ON THE RADICAL CURE
OF
REDUCIBLE INGUINAL HERNIA,
BY
A NEW OPERATION,
WITH CASES AND REMARKS.
BY
T. SPENCER WELLS, F.R.C.S.

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IN the year 1847 I assisted Dr. Burmester at Malta to perform an operation for the cure of reducible inguinal hernia. The operation adopted has not been made known in this country so far as I am aware. It was devised by Professor Wützer, of Bonn, and I shall presently describe it.

Dr. Burmester's patient was a gentleman 28 years of age, who had suffered for about eight months from oblique inguinal hernia on the right side. The external ring was dilated, but the intestine had not descended into the scrotum. The inguinal canal readily admitted an ordinary-sized finger. The patient was strong and healthy. He objected very much to wear a truss. No dangerous symptom followed the operation. The patient remained in bed eight days, and was confined to his room a fortnight longer. He afterwards wore a truss for four months. It was then left off, and he had not had any recurrence of the protrusion a few months ago when I heard from him, upwards of six years after the operation.

I have since performed this operation twice myself in two very similar cases; one in the year 1848, and the other in 1850. One patient was a naval officer, the other a groom,

their ages being 18 and 20, and the hernia of recent formation, both oblique inguinal on the right side. Complete success followed, and although both patients are accustomed to very active exercise, no return whatever of the hernia has taken place.

I have not met with other cases suitable for operation in my own practice; but when at Bonn in the year 1850, Professor Wützer showed me two of his patients upon whom he had performed the operation, one only eight days before I saw him, the other about two years before. No unpleasant symptom had followed in the first case, which was going on well, and in the second a radical cure had been effected. In reply to a question I lately addressed to the professor as to the numerical results of his operations he says: "I am not able at present to give you the statistical results of all the cases upon which I have operated, as I have not time to collate them. I can now only say that, since the autumn of 1838, I have repeatedly practised my operation in the Klinik every session before many witnesses, and that I have never seen severe peritonitis follow it, still less any fatal result. All those operated on have not been cured. In several relapse followed, but this was traceable either to the patient's leaving off the truss too soon, or undertaking very hard bodily labour soon after the operation." When at Vienna last year, Professor Sigmund informed me that he had performed the same operation nineteen times in the great hospital of that city, a successful result following in fifteen cases. In two cases gangrene of the integuments followed, and in two others relapse occurred after some weeks, but no death had happened. Professor Rothmund, of Munich, has published the result of his operations on the same plan in the hospital of that capital. He had operated thirty-five times in thirty-two cases, in two years and a half, and no death had followed. His results are almost uniformly successful; but I am informed by a gentleman who wrote to me lately from Munich, that these statements are not deserving of very great weight, as the patients were not watched long after the operation to test the occurrence of relapse. But I trust that a

few remarks upon a method of operating which has led to the results I have just recorded may not prove unacceptable to the Society.

When a surgeon operates skilfully upon a strangulated hernia at the proper moment, he achieves one of the greatest triumphs of our art, for he unquestionably saves the life of the patient without removing or deforming any part of his body. A surgeon who should invent a method of radically curing hernia certainly and safely, would be a great public benefactor, not only by relieving thousands from the inconvenience of wearing a truss, but by averting the danger of strangulation to which they are continually exposed to, in a greater or less degree, through every period of life. It may be said, that the security afforded by a well-fitted truss is almost perfect, and the inconvenience it produces not very great, but patients differ very much in their estimate of the evils of wearing a truss for life; and the frequency with which strangulation occurs among persons who do wear trusses, proves that a more effectual safeguard is required.

Every one must admit that the balance of opinion in the present day among the most experienced surgeons of Great Britain, France, and Germany, is decidedly against any operation for the radical cure of hernia. It must also be admitted, that the opinion has been formed upon facts which fully justify it, for the various modes of operating condemned have been often followed either by death, dangerous peritonitis, gangrene of the soft parts, or by recurrence of the protrusion, so that the patient, after exposure to danger, has been left in no better condition than before. So far as any proceeding implies either opening of the hernial sac, its destruction by the cautery or caustics of any kind, its scarification, the introduction of foreign bodies into it, or the application of a ligature around its neck, every man of sound judgment must agree with the general opinion. For, even if the danger of peritonitis or gangrene were escaped, one would naturally expect that adhesions of the neck of the sac would soon extend, become loose, and give way before the pressure of the viscera, and a new hernial protrusion occur.

But the question becomes quite a different one when a mild operation of invagination, skilfully practised in properly selected cases, has to be considered. It is true, that Gerdy's method of invagination, although occasionally successful, has led so often to death, or to gangrene of the scrotum and exposure of the testicle, and in the more successful cases has been so often followed by relapse, that it has fallen deservedly into discredit, and is now very seldom performed. But if an array of facts, such as those I have collected at the commencement of this paper, prove that invagination can be so performed as to be safe and generally effectual, perhaps the opinion now entertained may be modified.

The radical cure of reducible hernia can be effected in two ways: 1, by inducing union of the two opposed serous surfaces of the hernial sac by adhesive inflammation and exudation; and 2, by producing close union with an organic body pushed from without into the canal.

I think it better to pass over the various plans which have been adopted with the hope of curing hernia by the first of these plans; for, with the exception of compression, they have all been exploded. A well-fitted truss, properly and permanently applied, gradually excites exudation and adhesion, and in young persons hernia of very considerable size is frequently cured radically without further treatment. But, in adults, compression is only palliative; for the cases in which it effects a radical cure are so rare, that such a happy result is scarcely to be expected in any given case.

The attempts of Belmas, Gerdy, Leroy-d'Etiolles, Signoroni, and Jobert, to close the hernial canal by means of organic union with it of a part of the body of the patient himself, though sometimes successful, have on the whole proved that it is desirable to adopt some plan by which the same end might be attained more safely and securely. It being understood that the inguinal canal must be closed by a portion of skin pushed into it, the first precaution necessary is to effect the closure in such a manner that the adhesive inflammation which it is desired to excite in the hernial sac should not extend to the peritoneal cavity.

Now it has been supposed by Gerdy and others that, when a hernial tumour is pushed before the skin of the scrotum by the finger of the surgeon, the sac is pushed upwards; and that the needle, passed after the method of Gerdy, does not implicate the sac. This, however, is not the case. It is contrary to the anatomical condition of the parts. The serous hernial sac is so firmly adherent to the inner surface of the inguinal canal, that it cannot be separated without the assistance of the knife. In one case recorded by Wützer, where a hernia had only existed three days, the adhesion of the sac to surrounding parts by inflammation and exudation was so firm, that separation could only be effected by the knife. If the sac were really moveable, the attempts of Gerdy and every other surgeon to cure reducible hernia radically would necessarily be uncertain, for all we have to trust to is closure of the abnormally dilated canal by adhesive inflammation. We must consider all this fairly in judging of any operation. Professor Wützer did so before he devised the instrument which is now brought before the Society.

He thought that the most safe and promising plan of closing the canal would be by effecting upon its whole inner surface up to the internal ring (and when possible closing the ring itself) an equal mechanical pressure which could at any time be increased or diminished as might be desired or requisite. While keeping a compressing instrument firmly fixed during several days, all use of the knife, and of every caustic under whatever name, should be excluded, and the entrance of air into the peritoneal cavity carefully prevented.

It may be seen that the instrument consists first of a cylinder of very hard wood. This is $3\frac{3}{4}$ inches long, and is made of different diameters, according to the breadth of the canal. It is destined to take the place of the index finger, after the latter has pushed a part of the scrotum through the abdominal ring into the inguinal canal. Towards its anterior blunt extremity it becomes gradually thinner. It contains a canal, lined with metal, which conducts an elastic steel needle, flattened on the point and furnished with a moveable handle. A round opening near the point of the cylinder allows the needle to pass through, so that, when the cylinder has been properly introduced, pressure upon the handle of the needle sends its point along the interior of the cylinder, the skin of the scrotum, the serous coat and coverings of the hernial sac, projecting at last through the integuments. In order to increase the pressure which the wooden body remaining in the canal itself exercises, a moveable case of hard wood is made concave, corresponding to the outer convex side of the cylinder. It is made rather wider than the cylinder, projecting two or three lines on either side, in order to distribute the pressure more equally, and near the end is an opening to receive the projecting point of the needle, which thus fixes one end of the cover over the cylinder. The other end is supported upon a moveable metallic staff; near this is a screw, by means of which cover and cylinder can be pressed together to any degree of strength, so that in a moment the anterior wall of the hernial sac, of the inguinal canal, and the tissues between the cylinder and the cover can be compressed to the precise degree each case may require.

The cylinders are made of various calibres, to adapt them to the different diameters of the inguinal canal, as a great deal depends on the proper filling of the canal by the cylinder, the pressure of which should operate as equally as possible upon all parts of the inner surface of the sac. On the other hand, the diameter of the cylinder must not be too great, or it would be impossible to pass this blunt end to the internal ring, and our object would be defeated; a

diameter of five to seven lines suits such cases. The invaginated scrotum fills the rest of the canal.

The instrument is used in the following manner:—After the hair has been shaved off, the bladder and rectum emptied, the patient lies on his back, with the thighs flexed and raised, and the operator stands or sits between them. The intestine is replaced, if down. The surgeon then places the point of his left forefinger upon the scrotum, about an inch below the abdominal ring, on the affected side, and by carrying the finger, with its palmar surface directed upwards and outwards, through the ring into the canal, he pushes the yielding skin of the scrotum into the canal as deep as practicable; at all events, so far that the apex of the cone of skin thus formed reaches the internal ring. The cylinder having been oiled, it is now introduced by the right hand, withdrawing the finger as the instrument enters. This is not always done without difficulty, and requires some practice: the invaginated skin may return as the finger is withdrawn, and require replacement; or, in cases where the ring is moderately narrow, the cylinder may not be easily introduced by the side of the finger. In this case the finger must be partially withdrawn, to make room for the advance of the end of the instrument. Again, in old herniæ the cellular tissue about the ring is so lax, that the cylinder may be pushed up beneath the skin outside the canal; when this happens, the cylinder is found, on examination, to be much more moveable than when it is within the canal. When convinced that the cylinder properly fills the inguinal canal, the needle is passed through the cylinder, the canal, and the integuments; the wooden cover-plate is placed over it, and pressed against the skin by the screw; the handle of the needle is then unscrewed, and the projecting point is covered by a small piece of cork.

The patient is kept quiet on his back, with the knees bent and supported by pillows. The diet must be so regulated that, on the one hand, we may not prevent a sufficient degree of inflammation in the canal; and, on the other, we may guard against the further extension of it to the perito-

næum. Should symptoms of peritonitis occur, they must be immediately met with energy; but this is very seldom the case if the patient remain quiet. Very gentle pressure should be employed at first; but the screw may be tightened daily, although, in doing this, it is advisable to raise the plate, in order to judge of the degree of existing inflammation, and regulate the after proceedings by it. If this is found to be more than requisite, the pressure is diminished, or the instrument entirely removed.

About the fourth or fifth day the punctured wound begins to suppurate, and there is more or less redness and swelling around it. Professor Wützer says it is not necessary, on the average, to leave it applied more than six days; I have left it seven and eight days. It should be withdrawn as soon as serous fluid, containing fat and epidermis, begins to ooze from the plug; if left longer, injurious suppurative inflammation comes on, and gangrene may commence around the needle puncture. When the instrument is removed, the cavity which remains is filled with soft dry charpie, the puncture is dressed simply, and the whole is supported by a bandage. The patient should remain on his sofa, not only until the cicatrisation of the puncture, but at least eight days longer, so that the fresh adhesions be not broken up by too early movements. In my second case I did not follow Wützer's plan of introducing lint into the cavity, but followed the advice of Rothmund, and endeavoured to procure union of the opposed surfaces of the plug by a graduated compress. No union, however, took place. After either plan, a firm plug is formed in the interior of the inguinal canal, and at first an opening or depression is seen in its mouth; but this entirely disappears after some months, although the plug remains in its place. After a lapse of years, the plug itself becomes gradually diminished, and can scarcely be perceived on examination.

In order to ensure permanent success, the patient should wear a suspensory bandage and a lightly-pressing truss for at least three months after cicatrisation of the puncture; otherwise the adhesions, while fresh and yielding, would be

apt to give way, and the weight of the testicles, if not supported, might tend to draw down the skin of the scrotum to its original position. Powerful exercise of the body should also be forbidden until the truss can be left off.

Two important questions now suggest themselves: 1st. Is the evidence adduced in favour of this operation sufficient ground for admitting it within the province of legitimate surgery? and 2d. If so, in what class of cases should it be performed?

In answer to the first question, I can only refer to the imperfect account of its results with which I commenced this paper. Of 57 cases there reported, no death or dangerous symptom followed in any one, and the proportional success is large. Professor Wützer does not give the number of cases he has treated, but we may presume that it is considerable, and no death has resulted. I have heard that in one case at Brussels death did follow, but that the operation was very unskilfully performed, upon a patient suffering at the time from primary syphilis; so that this misfortune is not to be attributed to the operation, but to the operator. I think, therefore, that if any means are to be resorted to in order to cure hernia radically, that Professor Wützer's operation is that which is the safest hitherto adopted, and the one which offers the greatest chances of success. A truss is always inconvenient: it never gives perfect security against strangulation; it excites in many persons, especially during the first year or two of wearing it, a great deal of mental annoyance, reminding them of a defect in the neighbourhood of the genital organs; it diminishes the aptitude of the wearer for hard bodily labour or active exercise, for there is no truss which can be trusted to keep up a hernia in those who are employed to carry heavy loads, in seamen who have to do duty aloft, or in grooms; yet, as a rule, no warning suffices to keep men from such pursuits because they are ruptured. The cares of a family dependent on labour for support, habit which has grown up from early youth, and ignorance of the dangerous nature of the hernia, are all reasons against an alteration in fixed modes

of life. If all this be taken into consideration, I think that the danger attendant upon such an operation as that I have described, when carefully performed, in fit cases, is slight, when compared with the disadvantages to which a hernial patient is exposed who has to wear a truss for the remainder of life; and therefore that we are bound not to neglect this operation.

As to the class of cases in which it is indicated, perhaps we might say—1st. In all strong, otherwise healthy persons, up to 40 or 45 years of age, who lead a life of active bodily exercise. In such patients where the hernia has only acquired a moderate size, has not become adherent, and where the long diameter of the inguinal canal has not been much shortened by the continued pressure of the intestine, we can most certainly depend upon the excitement of a passive exudative inflammation with subsequent adhesion—in other words, upon a radical cure.

The inguinal canal becomes wider, and at the same time shorter and narrower, the more extensive, old, and neglected the hernia may be. At length the shortness of the canal, the relaxation of its walls, and the large circumference of both rings, form so many impediments to a successful union; and the attempt at a radical cure will be more unsafe in proportion as these impediments increase. All this must be taken into account when considering the second class of cases in which this operation may become advisable, namely, in patients who have not arrived at the age of decrepitude, whose hernial tumours cannot be longer kept up by any mechanical assistance. This may be the case when the inguinal canal is extremely dilated and shortened; in certain species of omental hernia; in cases of great sensibility of the spermatic chord; and in persons with a fat, pendulous abdomen, upon whom the pad of the truss slips when they move. Such persons live in constant danger of strangulation; and in them herniotomy would be infinitely more dangerous than invagination, performed at a proper time. If the neglect have been carried to its highest degree, and the rings have become widely dilated, probably

no method of operation will avail to close them perfectly ; yet the patient gains a great deal if, by such a proceeding, the evil can be at least so much diminished that a truss can be successfully worn. In one such case, operated on by Professor Rothmund, in an old woman who had a labial hernia which had reached the knee, four fingers together could be passed through the ring, and no truss was of any use ; yet, although no radical cure was effected by the operation, it had the good effect that the hernia could be afterwards properly kept up by a truss.

Allow me to add, in conclusion, that whatever operation be proposed for the radical cure of hernia, it can only be successful when the whole inguinal canal can be so permanently closed by a new, firm, organic substance introduced into it, that, besides the spermatic chord or round ligament, no other parts can find their way through. All methods of cure which can only stop the passage through the abdominal ring must fail in their object, so long as any part of the inguinal canal is left open. In successful cases they may prevent the passage of an inguinal hernia into the scrotum, but are incapable of obstructing renewed protrusion of intestine into the inguinal canal—in other words, of preventing a relapse of the hernia. It is in this respect that Professor Wützer's operation appears to me to be so far superior to others, that I have ventured to bring it before the notice of this Society. It will be for the members to consider how far the evidence I have adduced of its safety and success should lead to its further adoption in this country.