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SURGICAL DRESSING

William James Gardner, Cleveland Heights, Ohio,
assignor to Cleveland Clinic Foundation, a non-
profit corporation of Ohio

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This invention relates to surgical dressing, and more particularly to an improved closure and dressing enabling traction to be placed on the wound, and which dressing is of the general character described in my Patent No. 2,421,193.

It is well known to those versed in the art that it is desirable in cases of wounds or cuts to bring the raw edges of the wound together. This enables the healing action to take place more rapidly, reduces the danger of infection, and reduces the size of the scar. Heretofore the raw edges of the wound have been brought together in various manners the most common of which was by suturing. This, although effective, has its disadvantages, for if the patient is conscious, it is painful and has a tendency to cause shock. Furthermore, there is the danger of infection from the suture; and if the stitches are not close together, there is the tendency for the wound to gap between the stitches. This is also a time consuming operation. After the wound is healed, there is also the problem of removing the stitches, and the stitches themselves have a tendency to form a scar. Since there is a definite limit to the number of stitches that may be used, there is also a tendency for the strain therein to be such as to cause them to tear loose.

Still other methods, such as clamps or bandages, all have definite disadvantages. Clamps cannot be used on wounds with large gaps, and bandages, if tight enough to draw the wound together, act as a tourniquet and cut down the circulation. For the larger wounds where the skin and flesh have been removed, the practice of sewing buttons onto the skin and stretching rubber bands between them for traction also has its disadvantages.

One particular disadvantage attendant to all the prior processes is the time necessary to close the wounds and apply the dressing. The faster the wounds may be approximated, the less chance there is for infection. Furthermore, many of these prior practices do not lend themselves to temporary dressing. These items are of particular interest in dressing stations at the battle front where many wounds must be dressed quickly. If means are provided for quickly and easily applying the dressing, the surgeon may attend to more cases with less casualty losses. Also, if the dressing is easy to attach, it may be done by those less skilled in surgery.

By my present invention, I have provided a dressing which may be applied to large gaping wounds, as well as small wounds, and it is effective to bring the edges of the wound close to-

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gether. The wounds may have traction applied thereto along their entire length, which traction is evenly distributed and is maintained all the time the dressing is in place. The dressing may be applied without discomfort to the patient, quickly and easily by those with a modicum of skill. It also adapts itself to temporary dressing, since it can be quickly and easily removed without discomfort to the patient. It is also very useful in providing traction over large open wounds where it is desirable to stretch the skin to cover denuded areas.

Still other advantages of the invention, such as cleanliness, the elimination of trauma, and the additional protection afforded against infection, will become more apparent from the following description which is illustrated by the accompanying drawings and forms a part of the specification.

In the drawings:

Fig. 1 is a side elevational view of a dressing of my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a bottom plan view thereof;

Fig. 4 is an enlarged section taken on the lines 4-4 of Fig. 3;

Fig. 5 is a diagrammatic view showing the manner of its application to a wound;

Fig. 6 is an enlarged fragmentary plan view of the skin engaging portion of the dressing;

Fig. 7 is a perspective view of a clip used for securing the dressing together;

Fig. 8 is a magnified view of one of the skin engaging barbs or spicules.

Fig. 9 is a side elevational view of a modified form of the invention; and

Fig. 10 is a bottom plan view thereof.

In carrying out my invention, I preferably provide an intermediate body portion of highly elastic material, such as rubber, latex or one of the synthetics, which body is provided at opposite ends with members preferably of metal that have a plurality of sharp points adapted to be engaged with and penetrate into the skin to provide traction for said body portion when the dressing is stretched and applied across a wound. Preferably, the body portion is made in the form of a composite strip, the mid portion of which is elastic, and the end portions of which are rendered inelastic by bonding a piece of fabric or the like to the rubber. The attaching members are preferably secured to these end portions by cement and by clamping means, which cement and clamps hold the parts together adjacent the elastic part, the extremities of the respective end

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portions which are rendered inelastic providing tabs which may be grasped by the fingers providing a convenient means for manipulating the dressing when attaching the same to the wounded member of a patient.

More specifically, as shown in the accompanying drawings, throughout which like parts have been designated by like reference characters, the dressing includes a composite strip, the center portion 10 of which may be constructed of rubber, latex or any of the synthetic compounds having a high degree of elasticity. This elastic center or mid portion will preferably be made in various lengths and widths adapting the device to be used to dress various sizes and types of wounds. At opposite ends of the elastic portion, there are non-elastic portions 11. These are preferably provided by uniting with the elastic in these zones a layer of fabric 12.

Preferably, the bond between the fabric and rubber is effected during the curing of the rubber and in such a manner that a continuous layer of rubber is provided on the under side, as viewed in Figs. 1 and 4, with the rubber extending into the interstices in the fabric as well as uniting with the individual fibers of the fabric. The top of the fabric remains comparatively free from the rubber, however, thus providing a relatively rough and relatively stiff surface which enables the same to be better gripped by the fingers. There is thus provided a composite strip having a center portion which is highly elastic and end portions which are inelastic and which strip has a continuous rubber underside and is provided with roughened upper end surfaces. The addition of the fabric to these ends not only reduces the elasticity of the strip at these points, but also stiffens the strip and provides more "body" to it which, as will be seen later, assists in securing the other parts to the strip. The amount of stiffness of the ends is a matter of choice and may be varied between relatively wide limits. Preferably, a certain amount of flexibility is desirable.

Means are provided for connecting the composite strip to the body of a patient in such a manner that the elasticity of the mid portion is utilized to apply traction through the connector means on the opposite sides of a wound. This generally comprises metal members having sharp points that penetrate into the skin. Specifically, these members may each include a flat body portion 15, adapted to lie flat against the under side of the strip at a zone 11, and having an end portion which curves downwardly as indicated at 16 and then turns backwardly at 17 to form a transversely extending lip. The edge of the lip 17 is provided with a plurality of needle like projections or spicules 18, which extend toward the mid portion of the dressing.

There is thus provided a member which is generally hook shaped in longitudinal section and has sharp points. Two of these members are used in connection with each of the composite strips, being secured to the inelastic portions adjacent the elastic portion and in such a manner that the projections 18 point in the general direction of the center of the strip. These members are secured to the underside of the composite strip with the flat part disposed adjacent the elastic zone and the bight of the hook being toward the end of the composite strip, by cementing and a clip (Fig. 7). The clip comprises a flat strip 20 which engages with the upper surface of the fabric 12, and the ends of which extend

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around the edges of the flat body portion 15 at 21 and are then bent backward at 22 against the underside of the flat body portion 15. If desired, the bent part 21 may be notched at 23 to facilitate the bending of the clip and provide a tighter joint between the clip and the projection carrying body portion 15 to thus more securely grip the composite strip therebetween. Prior to assembly, cement is applied to the adjacent faces of the body portion 15 and the composite strip at the under side, and the body portion and composite strip brought together and held in position by the clip until the cement has an opportunity to set. After assembly, the cement and the clip both cooperate to hold the parts securely together.

It will be apparent that the point carrying metal members may be secured to the composite strip in other manners than that shown, but I have found that the means illustrated and described are very effective, economical and easy to construct.

The ends 11 of the composite strip extend beyond the attaching members and provide tabs which may be grasped by the fingers or forceps for manipulation of the device. The effectiveness of these tabs is increased by having the upper surface comparatively free from rubber, which leaves a good rough gripping surface, the roughness of which depends upon the coarseness of the fabric.

The projections 18 may be provided on the edge of the lip 17 in various manners. I have found that one manner of forming them is by lapping as shown in the copending application of Valentine B. Seitz, Serial No. 561,365, filed November 1, 1944, and which has become abandoned. Preferably, the projections are disposed in closely spaced relation along the edge of the lip, and as best shown in Fig. 8, and may be substantially pyramidal in form. In one case, I have found that 20 of these points per inch and each approximately .004 inch square at the base and .020 inch in length provide a very effective action. It will be apparent that the number and size may be varied. By lapping the points, they may be made very sharp, which allows them to penetrate with very little trauma. Having the points closely spaced enables traction to be evenly distributed over a wide area, and the length is so gauged as to prevent deep and painful penetration.

Fig. 5 shows the manner of application of the dressing of my invention. The body of a patient is shown at 30 and as containing a cut 31. The cut will ordinarily be gaping but is shown nearly pulled together due to the traction exerted by the dressing.

In applying the dressing, the ends, or tabs 11, of the dressing are grasped between the fingers and pulled in opposite directions. This causes the mid portion 10 to be stretched.

Preferably, the thumbs engage with the clips 20, and the elements carrying the sharp projections may thus be tilted so that the projections 18 point in a generally downward direction but still point toward the medial portion of the dressing. The projections 18 are then brought into engagement with the skin on opposite sides of the cut and the projections 18 gently pressed into the skin and toward the wound from opposite sides while at the same time the tension on the tabs 11 is released. The tension exerted by the part 10 then holds the projections in the skin, their penetration, however, being limited by the length of the projections.

Because the projections are sharp, very little

discomfort is experienced, nor do they penetrate far enough to cause any damage to the flesh under the skin, or for that matter, the skin itself.

As is best illustrated in Fig. 5, the skin adjacent the projections, and between the projections and the wound, tends to heap up providing a more effective engagement therewith, and the curved structure 16 provides a clearance space preventing the projections from being displaced from their engagement by this "heaping up."

The dressing, after the tabs 11 are released, assumes a position substantially as shown in Fig. 5, the part 10 causing the connector means and their projections to be steadily pulled in toward the wound. The placement of the projections causes this traction to be distributed over a wide area with the result that considerable traction may be produced which soon draws the edges of the wound together, materially increasing the healing rate and speeding epithelization by reducing the area to be epithelized.

If desired, the traction can be enhanced by fastening a strip of adhesive tape over the ends 14 and/or the connector means to hold the same more closely to the body of the patient.

It will be seen that the traction exerted is largely determined by the character of the rubber. The invention adapts itself very readily to making dressings of various widths and lengths. It also enables the dressing to be placed directly over the wound, and the rubber will not adhere as readily as the conventional dressings to the excretions therefrom. The material of the strip may be sufficiently transparent to allow the wound to be viewed without removing the dressing. If desired, the wounded member may be wrapped with a gauze bandage for further protection and to absorb the excretions from around the edges and prevent foreign matter from entering under the edge of the dressing.

It can be seen that the dressing may be applied in a matter of seconds, and if the user thereof is not satisfied with the manner of its placement, it may be as quickly removed and reapplied, all without pain or discomfort to the patient. Because of its construction, traction may be applied in a direction to better close the wound, and the wound edges may be brought so close together that it is unnecessary to use a gauze bandage directly adjacent the wound.

In Fig. 5, it will be noted that the actual point of traction is displaced somewhat from the edge of the wound. The point where the traction is applied may be varied to some extent by the length of the intermediate elastic portion. In some instances, however, it may be desirable to apply the traction along close to the edge of the wound; this allows the wound to be closed more and also provides more skin on either side of the wound which may be stretched.

In Figs. 9 and 10, I have illustrated a modified form of the invention which allows traction to be applied closer to the edge of the wound and which also permits greater traction to be applied. The principle difference between this dressing and that of the other figures is in the provision of a downwardly and inwardly extending portion 40 which extends at substantially the same angle as the part 17 and is provided with points or spicules 18'. Thus the elements which are secured to the inelastic parts of the composite strip are each provided with two sets of skin engaging points, one set of which is the same as the preceding embodiment, and the other set of which is inwardly spaced therefrom and

adapted to engage with the skin close to the edge of the wound.

Thus substantially twice as much adhesion may be realized, and traction may be applied very close to the edge of the wound which affords a still greater amount of skin that may be stretched.

In some cases, it may also be desirable to construct a dressing similar to that shown in Figs. 9 and 10 but with the outer set of spicules 18 and the supporting portions 16-17 removed and only the portion 40 with the spicules 18' remaining. It will be seen, however, that in this case it is most desirable to have additional means to hold the end of the metal member having the sharp projections from tilting, as in this structure, the tendency would be for the spicules 18' to act as a fulcrum about which the portion 40 could revolve, and the dressing would thus be pulled out of engagement.

It will also be seen that more than one dressing may be used if desired and in such a manner as to place greater traction in one area than another, and that it is possible to use these dressings in such a manner that the elastic portions cross each other if desired, thus putting traction on wounds from different directions.

Having thus described my invention, I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of my invention.

I claim:

1. A dressing comprising a mid portion of a material having a high elasticity, end portions extending from said elastic mid portion and comprising a stiffening material to which said elastic portion is secured to hold said elastic material against stretching and provide relatively stiff end portions, means for attaching said dressing to the body of a patient comprising metal skin gripping members, said stiffened portion extending beyond said metal portions to provide tabs to facilitate manipulation of the dressing when attaching or removing the same from the patient's body.

2. A dressing comprising a mid portion of a material having a high elasticity, end portions extending from said elastic mid portion and comprising a stiffening material to which said elastic portion is secured to hold said elastic material against stretching and provide relatively stiff end portions, means for attaching said dressing to a patient's body comprising metal skin gripping members and means for securing said stiffened portion and said gripping members together, said stiffened portion extending beyond said metal portions to provide tabs to facilitate manipulation of the dressing when attaching or removing the same from the body of a patient.

3. A dressing of the class described comprising a resilient body portion and end portions of relatively non-resilient material extending therefrom, means to attach said dressing to the body of a patient with the resilient portion over a wound comprising metal skin engaging members having portions for engagement with the skin on opposite sides of the wound and spaced therefrom, means to attach said members to the said non-resilient portions, and means for manipulating said dressing comprising ends of said non-resilient portions extending clear of said metal skin engaging members.

4. A dressing comprising means to exert traction on a patient's body including an elastic portion of rubber or the like, end portions extending

from said resilient portion including means to stiffen the end portions and hold said end portions against stretching, means for securing said dressing to a patient's body by engagement with the healthy portions of said body comprising metal members provided with sharpened projections adapted to engage with said body and means for securing said members to said stiffened portions, said stiffened portions extending beyond said metal portions to provide convenient means for manipulating the dressing for attachment or detachment.

5 5. A dressing comprising means to exert traction on a patient's body including an elastic portion of rubber or the like, end portions extending from said resilient portion including means to stiffen the end portions and hold said end portions against stretching, means for securing said dressing to patient's body by engagement with the healthy portions of said patient's body comprising metal members provided with sharpened projections adapted to engage with the patient's body and means for securing said members to said stiffened portions, said stiffened portions extending beyond said metal portions to provide convenient means for manipulating the dressing for attachment or detachment and having a roughened surface providing a friction surface for engagement with the fingers or a manipulating tool.

6. A dressing comprising an elastic portion, members for attaching said dressing to a patient's body comprising metal members secured to said dressing at spaced apart points and each having downward curved parts and the ends provided with sharpened points adapted to penetrate into the skin of the patient.

7. A dressing comprising an elastic portion, body attaching members for said dressing comprising metal members secured to said dressing at spaced apart points and each having a downward curved portion and the edge provided with sharpened points disposed at spaced intervals along the edge extending from the edge toward the mid portion of the dressing and adapted to penetrate into the skin of the patient.

8. A dressing comprising an elastic mid portion and members for attaching the dressing to the body of a patient each comprising a portion adapted to be secured to said elastic portion and having a longitudinally curved portion curving downward away from said elastic portion and terminating in a portion extending at an angle toward the center of the dressing and away therefrom and a second portion spaced inwardly from said first portion and extending at an angle away from said elastic portion but toward the center line of said dressing each of said portions having a plurality of spaced projections on its edge adapted to penetrate the skin of the patient to provide a plurality of spaced traction engaging parts on each side of a wound.

9. A dressing comprising an elastic mid portion and non-elastic end portions, members for attaching the dressing to the body of a patient each comprising a flat metal body portion and means for securing said metal body portions to said non-elastic portion, each of said metal body portions having a longitudinally curved portion curving away from said non-resilient portion and a portion extending toward the center of the dressing having a row of sharp points for engagement with the skin disposed along its edge, said dressing adapted to be applied to a patient's body by stretching the same and applying to the body, the resiliency of the mid portion causing said

points to penetrate the skin after the dressing is in position, said non-resilient portions extending beyond said metal portions to provide tabs to facilitate manipulation of the dressing.

10. A dressing including a traction exerting member having an elastic mid portion of rubber or like material adapted to be stretched and having characteristics which cause it to tend to return to its original form when the stretching power is removed, end portions for said member comprising fabric joined to said members on the upper surface thereof and reinforcing said member in its opposite end zones and holding the end portions against stretching, means to secure said dressing to a patient comprising metal members secured to said reinforced end zones adjacent said mid portions and having a portion at the edge most remote from said mid portion extending in the general direction toward said mid portion provided with sharpened projections for engagement with the skin.

11. A surgical dressing comprising an elastic body member of rubber or like material having an intermediate zone of high elasticity and opposite end zones each having means for rendering said end portions inelastic, comprising fabric, having interstices, secured to one surface thereof with said body having portions extending into the interstices of the fabric, means for securing said dressing to the body of a patient comprising thin sheet metal members each including a substantially flat body portion adapted to lie flat against the under side of said end zone and a metal clamp member extending across said end zone on the other side thereof having portions bent over the sides of said metal member and against the bottom face thereof to securely clamp the corresponding member to the corresponding end zone, the corresponding members each having a portion beyond said clamp curved downward away from said end zone and extending backward toward said intermediate portion, the edge of each member being provided with a plurality of spaced sharp projections adapted for engagement in the skin of the patient, and said end portions of said body member extending beyond said securing members to provide tabs adapted to be grasped to facilitate application and removal of the dressing.

12. A dressing comprising an elastic mid portion and non-elastic end portions, members for attaching the dressing to the body of a patient each comprising a flat metal body portion and metal clamps for clamping each of said metal portions to said non-elastic portion, each of said metal portions having a longitudinally curved part curving away from said non-resilient portion and a backwardly extending portion having a plurality of sharp points for engagement with the skin, said dressing adapted to be applied to the body of a patient by stretching the same and applying to the patient's body, the resiliency of the mid portion causing said points to remain in the skin after the dressing is in position.

13. A surgical dressing comprising an elastic body member of rubber or like material having an intermediate zone of high elasticity and opposite end zones each having means for rendering said end portions inelastic comprising fabric, said elastic body member having portions extending into the interstices of the fabric, means for securing said dressing to the body of a patient comprising thin sheet metal members each respectively including a substantially flat body portion adapted to lie, respectively flat against the under side of the respective one of said end zones,

and respective metal clamp members extending across respective end zones on the other sides thereof having portions bent over the sides of said metal members and against the respective bottom faces of said metal members to securely clamp said members to said end zones, said members each having a portion beyond the clamp associated therewith and extending backward toward said intermediate portion, the edge of each member being provided with a plurality of sharp projections adapted for engagement in the skin of the patient, and said end portions of said body member extending beyond said securing members to provide tabs adapted to be grasped to facilitate application and removal of the dressing.

WILLIAM JAMES GARDNER.

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