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ON

OVARIOTOMY

AND ITS RESULTS.

BY

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OVARIOTOMY AND ITS RESULTS.

It is my intention in the following remarks to give a brief retrospect of my operations for the extirpation of diseased ovaries from the year 1842 to the present time, together with such observations as my lengthened experience will enable me to offer, in order to present the reader in as small a space as possible with all the necesssary information (as far as I am able) for the purpose of enabling others to form their own opinions, and to be in some measure a guide to them in the treatment and management of these very formidable cases.

It is not my intention to enter into the consideration of any questions, excepting those directly in reference to ovarian disease, where an operation is determined upon, and the result of such operations when performed. I shall also chiefly confine myself to those cases on which I have operated, leaving it to others to record their cases in like manner. Before proceeding to the main object more particularly in view in this paper, I will first make a few general remarks on points of importance, which in my opinion have become established facts, very valuable in themselves as landmarks on which to base an opinion for future practical purposes. And I will begin this portion of my subject by remarking, that ovarian diseases are far more frequently observed in practice now than formerly; not that the disease is in itself more prevalent, but that more attention is paid to the question, leading to its more frequent discovery, where previously it might have been overlooked, or classed under the head of other dropsical diseases. I am therefore decidedly of opinion that the diseased ovary always existed to a greater extent than we have been led generally to admit; in fact, that it is, and always was, a very wide-spread disease; and from the very imperfect information as to its early history, it is very difficult to say if the malady is on the increase or not, but I should feel inclined to think that society and its modern customs are in some degree increasing this dangerous class of diseases, from the numerous cases now presented to our notice. Respecting the frequency of ovarian disease, I find my own memoranda show that 1,600 cases have sought my opinion since my first operation in 1842. It is on this number of cases I shall make a few statistical remarks, which, I believe, will be worth inquiring into, and deserving of particular attention.

This large number of cases of one disease only, to one individual, although from many parts of the three kingdoms,

shows most decidedly how extensively the disease exists, and the great and paramount necessity for some radical means of cure being adopted, however hazardous: more particularly from the fact, that all attempts at cure by medicine are absolute failures, and very often expose the poor sufferer to still greater tortures, without the slightest redeeming benefit ever accompanying them. This large number also shows, that though the operation of extirpation is now pretty generally admitted as a legitimate operation in properly selected cases, notwithstanding that it was at first almost universally and violently opposed, even yet a very small proportion of those suffering under this disease submit to the removal by operation, the remainder (a very large number) are allowed to sink from prejudice, or a want of courage to meet the operation, although those parties opposing the operation have nothing to offer in the way of treatment or otherwise, that can be attended by any advantage to the patient whatsoever. Indeed, I may go farther and say, that many of the plans proposed have the direct effect of aggravating the disease, often rousing into great activity that which previously was comparatively dormant, and often bringing a case to a rapid aud fatal termination in as little time as an unsuccessful operation, and with a far greater amount of suffering; very many of these cases, if not so experimented upon, might have continued for some time without any great amount of pain and inconvenience.

Plans of treatment, with the view of lessening the bulk of the tumour by absorption or otherwise, as by iodine, mercury, &c., without being attended by the slightest possible advantage, yet so far prostrate and depress the physical powers of the system as entirely to destroy any prospects of success in an operation, should the patient seek it, although a fair average of success might have been anticipated if such pernicious treatment had not been put in force. Pressure and galvanic currents on and through the tumour have each been advocated very strongly by some parties. I have heard of no cases where any advantage has been gained by galvanism, nor do I believe any good result could possibly be gained by such process, while there is a probability of rousing into greater activity a disease almost dormant, or very slow in progress at the time. As to pressure, save and except in such rare cases where it can be certain that a single cyst unaccompanied by solid nucleus exists, in such a case it is just within the bounds of probability that success might attend the process; but in all other cases, that is in nineteen-twentieths of the cases I have seen, pressure would not only be unattended by any advantage, but decidedly the most pernicious and injurious

practice that could possibly be put in force. Suppose, for a single moment, a large multilocular tumour of many pounds weight (my own cases average 27lbs., and I have extirpated many heavier, and one of 73lbs.) how is it at all likely that any pressure could ever effect, by *absorptive process*, a disappearance of such a mass in the short time allotted to the lives of individuals suffering under this disease,—a term of not more than three years on the average? The whole affair is not only a physiological absurdity, but an impossibility.

The above are not the only objections. Violent and long-continued pressure for a time, will be as certainly followed by severe attacks of inflammatory action, resulting in extensive adhesions of the tumour to the abdominal parietes, or both of them to the pelvic and abdominal viscera, forming a matted mass of living structures impossible to unravel (proved in a *post-mortem* examination), and presenting insurmountable obstacles to any future attempts at extirpation, which it would be madness to encounter. I have invariably sent such cases back to the parties adopting such plans, that they might see the terminations of the sufferings they had occasioned. Two deaths have come under my notice where the pressure system had been tried to the fullest extent, and the awful sufferings of the poor creatures during the progress of enlargement, where all the parts concerned were matted together firmly (as was proved by examination after death) cannot be described. All the cases where I have seen pressure tried confirm my opinion that the progress of the disease was greatly accelerated, except, as I have before stated, in single cysts, thin walled, and not accompanied by any solid nucleus, but these cases are extremely rare.

From these observations, I conscientiously believe that neither medical treatment, external nor internal applications, pressure, nor galvanism are of the slightest benefit; they neither cure nor palliate the disease. All such attempts, then, are fallacious, and only throw obstacles in the way of any benefit that extirpation of the tumour offers, increasing the difficulties of that operation, if not defeating it altogether.

I ought in this place, before I proceed further, to admit one exception to this general condemnation, and that is in the case of one large single cyst with thin walls, which by tapping and injecting the sac afterwards with two or four ounces of the strong Edin: tinct: of iodine, might be productive of cure. I have seen three cases succeed by this plan, and as these operations took place now three years ago, the result has fully justified the means employed. Thus, then, in single cyst cases, I think such means ought first to be tried, even to a second or

a third injection, before requiring the patient to submit to the process of extirpation. Still, I must not omit to mention that the chances of success of extirpation are not improved by the previous use of iodine; such cases never recover so well as those where iodine or mercury have not been used.

I have spent much time in endeavouring to decide if ovarian disease be more prevalent in young females or in older persons,—in single, or married females. It is a question of great difficulty in the absence of a larger range of statistical information than I or any other single individual could possibly have at command; still, with the information I have been able to obtain, I believe the preponderance is with the young and unmarried females; and I feel also certain that the tumours in those classes are far worse, as a whole, to cope with, having generally a larger proportion of solid mass, accompanied by more severe symptoms, more rapid as to growth, and, as a matter of course, lead to an earlier termination.

In elderly females, *unmarried*, the tumours are very frequent, and usually not of a very promising character; whilst, on the contrary, elderly *married* females seldom have the disease until after the child-bearing period; that is, after the cessation of menstruation. In such cases, the tumours are slow of growth, multilocular in character, and usually not much adhered; and, I may add, but seldom accompanied by severe inflammatory attacks. It is this last class of cases that I should prefer, before all others, for extirpation; and if I must have a choice of age, I prefer those between forty and fifty to any other. Of course, there may be good cases at all ages, and many good recoveries have been made at all ages; but my experience points out the above cases as most probable for success.

My attention was, contrary to my expectations, very early directed to one fact, which is, that the right ovary is far more frequently the seat of disease than the left, and I am yet unable to account for it. In my earliest cases I was impressed with the idea that the left would be found more frequently the seat of disease; experience, however, proves the contrary to be the fact; taking the whole number of my cases I may venture to say that at least two-thirds have been of the right ovary. With respect to the connexion of ovarian with uterine diseases, I have found about one-fourth of the entire number of cases to be more or less connected with uterine disease. In my "Manual of Obstetric Operative Surgery," published in 1856, I stated about one-third of ovarian cases were connected with uterine disease, but I have since found that in that statement the proportion was too large, the present announcement of

one-fourth will be found to be nearer the truth. I need scarcely remark that all cases of ovarian disease, accompanied by uterine disease involving its structure, such as hypertrophy, ulcerations, cancer, &c., &c., place the operation of extirpation entirely out of the question, to attempt which, under such circumstances, would be altogether unjustifiable, as it would certainly only hasten the patient's death. Hence the great necessity of defining, which is often a matter of great difficulty, whether the case be accompanied by uterine disease. The large number of cases presented for diagnosis compared with the small number operated on in my own practice, will at once defend me from the charge of seizing on every opportunity for operating; 104 operations out of 1,600 diagnosed cases is but a very small proportion. I could easily have trebled the number of operations, which would have added to my pecuniary advantages, but have preferred, after giving an opinion, rather to be sought after than to urge the sufferers to undertake the chances of an operation.

It might naturally be inferred, from the aptness of the ovaries to take upon them morbid derangements, that we should find both frequently affected at the same time. This is occasionally the case; but not nearly so often as we should be led to suppose. I consider it to happen not more than once in twenty cases. But when *both* ovaries are affected, it is almost always found that the uterus is also involved. Where both ovaries are affected, the operation for extirpation is scarcely admissible, though the uterus may be free, as it calls for the extirpation of both ovaries at once; or another operation will soon after have to be performed on the second ovary. I have had one such case, where a large ovary of 37lbs. was removed, and at the time it was found the other ovary was enlarged to the size of a walnut. Both were excised, the case did well, and made a complete recovery, but was followed by some curious physiological phenomena, such as loss of sexual passion, loss of voice, at least it became croaky, and many characteristics of the female vanished.

The characters of the tumours vary very considerably; about one-fourth of the whole are of a solid lobular kind, often considerably adherent, slow of growth unless provoked by accidental injury, or irritated by treatment, as by pressure, galvanism, &c. Such a class of tumours are not very favourable for extirpation. Nearly one-half, or more than a third have well developed, and more or less large cysts, with some portion of solid nucleus, pretty free from adhesion, are of more rapid growth, especially if any of the cysts should be emptied accidentally or intentionally; these are a class more

favourable to extirpation. A still smaller proportion consist of thin walled cysts, with scarcely any solid material (in some rare cases, of one large thin-walled cyst, with no traceable solid mass). This class is of rapid growth, seldom adherent, and very favourable to extirpation, and occur mostly with females of younger ages. In such cases it is only reasonable, before extirpation is proposed, to try the injection of strong tinct. of iodine after tapping, particulary where there is but one large cyst, and I would persevere to the second or third time, before proposing extirpation. I have seen three cases making rapid and permanent recoveries by this mode of proceeding, and I have also seen it fail in two other cases. Still it must be borne in mind, that the cases themselves are of the rarest kind, as I have not met with more than ten in the whole of my practice that I could call *single cyst*, and free from solid mass. It must also be recollected that, wherever iodine or mercury have been used to any extent, the chances of recovery from extirpation is considerably lessened. It is, therefore, desirable to use neither, as no good results from their use, except in such cases as has just been stated, where a reasonable prospect of success may be anticipated; although, if it fails, the subsequent operation is deprived of some of its chances of success. If there are more cysts than one, or if a cyst be accompanied by solid material, it would then be the height of absurdity to inject a cyst after tapping, as it cannot, in the slightest degree, check the formation of fresh cysts from the solid mass, or prevent the other cysts already formed from enlarging; therefore, as it is incapable of influencing the main disease, and would injure the prospects of success in the extirpation, such modes of treatment should be carefully avoided.

Mr. Safford Lee believes that married females are more liable to ovarian disease than single ones; my own opinion is, that the liability is about equal. As respects age, I believe the commencement and decline of menstruation are the periods most productive of ovarian disease, probably because of the irregularities attendant on the commencement and cessation of menstruation. I have said the duration of the disease, on the average, is seldom more than three years; this applies more strictly to younger persons; for, if we divide the cases into those *under* thirty years of age, and those above thirty, we should find that with the latter the disease is often of much longer duration than with the former.

The growth or progress of ovarian disease, when once established, forms a very important point of consideration, and often presents considerable difficulty in forming an opinion as to the

future prospects of the case; speaking of these cases as a whole, I consider them on the average very rapid in their development, and taking this view, I should not hesitate in limiting the duration to two and a half, or at most three years. Notwithstanding, there are many cases that suffer under this disease for very many years, attaining an enormous size, and some of these cases appear to suffer but little, except from the inconvenience of bulk, and inability to move about. Then, again, some have borne tapping a great number of times without much suffering, whilst others have immediately sunk after the second or third tapping; the former being the characteristic of the disease in advanced life, and the latter that of earlier or younger lives. On the average, then, these cases seldom exceed three years, and if tapping is resorted to as a simple means of relief, the patients generally sink after the second or third operation.

The growth of ovarian tumours appears to be considerably influenced by age, that is, if we divide cases into those above *thirty*, and those under *thirty* years of age, the former are of much slower growth than the latter, and accompanied by much less constitutional disturbance. I have generally found the most unfavourable cases and the most rapid growths during the earlier ages, and arising *rather* from obstructed uterine and ovarian functions during the child-bearing period, than at later periods of life, and more immediately connected with the cessation of the menstrual function. I conclude, then, from these remarks, that there are but few cases which do not complete their termination in some way within three years from their commencement.

I do not intend to occupy the reader's time by speculating on the pathology of ovarian disease; the seat of this disease is still disputed, and, if settled, can in no way alter the means proposed for its treatment, whether that be for the simple alleviation of suffering, or its radical removal. I would, however, say a few words on the varieties of tumour which present themselves to the practitioner.

And first, the *simple cyst* attached to the ovary, or broad ligament, either by a distinct pedicle of its own, or arising from a broader base. This form of the disease is very rare, and, as I have previously stated, I have seen but very few such in my practice; they are the only cases that are likely to yield to iodine injections after tapping; and in half of such, at least, tapping with injection will not succeed; still, if half succeed it would not be justifiable to neglect a trial. Spontaneous bursting and tapping have cured this form. *Cysts from breaking up of the graafian vesicles* is a much more frequent form of

ovarian disease, these cysts breaking up into each other until no remains of the original ovary are to be found; this class, as well as the simple cysts, are of rapid growth, and often attain a very large size. The fluid contents are generally coffee-coloured, but present considerable variety in appearance. From twenty to thirty pounds of fluid are often taken from cysts of this character, and I have in one case taken seventy-three pounds. In these cases the form of the tumour is more unequal or lobular than in the single cyst. Mr. S. Lee speaks of large cysts being formed attached to the liver, omentum, and peritonæum. I have not seen any such case, but, on more than one occasion I have found the abdomen filled by hydatids, which presented many of the symptoms characteristic of ovarian disease. The *multilocular tumour*, having very many cysts varying very considerably in size and in the contents of each cyst, is the most frequent of all forms of ovarian disease, and the kind of case where tapping can be of no use, and where, if adhesions are not very extensive, extirpation is most likely to be successful. The size of such tumours as are likely to be brought forward for the prospects of an operation is generally large, twenty-five to thirty, or thirty-five pounds, is very common, and I have removed one successfully weighing seventy-three pounds. From these remarks, some idea may be formed as to the extent of material removed in one hundred and four operations, which could scarcely average less than thirty pounds each.

The character or general appearance of ovarian tumours is of some importance, as it is just probable that great uncertainty may exist in the diagnosis, and it may be necessary to make an exploratory incision. In such a case, after every other mode of inquiry has failed, the first appearance of even a very small portion of the tumour surface will decide if ovarian or uterine; the pink blush, and moderately even surface is the character of uterine tumour; whilst the whitish, muddy pearl-like appearance, with a bluish tint here and there, will never fail to characterize the ovarian mass, the surface is also more irregular, more lobulated; the vessels are large and flat in uterine tumours, and are scarcely discernible; in ovarian cases, they appear on the surface larger than they really are, being much flattened, and confined chiefly to the surface. In uterine enlargements the vessels are very numerous, but more sub-divided and smaller, and interspersed throughout the whole mass. In all exploratory incisions, if the surface shows the pink shade before spoken of, the incision should be immediately closed. As to the interior of ovarian tumours, the cells or sacs vary considerably as to

size, from that of a pea to the enormous sacs spoken of in the preceding remarks. The contents are equally various, some gelatinous, some thin, some contain pus of almost every form and consistence; in some of the large sacs hang pedunculated masses, like the main mass. I have not seen any hydatids in the interior of ovarian tumours.

The vessel supplying the pedicle will guide the opinion as to the vascular character of the whole mass; I have seldom found it larger than a crow-quill, although those on the surface appear much larger, and yet their supply must be derived from the vessel of the pedicle only.

Adhesions.—In many cases there is not the slightest adhesion beyond the pedicle, others are adherent, not only to the viscera, but also to the peritonæum, though not extensively; in both these classes I should operate without any hesitation; the character of the adhesions varies considerably, in respect to different organisms. Those to the intestines, are generally threads or bands of lymph, easily separated by the bistoury without hæmorrhage, and are generally of no consequence. Those to the mesentery are patchlike, sometimes easily peeled off, but often firmly organized, and when separated are liable to hæmorrhage; such separations should be watched, and if any tendency be shown to bleed, the vessel should be secured with fine silk, and the ends cut off close. Lastly, the adhesions to the peritonæum are in broad patches, and often peel off with moderate ease, but in some cases are so firmly organized that it is better to cut off the tumour at the edges of the adhesion, leaving the broad patch of the adhered portion of the tumour attached to the peritonæal surface, to slough off and discharge itself by the aperture left for the ligature at the pedicle. I have frequently done this without any bad consequences arising from it. It is a curious fact, that those cases have often made the most rapid recoveries where there have been the most extensive adhesions, and considerable force required to overcome them.

As the contents of ovarian cysts are very variable, it would occupy considerable time to describe each variety, and as it would not be any advantage either in treatment or operation to dwell upon this portion of our subject, I shall next make a few remarks as to the development of symptoms in this formidable disease.

The symptoms of Ovarian Disease are very different when the disease occupies the abdominal cavity to what they are when only in the pelvic cavity in the earlier stages of its development. The *early symptoms* are deep-seated pains in the groin, bearing down sensation in the vagina, a feeling of fullness,

throbbing pain at the anus, more especially when voiding fœces, numbness on the side affected, loss of motion, hæmorrhoids, irregular menstruation, fluor albus, os uteri *in situ*, tenderness above the pubis inclining to one side; vaginal examination detects fulness on one side, with tenderness to the touch (these latter symptoms are more distinct on examination per rectum), constipation, flatulency, inability and desire to void urine, most of the symptoms simulating pregnancy. As the disease advances, and begins to occupy the abdominal cavity, many of the above symptoms are relieved, others aggravated; during the period of menstrual discharge very many of these symptoms are still further increased in severity.

Advanced Symptoms. Bladder somewhat displaced and more irritable, tympanites, sickness, occasionally œdema when the case is an extreme one, dyspnœa, often but not always fluctuation, belly shining, enlargement rather to one side, lobular, prominent at the centre, in extreme cases the ensiform cartilage and ribs forced upwards, umbrella form, if one or two cysts the fluctuation very distinct, if many cysts fluctuation obscure or altogether absent from the semi-solid character of the tumour; movements felt, often mistaken for fœtal, but only arising from the efforts of flatus passing along the intestines with difficulty, in consequence of the pressure of the tumour; the presence or absence of adhesion can only be attested by an experienced touch on the abdominal surface, and often great difficulties are encountered by the most experienced.

Examination per vaginam. Vagina elongated, os uteri displaced, drawn upwards and laterally, the uterus free, natural in size, and easily moved about, unless the pelvic cavity is filled with tumour mass, in which case it is difficult to ascertain, as the uterus is often out of reach or flattened; the vaginal walls are pressed in on the diseased side.

Diagnosis. From retroversion, it is distinguished by the situation of the os; from retroflexion, the uterine sound will easily determine; from ascites, by the system being in a healthier condition, by its lateral bearing, by duller fluctuation, by irregular surface, by elongated vagina, by os tilted on one side, and by seldom being accompanied by œdema of the legs. In cases where there is but one large cyst, with little or no solid mass, the distinction from ascites is more difficult, but such cases are rare.

From pregnancy, by its lateral position, by regular or irregular menstruation, vaginal examination shows the uterus not enlarged, moveable, no fœtal pulsation; the latter, however, may be present in cases where pregnancy co-exists with ovarian disease.

From Cystic Tumours not Ovarian. The history of the case; by the veering to one side, by the menstruation still less interfered with.

Enlarged Uterus. Differs from ovarian, by being less lobulated, more central, easily detected by uterine sound, size and weight of uterus by vag. examination, suppressed menstruation, general health more disturbed, and complexion more sallow.

From distended Bladder. By proper attention to symptoms, by which it will be impossible to confound it with ovarian disease.

Accumulated flatus has been mistaken for ovarian disease, and operated upon for it; in the present state of our experience such an accident seems impossible.

Other enlarged Viscera. An enlarged liver or spleen might possibly be mistaken for ovarian disease, but it is not very probable. As a rule, with enlarged viscera, the lower third of the abdomen is pretty free from tumefaction, whilst in ovarian disease that lower third is filled in preference. This point, coupled with the prominent constitutional disturbance in visceral enlargements compared with the trifling disturbance in ovarian mischief, will generally be a sufficient distinction.

With respect to the *treatment of ovarian disease* when once fairly and extensively developed, I have so little faith in any benefit by medicine, that I shall not repeat what I have already stated on that question in my "Manual of Obstetric Operative Surgery." I have not found any remedy that can in the least be depended upon in the form of medicine. *Tapping*, as a curative measure, is the worst that can be attempted, and can only be justified in cases where the operation prospects are hopeless, or where the invalid is determined not to submit to its chances. Tapping at all times can only be advanced as a means of temporary relief, and, as a rule, only spurs the secretory sacs to refill more rapidly.

Injecting with tinct. of iodine has succeeded in my hands frequently, but can only be justified where there is but one sac, where the walls are thin, and where there is no nucleus of solid tumour; lastly, in apparently the most favourable cases it has frequently failed.

Extirpation, where it can be done, is the only practical remedy, and is one in which, if it succeeds, the cure is permanent. By extirpation, I mean by the large incision, that is, *as large* as is necessary for the operator to manipulate easily and rapidly for effecting its removal. My friend, Dr. T. Smith, of London, considers the exposure of viscera in the operation for a length of time as a great source of danger. I fully agree with him on this point, and it is on that account I advocate a free and large incision, believing when the

operator has room to manipulate freely, he lessens the time of exposure very considerably, at which time, if the temperature of the room is carefully attended to, the danger cannot be increased.

I shall now conclude with a few statistical remarks on this operation. My own mind is still impressed with the importance of taking, as a guide to this question, the experience of those only, who have, like myself, operated a sufficient number of times to have formed some definite ideas on the points necessary to be enforced to secure the best prospective results, rather than to rely on general statistics which must of necessity be built up by a number of isolated cases by individuals who have scarcely ever operated a second time, or at most some two or three cases, both of which classes of individuals cannot have met with much to enhance their own experience sufficiently to enable them to become safe guides for others of still less experience to follow. To mix the results of these limited operators with the whole has a tendency to depreciate the general statistics materially, and lead to wrong impressions. This is the principal error in the lists of cases collected by Drs. Robert Lee and Safford Lee, as also in the very excellent and elaborate table of ovarian operations by John Clay, Esq., of Birmingham. I prefer statistics drawn from those operators who have performed it frequently, men who have had frequent opportunities of testing their practice, and from these alone I would adduce the best rules for the guidance of other operators in future. It must be apparent to all on reflection, that other information, however successful, must be so perfectly haphazard or accidental that such should not be mixed up with the general question. Indeed, such is often the unlooked for result of first cases undertaken without previous experience, that I am not certain if it would not benefit the general question more if the first three or four cases of every operator were rejected, as it is well authenticated that they will often recover under the most extraordinary disadvantages, whilst, on the contrary, they may sink without an apparent cause. In the "Dublin Quarterly Journal" of February, 1861, is reported a case of ovarian extirpation *with successful results*. In the report are some very lengthy instructions how to conduct such cases to a favourable issue, although it was the author's first and only operation, and, singularly enough, the case *never did recover*, but died almost as soon as the report of her cure was announced to the public, at least early in the March following, the date of the case in the journal being February. Since 1842 I have operated on 104 cases, 97 of which have been under my own treatment throughout. The

remaining seven were operated on at a distance from home, and the care of the cases was left to others, assisted by any suggestions I could make from time to time, but not accepting the whole responsibility. The following figures show the general result up to the date of this communication :—

	Cases.	Deaths.	Recoveries.
	97	29	68
	7	3	4
Total....	104	32	72

Taking the odd figures aside, the recoveries in round numbers will be as 70 per cent. From the length of time the disease has been established, when the case is presented for operation, the great debility of the system from frequent tappings, or the secretory supply called into action, I do not think we can reasonably hope to extend our success beyond 70 per cent., but even this far exceeds the first expectations, and is sufficient to establish the operation as a legitimate one in all well-selected cases, in the minds of those who are desirous of extending the benefits of surgical skill to these unfortunate sufferers.