A device, including a base, adapted to be adjustably and removably secured on a horizontally disposed operating table. An upwardly inclined support will support the leg bent at an angle, preferably less than 45° at the knee, with the knee elevated and both the upper and lower legs in a substantially vertical plane and free from obstruction to clear visibility, and access to the lateral sides of the knee, and also free from obstruction to lateral movement of the leg. The support is also adjustable as to height and to the angle at which the leg may be bent and supported, and to a position in which the leg is supported with the foot elevated to operating level for foot and ankle surgery.

3 Claims, 8 Drawing Figures
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SUPPORT FOR LEG DURING KNEE SURGERY

SUMMARY

Hereofore in knee surgery, a nurse or assistant holds the lower leg at the desired angle during the operation. Many times such operations are lengthy and the position of the knee changes due to the fatigue of the nurse. Also the surgeon is handicapped by not being able to clearly view the site of the operation, or to adapt himself to the best position for performing the operation. Frequently it has been necessary to repeat operations due to one of the above causes.

One of the objects of the present invention is the provision of a leg support that is adapted to support one leg of a person lying on the back with upper leg, or femur, extending upwardly and the knee bent so the angle between the upper leg, and the lower leg, or tibia, will be as small as possible in most instances, usually allowing the thigh to fall toward the abdomen. In this last position, the side or the inferior distal or lower portion at the knee (toward the foot) is accessible, and there must be no obstruction to ready access to the knee and, the lower leg in many instances should be supported in a manner permitting its manipulation.

Another object of the invention is the provision of a leg support for supporting the knee elevated and the leg bent at the knee, which support includes means for supporting the bent leg on an operating table adjacent to one side or the other while the other leg is straight and supported on the table, and which support is free from obstruction to full access to opposite sides for the performance of surgery on the knee.

An additional object is the provision of a leg support for supporting the upright leg of a patient lying on an operating table, with the knee bent for surgery, and which support is adjustable for legs of different lengths, and for supporting the leg bent at different angles, and also for supporting the leg with the foot elevated at operating height when ankle or foot surgery is required. Other objects and advantages will appear in the description and drawings.

DESCRIPTION OF INVENTION

Basically, the device comprises a pair of horizontally disposed base members generally designated 1 (FIG. 2) that are adated to be positioned cross-wise on an operating table.

A horizontally elongated element generally designated 2 (FIG. 1) is supported on members 2 at its ends, and extends at a right angle to said members 2.

An elongated upright 3 is secured at its lower end to one end portion of element 2, and an elongated leg support 4 is secured at one end to the upper end of upright 3 is downwardly inclined to connect at its opposite lower end with the end of the element 2 that is opposite to the lower end of upright 3.

The angle between the upright 3 and the support 4 may be varied, as will later be explained, but in FIG. 1 it is shown as approximately 35°.

The upper leg of a patient is indicated at 5 (FIG. 1) and the lower leg at 6 while the body 7 of the patient is lying on the table 8 that also supports the device (FIG. 3).

The buttocks 9 (FIG. 1) of the patient will be substantially against the lower end of upright 3 and the angle between the upper and lower leg will be approximately that of the angle between the element 2 and upright 3. The foot 9' of the patient will rest against the inclined support 4.

Cords 10 connected with the ends of the base member 1 (FIGS. 2, 3) may extend below the table 8 and are releasably tied together to firmly secure the device on the operating table at any point along the table without injury to the latter. The base members are sturdy relatively wide strips of rigid material and extend the width of the table to provide a stable support for the device.

Upright 3 comprises an upper strip 13 of approximately the same width as the element 2 and a hinge 14 pivotally connects the upper end of the strip 13 with the upper end of the inclined support 4.

The opposite longitudinally extending edges of upright 3 may be grooved at 15 (FIGS. 1, 5) to slidably receive the turned flanges 16 (FIG. 5) on the sides of a channel strip 17. The lower end of channel strip 17 is pivotally connected by a hinge 18 with one end of a corresponding channel strip 19 (FIG. 1).

Said element 2 comprises an elongated member 20 substantially corresponding to strip 13. Grooves 20' formed in opposite edges of member 20 slidably receive the turned flanges on the sides of channel strip 19.

A clamping screw generally designated 21 (FIGS. 1, 4, 5) has a relatively large manually graspsable head 22, and a threaded shank on said head extends through a slot 23 (FIG. 4) in the web of channel strip 17 and into a clamping member 24 (FIG. 5) held in strip 13 for releasably clamping strip 13 to channel strip 17 at different degrees of vertical extension of strip 13 relative to channel strip 19.

At the end of the member 20 opposite to the channel strip 19 is strip 27 that substantially corresponds to channel strip 19 and which channel strip 27 has turned flanges 28 (FIG. 6) slidable within grooves 20'. Said grooves 20' extend the full length of the member 20. The channel strip 27 is hingedly connected to the lower end of the inclined support 4 by a hinge 29.

The channel strips 19, 27 are each adjustably secured to the elongated element 2 in the same manner, hence
a detailed description of the strip 27 will apply to both.

The web of each channel strip 19, 27 overlies the upper side of member 20, and said web is formed with an elongated slot 30 centrally thereof extending longitudinally of strip 20. A screw generally designated 31 (FIGS. 6, 7) extends through slot 30 into a cylindrical clamping piece 32 having a circular flange 33 at its lower end. The piece 32 extends into a hollow cylindrical pivot member 34 that has a circular flange 35 at its upper end. The member 33 and the piece 34 are in circular aligned openings in one of the end portions of the base members 1, 20 and the flanges on their ends are respectively positioned within counterbored ends of said openings so that tightening the screw 31 extending through each slot 30 will not only clamp the channel strips 19, 27 to the member 20 in adjusted position of said channel strips, but will tighten the ends of the base members 1 against the member 20. Flange 33 is in a counter bore in member 20.

By this adjustment, the angle between the upright 3 and the leg support 4 may be varied, irrespective of the height adjustment of the upper strip 13 of the upright provided by channel strip 17.

The heads 36 of screws 31 correspond to the head of screw 21 being manually tightened and loosened and extending over the marginal portions of slots 30.

By removal of the tie cords 10, from one of the ends of the base members 1, the base members may be swung about the clamping pivot 34 through 180° so that the leg support may be positioned at the right or left hand side of the operating table 8. The screws may then be tightened.

The leg support 4 is provided with a cross piece 39 that is adjacent the upper end of said support to provide a support for the portion of the leg at about the calf during lateral manipulation or movement of the leg relative to the support.

Each of the tie cords 10 may be provided with a flanged ferrule 40 swaged onto one end (FIG. 8) for engaging the upper sides of the base members upon tightening the cords or ropes to secure the members 1 on the table 8. Obviously a single cord could extend through the openings in the end of each base member, if desired, with the ends tied below the bed in the same manner, with a section of the rope extending across the upper side of the table. In such instance said section would extend over the channel strips 19, 27 or past the outwardly facing ends of the member 20.

The upper end of the upper strip 13 of the upright 3 and the upper end of the inclined leg support 4 may have arcuate elements 41, 42 secured thereon, one over the other in slideable engagement to provide a rounded surface at the inner side of the knee, both for covering the hinge 14 and terminal adjacent ends of the strip 13 and support 4, and for the comfort of the patient.

From the foregoing description it is seen that the height of the upright 3 may be readily adjusted, and the angle between the upright 3 and support 4 may be adjusted. The leg will be firmly supported in any of the adjusted positions.

In some instances ankle or foot surgery as well as knee surgery may be required, in which case an elongated prop or support 43 of the same width as the leg support 4 is pivotally connected at one end to the underside of the latter by a hinge 44 positioned adjacent to the lower end of the inclined support. The hinge pin 45 connecting the leaves of the hinge 29 is axially removable to disconnect the central portion 46 of hinge from the end portions 47, and the support 4 is swung to the elevated horizontal position 48 indicated in dot dash lines. The end of the prop, support or post 43 opposite to hinge 44 carries hinge section 49 that corresponds to said portion 46, and this is connected by hinge pin 45 to end portions 47.

A brace 50 horizontally connected to the prop or support 43 at 51 carries a hinge section 52 at its end opposite to the hinge 51 that includes a removable hinge pin 53. This section 52 is connectable with hinge elements 54 on a central channel strip 55 that is adjustable on member 20 in the same manner as the channel strip 17, having a clamping member corresponding to member 24 (FIG. 5) and a clamping screw 56 corresponding to screw 21.

When the prop or post 43 is moved to the broken line position 57 and brace 50 is swung to the broken line position 58 the leg support 4 in its elevated position enables the foot to be supported at the same height as the knee.

The hinge 14 is also shown with a removable hinge pin, so that the device may be disassembled and assembled for convenience and storage, and the pivots connecting the base members 1 with the horizontal element 2 enable the members 1 to be swung to positions parallel with the element 2.

I claim:
1. A device for supporting the leg of a person during surgery thereon, comprising:
   a. a rigid, horizontally elongated member adapted to be supported horizontally on an operating table or the like,
   b. securing means for releasably securing said member horizontally on said table stationary relative thereto;
   c. a rigid, elongated upright extending upwardly from one end of said member and attaching means for securing the lower end of said upright to one end of said member;
   d. a rigid, elongated, lower leg support inclined downwardly from the upper end of said upright to the other end of said member for supporting thereon the lower portion of the bent leg of said person with the knee over the juncture between the upper ends of said upright and said lower leg support when said person is lying flat on said operating table with the rear side of the thigh against said upright and when said horizontal member is supported on said table;
   e. upper connecting means and lower connecting means respectively securing together the upper ends of said upright and lower leg support, and securing the lower end of said leg support to said other end of said member for holding said lower leg support and said upright at an angle of approximately 45° relative to each other;
   f. said securing means including a pair of horizontally spaced, horizontally elongated base elements extending transversely of said member below opposite end portions of the latter, secured thereto, and table engaging devices on the ends of said base elements for releasably holding said base elements stationary on said table;
   g. said member being at one of the ends of said base elements for positioning said member, said upright and said lower leg support having one side of said
table when said base elements are on the table extending transversely thereacross, and the portions of said base elements extending from said member to the opposite ends of said base elements being free for supporting the unbent other leg of the patient in a position extending horizontally across said portions;

h. vertical pivot means connecting said base elements to said elongated member for swinging said base members to positions extending to either side of said elongated member at one side or the other of such table according to which leg is being operated upon.

2. A device for supporting the leg of a person during surgery thereon, comprising:
a. a rigid, horizontally elongated member adapted to be supported horizontally on an operating table or the like;
b. securing means for releasably securing said member horizontally on said table stationary relative thereto;
c. a rigid, elongated upright extending upwardly from one end of said member and attaching means for securing the lower end of said upright to one end of said member;
d. a rigid, elongated, lower leg support inclined downwardly from the upper end of said upright to the other end of said member for supporting thereon the lower portion of the leg of said person with the knee over the juncture between the upper ends of said upright and said lower leg support when said person is lying flat on said operating table with the rear side of the thigh against said upright and when said horizontal member is supported on said table;
e. upper connecting means and lower connecting means respectively securing together the upper ends of said upright and lower leg support, and securing the lower end of said leg support to said other end of said member for holding said lower leg support and said upright at an angle of approximately 45° relative to each other;
f. said upper connecting means comprising a hinge pivotally connecting said lower leg support with said upright for swinging said lower leg support upwardly about said hinge to an elevated generally horizontally extending position spaced above said member;
g. said lower connecting means including a pin for releasably connecting said lower end of said lower leg support with said other end of said horizontally elongated member, said pin being movable from a releasing position to a connecting position and means for supporting said lower leg support in said elevated position;
i. said last mentioned means comprising a rigid post pivotally connected at one of its ends to said lower leg support adjacent to said lower end of the latter for swinging of said post downwardly to a vertically extending position extending between said lower end of said leg support and the other end of said member when said pin is moved to said releasing position releasing said lower leg support and the latter is moved to said elevated position; and
j. means on the end of said post opposite to its pivotal connection with said lower leg support engageable by said pin upon movement of said pin from said releasing position to said connecting position for connecting the lower end of said post with said other end of said member;
k. said lower connecting means comprising a hinge having parts respectively carried by said lower end of said lower leg support and by said other end of said member, said parts being connected by said pin;
l. said lower attaching means comprising a hinge whereby said member is pivotally connected at its said one end and its said other end with the lower end of said upright and with the lower end of said lower leg support respectively; and
m. a rigid brace pivotally connected at one of its ends with said post at a point intermediate its ends for swinging to a position extending between said point and a second point intermediate the ends of said member when said lower leg support is in said elevated position supported by said post; and
n. means on said member for securing said brace to said member at said second point for supporting said upright, post, and leg support rigid when the lower end of said person is supported generally horizontally on said leg support.

3. A device for supporting the leg of a person lying horizontally on a horizontal operating table during surgery on the knee of such leg, comprising:
a. a rigid, horizontally elongated base member adapted to be supported horizontally on one end of said table, said member being of a width for supporting only one leg thereon with the other leg horizontally on such table alongside said member in side-by-side relation thereto;
b. a rigid, elongated upright extending upwardly from one end of said member;
c. a rigid, elongated, lower leg support inclined downwardly from the upper end of said upright to the other end of said member for supporting thereon the lower portion of the bent leg of said person with the knee over the juncture between the upper ends of said upright and said lower leg support when said person is lying flat on said operating table with the rear side of the thigh against said upright and when said horizontal member is supported on said table;
d. a first hinge means pivotally connecting the upper ends of said upright and lower leg support together, and a second hinge means pivotally connecting the lower end of said upright and said one end said member together, and a third hinge means connecting the lower end of said lower leg support to said other end of said member;
e. said first, second and third hinge means connecting said base member for supporting said upright extending generally vertically upwardly with the knee joint at and over the juncture between said upright and said lower leg support;
f. said horizontal base member including means for supporting said second and third hinge means for horizontal movement to different positions apart horizontally and means for releasably securing them in each of said different positions, and said upright including means for supporting said first and said second hinge means for vertical movement to different distances apart and means for releasably securing them in each of said last mentioned different positions, whereby the height of said juncture between said upright and said lower leg support may be varied.