The association of such cases of jaundice with transfusion may easily be overlooked in view of the long symptomless period which intervenes.

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A NEW AND SIMPLE METHOD FOR SUBCUTANEOUS LIGATURE OF VARICOSE VEINS

BY

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The injection of various solutions into varicose veins often causes their obliteration; but this technique is generally useless when the upper part of the great saphenous vein is varicose: the downward pressure of this long column of blood unfortunately unseals the attempt at thrombosis.

In the past decade surgical opinion has recognized this factor, and operations for high ligation of the vein have become standardized. These are usually, and rightly, combined with injection of the vein's lower reaches. This combined operation is generally very successful. Lately, several surgeons have practised a still simpler technique: the vein is compressed subcutaneously instead of by open operation. I use the word "compressed" advisedly, as will appear later from the text, although these others refer to their methods as ligation. By this technique a curved needle is thrust into the skin at the side of the vein; it passes deep to the vessel and reappears at the other side of it. The two free ends are then tied over a pad of gauze. Below this the varicosities of the lower leg are injected.

I find that there are several marked advantages in these subcutaneous methods, particularly from a military point of view. First, there are a large number of men who obstinately refuse to be "cut about." When it is explained to them that the cure (I carefully avoid the word "operation") entails absolutely no cutting, they then find that they can furnish no adequate reason against being cured. Also, the method, being ambulatory, effects a great saving in hospital beds. With an open operation, even after the patient leaves the ward, he must remain relatively immobile until the wound has healed strongly. The use of the subcutaneous operation should result in raising thousands of soldiers into a higher category.

The method hitherto used is described as subcutaneous ligation. It is certainly subcutaneous, but it is a unilateral compression, not a ligation. A true ligation should evenly compress the vein's entire circumference towards its centre. A much more effective and permanent result is likely to follow from a true ligation. The simple method described below forms a true ligation around the vein. In addition the little operation is complete at one sitting. Patients need not return to the clinic for removal of stitches. Usually I tell them to return, but it is more for my interest than in theirs.

Method

The patient stands and the highest visible part of the internal saphenous vein in the thigh is shown; but it is advisable to

keep at least 2 in. below the saphenous opening. A local anaesthetic wheal is raised on each side of the vein. A curved cutting needle is then threaded with catgut. It is plunged into one wheal, passes deep to the vein, and emerges through the skin via the opposite wheal (Fig. 1). This curved needle (Fig. 2) is now removed from the catgut and a straight needle

FIG. 1

FIG. 2

FIG. 1.—Stage I: Curved needle passes through skin, then deep to vein, to emerge through skin at opposite side. Thus the two skin punctures A and B are made.

FIG. 2.—Stage II: Curved needle has emerged. A straight needle must now be substituted on to the catgut.

substituted on to the catgut. This straight needle is now thrust back into the skin via the same minute opening through which the curved needle has recently emerged. The straight needle passes in front of the vein and emerges through the same minute hole where the curved needle made its original entry (Fig. 3).

FIG. 3

FIG. 4

FIG. 3.—Stage III: Straight needle has re-entered skin via B and is about to emerge via A. Here needle passes in front of vein.

FIG. 4.—Stage IV: Straight needle has emerged and the two original ends of the catgut are ready to be tied together with a reef-knot, forming a true ligation around the vein.

The two ends of the catgut are once more in juxtaposition (Fig. 4); they are tied fairly tightly and cut short; the knot retracts and almost disappears. The little operation is complete. It is extremely simple to do; in fact, reading about it demands more effort than actually doing it. The area receives no dressing other than a small piece of bare elastoplast. This is removed in one week, when the catgut knot will have disappeared spontaneously. There will now be a minute puncture and the surrounding skin will have a slightly traumatized appearance, but no further treatment is necessary; in a short time the skin regains its normal appearance and elasticity.

A few days after the original ligation the varicose veins below the knee should receive one or more injections as necessary, but great caution should be observed; only a small quantity of the thrombogenic fluid should be injected at first (1 c.cm. of 5% sodium morrhuate would be a good initial or test dose). The reason for this cautious and small injection is obvious: with the main internal saphenous vein ligatured the venous current is so slow that dilution or washing away of the chemical hardly occurs; from a minimal dose maximal results are obtained.

For a week after the ligation patients can move about and are quite fit for light duties. After that they rapidly become normal.

Discussion

For the past few months I have carried out this simple procedure on every suitable case that has come under my care, the results being invariably successful. I must admit that as yet I have had no large series of cases. The procedure is so simple that I have already begun to ligate the larger varicosities of the lower leg in preference to their injection, though care is exercised in avoiding flexures.

Many surgeons have objected to any ligation of the saphenous vein short of its junction with the femoral vein. Some have even stressed the necessity for ligating the small tributaries (superficial epigastric, etc.) that flow into the vein at this level. In spite of these theoretical objections there is no doubt that ligation at a low level is effective. Is it permanent? Possibly not, but this slight procedure is so rapid and easy for both surgeon and patient that it is certainly worth doing, even though no lifetime guarantee is attached. In any case, we are living in times when it is probably wise to follow a short-term policy in such matters. If we can bring a man, and more especially a soldier, into a higher category for the duration of the war it is worth while.

Summary

A new and simple method is described for the complete subcutaneous ligation of varicose internal saphenous veins. It has the advantage that the operative treatment is complete at one sitting and that no incision is necessary. The treatment is ambulatory.

POST-OPERATIVE RESPIRATORY COMPLICATIONS IN SERVICE CASES

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Being struck by the high incidence of post-operative respiratory complications in Service cases as compared with those occurring in civilians, and noting that Kaye (1941) and Binning (1940) have described similar experiences, we decided to keep a record of a series of consecutive cases in an attempt to find some causative factor.

A record was kept of the age, operation, premedication, type and amount of anaesthetic, duration of anaesthesia, any unusual incident during anaesthesia, and any post-operative complications in a series of consecutive cases undergoing surgical procedures at an E.M.S. hospital. The patients were all members of H.M. Forces, the great majority of them anaesthetic-resistant subjects in the "pink" of physical condition. Many of them had that type of "dust and tobacco pharyngitis" described by Kaye (1941). The wards were remote from the operating theatre, necessitating a journey in the open air to and from the theatre.

Clinical

The cases developing post-operative respiratory complications all followed a very similar course. The temperature rose on the second, third, or fourth day to a point between 100° and 102° F., with cough and purulent sputum. All had moist sounds in the chest, which were usually most noticeable at the base on the side operated on. The signs were those of a simple bronchitis, and only three had signs of consolidation. If the temperature rose above 101° F. sulphapyridine was given; but the course did not seem to be materially altered by this, for in four days from the onset of symptoms most of them had settled down to normal, the sputum had become very scanty, and what there was of it was colourless and frothy.

All patients were operated on at the earliest opportunity, the majority on the day after admission, so that the risk of their getting any infection in the ward was reduced to a minimum. Most of them were smoking heavily up to the time of operation, and at one time, from February to April, all patients operated on for hernias and appendicitis were forbidden to smoke till after the fourth day. It was not found that stopping smoking after operation had any effect upon the incidence of complications, and non-smokers were affected as well as smokers.

It was soon apparent clinically that the power to cough and to breathe deeply were factors, and we began to institute measures to encourage free movements and deep breathing. For the 24 hours after operation all men operated on for abdominal conditions were given inhalations of carbogen for ten minutes every two hours when awake. This did not make any difference that we could detect. We then began to get

all these cases out of bed the day after operation; from the second day they stayed up longer, and were encouraged to walk if they wanted to. This procedure was continued even when the temperature rose, as the men soon found that they were able to cough much more easily when sitting in a chair than when propped up in bed. This routine was adopted after a personal communication from Lawrence Abel. On the first day the patients move out of bed rather unwillingly, on the second day they are quite willing to sit by the fire, and on the third or fourth they begin to walk about the ward and to go to the lavatory of their own free will. This has not lessened the incidence of complications, but it has diminished the time taken for recovery and has possibly been a factor in the avoidance of a real pneumonia. Before we started getting these cases up three men developed consolidation, but since that time we have had only one case, to be described later. When treated in this way the cough made no difference to the man's rate of recovery, for after four days he seemed none the worse, and was transferred to a convalescent home on the eighth day.

[The final end-results of the operations for hernia, which at present seem most satisfactory, will, it is hoped, be the subject of a later communication.—D. J. M.]

Throughout this series a critical attitude has been adopted as to what constitutes a chest complication. Any cough, even without rise of temperature or without sputum, has been recorded. As it was found that some house-surgeons were more critical in their attitude than others, the latter part of the investigation was entrusted to one person who made regular ward rounds, with the post-operative condition of patients as the sole object.

Deaths.—In this series there has been no death solely attributable to anaesthesia, but one case in which the patient died should be noted. He was admitted with a paralytic ileus, and an ileostomy was performed under nitrous-oxide-oxygen-ether anaesthesia. He had a continuous intravenous glucose-saline for eight days. No pulmonary symptoms developed. Twenty days later the ileostomy was resected under nitrous-oxide-oxygen-trilene-ether anaesthesia and the abdomen closed. After the second operation he was gravely ill, and among other symptoms developed a pneumonia which did not resolve, and he died 84 days later. Necropsy showed a number of small lung abscesses and a local peritonitis.

Complications after Various Operations

Out of 2,000 consecutive cases undergoing surgical procedures under anaesthesia, 101 had post-operative temperatures of over 100° F. with cough and sputum, and 46 developed post-operative cough with no rise in temperature. It soon became obvious that the type of operation and not the anaesthetic employed was the essential factor, and the following table shows the incidence of these complications after various types of operation.

TABLE I

Operation	No.	Fever and Cough	Cough	Total	%
Amputation digit	31	0	0	0	0
Amputation limb	10	0	0	0	0
Appendicectomy	98	26	9	35	36
Circumcision	41	0	0	0	0
Cystoscopy	38	0	0	0	0
Débridement	149	1	2	3	2
Haemorrhoidectomy, etc. ..	58	0	0	0	0
Hernial repair	192	61	26	87	45
Laparotomy	17	4	2	6	35
Menisectomy	57	0	2	2	4
Miscellaneous	194	3	1	4	2
Nephrectomy, etc.	3	1	0	1	33
Orchidectomy, etc.	51	2	2	4	8
Orthopaedic operations ..	114	0	0	0	0
Perforated peptic ulcer ..	6	2	1	3	50
Plaster	123	0	0	0	0
Tonsillectomy	113	1	0	1	1
Trendelenburg operation ..	128	0	1	1	1
Minor operations of less than 10 minutes' duration ..	577	0	0	0	0
Total	2,000	101	46	147	7.3

It is interesting to compare the figures for hernia repairs (average duration of anaesthesia, 27.34 minutes) with those for Trendelenburg operations (average duration of anaesthesia, 27.55 minutes). The types and amounts of anaesthetic employed were entirely comparable.