seem that it may be accepted as a working hypothesis that the testis so arrested is one that has very definite divergences from the structure of a normally-placed and fully-developed organ.

[The lecturer here described the microscopical appearances of normal testes, and then proceeded as follows:]

When the structure of the tubules of a testis that has not reached its proper level is examined, there will be found a very different histological picture in the majority of instances.

The tubules are fewer in number, smaller, and more widely separated from one another by interstitial tissue, consisting of loose connective tissue, which is rich in blood vessels in spite of the otherwise ill-development of the gland (Fig. 3).

Scattered throughout this will be seen nuclei belonging almost certainly to interstitial stroma cells. In some sections these appear to have undergone considerable increase both in number and size. Such interstitial cells are present in the connective tissues of the normal adult organ, but in comparatively few numbers. What their significance and function may be is still problematical. Possibly they are associated with an internal secretion of the gland, a secretion that may be needful for the full bodily development or sexual perfection of the man.

The fact that they are found in apparently larger numbers in particular instances of imperfectly-descended testes is a matter of great interest both from a physiological and pathological point of view. The connective tissue, moreover, here and there contains some large lymph spaces. The basement membrane of the tubules derived from the connective tissue as well as the membrana propria are well developed. The lumen of the tubules is most uncommonly found occupied by a mass of granular debris containing a large number of nuclei of various shapes and sizes, these being probably separated from the cells lining the tubules. As a rule, neither spermatoblasts nor spermatozoa can be demonstrated in the tubules of imperfectly descended testes.

In some instances, however, it is possible to show that there has been actual spermatogenesis, and this most usually in those testes which have passed into the perineum.

A NEW METHOD OF DEALING WITH THE PERITONEUM IN OPERATING FOR RADICAL CURE OF UMBILICAL AND INGUINAL OR FEMORAL HERNIA.*

By W. F. BROOK, F.R.C.S.ENG.,

Senior Surgeon to the Swansea General Hospital.

THE peritoneum of the anterior abdominal wall when viewed from within is stretched taut like a well-filled sail. Any pouching or pouting constitutes a weak spot, and one which the plus intra-abdominal pressure is always tending to deepen. If added to such weak spot the external supporting structures are deficient in strength, the result is sooner or later a hernia.

When operating for radical cure of hernia, whatever method be adopted of dealing with the other structures of the abdominal wall, the aim should be to leave the peritoneum stretched taut without pout or dimple over and around the site originally occupied by the neck of the sac.

Treves's and Kocher's operations for inguinal and femoral hernia are designed to remove the neck of the sac from its original position, and leave its site more or less covered in by a taut sheet of peritoneum. In the case of umbilical hernia, as far as I can find, no attempt has been made to apply the same principle. The usual operation, consisting of excision of the sac, and suture of the peritoneum and other constituents of the abdominal wall layer by layer, as far as possible, is faulty. First, because each line of suturing is bound to be almost immediately over the one below, consequently the weakest point in the peritoneum will be left opposed to the weakest point in the muscular wall. Secondly, because owing to the enormous thickness of the abdominal wall in these cases, sometimes to as much as 4 in., the suturing of

the peritoneum at the bottom of the ring (that is, at the bottom of a deep hole) cannot possibly be done so as to leave no sag or pouch, and sag or pouch is the first step in the direction of the recurrence.

The following method of operating is one which I adopted in two cases of large pendulous irreducible and painful hernia twenty-eight and nine months ago respectively. Both were as usual in enormously stout women. In the more recent the patient was 5 ft. 2 in. in height and 18 st. in weight. The other was of the same build.

A large elliptical piece of skin, its long axis in the mid-line, is dissected off the tumour, care being taken to avoid button-holing the sac where adherent to skin. The sac is then isolated as far as the edges of the ring and opened by a transverse incision. The contents having been treated in the usual way, the peritoneum is detached all round and well within the ring, especially around the upper segment where the separation is extended at least $\frac{1}{2}$ in. beyond the ring border (Fig. 1). The two halves

Fig. 1.—Peritoneum (p) stripped up around and within the ring.

Fig. 2.—Sac fashioned into upper (S) and lower (I) flaps. S' running sutures through edges of flaps.

of the sac are then shaped into two flaps, each of which is a little wider, and about two inches longer than the diameter of the ring (Fig. 2). [The shape and size of the sac or accidental button-holing may render it necessary to make these flaps right and left instead of upper and lower. In that case the sac will have been opened vertically instead of transversely. This was done in the first case.] Through the free edge of each flap running sutures of fishing gut are now passed at intervals of $\frac{1}{4}$ in. or in the case of the upper which is destined to lie within the abdomen at shorter intervals. The ends of each suture are for the time being clamped together with pressure forceps. The two ends of the central suture of the upper flap are mounted on a large semi-circular perineum needle. The point of this, protected by the left forefinger, is carried through the ring and thrust from within out through the whole thickness of the belly wall at a point in the middle line about $\frac{1}{2}$ in. below the ring. The needle is withdrawn and the two ends again secured by a clamp on the surface. This is repeated with each suture of the upper flap, so that the row of double-ended sutures emerging from the skin forms about two-thirds of a circle whose centre is a little below that of the ring. The sutures are now pulled up, care being taken that no overriding bowel is caught between the tightened edge and the parietal peritoneum, and the ends tied firmly together over a piece of lead wire bent to the required shape (Fig. 4). The lower flap is now treated in the same way except that the needle with the successive sutures instead of being introduced into the abdominal cavity is made to penetrate the abdominal wall from the space around the upper segment of the ring which has already been prepared by more extensive separation of peritoneum at this point. These sutures are pulled up and secured in the same way as the others and the ring is closed by one or more rows of buried sutures.

The result of this procedure is that the weak spot in the abdominal wall, the site of the ring, is backed by two thicknesses of peritoneum stretched straight and taut across it like a drumhead (Figs. 3 and 5). I do not for a moment claim that this method of operating for umbilical hernia will remove all chance of recurrence, but I do think that with efficient after-care it should tend to diminish that chance. Two cases with twenty-eight and nine months interval since operation do not afford sufficient evidence from which to draw conclusions. My hope is—and this is the object of my publishing this paper—that this evidence may be provided by others being induced to give the method a trial where possible, for in no other way can its efficiency be tested. I use the words where possible advisedly, for in a third case in which I attempted the operation the peritoneum was

* Read before the South Wales and Monmouthshire Branch of the British Medical Association.

so friable that it was impossible to strip it. In the second case the abdominal wall is now all that could be desired. The first I lost sight of until a few weeks ago. I then found that she had discarded her belt immediately after she had left hospital, and, as was to be expected, considerable bulging had occurred. This case consequently affords no fair test of the operation.

Fig. 3.—Section showing flaps drawn taut. (I) lower flap. (S) upper flap. (C) Central suture of lower flap. (C') central suture of upper flap.

Fig. 4.—Completed operation (skin aspect). (W) pieces of wire over which the sutures are tied.

Fig. 5.—Completed operation (peritoneal aspect). (S) upper flap (intraperitoneal). (I) position of lower flap (extraperitoneal). The dotted circle in Figs. 4 and 5 represents site of ring.

While operating on the second case it occurred to me that intra-peritoneal treatment of the sac might be applied in somewhat the same way to inguinal and femoral hernia, and that complete inversion followed by traction would allow of more thorough removal of the neck of the sac from the site of the ring than those operations already in vogue and above alluded to which have been designed with this object; and furthermore that the peritoneum left opposed to the ring and the whole canal would be more evenly and firmly stretched than by any extraperitoneal method of treating the sac.

I have since applied the principle when doing radical cure for 4 cases of inguinal and 2 of femoral hernia.

The following description of the operation applies to the inguinal variety.

The sac, having been isolated from the cord, is cut across immediately above the part which it is intended to leave in the scrotum. A running silk suture is passed across it just above the point of section. The two ends of the suture are threaded on an aneurysm needle. The latter is introduced into the abdominal cavity through the sac, its point being kept in contact with the inner aspect of the wall till it reaches a point $\frac{1}{2}$ to 2 in. above and internal to the internal ring (Fig. 7). Here a little pressure causes it to present beneath the skin. A small incision, $\frac{1}{2}$ to 1 in. in length, through skin and subcutaneous tissue exposes the point closely invested with a little process of peritoneum, together with which it has been readily forced through muscles and aponeuroses. The peritoneum is nicked with the point of a knife, and the small hole slightly stretched with a sinus forceps, and the aneurysm needle pushed through. The suture ends are now disengaged, the needle withdrawn, and by traction on the suture the sac is inverted and pulled well through (Fig. 8). This is now twisted through one or two turns, the little process of parietal peritoneum pushed back with fine sinus forceps to its proper level, and the sac cut off and the stump fixed by one or two buried sutures. The other structures concerned in the hernia are dealt with by whatever method is preferred; personally I adopt Bassini's where it is necessary to close them.

It will be noticed that this proceeding does away with the necessity of slitting up the external oblique fascia roofing in the canal. This is a distinct gain in those cases in which the canal has not been unduly stretched, and in which there is no

necessity for approximating the conjoined tendon to Poupart's ligament. The chief objections which may be urged against the operation are, first, that without exposing the site of the internal ring it will not be possible to so thoroughly detach the neck of the sac from the transversalis fascia as to allow of its being drawn sufficiently away from the position of the internal ring. In practice, however, the looseness of these attachments is surprising, allowing, as they do, complete and easy inversion of the sac. That this is so is shown by the fact that the length of the sac drawn out on to the surface is considerably greater than the distance between the internal ring and the point of section (Fig. 7). Secondly, it may be objected that the perforation of the peritoneum by the inverted sac would result in another weak spot. If, however, the perforation is situated in a muscular part of the wall (that is, through the rectus abdominis), and is made as small as possible, and chiefly by stretching rather than cutting, and is pushed well back after the sac has been drawn out so as to leave no funnel-shaped depression, I doubt if the objection is more than a theoretical one, especially as the muscles and aponeuroses have not been weakened by incision. The same description suffices, and the same arguments hold, in the case of femoral hernia, the sac being brought out above Poupart's ligament and $\frac{1}{2}$ in. outside the femoral ring.

Figs. 6, 7, and 8 represent an antero-posterior section of the abdominal wall and hernia in the axis of the inguinal canal. For the sake of clearness, the abdominal wall is represented as being perforated in the same line. E, external oblique; I, internal oblique and transversalis; P, peritoneum; E R, external ring; I R, internal ring; C T, conjoined tendon; P, pubic bone.

This operation I venture to put forward as one that is worth a trial, and if, as I suggest, the objections I have mentioned are entirely theoretical, I believe it is likely to be of real use, for it is a golden rule in surgery that in arriving at the required result the least possible injury should be done to the tissues concerned in the operation. Added to this recommendation, too, is the extreme simplicity of the procedure.

NOTE.

Since writing and reading this paper I am informed that the operation described for inguinal and femoral hernia is essentially the same as one which Professor Kocher, of Berne, has now for some time been practising, but has not yet published, he having abandoned the operation which is still described as his in the most recent textbooks and referred to above.

THE SECRET OF A LONG LIFE.—Sir James Grant, of Ottawa, not long ago, delivered a lecture upon The Secret of a Long Life, under the auspices of the Women's Residence Association of Victoria College. Sir James, as we gather from the *Canadian Journal of Medicine and Surgery*, found the secret in total abstinence from the use of intoxicating liquors. He made a strong plea for prohibition, not by law, but by the force of public opinion educated to a proper appreciation of the harmful nature and health-destroying agency of the use of intoxicating beverages.