decreases. If the spring is set primarily at 20 lb. (with $1\frac{1}{2}$ in. leeway) a stretching of 1 in. will leave the spring with $\frac{1}{2}$ in. leeway and a pull of 7 lb. The spring may have a dial inside its coils reading in pounds and inches.

Lately we have been using an extension applied with a cold glue composed of two parts mastisol and one part Canada balsam. The extension proper consists of a length of cotton stockinette, such as is ordinarily used by American orthopaedic surgeons in applying plaster casts. It comes in 25 yard rolls, and is circular, with a breadth of 4 in. The required length is cut off from the roll and rolled on itself, so as to make a garter-like circle. This is slipped over the foot, the leg is then painted in sections with the glue, and the stockinette is unrolled on to it, all the stretch being taken out during the unrolling. A roller bandage is then temporarily bound around it. The strip overhanging the foot, which is purposely left, is then split front and back and tied to the bars of the footpiece, from which the pull is taken at once. The foot is supported by glueing a piece of stockinette to the sole and suspending it from the footpiece.

If there are wounds of the lower leg, windows can be cut in the stockinette. There is seldom blistering, due to the fact that stockinette takes the pull evenly from every part of the skin, but care must be taken that the glue is not acid, or blistering may occur. Stockinette applied in this way does not slip as adhesive plaster does, and will hold a 20 lb. weight.

With this apparatus applied at the time of the first operation at the casualty clearing station a patient can travel comfortably, and arrive at a base with efficient extension and considerable reduction of the fracture. Incidentally this means immobility and the resultant good effect on sepsis and prevention of shock.

These appliances are all cheap, simple, and of wide application, and, except for the stockinette, can be used again and again.

SOME OBSERVATIONS ON SIX CASES OF RUPTURED SPLEEN.

BY

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WHILE with this casualty clearing station in Macedonia a somewhat remarkable series of accidental abdominal injuries came in for treatment within the space of a few months. They comprise the following cases of rupture of the organ mentioned: Kidney, 2 (both recovered); duodenum, 1 (recovered); small intestine, 1 (died); omentum, 3 (of whom 2 recovered and 1 died); spleen, 6 (all recovered).

It is only with the cases of ruptured spleen that I propose to deal, as the others are familiar injuries, while injuries of the spleen are not usual except where malaria adds to the size and vulnerability of the organ, and further extended notes of the individual cases have been omitted in the interests of paper saving.

In all this series the amount of violence was considerable, although rupture of the spleen may occur from slight injuries, and sometimes even spontaneously. In three cases the injury was a kick by a mule, in one a charge at football, one man fell across a trench, and in the next the injury was a bullet wound.

Condition of the Patient after the Injury.

Immediately after the injury the patient suffers violent abdominal pain and is collapsed, and may vomit or faint. An improvement in the general condition is observed in about an hour; this is followed by exacerbation of the pain and the signs and symptoms of progressive internal haemorrhage. Generally speaking, the gravity of the condition increases proportionately to the interval which elapses between the injury and the time of observation, but is modified in individual cases by the rate of haemorrhage, the external temperature, and the pain and suffering involved in transport over rough country. The administration of morphine greatly lessens the suffering and shock due to transportation, and consequently patients who have received an injection arrive in better condition than those who have not. The shortest time which elapsed between injury and operation was two and a half hours and the longest twenty-four hours.

Diagnosis.

The condition presents all the usual signs and symptoms of a grave abdominal injury, accompanied to a greater or less degree with those of internal haemorrhage. The pain, which may not be excessive as the patient lies quietly, is rendered extremely violent on movement, and particularly on coughing or deep breathing. In a case of left-sided abdominal injury in a malarial country the organ probably involved is the spleen. The history of the injury and sometimes the mark of the bruise confines the possible injuries to the left side of the abdomen—that is, kidney, intestine, omentum, and spleen. The question whether the kidney is involved is easily decided by the presence or absence of blood in the urine. If the liver dullness is present the omentum or spleen will be involved—that is, a case of haemorrhage without free gas. However, as distension of the intestine occurs early in these cases the liver dullness is often absent, and then diagnosis is impossible. Similarly, a differentiation between omentum and spleen cannot be made. It is fortunate that it is of no assistance to the operator to have this differentiation made before making the incision.

Operation.

On arrival the patients were disturbed as little as possible. They were put to bed and their clothes removed. They were not washed. They were given an hour in bed before operation with hot-water bottles and many blankets to rest and get warm. All had an injection of atropine.

A vertical incision 3 in. in length was made about an inch to the left of the middle line through the skin and anterior layer of the rectus abdominis; its lower end was at the level of the umbilicus. The rectus was then freed from its attachments to its sheath and drawn outwards. The posterior layer was divided in the line of the skin incision. Through this incision the abdomen was investigated and when a ruptured spleen was discovered the opening was rapidly enlarged, chiefly by extending it upwards to the costal margin.* If necessary the rectus can be divided transversely either in part or entirely. A considerable amount of room is gained by this manoeuvre, but the occasions on which it is required are extremely few and the chances of a bad scar enormously increased. Moreover, if the spleen is "mobilized" in the manner to be described the necessity for the extra amount of room will not be felt.

Standing on the right side of the patient, the right hand is passed below and behind the spleen and the lienorenal ligament identified and torn through with the fingers. When this has been done, further pressure backwards and upwards directed against the lower pole of the spleen will cause the upper pole to rotate forwards and appear in the wound, when the organ is readily delivered. In this manner control of the entering vessels, and consequently of the haemorrhage, is most rapidly attained. Some cases of rupture can be dealt with by suture, but in the whole of this series the tears were multiple and the spleen tissue too friable for the sutures to hold. Consequently the pedicle was ligatured in two or three sections close to the hilum and the spleen removed. The proximal end of the lienorenal ligament must be examined for possible bleeding vessels, and these dealt with if found. The advantages of mobilizing the spleen at once may be thus summarized: All bleeding is under control in about a minute from the time the hand is passed down to the organ; neither a transverse division of the rectus, nor, in fact, a very long incision is required; the fate of the spleen can be decided without interference from fresh haemorrhage. The remainder of the operation consists in mopping out the blood from the peritoneal cavity when the patient's condition allows and closing the wound.

After-Treatment.

The after-treatment does not differ from that of any other considerable abdominal operation. Actually the following procedure was carried out: (1) Intravenous injection of two pints of glucose solution, commencing during the closure of the wound; (2) half a pint of saline

* From recollections of a picture of a paracostal incision in a book on operative surgery such an incision was tried on one occasion. Fortunately the case was one of ruptured omentum which could be dealt with by this route, as neither the spleen nor any other organ could be easily approached from this direction. It is unsound anatomically.

solution hourly by the rectum as long as the patient continued to retain it; (3) pituitrin $\frac{1}{2}$ c.cm. every four hours until the pulse settled down. In practice this amounts to three or four injections.

Appearances of the Spleens Removed.

With one exception all the spleens were enlarged. The largest weighed 19 oz., 20 oz., and 28 oz. respectively. The tears were multiple in all, and varied in severity from nearly complete division of the organ to mere rents in the capsule. Extravasations of blood into the spleen pulp were also numerous. The spleen tissue was soft and friable.

Effects of Removal of the Spleen.

(a) No ill effect was noticed while any of the patients were in the casualty clearing station, and news of two patients some months after operation was entirely satisfactory. No information about the remaining four has been obtained. (b) A very high leucocytosis occurs rapidly after splenectomy, which is not apparently to be accounted for except as a consequence of the loss of the organ. No series of observations was made, but the following figures from four cases are illustrative:

(a)	42 days after operation	...	...	22,300
(b)	16 "	"	...	20,000
(c)	5 "	"	...	45,000
(d)	2 "	"	...	16,000
	12 "	"	...	12,000

White counts on two cases of nephrectomy for injury showed no excess. (c) Any operation in a malarial subject is likely to determine a relapse. A case of splenectomy is no exception, and the relapse does not differ clinically from those occurring in patients with spleens. (d) Late haemorrhage occurs sometimes after splenectomy. This event occurred in one case. About ten days after the operation there was a sudden severe haemorrhage from vessels in the abdominal wound. A considerable amount of blood had managed to find its way into the peritoneal cavity, but its origin was entirely extraperitoneal; it was arrested by ordinary methods and did not recur. There was no history of haemophilia and to a rough test the coagulation time appeared quite short.

I am indebted to Colonel Kelly, A.M.S., for permission to publish this series of cases.

SOME POINTS CONCERNING THE OPERATION FOR VARICOSE VEINS.

BY

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I RECENTLY witnessed an operation for varicose veins performed by another surgeon; it was needlessly tedious and bloody. As the operation is much simplified by the method that I have adopted for some time, I have thought that an account of it might be helpful to others.

I have tried the various new implements that have been devised for the operation, such as strippers and extractors, but they have not given satisfactory results in my hands, so I have returned to the simpler method of excision, which I perform as follows:

The night before operation the limb is dry shaved, rubbed with ether, painted with iodine, the veins marked with an indelible pencil, and then wrapped in a sterile dressing. The patient having been anaesthetized, the limb is held in the vertical position for a couple of minutes and emptied of blood as thoroughly as possible by firm upward kneading, and a tourniquet applied to the thigh as high up as necessary.

Suitable incisions are then made and the veins removed, the cut ends of the main veins and the larger tributaries being ligatured with fine catgut. The incisions are then closed by means of Michel's clips, the limb wrapped in large sterile pads, and a bandage applied evenly and firmly, but not too tightly, from the foot upwards. The tourniquet is then removed.

As the limb is bloodless the operation can be performed very rapidly, for the thickened veins are quite easily recognized and dealt with. Time need not be wasted in tying small tributaries, for the firm bandage effectually prevents subsequent oozing with the formation of those haematomata

which so delay healing. The use of Michel's clips has many advantages over ordinary interrupted or continuous sutures—they are far more rapidly applied, the necessary eversion of the skin edges is ensured, and the wounds consequently heal soundly with the formation of firm linear scars. The edges of the wounds are so thin that the use of any other form of suture is almost bound to result in more or less inversion of the skin edges, so that gaping of the incisions takes place after the sutures are removed, and results in slow and tedious healing, leaving thin wide scars that are often tender.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

AN ASPIRATOR FOR PARACENTESIS THORACIS.

I HAVE found the apparatus here described and figured very convenient for tapping haemothorax. Others may be using a similar arrangement, but, as I have not seen it described, a short note on it may be useful. It is quite simple and inexpensive, and can be put together from easily obtained materials. In most hospitals there is only one aspirator, but in a ward where chest cases are dealt with a second, not in general use, is a considerable convenience.

The apparatus, as shown in the figure, consists of two bottles connected by pressure tubing. The larger bottle, B, holds anything up to two quarts of water, and has an outlet at the bottom, D, to which is attached about a yard of indiarubber tubing furnished with a pinchcock (not shown in the figure). The bottle A holds fifteen to twenty ounces, and is connected by the tube C to some form of aspirating trocar and cannula. It is convenient to graduate it in ounces. The whole apparatus must be airtight at all joints. When in use the bottle B is filled with water, and the long tube D is allowed to hang vertically, its lower end dipping below the surface of some water in a large jar. The pinchcock is placed near the lower end of the tube, and a little water run out to remove any air bubbles. The trocar and cannula having been inserted in the pleura the pinchcock is opened, and negative pressure set up in the bottle A by the fall of level in the water in the bottle B.

I have found an aspirating needle known as Hodder's convenient to use, as it provides a good attachment for the indiarubber tube. The side tube of the ordinary Potain's trocar is too short to allow of an airtight joint. When the bottle A is full, the pinchcock is closed, the indiarubber cork removed and the bottle emptied; B can similarly be refilled with water if required. The stream of blood or serous fluid is watched as it runs into A, and its volume regulated by partially opening or closing the pinchcock, and thus altering the rate at which the water escapes from B.

The advantages of the apparatus seem to me to be: (1) It is cheap and easily made; (2) it is easily cleaned; (3) a continuous negative pressure is maintained; (4) there is no arm-aching exercise of pumping necessary; (5) there is no pump to get out of order.

It might be elaborated by introducing a manometer through the cork in the bottle B, or a funnel for filling it, but in practice I do not think these are required.

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BLOOD PRESSURE IN WAR TRAUMATISMS.

IN THE BRITISH MEDICAL JOURNAL of August 10th (p. 132) Dr. E. F. Cyriax states that in certain cases of unilateral traumas the blood pressure readings taken with the Riva-Rocci apparatus were different in the two arms, but that this difference tended to disappear as recovery took