter is narrow, the untoward effect of the above-mentioned factors is particularly marked. In such cases the situation may be improved by adjustment of the prosthesis.

In cases of chronic changes in amputation stumps, due to stasis, the method used at the Hospital of the Invalid Foundation has been, since 1957, to furnish the end of the socket with a pad of sponge rubber in order to create pressure against the stump. The intention has not been to make an end-bearing socket, which would hardly be possible. The variation in pressure between the stump and the pad caused by walking has a pumping effect, which should favourably influence the circula-

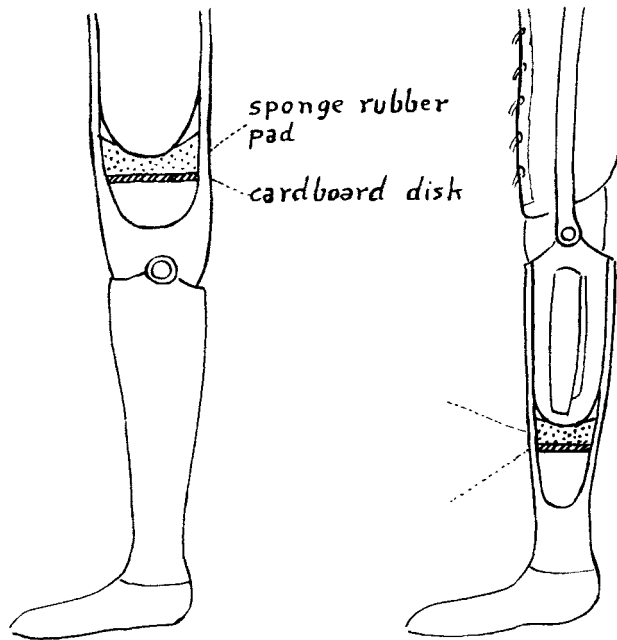


Fig. 1.

tion in the stump. Similar principles of treatment have proved successful in cases of *ulcus cruris*.

A sponge rubber pad may readily be fitted into both old and new prostheses at a low cost. It can be placed on a horizontal cardboard disk, which is the commonest mode of application, or directly onto the bottom of the socket of the prosthesis, if the stump is sufficiently long (Fig. 1). The thickness of the pad varies between 2 and 3 cm., and the surface facing the stump is made somewhat concave. The adjustment of the pressure between the stump and the pad is of paramount importance. To some extent it is facilitated by the elasticity of the sponge rubber. If pressure is too heavy, both pain and new changes of the skin will soon result. If anything of the kind occurs, the patient may react by refusing further co-operation. In addition, the possibility of allergic reactions to sponge rubber must be taken into account.

In the present study the following data were noted: the patient's age and occupation, the condition of the stump prior to the use of a sponge rubber pad, the colour of the skin, the presence of ulceration, tenderness, swelling and eczema, previous performance of sympathectomy, the effect of cold winter weather, the patient's own opinion on the effect

of the pad, and the time that elapsed before any improvement was observable. Photographs were taken of all stumps before pads were utilized.

The time of observation varied between two and five years.

The indications for the use of pads were discolouring of the skin, dermatitis and ulceration in the stump.

The series consisted of 22 cases (Tables 1 and 2), *i.e.* 9 above-knee and 13 below-knee amputations. Twenty of the patients were veterans. The patients' occupations are indicated in the tables. Their ages varied between 35 and 52 years. In 6 cases sympathectomy had been performed, and in 20 cases a plastic operation of the stump had been performed without any lasting result.

In the group consisting of 9 above-knee amputations, an ulceration healed within four days in one case, and in one case an eczema healed within two months. Two cases of ulceration and one case of eczema took half a year to heal. Three of the patients in this group could not use a pad.

In the group consisting of 13 below-knee amputations, one patient could not use a pad. Before the prosthesis was fitted with a pad, ulceration was present in 9 cases, and both marked discolouring and ulceration were present in 2 cases. An ulcer healed in one case in one day, in 3 other cases in two, four and six weeks respectively. In the remaining cases the time required for healing varied between three and twelve months.

In one case ulceration recurred when a new prosthesis without a pad had been made, but when the pad had been applied again, the ulcer healed. In another case ulceration recurred after a time of one year and four months in spite of the use of a pad. Three patients could not later use a pad, although this undoubtedly had brought about healing of their ulcers. These patients complained that the pad made the stump too warm and caused irritation, but no recurrence of ulceration was observable at the end of the observation time.

Of the 9 patients with above-knee amputations, 6 were satisfied with their pads, while of the 13 patients with below-knee amputations 12 were satisfied. Nobody complained that the pad was cold in the winter. On the contrary, all patients stated that it warmed the stump, just as was to be expected.

Thus, the result was favourable in 5 cases out of 9 with above-knee amputations and in 11 out of 13 cases with below-knee amputations. It is striking that all these patients had symptoms of long standing, which

TABLE 1

No.	Occupation	Age in years	Symptoms	Duration of symptoms	Time required for healing	End result
1	Blacksmith	36	Ulceration discolouring	5 years		Could not use a pad
2	Carpenter	42	Ulceration	2 years		Could not use a pad
3	Metal worker	38	Eczema	1 year	4 months	Healed
4	Farmer	43	Eczema discolouring	3 years	2 months	Healed
5	Metal worker	50	Eczema discolouring	5 years		Could not use a pad
6	Industrial worker	40	Ulceration	3 months	4 days	Healed
7	Farmer	37	Ulceration discolouring	2 years	5 months	Healed
8	Unskilled worker	52	Ulceration discolouring	6 months	6 months	Healed
9	Laboratory assistant	47	Ulceration discolouring	6 months	6 weeks	Healed

TABLE 2

No.	Occupation	Age in years	Symptoms	Duration of symptoms	Time required for healing	End result
1	Sailor	39	Ulceration eczema	3 years	5 months	Healed
2	Shopkeeper	35	Ulceration eczema	13 years	12 months	Healed
3	Farmer	44	Ulceration	1 year	3 months	Healed
4	Lumber-jack	37	Ulceration	1 year	1 year	Healed
5	Farmer	50	Eczema discolouring	3 months	4 months	Healed
6	Iron-plate worker	50	Ulceration	3 years	5 months	Recurrence
7	Electrical worker	44	Ulceration	4 years	5 months	Healed
8	Worker in rattan-cane	41	Ulceration	5 years	3 months	Healed
9	Engineer	41	Ulceration	5 years	6 weeks	Healed
10	Farmer	40	Discolouring	2 years	2 weeks	Healed
11	Shoemaker	43	Ulceration	1 year	3 months	Could not use a pad
12	Farmer	40	Eczema discolouring	1 year	3 weeks	Healed
13	Chauffeur	42	Discolouring	4 years	3 weeks	Healed

had defied previous treatment. The fact that the results were less satisfactory in the group with above-knee amputations may be due to the type of prosthesis used in these cases. The suction prosthesis makes great demands on the form, skin, muscles and circulation in the stump. Fit and alignment are of fundamental importance.

#### S U M M A R Y

In cases of chronic dermatitis, due to stasis, and ulceration in amputation stumps a pad of sponge rubber was used in order to create pressure against the surface of the stump. Thus, the principles of treatment were the same as were previously adopted in the treatment of *ulcus cruris*. The results were mostly favourable even in cases with long-standing symptoms.

#### R E S U M E

Dans les cas de dermatite chronique due à la stase et à l'ulcération du moignon de l'amputation, un tampon de caoutchouc spongieux a été utilisé pour établir une pression contre la surface du moignon. Les principes du traitement ont donc été les mêmes que ceux adoptés auparavant dans le traitement des ulcères variqueux. Les résultats ont dans l'ensemble été favorables même dans les cas où les symptômes s'étaient maintenus pendant longtemps.

#### Z U S A M M E N F A S S U N G

In Fällen von chronischer Dermatitis und Geschwürsbildung an Amputationsstümpfen als eine Folge von passiver Hyperämie wurde ein Schaumgummikissen verwendet um einen Druck auf die Stumpfoberfläche auszuüben. Das Behandlungsprinzip war daher das gleiche wie es früher in der Behandlung von *ulcus cruris* angewendet worden ist. Die Ergebnisse waren selbst in Fällen mit langdauernden Symptomen zumeist günstig.