CLAMP FOR RETAINING THE EDGES OF A WOUND IN APPosition

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Clamp for Retaining the Edges of a Wound in Apposition

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This invention is for a means for drawing and retaining the opposite edges of the layers of the skin and subcutaneous tissue of a wound or incision in apposition or in impinging relation so as to effect a more rapid healing thereof and to relieve the lower muscles from strain or stress.

The general practice of employing sutures or skin piercing clamps for drawing the opposite sides of a wound or incision together has been found objectionable since the same draw the edges of the wound or incision together at spaced intervals only and permits the wound or incision to separate between the stitches or prongs of the clamp, while the puncturing of the skin renders it susceptible to local infection. Furthermore, the subcutaneous fatty tissue has a tendency to recede from the wound or incision due to the fact that such tissue cannot be held together by surface sutures or clamps and no means other than bindings is provided for preventing strain or stress on sutured lower muscles which often results in rupture due to coughing or vomiting.

The present invention, therefore, provides an improved clamp or surgical appliance for drawing areas of the skin on opposite sides of a wound or incision towards each other to form an upstanding ridge between said areas to thereby dispose the edges of the skin and subcutaneous tissue on opposite sides of the wound or incision in apposition continuously throughout the extent thereof and with the wound or incision disposed longitudinally of the upstanding ridge and substantially at the center thereof and for drawing lateral areas of the skin on opposite sides of said first mentioned areas towards each other to form a relatively larger upstanding ridge or bulge between said lateral areas so as to dispose the first mentioned ridge longitudinally of the said larger ridge and substantially at the center thereof for preventing transmission of strains or stresses to the wound or incision and the lower sutured muscles.

The invention is further directed to surgical appliances having spaced parallel bars joined together by bowed bridge members and having adhesive strips carried by the bars for attaching the appliance in position with the bars disposed on opposite sides of a wound or incision so as to draw the opposite sides thereof outwardly into ridge formation with the edges of the wound or incision in continuous apposition.

With the foregoing and other objects in view, reference is now made to the following specification and accompanying drawings in which there is illustrated the preferred forms of the appliances for carrying out the method.

In the drawings:

Fig. 1 is a perspective view of one of the smaller clamps employed in carrying out the invention.

Fig. 2 is a similar view thereof with the adhesive strips applied thereto.

Fig. 3 is a transverse sectional view of a large and small clamp illustrating the same in applied position with reference to a wound or incision.

Fig. 4 is a perspective view of large and small clamps in applied position and illustrating a modified form of large clamp.

Fig. 5 is a transverse sectional view thereof.

Figs. 6, 7, 8 and 9 are perspective views of modified forms of smaller clamps with the adhesive tape omitted.

Fig. 10 is a perspective view of the large and small clamps illustrated in Figs. 4 and 5 of the drawings, the large clamp being provided with a modified form of auxiliary adhesive strip.

Fig. 11 is a perspective view of the clamp illustrated in Figs. 4, 5 and 10 with the adhesive strips removed.

Referring to the drawings by characters of reference and more particularly to the form of the invention illustrated in Figs. 1 to 3 of the drawings, the clamp indicated generally by the reference character A is adapted to be adhesively secured to areas B and C of the skin on opposite sides of a wound or incision D to thereby form an upstanding ridge E between the areas B and C and to draw the opposite edges of the wound or incision together to dispose the same in continuous apposition.

As illustrated in Fig. 3 of the drawings, the edges of the outer layer F of the skin on opposite sides of the wound or incision D are compressed together continuously throughout the extent of the wound or incision so as to close the same. The edge of the inner layer G of the skin on opposite sides of the wound or incision are likewise compressed together in continuous apposition and since this layer of the skin contains blood vessels, the same grow together more rapidly when firmly held together in continuous apposition.

A relatively large clamp H may also be employed which is adapted to be adhesively secured to areas J and K of the skin on opposite sides of the wound or incision and laterally of the areas B and C. In applying the clamp H to the skin, the areas J and K are drawn towards each other so as to form a relatively larger upstanding ridge or bulge L of the skin and subcutaneous
tissue between the areas J and K and within which ridge or bulge the wound or incision D is disposed longitudinally and substantially at the center thereof. The drawing of the spaced areas J and K inwardly toward each other into the up-standing ridge or bulge L produces a slackness on opposite sides of the wound or incision for preventing transmission of strains or stresses of the muscles to the wound or incision.

The clamps A and H are of substantially similar construction and each includes longitudinally extending bars 10 which are connected together in spaced parallel relation by bridge elements each consisting of an arcuate bight portion 14 and outwardly divergent leg portions 12, the terminals of which are connected with the bars 10 preferably at the ends thereof. The bars 10 each carries an adhesive strip 13 which embraces the same and is doubled on itself to provide a strip of two ply thickness with the plies secured together in any desired manner.

The strips 13 may consist of either single or double faced adhesive material, the outer adhesive surfaces of which are covered by strips of gauze 14 and 15 to maintain the same in an antiseptic condition until the same is to be used when the gauze strip 15 is removed to expose the fresh adhesive.

The clamps are composed of deformable material such as malleable or untempered steel or iron, synthetic plastic compositions or any other equivalent material which possesses the character or quality of retaining a fixed shape or formation against distortion under any usual strain or stress to which the clamp is subjected when in use, while permitting of the manual bending of the bridge elements or legs towards each other when adhesively secured in applied position. When the legs 12 of the smaller clamps are thus bent from outwardly divergent relation as illustrated in Figs. 1 and 2 of the drawings to inwardly bowed formation, as illustrated in Fig. 3 thereof, the bars 10 are compressed against the opposite sides of the ridge or bulge to retain the edges of the wound or incision in apposition. This inward bending of the legs may be periodically affected during the healing of the wound or incision.

In use, the clamp A is first applied by securing one of the adhesive strips 13 thereof to the area of the skin B longitudinally and at one side of the wound or incision D after which the opposite strip of adhesive is applied to the area C on the opposite side of the wound or incision D, while drawing the areas B and C of the skin together into ridge formation. When in applied position, the legs 12 are pressed inwardly or towards each other to thereby provide the desired compression on the opposite sides of the ridge B to dispose the edges of the skin and subcutaneous tissue on opposite sides of the wound or incision in continuous apposition throughout the extent thereof. The large clamp H is applied in a similar manner in straddling relation with the clamp A so as to provide the upstanding ridge or bulge L between the bars 10 thereof and with the wound or incision D disposed longitudinally of and substantially at the center thereof.

A clamp such as illustrated in Figs. 4 and 5 of the drawings may be employed for retaining in continuous apposition during healing the opposite edges of a wound or incision which is located in the walls of the abdomen or other parts of the body having fatty tissue between the skin and muscles. As shown therein the clamp M may be employed in addition to the clamp A which is secured to the areas B and C of the skin on opposite sides of the wound or incision D to form the upstanding ridge E as hereinafore described.

The clamp M is disposed in straddling relation to the clamp A and is adhesively secured to areas N and O of the skin on opposite sides of the wound or incision D and laterally of the areas B and C. The clamp is thus applied to draw the areas N and O of the skin towards each other so as to form the upstanding ridge or bulge P between the areas N and O and within which ridge or bulge P the clamp A and wound or incision D are located longitudinally and substantially at the center thereof. The ridge or bulge P is of a height that the fatty tissue and muscles located between the areas N and O are likewise bulged outwardly. The slackness produced by the bulge P extends into the muscles Q to thereby relieve strains or stresses from the sutures so as to prevent rupture thereof which frequently happens due to coughing or vomiting. The fatty tissue R on opposite sides of the wound or incision is also drawn together to thereby close the wound or incision between the skin and muscles and to cover and protect the sutures in the muscles.

The clamp M consists of longitudinally extending bars 17 which are connected together in spaced parallel relation by bridge elements located at the opposite ends thereof and each including a transversely extending elevated medial portion 18 and oppositely disposed confronting bowed end portions 19, the inwardly directed lower terminals of which are connected with the bars 17 respectively at the ends thereof. The said bridge elements are connected together at the juncture of the medial portions 18 with the bowed end portions 19 by longitudinally extending parallel bars 20. The bars 17 each carries an adhesive strip which embraces the same and is doubled upon itself to provide a two ply thickness with the upper ply 21 secured upon the lower ply 22 by any desired means, the lower ply 22 being adapted to be adhesively secured to the areas N and O of the skin as hereinafore described.

The bars 20 may each be similarly provided with an auxiliary adhesive strip 23 which embraces the said bars and is secured to the lower ply 22 at 24 in any desired manner and which lower ply is adapted to be secured to the skin at the areas S and T as illustrated in Figs. 4 and 5. These strips 23 function to draw the clamp M towards the body in order to assist the adhesive strips 22 for maintaining the clamp in position.

In place of the clamp A employed in carrying out the invention as illustrated in the forms hereinafore described, the same may be in the form of the clamps U, V, W, and shown in Figs. 6 and 9 inclusive of the drawings. As illustrated in Fig. 6, the longitudinally extending bars 25 of the clamp U are longitudinally curved to provide longitudinally extending concave bottom edges 26 adapted to be arranged in straddling relation with a wound or incision in a convex portion of the body. The longitudinally extending bars 28 of the clamp V illustrated in Fig. 7, are longitudinally curved to provide convex longitudinally extending lower edges 29 in order to engage on opposite sides of a wound or incision located in a portion of the surface of the body which is of concave formation, while in Fig. 8 the longitudinally extending bars 31 of the clamp W are curved or laterally offset intermediate their length in any.
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The clamp X illustrated in Fig. 9 of the drawings, is of relatively shorter length having the opposite bars 33 parallel and provided with the upwardly projecting lugs 34 for facilitating the grasping thereof, it being understood that the said bars in the clamps illustrated in Figs. 6 to 9 inclusive are provided with adhesive strips similar to the strips 13 for securing the same in position with the areas of the skin B and C.

In treating certain wounds or incisions it is desirable to provide means for periodically increasing the lateral pressure at the opposite sides of the longitudinally extending ridge or bulge P formed by the large clamp M. This may be effected by providing the clamp M with auxiliary adhesive strips which are adjustable to shorten their overall length.

As illustrated in Fig. 11, the clamp M is similar to the construction of the large clamp M shown in Figs. 4 and 5 of the drawings, and is provided with auxiliary strips 36 each consisting of sections 37 and 38, the former being attached to a bar 20 of the clamp, while the latter is adapted to be adhesively secured to the skin as at S and T. The sections 37 and 38 are provided with tie strings 39 and 40 adapted to be tied together for exerting outward tension on the bars 20 at the opposite ends of the clamp to thereby effect a drawing of the clamp towards the body and the inward tightening of the bars 17 against the opposite sides of the ridge or bulge P.

The clamps H and M may also be used independently of the small clamp A or the clamps U, V, W and X for gangrenous or sloughing wounds or incisions. When thus used, the opposite edges of the wound or incision are maintained in open relation so as to permit of drainage. The legs 12 of the clamp H and the bowed end portions 18 of the clamp M being deformable, the same may be progressively advanced towards each other to increase the pressure from day to day thus forcing the opposite edges of the skin and subcutaneous tissue gradually together as the cleansing and granulations of the wounds or incisions progress.

What is claimed is:

1. A surgical clamp consisting of longitudinally extending bars, bridge elements connecting the same together and each including a transversely extending elevated medial portion and oppositely disposed confronting bowed end portions having their inwardly directed terminals connected with the bars respectively at the ends thereof, and longitudinally extending bars connecting the bridge elements at the juncture of said medial and bowed end portions and adhesive strips carried by all of said bars to project laterally therefrom and adapted to be adhesively secured to the skin on opposite sides of an incision for producing an elevation of the skin and subcutaneous tissue on opposite sides of the incision.

2. A surgical clamp consisting of longitudinally extending bars, bridge elements connecting the same together at the opposite ends thereof, said bridge elements each including a transversely extending elevated medial portion, oppositely disposed confronting bowed end portions having their inwardly directed terminals connected with the bars respectively, and longitudinally extending elevated bars connecting the bridge elements at the juncture of said medial and bowed end portions, and adhesive strips carried by said longitudinally extending bars and by said elevated bars to project laterally therefrom and adapted to be adhesively secured to the skin laterally of said clamp, the adhesive strips carried by said elevated bars being adjustable intermediate their ends to shorten the overall length thereof for increasing the outward tension on the bridge elements of the clamp at the opposite ends thereof.

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