Two suggestions in surgical technique. I. A new method of compressing the subclavian artery. II. A new method of ascertaining whether the bladder is or is not ruptured / by W.W. Keen.

TWO SUGGESTIONS

IN

SURGICAL TECHNIQUE.

I.

A NEW METHOD OF COMPRESSING THE SUBCLAVIAN ARTERY.

II.

A NEW METHOD OF ASCERTAINING WHETHER THE BLADDER IS OR IS NOT RUPTURED.

BY

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TWO SUGGESTIONS IN SURGICAL TECHNIQUE.

I. A New Method of Compressing the Subclavian Artery.

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[Read February 12, 1890.]

I. Compression of the Subclavian Artery.

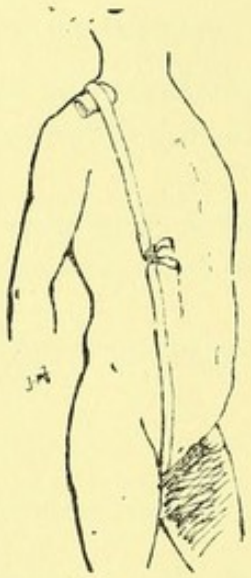
All surgeons know the difficulty of maintaining steady and effectual occlusion of the subclavian artery by pressure above the clavicle on the third part of the artery where it crosses the first rib. A recent and difficult case that I witnessed drew my attention to the subject afresh, and it occurred to me that compression might be much more effectually accomplished by an elastic band passing over the shoulder, down the back, under the perineum, and up in front of the trunk. It is analogous in its mode of action to Mr. Jordan Lloyd's method of compressing the external iliac artery. I have had no opportunity of putting it into practice in any actual operation about the shoulder-joint, but I have tried it on the living, and found it perfectly effectual and easy of accomplishment.

The strong elastic strap or band which comes with Esmarch's rubber bandage is the best means of applying the pressure. A suitable roller bandage, two inches wide, is placed above the clavicle over the position of the artery as ascertained by the touch. The elastic strap is then passed, as described, over the roller bandage, down the back, between the thighs, and up in front of the trunk. The ends can either be held by an assistant, or, better still, be tied or hooked together. (Fig. 1.) If it is desired to release the artery, the rubber strap is slipped off the bandage; pressure can be renewed as easily. An assistant should stand on the side of the patient opposite to that on which

the operation is to be done, to steady the elastic strap and roller bandage in position.

The advantages of the method now proposed are, that it is reliable; that the elastic band will maintain compression even though the patient should struggle during the operation; and not only is the assistant

FIG. 1.



not tired out by the fatigue of compressing the artery, but he has one hand free to assist the operator, if need be. Its chief advantage, of course, lies in its absolute certainty and continuousness. An Esmarch bandage can, of course, be applied to the arm previous to applying the compression. [The method was shown on a patient, and its efficacy verified by several members of the Society.]

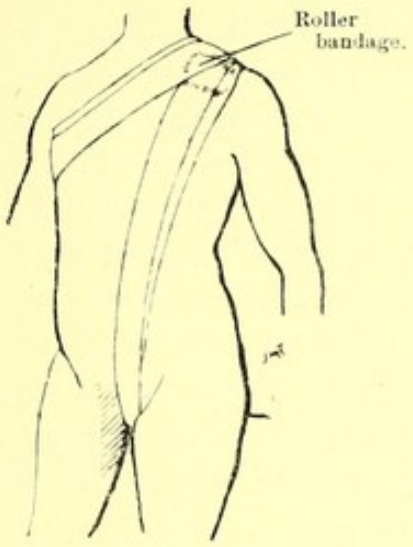
ADDENDUM.

Further experiments in the method I proposed, since reading the above paper, have led me to modify the means employed, as follows:

With the elastic strap of the Esmarch bandage I have found some difficulty in retaining in place the roller bandage over the subclavian. It has a tendency to fall downward over the clavicle, and outward toward the shoulder. To obviate this, I have resorted to the elastic *bandage* of Esmarch instead of the strap, and have applied it as follows: The tendency to displacement of the roller bandage downward below the clavicle is counteracted by laying the end of the bandage on the chest, and carrying it over the shoulder and down the back. If the elastic strap is used, the natural tendency, when it is placed in position, is to pull upon both ends at once, and the upper end being drawn downward tends to displace the roller bandage downward. If

it is applied by the elastic *bandage*, as now described, traction being always made with the unrolled part of the bandage, over the shoulder *from front to back*, this subclavicular displacement is prevented. To

FIG. 2.



prevent the outward displacement I carry every alternate turn under the *opposite axilla*. By this means the roller bandage is held in place absolutely, even without care from an assistant.

II. A NEW MEANS OF ASCERTAINING WHETHER THE BLADDER IS RUPTURED BY INJECTING FILTERED AIR INTO IT.[1]

This, also, I have had, as yet, no means of testing in the living body. When using Senn's hydrogen test, on an animal recently, the idea occurred to me that it would be an excellent means of ascertaining the fact of rupture or non-rupture of the bladder. In order, however, to make it more available, the following modification suggested itself to my mind:

1. Introduce the catheter and empty the bladder of any urine that may be present.

2. Connect the catheter with an ordinary Davidson's syringe. This should have been disinfected. Over the distal end of the syringe a

[1] The subject-matter of this paper had been in my mind for some weeks, but on the very day on which I wrote it, I read a reprint of a paper by Dr. T. S. K. Morton, from the Journal of the American Medical Association, January 4, 1890, in which I found that he had already made the suggestion to use insufflation of hydrogen for a similar purpose. I was not aware until then that it had been suggested before. Filtered air seems to me, for the reasons stated, to be much simpler, and therefore more useful, than the method suggested by Dr. Morton.

moderately copious mass of absorbent cotton is tied. If the operator prefers, he can connect the distal end by a rubber tube with a glass tube, which has been packed with absorbent cotton, which may itself have been made antiseptic. The cotton in either case acts as a bar to the entrance of germs as in the tubes of bacteriologists. Air is then pumped into the bladder. Should no rupture have occurred, the rounded, elastic, tympanitic bladder will appear in the hypogastrium. Should there be a rupture, the air will escape through the rent into the general peritoneal cavity, and distend the entire belly. It is perhaps even a needless precaution to have the air filtered free from germs in carrying out this procedure, for should the bladder be ruptured, laparotomy, of course, would be done, and the unfiltered air of the room would gain free access to the peritoneal cavity from the abdominal wound. If the bladder is not ruptured, the air pumped in would, of course, escape at once by the catheter, and have done no harm; but I should decidedly prefer to filter the air, and so exclude any possibility of infection.

The great advantage filtered air would have over hydrogen is, of course, the ease and instantaneousness with which it can be used.

ADDENDUM.

A modification combining Dr. Weir's method with water (see the discussion) has occurred to me as follows: If a quart or larger-sized bottle be connected to the catheter by rubber tubing and filled with filtered air, water could be poured into it by a second tube and funnel, thus forcing a measured quantity of air into the bladder by hydraulic pressure. Then substituting a Davidson syringe for the funnel and sucking the water out, the air would be drawn from the bladder back into the bottle and the amount measured. If equal to that just injected, it would be an additional evidence of non-rupture of the bladder. An error, however, might arise from the easy compressibility of the air.