

more might be included, what has been written will be found to be all that is essential in actual practice. Many manuals on bandaging and minor surgery are filled with methods of bandaging that are never used in practice, seeming to be designed more for the purpose of exercising the student, or showing the ingenuity of the writer.

PART THIRTEENTH.

PERMANENT DRESSINGS.

In cases of fracture as well as some forms of morbid action, circumstances frequently demand that insecure, movable, or temporary apparatus be replaced by something more permanent in character, permanent in the sense that its use may be continued until the treatment of the case has terminated. These dressings are of two general characters, which may be described under splints, and the application of bandages, stiffened in various ways, which are designed to take the place of the former. The consideration of splints will be withheld for a subsequent chapter.

The use of bandages stiffened by various substances, has recently attracted much attention, but is far from being of modern origin. In some forms the principle was recognized by some of the ancient surgeons, Hippocrates and Galen having employed some preparations of glue, and Avicenna refers to similar procedures. COOPER, as late as 1830, was the first of the more modern surgeons to employ such dressings with any frequency, but it was not until within the last fifteen or twenty years that the practice became at all general.

The material used to stiffen the dressings, is either starch, plaster of Paris, silicate (liquid glass), various mucilages and glues, solutions of rubber and the like, but the choice at present seems to be limited to either starch or gypsum. Each of these articles has earnest advocates; MR. ERICHSEN

being the most prominent champion for starch. While such authority is sufficient for many practitioners, I think, in this country at least—gypsum is more commonly used.

Whichever agent is used, the methods of application, as far as the preliminaries are concerned, is as follows: The part to be bandaged is to be placed in the most easy and comfortable position, providing the position does not disarrange fragments, in the case of fracture—or in cases in which ankylosis is threatened or possible, the position is not one that would impair usefulness of the member. The part should also be thoroughly cleansed, and care taken that nothing be left in contact with the integument that would irritate it. All inequalities in the limb are to be filled up with clean cotton batting, and the whole part enveloped in a thin, evenly-disposed layer of the same material. It is my practice to cut strips of binders-board, stiff pasteboard, or even tin—say an inch and a half in width, and long enough to extend the whole length of the member—which are laid on the cotton, about one to each aspect of the part—and temporarily held in position by a piece of tape or string. On applying the bandage these tapes or strings are to be cut and removed as they are reached.

To apply the *starch bandage*, we now proceed as follows: With an ordinary roller bandage, one that has been washed, or made of old muslin or sheeting to be preferred—bandage the limb carefully and smoothly, from the distal extremity as high as may be needed. Secure the end with a strip of adhesive plaster. Have the starch ready mixed, thin enough to “run” easily, and yet not too watery—and kept warm. With a varnish brush or a mop of muslin, paint the bandage already applied thoroughly, covering every part of it with the starch. Now apply another course of bandaging,

in an opposite direction, *i. e.*, from above downwards, covering it with starch in the same manner. This process may be repeated until four, six, or eight thicknesses of bandaging are applied, as may be deemed necessary from a consideration of the accidents to which the part will be exposed, and the strength of the muscles. Two or three layers or thicknesses of bandage may be sufficient, when reinforced by the strips of tin or pasteboard.

To apply the *plaster of Paris* or *gypsum* bandage, we have a choice of three methods:

1. After preparing the part as above, mix plaster of Paris and water, until a consistency equal to a thin batter is attained, which is to be kept in motion by stirring; the quantity mixed, however, should not be large, not more than a teacupful. Apply the bandage as before, and paint the mixture over it, precisely as in the case of the starch bandage. Two or three thicknesses will usually be sufficient. Hardening will usually be very speedy, and in course of half an hour the dressing will be sufficiently firm.

2. The second method is somewhat different, and while that most generally adapted is not in my opinion to be preferred to the first, as a rule. The material for the bandage should be of some coarse material, an open texture, as the coarser varieties of unbleached muslin, without siezing. The plaster is rubbed into the meshes of the bandage, dry; care being taken to have it well filled. Apply the bandage as usual, and as each layer or course is completed, wet it with a sponge or brush. Continue the bandaging in successive layers, until the desired thickness or strength has been attained, when cover in the whole with an ordinary roller.

3. The third method is occasionally very useful, and is the only form of the many-tailed bandage of SCULTETUS

that is at all useful or practicable. It is made by cutting a number of short pieces of bandage of a suitable width, into lengths equal to one and one-third the circumference of the part. The plaster, mixed to a consistency of thin batter, is prepared in a tin basin. The strips are dipped into the mixture and immediately applied; each strip to overlap the preceding about one-half its width, and made lie smoothly by pressing with the hand. As many thicknesses may be applied as is desirable and needed.

No matter what the agent may be that is employed to give solidity to the dressings, it will be necessary to keep the member immovable until the dressings have attained the requisite degree of solidity. This will require from ten to twelve hours in the case of starch, to from half an hour to an hour in the case of plaster. I am not partial to splints, for this purpose, as they may exercise injurious compression on the plastic material. Long narrow bags filled with sand or bran is much to be preferred; they may be simply laid in contact with the parts, one on each side, and will be found to perfectly control muscular motion.

In the case of a wound or an ulcer, in the part to which the dressing is applied, as in the case of compound fracture, the bandage may be cut while soft, so as to make a trap (Fig. 69), which will readily permit an easy inspection of the parts, as well as an opportunity for the application of topical remedies. Furthermore, the annoyance and danger that would attend a retention of the discharges will be avoided.



FIG. 69.

Should the part swell to an extent to cause discomfort or endanger the life of the part; or should a pre-

viously existing swelling diminish to such an extent that the bandage ceases to fulfill its indications, it must be opened and the fault corrected. For this purpose the anterior surface of the dressing must be divided throughout its whole extent, down to the layer of cotton batting, by means of strong cutting pliers. The part may then be encircled by tapes, permitting the bandage to be loosened when too tight, or tightened by overlapping, when too loose. In place of tapes it is neater, and more efficacious to apply a roller over all.

It is a question of some interest, when to apply the bandage, in acute cases, before or after swelling, *i. e.*, primary or secondary. It is asserted that the pain caused by the swelling of a fractured limb after the application of a permanent dressing, is very great; that the swelling also necessitates an early derangement of the bandage, and nothing is practically gained by pursuing the practice. This is quite true, and the objections are valid. On the other hand, it is held that a secondary dressing, that is after the subsidence of swelling, exposes the sufferer to danger of displacement of the fragments it is true, but care and watchfulness will prevent this, and there is no danger of pain and strangulation of the part. After some considerable experience, and weighing well the arguments on both sides, I have finally made it a practice to apply the dressings primarily, and think the early opening on account of swelling is advantageous, as it permits a daily inspection of the part, and the preservation of the requisite support by varying the compression as the swelling augments or subsides. As will be seen elsewhere (*Accidents and Emergencies*), the extension method of BUCK is used for the first few days, in cases of fracture, followed by the application of the permanent dressing as soon as the more violent local symptoms have abated.

After a time varying from a week to a fortnight—depending somewhat upon the excellence of the apparatus, or the influences to which it has been subjected, the dressings will become more or less broken or pliable, and its usefulness correspondingly impaired. The question will then arise, whether to apply a new dressing, or reinforce the old one with some additional thicknesses. When the shape has been retained, and there are no sharp angles or corners to cause excoriation of the integument, the best practice is to apply one or two additional thicknesses of bandage, over the old dressing, with a few strips of tin or binders-board between them. If the layers are equal in number to the original dressing, the part will be too bulky.

Without accident, and as long as the course of the case is satisfactory, the bandage should be retained. In the case of fracture; from six to eight weeks is usually ample time, but the period must be determined solely with reference to the degree of consolidation in the broken bones. Under all circumstances, however whether the case be one of disease or accident, it is better to remove the dressing entirely once or twice a week, and carefully supporting the parts, bathe the integument, and attend to any excoriation that may exist.

This concludes what was intended to include a practical account of bandaging, both temporary and permanent. Very many methods have been intentionally omitted, as forming for the most part, simply exercises to familiarize the student with the roller and manipulations. In actual practice nothing will be required in addition to what has been given, but should the occasion arise, a modification of the dressing laid down in these pages will be all that is needed. If the practitioner is unable to vary these methods to suit particular cases, he is certainly unfitted for the practice of surgery, and

no amount of additional instruction would make him an expert. Among the omitted bandages will be noted the many-tailed SCULTETUS; the invaginated, for wounds; and one or two that are equally obsolete and useless. I think all surgeons of experience will be found agreed, that such dressings are not only valueless, as compared to others, but are even at times hurtful.