EXPERIMENTAL PLASTER BANDAGES

W. SAYLE-CREE, MANCHESTER, ENGLAND

From the Salford Group of Hospitals

This brief report is submitted by one who has used plaster-of-Paris for twenty-five years, has experimented with other forms of splintage, but prefers something that sets with extreme rapidity. It is realised that some surgeons prefer a plaster that sets rather slowly.

From time to time attempts are made to produce a type of tailor-made external splintage that is better than plaster-of-Paris. External splintage is used in two rather different ways. The first is for short-term splintage of fractures or joints where the splint must set rapidly to ensure that the position obtained by manipulation is retained. The second type is where some form of splintage is required for long periods and it is of advantage that it should be light, durable, unaffected by water and permeable to x-rays. It is not so important that the second type of splint should take a long time to make and become hard.

For the first type, plaster-of-Paris has been used for a very long time. The advantages of plaster-of-Paris are: ease of application, rapidity of application, rapidity of setting and comparative cheapness. The disadvantages are: relatively heavy weight, relative impermeability to x-rays, failure to stand up to unprotected weight bearing when applied to the lower limb and rapid softening and loss of efficiency if moistened.

So far, attempts to replace plaster-of-Paris have meant that, while the advantages of lightness, durability and permeability to x-rays were obtained, there was difficulty in application. Rather special skill was required for the application of substances like glass acetate fibre. These also took a long time to set and were therefore of little value in a busy clinic or where fractures had been reduced. Other methods have required the use of heat ovens and a special technique in application as well as a good deal of time, and for this reason they are inapplicable to a busy clinic.

There have been suggestions that by incorporating substances such as resins with plaster-of-Paris, the advantages of lightness and greater strength would be obtained. An experimental resin-impregnated plaster has recently been on trial at this group of hospitals, and it appears to possess advantages and no disadvantages. The bandages are soaked in water in the normal manner, and the plaster sets rapidly. It is durable. It is non-irritating to the skin and it has the additional advantages of being lighter and stronger. Only two-thirds of the normal amount of bandages are required.

The dry bandage looks like any other plaster bandage. It feels perhaps a little rougher. In soaking, hardly any of the plaster is lost in the water. Whereas three orthodox plaster bandages left 11-5 grammes (dried) of plaster in the bucket, those of the new type left only 0·2 gramm. The bandage could be wrung out almost dry after soaking.

The new bandages were economical in use. For example, whereas with ordinary plaster I would use one six-inch bandage in the form of a slab fixed with an open-wove bandage to immobilise a Colles's fracture, with the new type only one four-inch bandage is required and, if anything, the new splint is stronger than the old one. A below-knee plaster for a man can be made with two and a half six-inch bandages. There is no skin irritation when the plaster bandage is applied directly to the skin.

Tests of strength were carried out. One six-inch plaster bandage of orthodox type was made into a slab fifteen inches long and allowed to set and dry. A similar slab was made from the resin-impregnated plaster bandage. The slab was supported between wooden blocks and weights were applied until it cracked. The weights required to cause a crack were: orthodox plaster, three and a half pounds; resin-impregnated plaster, four and a half pounds.
This is admittedly a crude method of testing because a flat slab is nothing like so strong as a curved slab or cylindrical plaster normally applied, but it nevertheless gives an indication of the added strength imparted by the resin.

Three ordinary four-inch bandages after soaking and drying weighed 336 grammes, whereas three new bandages similarly treated weighed 333 grammes, which suggests that they are very slightly lighter than the old ones.

**SUMMARY**

Clinical trials and experiments with a new plaster-of-Paris bandage which can be used in the normal manner are described. Only about two-thirds of the usual number of bandages are required to produce a plaster case of equivalent strength.

Supplies of this new resin-impregnated plaster bandage were kindly provided by Messrs Smith & Nephew Ltd., of Hull, England, makers of the Gypsona plaster bandage.