

Technical note

A method for socket duplication using Silcoset R 105

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Abstract

A technique for duplicating an existing comfortable socket has been in use for two years. The method, using *Silcoset R105, provides the prosthetist with a re-usable positive mould thus enabling the manufacture of two prostheses of comparable fit.

Introduction

Amputees have often expressed a desire to be provided with two prostheses of similar characteristics. The main factors contributing to this state are socket fit and alignment. Although it may prove impossible in the clinical situation to align two prostheses identically, it should be possible to provide identical sockets. The following technique has been used on patellar-tendon-bearing (PTB), above-knee (AK) quadrilateral and Syme sockets, but could be adaptable for other types of limb.

Method

The socket to be duplicated must be internally clean and dry. Silcoset will separate freely from most plastics, but porous materials such as cordovan may require a very thin coating of a separating agent. Any proprietary domestic wax or silicone based polish should prove suitable for the purpose, it can be removed after duplication by wiping over with a solvent such as acetone. This may however affect the colour of the material in question.

Before attempting to duplicate sockets, it may therefore be a worthwhile exercise to evaluate the separating abilities of the agents and solvents in use on samples of the materials employed at that centre. The socket is cast in situ and a wrap

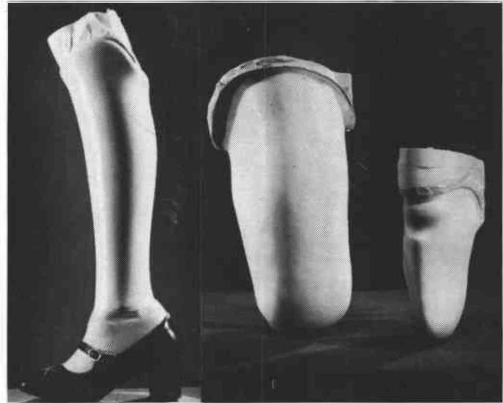


Fig. 1. Left, PTB prosthesis with masking tape around socket brim. Right, Silcoset moulds of quadrilateral AK and PTB sockets.

of masking tape a few centimetres high around the brim of the socket will aid stability when the cured Silcoset is removed (Fig. 1, left).

The amount of Silcoset required in each case can only be determined by experience, but most PTB sockets will require 2-3 layers giving around 900 g total weight.

To ensure that the first layer freely covers as large an area as possible, grade 2 silicone fluid (10% by volume) manufactured by Charles F. Thackray may be added to reduce the viscosity. This mixture should only be used as a primary coating as the rigidity of the mould is reduced if subsequent applications are applied. The manufacturers of Silcoset supply a rapid curing agent which when used as the catalyst (0.5% by volume) should allow 3-5 minutes working time. The Silcoset is distributed around the socket walls by rotating the prosthesis until the material sets. This process is repeated, allowing an interval of around 10 minutes between applications until

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a suitable thickness of mould is obtained. This is normally 0.5–1.0 cm but will depend on the dimensions of the socket in question. It has been found that additional bulk around the brim will aid dimensional stability when the mould is poured.

The cured Silcoset mould may be separated and removed about 15 minutes after the final layer has set. Should difficulty arise in removal, some silicone fluid applied to the hands will enable them to be slipped between the mould and socket interface. Once the distal surfaces have been separated and the vacuum broken, the mould can be pulled out by its base.

The duplicate mould (Fig. 1, right) is poured in the usual fashion with plaster of Paris. The antero-posterior and medio-lateral dimensions of the socket brim should be checked with those of the mould before the plaster has set, if any variation is found the mould can be distorted manually to the correct size while setting is in progress. While discrepancies of this nature are

rare, they can occur if the Silcoset walls are particularly thin or the proximal circumference larger than usual. An alternative technique when pouring is to immerse the mould in water to brim level to help equalize the outward pressure of the plaster. Lamination can now be carried out over the duplicate mould in the usual manner, the plaster removed and the Silcoset freed from the new socket and stored for future use. Large duplicates may be poured in two stages. While the mould is supported proximally, plaster is poured to around mid level and allowed to set. This then provides a stable key for the remainder to be filled. Damage to a mould such as tearing may be repaired using Silastic R medical adhesive type A.

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