THE DOUBLE-FILIGREE OPERATION FOR THE RADICAL CURE OF INGUINAL HERNIA,

WITH NOTES OF THIRTY-THREE CASES; AND ON CERTAIN CASES OF VENTRAL HERNIA CURED BY THE IMPLANTATION OF FILIGREE.

BY

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THE results of operative surgery in the treatment of large inguinal herniae leave much to be desired. Even at the present time, when so much has been accomplished in other departments of surgery, it is the general complaint of surgeons that in inguinal herniae in patients of poor physique, in elderly subjects, in those whose occupation involves a constantly-recurring increase of intra-abdominal pressure, and indeed in any patient in whom such hernia has recurred or has exceeded the more moderate dimensions, the prospect of accomplishing a really radical cure is extremely remote and in some cases quite hopeless.

So much has already been written on the causes which originate a hernia and on those which contribute to its recurrence after operation, that it would be a mere waste of time to reproduce them here. There are, however, certain points with regard to the principles underlying the operative treatment of inguinal hernia which can only be brought home by repetition; and these I would venture to state here, as I have already done elsewhere.

I.

The complete and permanent cure of inguinal hernia depends on: (*a*) The total abolition of the peritoneal sac or *sacs;* and here it must be remembered that one of these may be thick-walled and perfectly obvious, while another may be present which is of the most extreme tenuity, difficult to find, with a lumen only admitting a probe, and yet quite capable of enlarging one day to greater capacity. (*b*) The *permanent* approximation of the muscular structures of the inguinal canal to Poupart's ligament. (*c*) The maintenance of the histological character of these structures by careful operative technique and by the subsequent employment of properly regulated physical exercises. And (*d*) on the prolongation of convalescence in the recumbent position for a period much beyond that which is usually accorded to these cases.

It is easy to see that while the first and fourth of these essentials present no very great difficulty, the second and third are not so simply attained. The gap to be covered may be enormous; the musculature may be attenuated, friable, and fibrous, and thus it may be that the whole inguinal canal presents such a wreck that the possibility of cure seems quite out of the question. In other cases, although the structures may be in fair condition, the amount of dissection required to accomplish the approximation, especially in old-standing and recurrent cases, and possibly the tension necessary to keep muscle and ligament in accurate contact, are such that, within a few weeks of the operation, what was muscular is reduced to fibrous tissue.

Now the muscle which is brought down is brought down with a very definite object; its purpose is not merely to block the canal *passively* by its presence (the peritoneum and the abdominal aponeurosis would of themselves do that), but by its *active* contraction to tighten up the walls of the canal without suffering permanent loss of elasticity in doing so. When an operation has been done and the trouble recurs, it is not muscle which is found covering the sac; what is found is merely the fibrous remains of the stretched union, the muscle having receded to a point above the level of the canal. Had the muscle been sound and active, and had it remained in close apposition to Poupart's ligament, recurrence would have been impossible. It is therefore clear that to get a permanent result which shall honestly deserve the term "radical cure," a term hitherto much misused, is not by any means so simple as it would at first sight appear.

II.

It must be borne in mind that in no branch of surgery is the old proverb concerning "the stitch in time" more truly applicable. Bassini's operation, when done early in the history of a hernia and followed by sufficiently protracted convalescence, is an excellent operation in most cases; there are others, however, in which it fails to meet the requirements of modern surgery, and these may said to be the following:

1. Those of inguinal hernia in elderly subjects.
2. Those in adult life where the strain of certain occupations is so constant and severe upon the abdominal walls, that it is unreasonable to expect a cure when treated by the ordinary methods.
3. Those in which, although in young subjects, the muscular structures of the part are found at time of operation to be thin, badly developed, or stretched and loose over a large area.
4. Those in which the hernia has recurred, especially if after a carefully carried out operation followed by a primary union.
5. Those in which the hernia is of such size that the gap cannot be closed without the exercise of such tension as to produce strangulation of the structures within the grip of the sutures—a condition which is one of the most certain of all the predisposing causes of recurrence.

III.

It is even at the present time no uncommon thing for the surgeon to be expected to bring about a cure in a case where, for years, the hernia has been subjected to the pressure of a truss. In such a case it is quite unreasonable to hope for any permanent result, especially if the truss has been a very heavy one, possibly badly fitted, or more probably never fitted at all in the proper sense of the term. The tissues underlying such a truss, and indeed under every truss, will be found to be matted, thinned out, and the muscles almost entirely converted into fibrous tissue. It is impossible to look upon the truss as anything but an antiquated piece of apparatus, the very existence of which is a sorry testimonial to progressive surgery, the use of which generally results in gradual injury to the wearer, and the results of which tax the surgeon's best efforts to undo when the time comes that the truss is no longer able to hold up the protrusion.

IV.

There is a point which is entirely ignored in most text-books on the subject of inguinal hernia, and which is yet of the greatest importance in dealing with the trouble in herniae of long standing and in elderly subjects. This is the weakness of the abdominal wall so frequently seen to the *outer* side of the internal abdominal ring. There is little doubt that this weakness, which is evidenced by softness and bulging of the tissues here, is responsible for much of the recurrence seen after Bassini's operation in these cases. No matter how carefully the suturing of the canal may have been carried out, the failure to strengthen this region will greatly prejudice the result in the course of time, and if a cure is to be achieved, some method must be adopted by which the muscles can be reinforced and the tendency to bulge can be counteracted.

V.

Lastly, referring to a point already mentioned, it cannot be denied that, in this country at least, the constantly increasing demand for admission to hospital, a sense of monotony on the part of the surgeon who has to deal with an unending stream of hernial operations differing very slightly in interest, and the constant thirst of the student for a fresh draught of clinical material, has brought about the undesirable practice of unduly shortening the period of convalescence of the patient, with the result that in most hospitals this period is represented by a bare three weeks. Now, when we consider carefully the condition of a cicatrix resulting from a union by first intention at the end of three weeks, it must be perfectly obvious to most of us that it is simply courting failure to allow the patient to get about so soon after operation. The new exudate from the lips of the wound is barely organized; such fibrous tissue as is formed from it is immature and extremely distensible, the sutures are not yet absorbed,

and in some patients there is comparatively little difficulty even in opening up the deeper tissues of the cicatrix with the handle of a scalpel at this date. It seems to me to be an absolute waste of time, skill, and material to perform an operation which is expected to result in a radical cure, and then to ruin the whole of the work by sending the patient out at a time when his wound is barely consolidated. Surely it seems worth while, for the sake of our professional reputation as well as for the benefit of the patient, that convalescence should be sufficiently prolonged to render the result of the operation permanent, even if the cost to the hospital is thereby slightly increased.

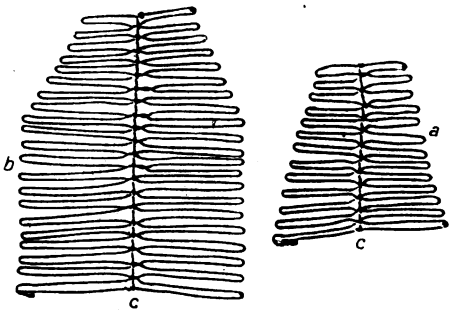

Fig. 1.—*a*, Iliac section; *b*, pubic section; *c*, midrib of filigree.

It was with the idea of bringing *all* cases of inguinal hernia within the scope of operative treatment, of doing away entirely with the use of the truss, and of establishing a method of treatment which should honestly deserve the name "radical cure," that I devised in 1905 the method which I have termed the "double-filigree method," and which I described in the following year at a meeting of the Clinical Society. This method I now propose to describe more fully, since I have found it to bear out in the fullest manner all that I then claimed for it. The method consists in strengthening the walls of the inguinal canal by the implantation of two filigrees of silver wire in the tissues in such a way that subsequent stretching or bulging is rendered impossible, and the necessity of a truss is entirely done away with. The results obtained by the implantation of filigrees of silver wire in the cure of ventral herniae of large dimensions—an operation first devised by Bartlett in America—have proved that not only is the area involved rendered permanently unstretchable, but that there is no tendency on the part of the tissues to cast out the structure as an irritative foreign body, even when enormous filigrees are employed. Thus, I myself (as has also my colleague, Mr. Douglas Drew) have on many occasions buried abdominal filigrees measuring as much as 9 in. to 10 in. in length, and 4 in. to 5 in. in breadth. This being so, the idea occurred to me that some such method might be applied to the cure of inguinal hernia, especially in those cases which I have tabulated under my second heading. Before detailing, however, the method of manufacturing and applying these filigrees, I would state briefly the principles underlying their use.

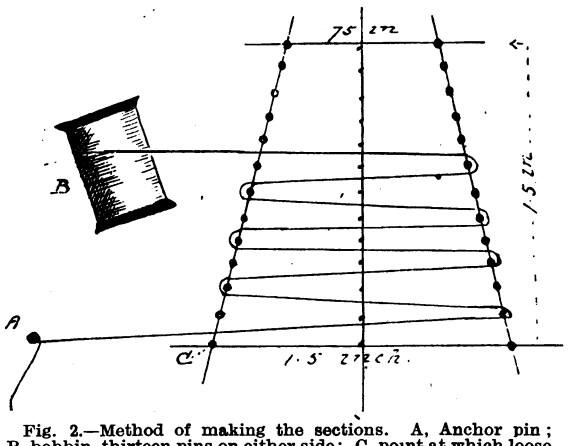

Fig. 2.—Method of making the sections. A, Anchor pin; B, bobbin, thirteen pins on either side; C, point at which loose ends are twisted on completion of zig-zags. The black dots represent pins.

In all cases in which hernia occurs or recurs, the chief factors are:

(*a*) The presence or formation of a peritoneal sac.

(*b*) The recession or pushing aside of the muscular walls of the inguinal canal,

(*c*) The stretching of the fibrous structures covering the canal.

Remove the sac, fix the muscles *permanently* in position, prevent the fibrous structures from stretching, and the cure will be a "radical" one. Of the last two of these requirements the second is by far the most important; the sac must of course be removed, but it is upon the third especially that the ultimate cure depends. Now, when a filigree of silver wire, such as I shall presently describe, is placed in the tissues composing the inguinal canal, presuming that it is perfectly aseptic, the first effect is that of local irritation of the parts in contact with it; this results in the exudation of lymph, which rapidly organizes about the filigree, and in a very short time new vessels and young fibrous tissue are produced and grow around, among, and between the wires of the filigree to such an extent that ere long a solid plaque is formed which once and for all converts the inguinal canal into a sound, resistant area, which will neither stretch nor bulge, the muscles, peritoneum, and aponeurosis being welded together by the filigree, which acts much as the backbone of a sole does upon the tissues which it supports; but there is this difference, that the ends of the filigree wires, being in the form of a loop, they are capable of acting as retaining sutures, whereas the bones of the sole only act as a scaffolding for support. The following is the method of making the filigrees I am in the habit of using, and which until recently I made myself.

They are made in two sections—namely, a pubic (*a*) and an iliac (*b*), Fig. 1; the former is always made of the following dimensions: At the narrow end its width is ¾ in.; at the wide end, 1½ in.; its length is also 1½ in., this being the usual length of the adult inguinal canal. Being constructed on the principle that every filigree, whether abdominal or inguinal, should be made with not fewer than eight loops to every inch of its midrib, this will give thirteen loops on either side of the pubic section of an inguinal filigree. The iliac section (*b*, Fig. 1) is made in such a way that its inner third corresponds in shape and size to the outer two thirds of the pubic section. Its outer end must meet the requirements of the case, being trapezoid, square, or, what is more usual, oblong, and of a total length of 2½ in. to 3 in., as may be found necessary. The wire must be of unalloyed silver, and it is well to keep to the same gauge for all filigrees—namely, No. 28 Standard wire gauge.

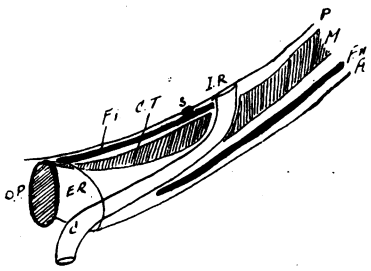

Fig. 3.—Horizontal section of inguinal canal.

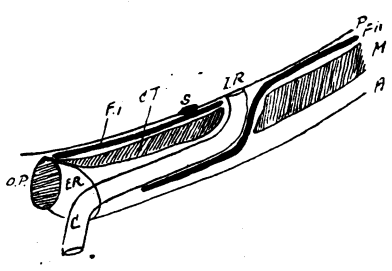

Fig. 4.—Iliac section placed deep to internal oblique muscle external to internal abdominal ring.

A, Aponeurosis; C.T., conjoined tendon; C, spermatic cord; O.P., symphysis pubis; F.i., pubic section of filigree; F.ii., iliac section of filigree; E.R. and I.R., external and internal rings; S, neck of sac tied off; P, parietal peritoneum; M, muscle.

A board of soft wood or cork is taken, and on it is placed and fixed by pins a sheet of white paper; upon this the plan of the filigrees to be made is drawn out accurately. Stout pins are then inserted vertically, as in the diagram,

and an odd one, the "anchor" pin (*a*, Fig. 2), is placed to the left of the wider end of the plan from which to start, the wire being given a turn or so round it. The wire now runs from the end pin on one side to the second from the end on the other, and so on from side to side, a pin being missed each time, and the wire being carried round the outer side of the pins. Having reached the last pin on one side, it is carried across to that of the other, and so begins to travel back to the pin from which it started, when the anchor pin (*a*) is removed, and the ends of the wire are neatly twisted together round the outer side of the first pin of the row and cut off short. It will now be seen that the crossing of the wires falls evenly down the centre of the filigree, and the mid-rib (*c*, Fig. 1) is attached. This is done by taking a separate short strand of wire and fixing it to the centre of the strand at the wide end; from this point it is carried along the centre of the filigree, a turn being made round each point of crossing of the wires, at which points it is firmly pinched by a pair of dissecting forceps to fix it in position. On reaching the opposite end of the filigree the mid-rib is finished off by being attached to the last strand in the same manner as that by which it was fixed to the first. The surplus being cut off short and the pins removed, the filigree is complete. A little practice is required to produce the most perfect work, as the pull of the wire must be kept equal at all points and breakages avoided, since joins are not only clumsy but difficult to effect. The method of employing these filigrees is as follows:

As perfect asepsis is imperatively necessary here, indeed even more so than in the case of abdominal filigrees, it may be said that the filigrees should be placed in ether for five minutes to remove all grease from them, and should be left in the sterilizer *in the centre of the most actively boiling area*—it is necessary to emphasize this point, as I have seen them placed at one end where there was barely a trace of ebullition—and left there till the moment of implantation, when they are lifted straight from the sterilizer into the wound.

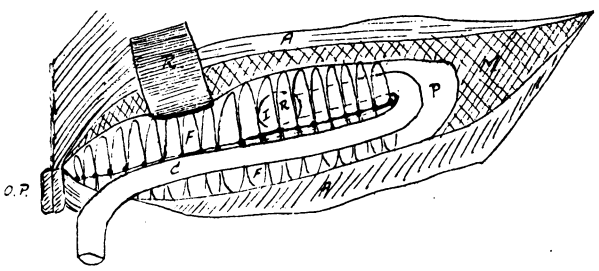

Fig. 5.—A, Aponeurosis; C, cord; F, filigree; M, internal oblique muscle; R, retractor; O.P., os pubis; P, peritoneum; I.R., internal ring.

The operation is at first conducted exactly as in performing an ordinary Bassini's closure, except that the aponeurosis should be split to a point rather farther out, and the peritoneum must be more freely separated from the posterior surface of the conjoined tendon, as must the latter be from the aponeurosis overlying it. From this point the steps are as follows: The sac having been isolated and dealt with, the cord is held out of the way, and the first two of the sutures which are to approximate the conjoined tendon to Poupart's ligament are inserted, and their ends are caught by pressure forceps. These sutures being held aside by the assistant, the pubic section of the filigree is placed upon the peritoneum, its narrow end being close to the pubic spine, and its wide end at the inner margin of the internal abdominal ring. If the peritoneum is very loose and inclined to sag, a fine suture may be used to unite it to the filigree; as a rule, however, this is unnecessary, and all that is required is to bring the conjoined tendon into close apposition with Poupart's ligament *over the filigree* by the two sutures already inserted, and then to insert as many more as may be deemed necessary, care being taken to keep the bed in which it lies as dry as possible. In cases in which the muscular wall of the abdomen external to the internal ring is sound and strong, the cord is placed in position, and the iliac section of the filigree is taken from the sterilizer and is placed beneath the aponeurosis in such a way that its inner end lies over the internal abdominal ring and upon the cord for a space of ¾ in., the outer end being carried outwards and laid upon the surface of the internal oblique muscle, one or two sutures holding it in place (Fig. 3). If the above-mentioned weakness is present, the muscular wall is divided from the ring outwards towards the iliac spine for about an inch, and is separated from the peritoneum by the handle of a scalpel; upon this peritoneum the outer end of the iliac section is laid, being lightly sutured in place, and the muscles are brought together again over it (Fig. 4), the inner end lies as already described. Finally, the aponeurosis is sutured in place and the wound closed by means of Michel's clips, which are removed on the fifth day.

It will be seen from this that the cord comes to be "sandwiched," as it were, between two layers of filigree in the canal, the natural relations of which are hardly altered; and further that the area external to the internal abdominal ring is fortified by a filigree which may be made of any size which may be deemed necessary.

It is obvious that such a proceeding as I have described must in most cases be comparatively simple in its performance; it will be found equally satisfactory in its results. Granted a primary union of the wound, the hernial gap will be found to become as impermeable and as unstretchable as a pad of leather. There will be neither pain nor discomfort afterwards; there is not the least fear of interference with the cord nor with the functions of the testis; the necessity for any form of truss is done away with permanently, and the operation thus offers the patient a radical cure in the truest sense of the word.

Now what are the disadvantages of the method, if there are any, to be placed against these points in its favour?

I think I may honestly say that the only disadvantage is that, if suppuration should occur, the iliac section and possibly (although not so probably) the pubic section, may shift their positions; or if only a slight sinus should develop, that convalescence may be unduly prolonged. It must be understood that the inguinal region is by no means so favourable a site for an aseptic operation as is the abdominal wall when one is dealing with a ventral hernia. If suppuration occurs and the filigrees shift, the probability is that the cure will fail, just as it does in cases where no filigree is used. In this respect the operation differs entirely from that for ventral hernia, where even if sepsis occurs, not only is there no possibility of the filigree shifting its position, but the eventual result is only to fix it more firmly and to consolidate the tissues more thoroughly. In such a case of failure, it is perhaps better to remove the filigree, wait until healing has taken place, and again perform the operation. To some extent this plan was adopted in one of my cases (Nos. 7 and 18) and a cure was then effected.

In cases in which the suppuration is purely superficial and slight, and in which it is felt that the iliac section has not shifted, it should on no account be removed, as in most cases it will not affect the result and careful dressing will usually induce the sinus to close.

It may be asked why these cases are more likely to break down than other cases of hernia. The answer is that they are the largest and worst cases; many of them are recurrent herniae, and therefore the amount of tearing and dissection necessary to separate the layers and make a bed for the filigree commonly results in the oozing of blood serum and fat, which, taken in conjunction with the proximity to the genitals and anus, renders the wound a particularly favourable nidus for bacterial action.

Since I first devised this operation I have had occasion to perform it in the following 27 cases, and to these cases I have added 3 cases operated upon by my colleague, Mr. C. C. Choyce, who has kindly allowed me to publish them, as well as 3 cases in which a single long filigree was used, the first cases in which I attempted to treat inguinal hernia by filigree; two of these were in women, and one in a man. Since these latter were done, however, although they have been perfectly satisfactory, I have used only the double filigree method, as it has enabled me to deal with cases which the single filigree would hardly have controlled, and this is especially the case in men, in whom the anatomical conditions necessitate a difference in method.

CASE I.

A woman, aged 40. Gap in the left inguinal canal admitting three fingers straight into the abdomen; ten years' history;

sac the size of an orange; pain and dragging sensation preventing her work. Sac excised and filigree measuring 3 in. by 1½ in. placed deep to conjoined tendon. This patient is engaged in heavy manual work, and although she has never worn any support since operation, the inguinal region is sound and firm. Done four years ago.

CASE II.

Seaman, aged 61. Very large inguino-scrotal hernia, partially reducible, and of many years' standing, for which he has worn a truss; this has, however, failed to control the mass for the last nine months. Sac very thick, and tissues much thinned out and adherent about the neck; adherent omentum in sac. Filigree measuring 3 in. by 1½ in. placed deep to conjoined tendon. In order to allow filigree to defend space outside internal abdominal ring, cord had to be drawn outwards round the end of filigree, and was then carried down in front of muscle after its approximation to ligament (Fig. 5). It was this case which, owing to this difficulty with the cord, suggested to me the necessity for the use of two filigrees, in order that the natural position of the cord might be maintained, and at the same time the space outside the ring efficiently strengthened. Unfortunately a stitch sinus resulted, and the filigree could be felt for some weeks through it. I then advised removal of the latter. Patient refused, saying he preferred the "little hole" to the chance of his hernia returning, and went out. Six weeks later sinus had healed. Two years later he wrote saying that he was "well and sound in spite of constant hard work as a pilot, and was grateful for not having to wear a truss." Done nearly four years ago.

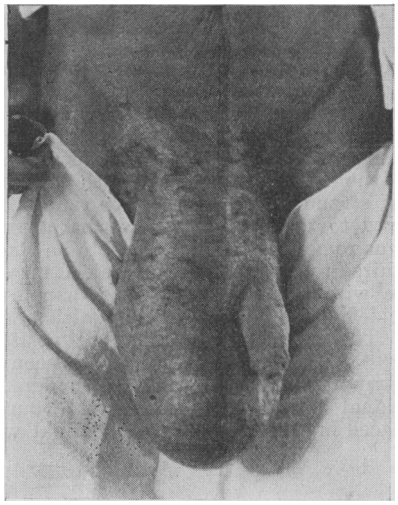

Fig. 6.—Case VIII.

CASE III.

A woman, aged 63. Large left inguinal hernia presenting for ten years. Operation similar to Case I. At present time well and sound, doing hard housework and wearing no kind of support. Hernia admitted half the hand into abdomen, and muscles were very thin. Done three years ago.

CASE IV.

Seaman, aged 17½. Double inguino-scrotal hernia, right side recurrent from operation done abroad. Abdominal muscles weak and bulging towards iliac spine on either side; wide neck to both sacs. This was the first case in which the double-filigree method was done. Convalescence normal. Done three years ago. Last April had an inguinal bubo which caused iliac section to present; this has left a sinus. Up to time of infection was sound.

CASE V.

Seaman, aged 58. Large right direct inguino-scrotal hernia, gap admitting four fingers; has worn a truss for many years. Now gets griping pains, and has to give up work at times. Omentum adherent in a thick sac, the neck of which was almost cartilaginous; much matting round neck. Double filigree implanted three years ago. (No reply as yet.)

CASE VI.

Seaman, aged 51. Almost exactly similar case to the preceding. Implantation three years ago. Writes to say he is "well, up to date."

CASE VII.

Seaman, aged 40. Recurrent left inguinal hernia, admitting three fingers into abdomen; patient alcoholic and slightly cirrhotic; tissues found matted and friable, their separation resulting in much oozing into the scrotum. Double filigree implanted. Sinus formed on tenth day and discharged freely; subsequently became very much smaller and finally healed, and patient went out. At this time there was some bulging, and it was clear that the filigree had shifted its position. Warned patient to return if hernia recurred. (See Case XVIII.)

CASE VIII.

A negro seaman, aged 43, with a very large traumatic inguino-scrotal hernia (Fig. 6), measuring 12 in. long and 18½ in. in circumference. Sac contained much omentum, bowel, and mesentery, the neck of the sac measuring 3 by 2 in. The hernia was complicated by an old and very thick-walled hydrocele of such a character that I considered it wise to remove the testis. Double filigree implanted 2½ years ago. Wife has written to say patient gone to sea well and sound.

CASE IX.

Seaman, aged 72. Large right inguino-scrotal hernia for sixteen years. Truss had thinned out and almost destroyed the muscular walls, so that bowel seen through skin. Small sinus followed operation, but he went out with inguinal region firm and strong. Implantation 2½ years ago. Writes to say there has been no return of rupture, and is well and sound.

CASE X.

Seaman, of 36, with large double inguinal herniae of six years' standing. Gaps admitted three fingers on either side, and there was much bulging outside the internal abdominal rings. Implantation done two years and three months ago. Writes to say, "Operation is quite a success, in spite of heavy stoking and blacksmith's work for many months."

CASE XI.

Seaman, aged 62, very stout and plethoric, with an enormous left inguino-scrotal hernia of nine years' standing (Fig. 7). This was, I think, the largest inguino-scrotal hernia I have ever seen, and measured 15 in. in length and 25 in. in circumference; the penis had retracted entirely out of sight. This was the first case in which I employed spinal analgesia. The sac was so adherent that it could not be removed, and contained the whole of the sigmoid colon with its mesocolon, and a very large mass of omentum, all of which were adherent to the sac and to each other. When reduced it was found that the whole fist could be easily passed into the abdomen through the neck of the sac. The sac was isolated at its neck and divided between ligatures; a double filigree was implanted, and convalescence was uninterrupted. Done nearly two years ago. Fig. 8 shows this patient after operation; a Keetley's suspender is applied to assist the shrinking of the scrotum. As yet no answer.

CASE XII.

Seaman, aged 59. Left inguino-scrotal hernia. Double filigree implanted eighteen months ago. Convalescence normal. Spinal analgesia. Writes to say, "Well, up to date."

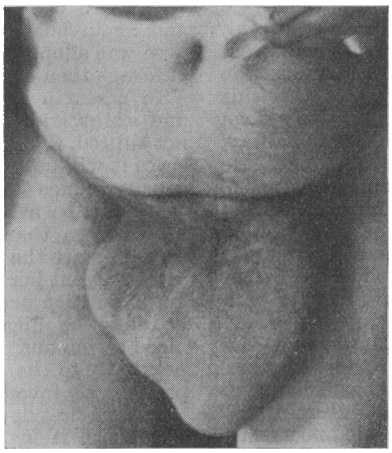

Fig. 7.—Case XI.

CASE XIII.

Seaman, aged 25. Inguinal hernia on right side, inguino-scrotal on left; Bassini on right, double filigree on left. Normal convalescence. Implantation eighteen months ago. Spinal analgesia. So far no answer.

CASE XIV.

Seaman, aged 32. Right inguino-scrotal hernia; double-filigree inserted eighteen months ago. Convalescence normal. Spinal analgesia. No address for inquiry.

CASE XV.

Seaman, aged 44. Large inguinal hernia on right side which had twice recurred after operation. Prolonged dissection required to separate the structures about the neck of the sac. Gap admitted half the hand. Double-filigree implanted sixteen months ago. Convalescence normal. Spinal analgesia. Writes to say no pain or discomfort, and is stronger than ever.

CASE XVI.

Seaman, aged 50. Large inguino-scrotal hernia on the right side; thinned tissues owing to truss pressure. Double-filigree implanted sixteen months ago. Convalescence normal. Spinal analgesia. No answer received yet.

CASE XVII.

Colour-Sergeant, late R.A.M.C., aged 42. Very large inguino

scrotal hernia of seven years' duration; gap measuring 3 in. by 1½ in. Implantation done sixteen months ago. Convalescence normal. At work ever since and doing heavy gardening work without difficulty. Spinal analgesia.

CASE XVIII.

Same case as No. 7. Returned with his hernia recurrent, as I anticipated, the filigree having shifted as the result of the suppuration above mentioned. Pubic section firmly in place, iliac section found lying 1 in. above its proper level and too firmly imbedded for removal; hernia appearing external to internal abdominal ring and just below iliac section. Sac removed and a fresh iliac section implanted. Convalescence normal. Done fifteen months ago under spinal analgesia. Writes, "Operation quite successful, and I feel better than I have been for years."

CASE XIX.

Seaman, aged 50. Right inguino-scrotal hernia for seven years; has worn a truss up to date. Double-filigree implanted thirteen months ago. Convalescence normal. Spinal analgesia. No address available for inquiry.

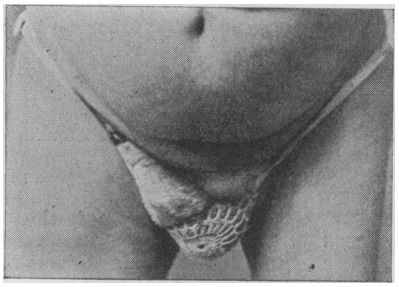

Fig. 8.—Case XI.

CASE XX.

Seaman, aged 29. Large recurrent inguinal hernia on the right side. Recurrence was the result apparently of sepsis, as the scar is stretched and pigmented. Patient says the operation was done three years ago, and the recurrence was noticed at the end of six months. Double-filigree implanted a year ago. Convalescence normal. Spinal analgesia. No answer received to date.

No inquiry has been made in the following cases as all are less than a year old.

CASE XXI

Seaman, aged 38. Double inguino-scrotal hernia for five years; has never worn a truss. Although both herniae were large, the tissues were not markedly matted, and the muscles were in fair condition, which would not have been the case if a truss had been worn. Double-filigree implanted on both sides; convalescence normal. Done nine months ago under spinal analgesia.

CASE XXII.

Seaman, aged 49. This case was of interest not only from its size, but because it was entirely extraperitoneal of the bladder, this organ being enormously enlarged, so that the portion of it composing the hernia could easily have contained over a pint of fluid. The peritoneum was sutured into the angle of the pubes, and a double-filigree implanted under spinal analgesia. Convalescence was normal. Done nine months ago.

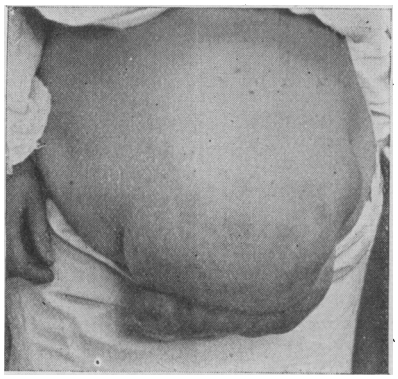

Fig. 9.

CASE XXIII.

Seaman, aged 51. Recurrent inguinal hernia on right side. Double-filigree implanted seven months ago under spinal analgesia. Convalescence normal

CASE XXIV.

Seaman, aged 52. Large inguinal hernia of right side of six years' standing; no truss had been worn. Double-filigree inserted. Normal case, done under spinal analgesia four months ago.

CASE XXV.

Seaman, aged 41. Double inguinal hernia (inguino-scrotal on the right side, and wide gap on the left). Double-filigrees on both sides; convalescence normal. Done four months ago under spinal analgesia.

CASE XXVI.

Seaman, aged 34. Large recurrent inguinal hernia on the right side. Sac very adherent and tissues much matted about the neck. Double-filigree implanted under spinal analgesia three months ago; subsequent extensive oozing of blood into scrotum, groins, and perineum. Scrotum opened and clots removed. Wounds remained aseptic; scrotum shrank to normal size in three weeks. Inguinal region firm and strong on discharge. Done four months ago.

CASE XXVII.

Seaman, aged 27. Large reducible inguino-scrotal hernia on left side; gap admitting four fingers; cord frayed and stretched out over sac; muscles thinned and adherent at neck; double filigree implanted; convalescence normal; done under spinal analgesia two months ago.

CASE XXVIII.

Seaman, aged 45. Stout heavy man, with a large inguino-scrotal hernia on right side, which he has had for five years. Contents reducible, but tissues extensively matted at neck, and cord spread out over sac; gap admitted half the hand. Much bulging towards the iliac spine. Owing to the width of this man's pelvis and the extent of the bulging I was compelled to use a third filigree to cover the area, not having an iliac section of sufficient size at hand. Convalescence normal. Done under spinal analgesia recently.

CASE XXIX.

Seaman, aged 54. Prematurely aged and feeble man; muscular wall of abdomen flabby and weak; was operated upon some years ago for hernia of the right side by Mr. Johnson Smith (no sign of recurrence); left inguinal hernia present for three years. Gap admits three fingers directly into the abdomen. At operation sac very thin indeed; muscles almost converted into fibrous tissue; rectus muscle brought out of its sheath in order to cover the pubic section; iliac section deep to abdominal muscles. Done under spinal analgesia; patient still in hospital.

CASE XXX.

Seaman, aged 59. Large direct inguinal hernia on right side for last twenty years and slight bulging on left. Muscular walls of abdomen bad; much matting about neck of sac, and bad bulging outside internal abdominal ring. Double filigree implanted under spinal analgesia on right side and Bassini's operation on left. Done recently; patient still in hospital.

The following are Mr. Choyce's cases:

CASE XXXI.

A seaman, aged 37. Left inguinal hernia operated upon nine months previously, had since recurred, although he had rested six months before returning to work. He also had a right inguinal hernia. On left side neck of sac very wide, necessitating suture in place of ligature. Single filigree implanted on peritoneum and muscles sutured over it. Healed by first intention. Done two years ago. No address available for inquiry.

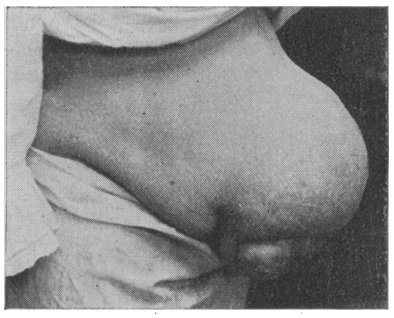

Fig. 10.

CASE XXXII.

This patient, a seaman, had a very large inguinal hernia, which had been unsuccessfully operated upon four times in the previous twenty years; on each occasion the hernia had recurred within a month. He had worn a truss, which, however, no longer controlled the rupture. Last operation was done five years previously. Skin showed old cicatrices of operations and counter-incisions, pointing to old suppuration, which had occurred after two of his operations. Sac found very thick and adherent to contents. Muscles almost unrecognizable, owing to fibrosis. Double-filigree implanted in planes representing those in which the filigree is usually placed, but which, in this case, it was quite impossible to differentiate. Patient healed by first intention, and was discharged well. Mr. Choyce remarks: "In July, 1908, this patient attended my out-patient room for another condition; his hernia had not recurred, nor was he wearing a truss. He had no untoward symptoms, and there was no pain nor discomfort from the filigree." At this time the operation had been done nearly two years. This patient is sound and well at the present time.

CASE XXXIII.

A seaman, aged 42. Left inguinal and interstitial hernia of five months' duration, following a fall. There was a large gaping ring. A single filigree was implanted superficial to the cord. Primary union. Patient has not been seen since. Done fifteen months ago. No address available for inquiry.

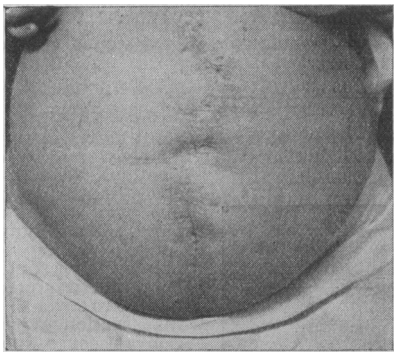

Fig. 11.

In conclusion, I would draw attention to the fact that I have carefully excluded from my series of cases any in which there was even a remote prospect of cure by Bassini's method; consequently there is no case here reported which was not considered by others as well as by myself to be quite outside the scope of any operative method hitherto published.

The results tend, I think, to show that the method is capable of dealing with herniae of the largest dimensions, and in patients whose age has hitherto been considered as a contraindication to operation, owing to the tendency to recurrence.

NOTE ON VENTRAL HERNIA.

As regards the subject of ventral hernia, the chief object of this note is to publish the accompanying photographs, which are those of two cases under my care some time ago, and the particulars of which I have not hitherto published; and to depict the filigree which I now use, and which is a modification of that originally described by Bartlett.

Fig. 13.

The first of these photographs (Fig. 9) is that of a woman of 49 years of age, who was admitted to the Seamen's Hospital in August, 1907, for an enormous umbilical hernia of many years' standing. As will be seen, the lower part of the sac was occupied by a large adherent mass of bowel and omentum. The amount of sacculation present necessitated the removal of so much of the abdominal wall that the return of the contents to the abdominal cavity, and the closure of the abdomen, was only accomplished with the greatest difficulty at the end of an hour. A filigree measuring 9½ in. by 4½ in. was implanted and covered as far as possible by the frayed-out remains of the rectus muscles. Owing to the great intra-abdominal tension, even after nearly the whole omentum had been removed, the patient remained very collapsed through the night. She recovered well however, the wound, which measured 14 in., closing by first intention, and she returned to her work, that of a cook, at the end of six weeks. The second photograph (Fig. 10) shows the hernia from the side, and Figs. 11 and 12 the result of the operation, also from the front and side. I have recently heard from this patient that she is in good health, doing her work without any form of support, and that the filigree causes her no discomfort whatever.

Fig. 15.

Figs. 13 and 14 are photographs of another woman, aged 43, who was admitted for a post-operative hernia of very large dimensions, nearly a year ago. The skin was in very bad condition, and so adherent that almost the entire covering of the sac had to be sacrificed. There was a large amount of adherent bowel and omentum, and the right rectus muscle was atrophic and pushed to the right of the hernia. A filigree of the same size as the last was inserted between the muscle and peritoneum below, and between the muscle and posterior sheath above. On the twenty-first day a small stitch sinus developed and gave some trouble, remaining open down to the filigree for some weeks. Eventually this closed, and the patient went home well in every respect. She is now, and has been since her discharge, doing hard manual labour at home, without the support of any form of belt, and feels no discomfort from the presence of the filigree.

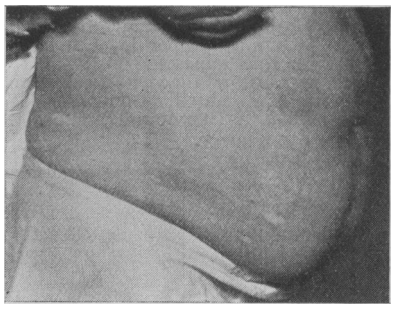

Fig. 12.

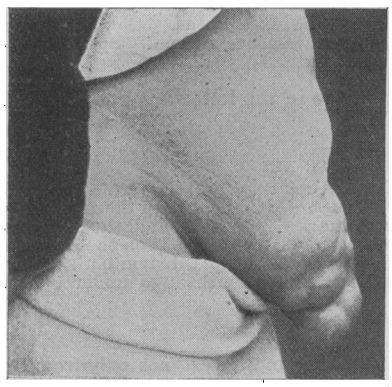

Fig. 14.

These photographs will, I think, give some impression of the very large size of herniae which may be successfully dealt with by this method. It is hardly necessary to point out that these operations are often not only prolonged but extremely difficult, and not to be undertaken without a sufficiency of help, a full knowledge of the difficulties to be encountered, and every provision which can be made for the patient's comfort and safety.

The last photograph (Fig. 15), which, owing to the closeness of the wires, is hardly as clear as I should like it to have been, shows the filigree, which I have found to be more easily manipulated than that which was first introduced by its originator, Willard Bartlett. The modification consists simply in providing *three* backbones in place of the one midrib. At a point 1 in. from the edge of the filigree, a strand of wire is carried along it, binding each pair of contiguous wires together. In the diagram this may be easily made out by the use of a hand magnifying glass. The result is that a filigree is produced which is very much stronger, and which can be introduced very much more easily than the original pattern, in which there was always a tendency for the loops to get bent and crossed during introduction. The number of loops to the inch remains the same, namely, eight, as does the standard gauge of the wire, namely, twenty-eight. The ends should measure in width about two-thirds to three-fifths o the width of the filigree at the centre.

NOTE.—Since this article has been in the press several replies have been received from patients in various parts of the world, all of which show the operation to have been successful up to date. To the stated period since operation five months must be added in every case.

ACUTE NECROSIS OF SKIN.

BY CAREY COOMBS, M.D.LOND.,
CASTLE CARY.

IN the following remarkable case the persistence of high temperature, the appearance and progress of the sore, and the fact that the first nurse had to leave because her hands became infected suggest a bacterial cause. Syphilis may be dismissed, and tuberculosis is improbable, as the patient and her children had never shown any tendency of the kind.

History of the Case.

A stout lady of yellowish complexion began to suffer from remittent fever on April 10th, 1907. There was much pain in the course of both sciatic nerves, followed after a few days by the appearance of three or four bullae, like those of ecthyma, about ½ in. in diameter, near the tuber ischii. These bullae formed sores which healed in three months. On the inside of the right knee one bulla appeared about May 11th, ½ in. in diameter; nine days later it was 3in. in diameter. Its margin was purplish-red, raised ⅛ in. above the surface of the sore, which consisted of healthy granulations. In two months the whole thickness of the true skin had gone from the right leg; the limits in the front of the foot were the bases of the toes, on the sides of the foot the points of the malleoli, the upper edge being on the level of the patella. The tendon of the extensor of the toes was exposed on the dorsum of the foot. On some days more than a square inch of skin died. The process usually began by serum appearing under the epidermis at the growing point of the necrotic area; the cutis vera died in a few hours; when it was cut off, granulations were found growing beneath.

The necrosis ceased at the end of July—that is, in the tenth week—and the whole surface had skinned over in November, 1908, eighteen months after the disease started.

As a rule, the edge of the wound was well defined, purplish-red; the surface generally was clean, and islands of new skin appeared from time to time. Skin-grafts generally grew readily. But in March, 1909, the skin began to die again on the inner side of the calf, and in six weeks the surface of the sore was 3in. in diameter. The patient's temperature was above 99° at night for twenty-five weeks, the highest point being 104°. The discharge from the sore was not examined until the recurrence took place in 1909.

There can be no doubt that the patient's excellent appetite helped her recovery. The recurrence has followed four months of lack of nourishment, as her food began to return daily soon after she started a laryngeal cough. Her veins were weakened by her pregnancies, and venous bleeding has three times followed lowering the leg to the floor. Bier's bandage had the result that great pain and large blebs of blood appeared in two minutes after it was applied. The whole limb became oedematous, just as the sore was nearly healed.

Treatment.

Quinine and iron were taken throughout the illness. Opium was given at night, and was added to the ointment used for about a year—namely, lanoline containing tincture of benzoin and opium, suggested by Dr. Milner Moore. At first boric acid was used in carbolic lotion, 2½ per cent. Then, by the advice of Dr. Firth, of Bristol, iodoform was added to the lotion, and the edges of the wound were painted with hydrogen peroxide. These methods were continued during the time of rapid sloughing—ten weeks. When the skin began to die again, in March, 1909, I ionized the sore by placing the positive electrode of a Leclanché battery over layers of lint soaked in 2 per cent. zinc sulphate solution on the sore; 10 to 12 milliampères of current were used for ten minutes every two or three days. The result was to make the surface look silvery white, as though mild silver nitrate had been applied. But the use of hydrogen peroxide and iodoform lotion had a better effect, and at the end of six weeks the recurring ulceration is arrested. One ulcer, 2 in. in diameter, is closing, and seven, which are about half an inch across, are stationary.

THE Edinburgh Post-Graduate Course, which commences on August 30th and extends for four weeks from that date, promises, judging from the number of entries, to be at least as popular as its predecessors. The full number of applications for the Special Surgical Course, the attendance on which is limited to twenty-five, were indeed received almost a month prior to the date of its commencement, and some of the limited classes of the General Course, which is, as in former years, divided into two quite independent fortnights, are filling up rapidly. Among those who have entered are several who have taken out the Course in previous years.

Three Demonstrations
ON
CONGENITAL MALFORMATIONS OF PALATE, FACE, AND NECK.

GIVEN AT THE ROYAL COLLEGE OF SURGEONS, ENGLAND.

BY
PROFESSOR ARTHUR KEITH, M.D., F.R.C.S.ENG.,
CONSERVATOR OF THE MUSEUM.

II.—CONGENITAL FISTULAE OF THE LOWER LIP.

A BILATERAL cleft in the upper lip is frequently associated with a curious malformation of the lower lip, in which two fistulae or recesses open on the lower labial surface opposite the clefts in the upper lip. The orifice of each recess may be raised into a nipple-like process, which, when the mouth is shut, fits into the corresponding upper cleft. This was the condition in a specimen submitted to me by Mr. Woolcombe,[1] which was excised from the lip of a boy, aged 3 months. The orifice of the recess was situated at the apex of the papilla; its fundus, about the size of a rice-grain, lay within the substance of the lip, and was surrounded by mucous glands which opened into it. A layer of striated muscle surrounded the pocket, which in nature was clearly a localized invagination of the mucous membrane and glands of the lip. In three cases reported recently by Mr. R. C. Dunn,[2] there was one in which the recesses opened on nipple-like processes; another in which the orifices were wide and flush with the surface of the lip; while in the third the two recesses were confluent—thus forming a transverse depression on the surface of the lower lip. The condition has been described by Mr. Bland-Sutton, Mr. Arbuthnot Lane, Mr. Clutton, and Dr. Ballantyne. There is no example of this malformation in London museums. An appeal to comparative anatomy does not afford a satisfactory explanation. Seeing that the malformation is so closely associated with bilateral harelip and cleft palate, a condition which occurs normally in certain fishes, it is clearly in this vertebrate class that an explanation of the condition is to be sought. On each side of the middle line of the lower lip of sharks, and exactly in the position where these recesses are found, open a group of mucous canals which are connected with nerve endings found in fishes. It is possible that these labial recesses have some relationship with these two mucous labial organs found in selachians, but the matter requires further investigation.

TABLE II.

	A.	B.	C.*	Total.
Recesses and papillae on the lower lip ...	—	—	—	—
Median clefts on the lower lip and mandible	—	1	3	4
Naso-maxillary cleft	—	4	—	4
Lateral nasal clefts...	3	1	—	4
Mesial nasal clefts	—	—	5	5
Lateral nasal proboscis	—	—	—	—
Recess on nasal septum	—	—	—	—
Congenital perforation of nasal septum ...	1	—	—	1
Occlusion of anterior nares	2	—	—	2
Occlusion of posterior nares	—	—	—	—

* For explanation see Table III.

Median Cleft of the Lower Lip and Mandible.

Among the 250 specimens of malformation examined, only 4 showed this condition—a full-time child in the museum of St. George's Hospital and three specimens in the museum of this college, one from an ass, another from a cockatoo, and a third from a sparrow. Seeing that the lower lip and mandible arise by the fusion of right and