Ovariotomy : a paper read before the New York Academy of Medicine, June 15, 1864 / by E.R. Peaslee.

OVARIOTOMY:

A PAPER READ BEFORE

THE NEW YORK ACADEMY OF MEDICINE, JUNE 15, 1864.

By E. R. PEASLEE, M.D., LL.D.

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ON OVARIOTOMY.

By E. R. PEASLEE, M.D., LL.D.

READ BEFORE THE ACADEMY, JUNE 1, 1864.

Mr. President and Fellows:

It is not my purpose at the present time to give the details of my own experience in Ovariotomy. My cases, only six in number, have all proved successful, and may all be found reported in the American Journal of the Medical Sciences.*

In a paper read before this body a few weeks since,† I arranged the various surgical methods of treatment of ovarian tumors under the following heads:

A. Simple Tapping.
   1. Per parietes abdominales.
   2. Per vaginam.
   3. Per rectum.

B. Tapping followed by pressure.

C. Tapping and formation of permanent opening in sac.
   1. Externally.
   2. Per vaginam.
   3. Per rectum.
   4. Internally.

D. Tapping followed by injections of iodine.

E. Ovariotomy, or extirpation of the ovarian mass.

I at that time considered all the preceding methods of treatment excepting ovariotomy, and deduced certain conclusions which I shall presently repeat here. This evening I propose to consider the value and the justifiability of ovariotomy as a

* April, 1851; Jan. 1856; Oct. 1858; April, 1863; July, 1864.

† March 17, 1864.

surgical procedure, as well as the circumstances, and the methods of effecting the various steps of the operation, which promise the greatest success.

There is, however, a single point to which I desire to direct attention before I enter upon the topics just mentioned, viz. the assertion of English writers that ovariotomy is an operation of British origin. And the following statement of facts will show how much foundation there is for such a claim.

It is generally asserted in England that the operation of ovariotomy was first suggested by Wm. Hunter one hundred years ago;* and that the suggestion was endorsed by John Bell, afterwards Prof. of Surgery at Edinburgh. This statement perhaps needs confirmation; but at any rate Dr. Ephraim McDowell of Kentucky was the first who ever performed the operation; though, as he had been a pupil of John Bell, he might have heard it suggested as possible by his teacher. Dr. McDowell performed his first operation (which was successful) in 1809, or fifty-five years ago; and up to the time of his death, in 1830, he had operated thirteen times, and is known to have succeeded in at least eight of his cases.

Dr. McDowell sent a report of some of his first operations to his former teacher, Prof. Bell; but the latter having died before it reached him, it fell into the hands of his successor, Mr. Lizars of Edinburgh. The operation was, however, never performed by any one except Dr. McDowell for fourteen years after his first attempt. In 1823 Mr. Lizars attempted it but failed, inasmuch as there was no ovarian tumor to be removed; nothing but "tympanitis and obesity." During the next two years he operated twice more; once successfully, and once without completing the operation, on account of another mistake in diagnosis.† Dr. Granville, of London, attempted ovariotomy twice in 1827. One case proved to be a uterine tumor, and the other was abandoned on account of adhesions.

There were no more operations in Great Britain for nine years, or till 1836. Dr. McDowell died in 1830, and at that time the statistics stand thus: Dr. McDowell had operated

* In 1762; and he rather discouraged it.

† All three of Mr. Lizars's cases recovered, however.

thirteen times, and at least eight times successfully; all the attempts at operations in Great Britain had been five, of which three only had been completed, and two in all had been successful. This was also the state of things in Great Britain up to 1836; though in the meantime the operation had frequently been successfully performed in this country, and twice at least in this city by Dr. Rogers and Dr. Billington.

If ovariotomy is of British origin, then, Wm. Hunter originated it; which he certainly did not. He simply suggested its possible practicability, which suggestion was probably repeated by John Bell; but it had been before the profession in Great Britain for forty-seven years to no purpose; and, for aught any one can show or perceive, might have remained so a century longer, had not an American surgeon reduced the suggestion to practice. It is an American operation, suggested by a Scotch intellect. Scotland, however, seems to have disowned it almost entirely; for since the operations of Mr. Lizars, it has very seldom been attempted; and up to Sept. 1862, it had succeeded only in a single instance.* In Ireland also the operation had been performed but three times up to April, 1862, and always with a fatal result.† Up to the present time, indeed, ovariotomy has not found favor in any country in Europe excepting England, and to some extent also in Germany. In the latter, however, it is not yet attended with much success; while in France it is still denounced by the profession generally, and very seldom attempted.

It is not uninteresting, in connexion with the question as to its origin, to show‡ that this operation made but a very slow progress into favor even with English surgeons till within the last eight or ten years; although it had meanwhile been so often successfully performed in this country.

Recurring to the year 1836, when only one successful operation had been performed in England, we find that three operations, all successful, were that year performed. In 1838 there was one successful operation; in 1839, one successful, and one

* London Lancet, Jan. '63, page 70.

† Amer. Journal of Med. Sciences, Jan. 1863, p. 239.

‡ T. Spencer Wells's History of Ovariotomy in Great Britain; in Medico-Chirurgical Transactions, Vol. xlvi., 1863.

not completed. In this year the operation was also first attempted (but not completed) in a London hospital; and in 1840 it was first completed in a London hospital by Benjamin Phillips, though the patient died. The first successful operation in a metropolitan hospital was performed by Cæsar Hawkins in 1846; and the next successful one did not occur till twelve years after this one. Dr. Clay, of Manchester, commenced his career in 1842, saving three out of four patients. Aston Key first removed both ovaries in 1843; the patient died on the fourth day; and Bransby Cooper had a similar result the same year.

Up to 1842 the operation had never succeeded in London, though there had been ten successful cases in the Provinces. In November of this year Mr. Walne had the first successful case in the city. He had two fortunate cases in 1843. In the next three years (to 1846) there were eleven operations in England, almost all successful. I find no more mentioned till 1849 and 1850; two successful cases each year. Mr. Duffie first operated, leaving the pedicle outside, in 1850. I. Baker Brown operated nine times from 1852 to 1856, saving but two patients; and then ceased for more than four years. Besides his cases, I find but nine operations in England in the seven years from 1850 to 1857. T. Spencer Wells commenced his career as an ovariotomist in 1857; and since that time the operation has been frequently performed in England. Mr. Hutchinson first operated (successfully in two cases) in 1858; and he first used the clamp in the management of the pedicle of the ovarian tumor.

It is therefore only in the last six or seven, and especially in the last four or five years, that ovariotomy has frequently been resorted to in England. Great improvements have also been made in the manner of operating during this short period; and for these we are mainly indebted to English operators.

Up to the commencement of the present year, about six hundred cases of ovariotomy had been reported in the British possessions, this country, and Germany—a sufficient amount of experience, it would seem, to determine the merits, both absolute and relative, of the operation, and the best method of performing it. Still, there is hardly a question connected with the

subject which is actually settled by the profession, even in this country.

In deciding, so far as I may, the points just alluded to, I shall discuss the subject under four distinct heads or inquiries:

I. Should ovariotomy be recognised as a legitimate operation in surgery?

II. In what classes of cases, and in what special circumstances, is it proper to resort to it? and what conditions forbid it?

III. How should the operation be performed?

IV. What is the appropriate treatment after ovariotomy?

I. SHOULD OVARIOTOMY BE RECOGNISED AS A LEGITIMATE OPERATION IN SURGERY?

Those who maintain that ovariotomy is never justifiable, base their objections upon three distinct grounds:

1. On statements sustained by mere *à priori* reasoning.
2. On authority.
3. On the asserted unreliability of the statistics of ovariotomy.

1. It ought to be unnecessary to remark, that no practical question in our art can ever be settled by either *à priori* reasoning or by mere authority. For, while either is deciding that a thing is impracticable, some one may do the thing in question. Dr. Lardner demonstrated by that kind of reasoning that no steamer could ever cross the Atlantic, and had hardly stated his reasons at length before the thing deemed impossible was an accomplished fact. Many similar instances have occurred in the history of our profession. I will merely repeat the objections based on *à priori* considerations to which I have alluded; but they have been so ably answered and refuted by Prof. Miller of Louisville,* and Prof. Simpson of Edinburgh,† that I will not further occupy the time of the Academy with them:

1. The great danger of the operation.

* American Journal of Med. Sciences, April, 1859, p. 336.

† Lectures on Diseases of Women.

2. So violent a remedy not sanctioned by the nature of the disease. It may terminate spontaneously.
3. Palliating treatment may prolong life indefinitely.
4. Even if the operation succeeds, it may not secure permanent relief.
5. The difficulty of a correct diagnosis.

Perhaps, however, the fourth objection needs some explanation. It means that, if you operate and cure the patient, the other ovary may possibly become diseased at some future time!! The preceding objections apply as truly to most other capital operations. The last objection alone has any special weight as applied to ovariotomy; but the difficulty of diagnosis really existing in some cases, may be practically neutralized in perhaps every instance by the two following rules:

1*st. Never regard ovariotomy as an operation to be performed in a hurry, or while the patient is in good health.* If you wait some months, or a year or two, if possible, you will gain time to form a correct opinion of the case, and if tapping becomes necessary, the diagnosis can thus be confirmed or corrected; while at the same time the chances of recovery from ovariotomy are on the whole, perhaps, by that palliative operation increased.

2*d. When you commence the operation of ovariotomy, always regard the incision as merely explorative, until you reach the point to determine whether you will finish the operation or not.*

I should, however, add that most of the blunders in diagnosis which have been quoted to the discredit of ovariotomy, were committed before the invention of the uterine sound, or by those who refuse to use it—an instrument which I consider indispensable to a decisive diagnosis in cases of ovarian tumors. At any rate, the difficulties of diagnosis have been generally overcome by recent operators. Dr. Savage, of London, states* that in fifty-two cases, T. Spencer Wells committed not a single mistake; and Dr. Tyler Smith, in fourteen cases, committed but one error in diagnosis.† Still, there are two points which can in no case be precisely determined till after the operation is

* Amer. Journal of Med. Sciences, Jan. 1863, p. 235.

† See T. S. Wells's remarks on the difficulty of diagnosis. Amer. Journal of Med. Sciences, Jan. 1863, p. 233.

commenced—viz. the side on which the disease originated, and the extent of adhesions. The former is, however, a matter of no practical importance; and the latter will, in but a very small proportion of the cases, deter us from completing the operation.

The third objection mentioned to the operation suggests the inquiry—What is the average duration of the disease, after the tumor becomes appreciable, before the fatal termination? Velpeau, who is opposed to ovariotomy, assigns a period of four, six, or even twelve years; while Mr. Thomas Lee gives the average as only two years, though some of his cases lived four years. Cazeaux states that of thirty-one cases, seven only lived over ten years.* In my own observation the average duration has not exceeded four years. But the progress is more rapid if the patient is quite young (less than twenty to twenty-two), and the reverse if over fifty. I have found polycystic tumors more rapidly fatal than the monocystic, since they cannot be so completely relieved by tapping; and the solid tumors the slowest of growth. Flaccid cysts also grow very slowly. Cruveilhier saw one already thirty years old. But even these cases of long duration of the disease furnish no ground against ever performing the operation of ovariotomy; but only against operating too early.

2. Nor can mere *authority* decide *a practical* question, whether of individuals or of learned societies. The first question that always occurs is—What special qualifications have these persons or this body to decide the question? A State Medical Society, a few years since, denounced the operation I am considering by a formal vote. But what surgeon, even among the members of that association, was in the least influenced thereby? If the self-constituted authority has practical experience or observation, it has a special right to be heard; if not, it has no such special right or influence. It is therefore our duty to challenge, and often to reëxamine, the conclusions in our science which are based on mere authority or the general sentiment of the profession, as well as on *à priori* considerations.

*The remainder averaged only two to two and a half years. Amer. Journal of Med. Sciences, April, 1859, p. 336.

I will rapidly pass in review some of the authorities opposed to the operation of ovariotomy; the most distinguished being the late Prof. Mütter of Philadelphia, Mr. Liston, Dr. J. M. Duncan of Edinburgh, Dr. Robert Lee of London, and several members of the Imperial Academy of Medicine of Paris. It is true that enough has been done since these gentlemen promulgated their views, to establish the claims of ovariotomy to be accepted as a legitimate operation; but as they are still quoted by its opponents, they should receive some notice here.

Now it occurs to remark at the outset, that not a single one of the gentlemen I have just mentioned ever performed the operation of ovariotomy; most of them never saw it performed; and one, for a long time after he had committed himself against the operation, refused to see it performed. Besides, a majority of them are mere physicians who never engage in surgery at all. By what special right, therefore, do they assume to decide this question? Is not the opinion of Dr. Atlee alone, or of Dr. Clay, of Manchester, worth more than any number of opinions from such a source? These two gentlemen are entitled to speak, having performed the operation over one hundred times each. But to return.

Prof. Mütter adopted the ideas upon ovariotomy of Mr. Liston, whose volume on Operative Surgery he edited; and like his original, he "set his face against the operation, and thought he always should." His objections were some of the *à priori* considerations I have already quoted. Dr. J. Matthews Duncan,* a physician, admits that cases justifying the operation may possibly occur; but asserts that there is no class of cases for which it is a scientific therapeutic measure. I shall expect to define that precise class of cases further on. He refers "all such difficult and complicated practical questions as this to the arbitrament of professional opinion, as the ultimate resort;" and adds that "this opinion is, generally speaking, decidedly against the propriety of ovariotomy."

But how does professional opinion always decide every new question at first? In the negative, of course, as is shown by the history of every improvement in our art. The profession are

* London Lancet, May, 1857, p. 519.

not at once competent to decide affirmatively, and must therefore decide negatively, if at all. The burden of proof lies on the innovator, not on the profession; and until that proof is given, they are silently indifferent, or inactively opposed to the innovation. So much for the value of the arbitrament of professional opinion in "such difficult question as this." But in all such instances, some few individuals will exert themselves as *active* opponents of the novelty. These are the *champions of the negative proposition*, and it is interesting to see them always going over the same ground. They first attempt to prove that the thing proposed is impracticable; driven from this proposition, they next try to show, by garbled quotations from Hippocrates and Galen, that it was done more than two thousand years ago; and when the profession are at last obliged to admit the merits of the new procedure, they make a last effort to demonstrate that it is of no account after all. It is therefore no proof that an operation is not justifiable, that the opinion of the profession is at first, "generally speaking, decidedly opposed to it." And if it be opposed to ovariotomy up to the present time, I hope that opinion may be modified by the facts hereinafter adduced.

Dr. Robert Lee is merely an obstetrician, but not an obstetric surgeon, and therefore has no special claim to be heard on this question. He, however, denounces the published statistics of ovariotomy as worthless, since all the cases have not been reported; he himself having, after long research, found thirteen unsuccessful cases which had never been reported. As an offset to this idea, I would remark that I have found over fifty successful cases which have never been reported.* Dr. Lee thinks it "unphilosophical to set aside the experience of the world during a long course of years, and now to substitute in its place the experience and the marvellous success of a few practitioners during the last two years." But it occurs to us that the experience of the world has not been very extensive in *ovariotomy* during a very long course of years, while the improvements of the last two years before Dr. Lee expressed this opinion, were of the greatest importance. He doubts if

* Thirteen cases by Dr. Kimball of Lowell, and forty by Dr. W. L. Atlee of Philadelphia.

human life has been prolonged by the operation, when we come to offset those who have been killed by it against those with whom it has succeeded. Still, he concludes by admitting that ovariotomy may *sometimes* be desirable, though it is unjustifiable when the life of the patient is not in immediate danger, and when there is not a great probability that the life of the patient will be saved by the removal of the disease.* The precise modifications this last proposition should receive, will be made under the next head. I only add here, as indicative of the *animus* of Dr. Lee in connexion with this subject, that, though repeatedly invited to witness the operation of ovariotomy, and having often appointed to do so, he would always fail, till the 17th of November, 1862—a day thus rendered memorable in the history of ovariotomy—when he actually witnessed an operation by T. Spencer Wells. This operation was successful, but it produced, it would seem, a very peculiar effect upon Dr. Lee. Instead of watching its steps with interest, and discussing in his own mind the chances for a successful issue, as we would suppose so laborious a searcher for truth in connexion with this subject would have done, he says, in speaking afterwards of the occasion before a learned society: "I thought of Judas Iscariot," and then quoted and endorsed the coarse expression of Liston, who used to call ovariotomists "belly-rippers, with a B before and a B behind."†

The discussion‡ upon ovarian cysts, in the Imperial Academy of Medicine of Paris, was commenced in October, 1856, and continued till the next February, and the following members, half of them eminent surgeons, participated in the debate: Velpeau, Cruveilhier, Cloquet, Jobert (de Lamballe), Malgaigne, Huguier, Guerin, Gimelle, Trousseau, Piorry, Moreau, Robert, Barth, and Cazeaux. With a single exception, all these gentlemen condemned ovariotomy as a rash and unjustifiable procedure. M. Malgaigne said "the statistics of ovariotomy prove nothing; we all know the value of statistics where all the successes are collected, and all the reverses concealed." Piorry, a

* London Lancet, May, 1863, p. 339.

† London Lancet, Feb., 1863, p. 139.

‡ Reported in the Bulletin de l'Academie Imperiale, for Oct. 1856 to Feb. 1857.

physician, admits that "in certain circumstances we might attempt the excision of ovarian tumors, but to do this we must possess an American audacity" (une audace Americaine). But Cruveilhier's ideas were most remarkable, and have been the most frequently quoted by the opponents of ovariotomy. After stating that two kinds of ovarian tumors (the solid and the polycystic) "are marked by the seal of incurability, there being no treatment for them, either palliative or curative," and admitting that even these tumors "have a great many times been removed with success, especially in England and America," he still adds, "I do not think this bold operation entitled to be cited in science." Eminent as these gentlemen are in their respective spheres, I have already suggested the reason why they can claim no special right to decide the question under consideration. I may also add that the invidious accusation of Malgaigne is not sustained by facts; while the conclusion of Cruveilhier is inconsistent with his own admission as to the success of the operation. Such ideas may perhaps answer still, though seven years old, for Paris and France; but not for a latitude where ovariotomy in its improved condition is understood.

A single one, however, of the participants in that discussion had a special right to speak with authority on this subject. His studies and his constant acquaintance in practice with the nature and progess of ovarian tumors, qualified him to hold an intelligent opinion on this subject. I allude to the distinguished surgeon-accoucheur, Cazeaux, and whose voice alone was raised in favor of the operation. If I say his opinion alone was worth more than all the other opinions, the grounds of such an assertion have already been given. It is also a pertinent fact in this connexion that not a single member of the Obstetrical Society of London has raised an objection to the principle of ovariotomy; though several of them were for years opposed to it (among them Drs. Hall Davis and Tyler Smith) until they became acquainted with the facts.

In contrast with their French *confrères*, the leading English surgeons have made no opposition to ovariotomy; but the reverse, even, so far as they understood the subject. "With

the exception," says Mr. Charles Hawkins,* "of those who have made this class of disease a specialty, not three of the leading surgeons of London have said anything for or against this operation." And Mr. Curling adds, the reason of this is, that "hospital surgeons can speak only *from a limited experience.*" Of late, however, Mr. Fergusson, Mr. Erichsen, and other Hospital surgeons have frequently endorsed the operation in the most effectual way, by performing it themselves.

In closing my remarks on the value of mere authority in deciding a practical question, I wish to record my protest against borrowing our medical and surgical opinions from any foreign source. We should be thankful for facts from any and every source; but I trust we are capable of forming our own opinions upon the facts. To go to France, where ovariotomy is almost never performed, or to Germany, where seventy-four out of one hundred operated upon, die, to inquire if it be right for us in America to operate, is absurd. In this case it is *we* who have the facts.

3. I next consider the bearing upon the question under consideration of

The Statistics of Ovariotomy.

The question whether ovariotomy is justifiable, can be finally settled only by an appeal to its statistics; and if we assume with Dr. Robert Lee and M. Malgaigne that the latter are totally unreliable, its decision is impossible. I have already exposed the shallowness of Dr. Lee's objections, and now add that Malgaigne's assertion, that "ovariotomists collect all the successes and conceal all the reverses," is a gross libel on that class of operators; the fact being that all the experienced ovariotomists have reported *all* their cases, unsuccessful and successful, when they make a report at all. And this is as good as we can have if we would collect the statistics of any other capital operation. The recent statistics of ovariotomy are therefore as reliable as those of any other operation.

In two respects, however, former statistics of ovariotomy should undergo revision.

1. The grouping together of complete and incomplete opera-

* London Lancet, June, 1863, pp. 340 and 528.

tions of ovariotomy in the same collection, has no foundation in reason or justice. An incomplete or unfinished operation is not an operation of ovariotomy at all. The latter operation implies the removal of the diseased ovary, after bringing it into view by opening into the abdominal cavity.* If we only do the latter, we have performed gastrotomy merely, but not ovariotomy. Now, mere gastrotomy is comparatively not a dangerous operation; gastrotomy, with removal of the ovarian mass, or *ovariotomy*, is a dangerous operation. Is it just to the latter to class it with another far safer operation, when we come to speak of its fatality? If I perform one hundred operations of ovariotomy, and fifty cases recover; and fifty operations of gastrotomy, and all recover, and then arrange them under one head —ovariotomy, complete and incomplete—I thus have one hundred and fifty cases of ovariotomy, and one hundred recoveries, or about 67 per cent.; while in fact I had but fifty recoveries out of one hundred actual cases, or fifty per cent. instead of sixty-seven. I shall therefore, in my own statistics, include only actual cases of ovariotomy, and quote the former statistics only after being thus corrected.

2. As a matter of taste, I shall always state the number and the per cent. of those who have been *cured* by the operation; former statisticians having told us how many have died after it.

I first call attention to the statistics of Dr. G. N. Lyman of Boston, published in 1856.† Of the three hundred cases mentioned by him, two hundred and twelve were cases of ovariotomy; and of these 57.22 per cent. recovered.

Mr. John Clay of Birmingham, England, brought the statistics of ovariotomy up to the beginning of the year 1860. Of his five hundred and seventy-seven cases, four hundred and twenty-five were cases of ovariotomy; of whom two hundred and forty-two, or fifty-seven per cent., recovered. The countries in which three hundred and eighty-six of these operations were performed, and their results, were as follows:

* I have not devoted any time in this paper to *partial* ovariotomy, or excision of a portion of the sac, since Mr. Clay of Birmingham shows that this operation is far more dangerous than the excision of the entire tumor; fourteen dying out of twenty-four.

† Amer. Journal of Med. Sciences, April, 1857, p. 462.

Great Britain,	222 cases;	and 127—57.2	per cent. recovered.
United States,	113 "	64—56.63	"
Germany,	51 "	13—25.5	"

Dr. Fock of Berlin collected two hundred and ninety-two cases of ovariotomy; of whom one hundred and seventy, or fifty-nine per cent., recovered.*

Of forty-four cases of ovariotomy collected by Simon, they all having occurred in Germany, only twelve, or twenty-seven per cent., recovered. Dr. Simpson also mentions a collection of one hundred and seventy-nine cases by Dr. Atlee; of whom one hundred and twenty, or sixty-seven per cent., recovered.†

If we omit the extremes just given (the very unfavorable results of ovariotomy in Germany, and those also of Dr. Atlee's collection) we find the average per cent. of Drs. Lyman, Clay, and Fock to be 57.74 per cent. saved by the operation. Can the gentlemen who denounce the operation show any better results than these from their *do-nothing* system?

But the preceding statistics are relatively unfair to ovariotomy, since they comprise *all* the operations reported, since the very first by Dr. McDowell. This is not the case with the statistics of any other capital operation. It is admitted that they must all go through a formative stage at first. Nobody goes back to Frère Come to commence the statistics of lithotomy, nor to John Hunter to begin with those of the ligation of arteries for the cure of aneurisms. I have therefore confined my own statistics to cases which have occurred during the last four years, viz. 1860–61–62–63. I have thus endeavored to include all the cases which were omitted by Mr. Clay, and which have occurred since his collection was published.

Rejecting a very few cases which were reported so soon after the operation as to leave some doubt as to the final result, I have collected one hundred and fifty cases of ovariotomy‡ not before collated; of whom nine-nine, or sixty-six per cent, recovered. Dr. Simpson has shown that even the average before mentioned is more favorable to ovariotomy than

* Prof. Simpson's Lectures, p. 379.

† Lectures, p. 379.

‡ To be published in Amer. Journal of Med. Sciences, Jan. 1865.

are the statistics of other capital operations to them; and I refer to his Lectures on Ovariotomy for the particulars. But even the result of my own collected cases, or the recovery of a small fraction less than two out of three of all operated upon, is still relatively unjust to ovariotomy; since very many of the one hundred and fifty operations were performed by inexperienced operators. In collecting the statistics of the other great operations, on the contrary, we select the practice of a single or of several hospitals; or at least we collate the results of experienced surgeons. But every one seems to feel at liberty to perform the operation of ovariotomy at least once, even though he never thought of performing any other important surgical operation; and the results of such temerity, of course, diminish the percentage of success which the experienced would obtain.

Let us then see what is the success of those who have had the most experience in ovariotomy.*

Dr. Clay of Manchester,	104	operations;	72	recovered.
T. Spencer Wells,†	55	"	37	"
Dr. Kimball (Lowell, Mass.),	23	"	15	"
I. B. Brown,	58	"	32	"
Dr. Dunlap (Ohio),	19	"	15	"
Dr. Tyler Smith,	14	"	11	"
	273	"	182	"

Here, then, we have an average of sixty-six and two-thirds per cent., or two out of three, recovering from ovariotomy, if we take the *whole* experience of the best ovariotomists. But if we only include their operations within the last four or five years, so far as known, and those performed under the most favorable circumstances, we get the following results:

* I regret that I cannot precisely state the success of Dr. Atlee of Philadelphia. He has not yet reported his last seventy cases; his whole number being now over one hundred.

† Up to Aug. 22, 1864, Mr. Wells had had one hundred and six operations and seventy recoveries.

T. Spencer Wells	last	15	cases;	14	recovered.
I. B. Brown	"	15	"	11	"
Dr. Tyler Smith	"	13	"	11	"
Dr. Dunlap	"	19	"	15	"

Here we have sixty-two operations and fifty-one recoveries; or eighty-two and one-quarter per cent. saved by the operation. I have no doubt the more recent experience of Drs. Atlee and Clay is equally successful, since they both state that their success is constantly increasing. And if we add to the above my own limited experience of six successful cases, the percentage of recoveries amounts to a small fraction short of eighty-four per cent. ($83\frac{1}{17}$.)

Tested statistically, therefore, on the same conditions as the other great operations are, ovariotomy now presents a success in this country and in England of at least seventy-five per cent. Can *any other* capital operation show such a record? And can any medical man cognizant of these facts continue to assert that ovariotomy is an unjustifiable operation, and one that should not be recognised in surgery, nor "cited in science?" Dr. Hall Davis of London for many years objected to it in his lectures, but now approves of it.* Mr. Fergusson now frequently performs the operation, though formerly prejudiced against it. Dr. Tyler Smith objected to it for twenty years, but is now, himself, one of the most successful of ovariotomists.† Dr. Savage, and the other authorities of the Samaritan Hospital, were opposed to it; but he is now its defender, "its success is so conclusive."‡ Dr. Charles West of London commends it in the last edition of his Lectures on Diseases of Women; having opposed it in the previous editions. How could these gentlemen conscientiously do otherwise than favor the operation, on knowing the facts. I conclude in the words of I. B. Brown: "Daily experience must satisfy every unprejudiced mind that this is more successful than any other great operation of surgery, and that all the old objections must give way."§

* London Lancet, June, 1862, page 391.

† Amer. Jour. of Med. Sciences, Jan. 1863, p. 233.

‡ Amer. Jour. of Med. Sciences, Jan. 1863, p. 235.

§ London Lancet, Sept. 1861, p. 183.

II. THE CLASS OF CASES TO WHICH OVARIOTOMY IS ADAPTED; AND THE SPECIAL CIRCUMSTANCES WHICH TEND TO A FAVORABLE RESULT, OR THE CONTRARY.

A. *To what Class of Cases is Ovariotomy adapted?*

The assertion of Dr. Duncan has already been quoted, that "though cases justifying the operation of ovariotomy may possibly occur, there is no *class* of cases for which it is a scientific therapeutical measure." I hope to show the incorrectness of this opinion.

I cannot discuss the pathological anatomy of ovarian tumors in this paper; and it will be understood that I also pretermit malignant diseases of the ovary, as not demanding any form of surgical interference. It is sufficient for my present purpose, as in my former paper, merely to recognise the two classes of ovarian tumors—the solid and the cystic—and the two varieties of the latter—the *monocystic* or unilocular, and the *polycystic* or multilocular. I also showed that for practical purposes we have the simple monocystic tumor on the one hand, while on the other, the polycystic and the solid tumor are to be grouped together. And having considered all the other surgical methods of cure except ovariotomy, I arrived at the following conclusions:

1. "Simple tapping of ovarian sacs is merely a *palliative* measure; by no means to be regarded as a harmless one in any circumstances, and proving fatal in one case out of seven (to four) when resorted to for the first time.

2. "All the *curative* methods I have considered, totally fail in cases of *polycystic* tumors, leaving *ovariotomy alone as adapted to them.* They all, moreover, in their application to monocystic tumors alone, give but a very slight promise of success, except the iodine injection, and, in a few cases, the tapping *per vaginam* and leaving the canula *in situ.* Besides, they are all, except the iodine injection and the formation of a permanent opening of the sac into the peritoneal cavity, as dangerous as ovariotomy, or even more so.

3. "Of all the curative methods I have considered, the iodine injection alone (and the tapping *per vaginam* and leaving

the canula *in situ*, in a few cases) is therefore to be commended, even in the treatment of monocystic tumors.

4. "Iodine injections are valuable as a curative method, if restricted to single sacs containing a clear, serous fluid, thus proving successful in one-third to one-half of the cases; they may, perhaps, succeed, if the contents of the sac are albuminous, provided the fluid is completely removed from the sac by injections of warm water before the iodine solution is used. But the latter failing in either case, ovariotomy alone remains as a curative measure.

5. "Injections of iodine may however *retard the refilling* of simple sacs, and even of one or more of the principal sacs of a polycystic tumor, and may be used with this expectation merely, when ovariotomy is out of the question.

6. "Iodine injections are not to be regarded as unattended by considerable risk; and which is probably much greater in a patient never before tapped.

7. "If in case of a monocystic tumor circumstances compel us to reject the treatment, with a curative intention, by the iodine injection, and by leaving the canula *in situ*, ovariotomy becomes the sole curative method in this case also, as well as in all cases of polycystic and solid tumors."

There are, then, two entire classes of ovarian tumors—the polycystic and the solid—which are, to quote Cruveilhier again, "marked with the seal of incurability." None of the methods before considered, nothing but extirpation, is of any avail with them. And ovariotomy has been performed with success in hundreds of such cases. Ovariotomy is therefore the *sole* and the scientific remedy in such cases.

It has, moreover, been shown that there are cases even of monocystic tumors also, which, after the ineffectual use of other curative methods, can be cured only by ovariotomy.

The *classes* of ovarian tumors, therefore, to which ovariotomy is adapted as a curative method, are—

1. All solid tumors.
2. All polycystic tumors.
3. All monocystic tumors also, which, for reasons above stated, should not be treated by any other of the before-mentioned methods.

The question whether ovariotomy should be resorted to in any given *case* of ovarian tumor, will be decided from the data given under the next topic—viz.:

B. *What are the Special Circumstances which Tend to a favorable Result of Ovariotomy, or the contrary? and what Conditions forbid it?*

B. The circumstances tending to a favorable result, or the contrary, after ovariotomy, will be better appreciated if we first examine—

The Causes of Death in Case of those who Die after the Operation.

Of the one hundred and fifty cases of ovariotomy of which I have collected the statistics, fifty-one died after the operation; and from the following causes:

Peritonitis . . .	12—$23\frac{27}{51}$ per ct.	Strangulation of intestine in wound	1
Septicæmia . . .	9—$17\frac{33}{51}$ "	Diarrhœa	1
Shock or collapse .	7—$13\frac{37}{51}$ "	Erysipelas	1
Exhaustion . . .	7—$13\frac{37}{50}$ "	Tetanus	1
Shock & Septicæmia	1—09 "	Ulceration through bladder . .	1
Hæmorrhage . .	1—09 "	Unknown	9

Thus peritonitis destroys nearly one-fourth of all who die after ovariotomy (and some statisticians say even forty-three per cent.); septicæmia (blood-poisoning) destroys about one-sixth of all; shock, collapse, and exhaustion, each over one-eighth. I use the term septicæmia as being here more accurate than pyæmia.

Hæmorrhage from the pedicle is said by some former statisticians to cause one-sixth (and even one-fourth) of all the deaths after ovariotomy. It is, however, an interesting fact that but one of the fifty-one deaths in my collection of cases is attributed to that cause. This would indicate that better precautions are now taken against hæmorrhage than formerly, in the management of the pedicle. It is, however, not improbable that some of the nine cases of death from causes not known were due to hæmorrhage; and some of the instances of septi-

cæmia may have been the secondary result of a hæmorrhage not sufficient rapidly to prove fatal as such. In some of the cases of death from exhaustion, the actual cause may have been a slow bleeding internally. The other causes of death do not admit of classification. I may add that bilious vomiting has also proved fatal, especially in cases in which the clamp has been so applied as to drag upon the uterus.

It follows, then—if we ascribe only five per cent. of the deaths after ovariotomy to hæmorrhage—that peritonitis, septicæmia, shock and collapse, exhaustion, and hæmorrhage, together, cause seventy-three and one-fourth per cent. of all such deaths. And all the special circumstances of the individual patient which tend to prevent the occurrence of these causes, just so far tend to render the operation successful. I shall consider the circumstances affecting its result under the following heads:

Personal conditions.

1. Duration of the disease.
2. Present general health of the patient.
3. The kind of tumor, its size, and the thickness of the abdominal walls; and effects of previous tappings.
4. Other pathological conditions complicated with the ovarian disease.
5. Age of the patient.
6. Temperament and mental state.
7. Married or single.
8. Previous diseases.
9. Certain external circumstances.

1. The fact that the disease has had a *duration of two to four years*, is to be regarded as of favorable import, if the operation be performed. If, however, the tumor has grown very slowly for many years, and the patient is advanced in life, it may not be deemed necessary to operate at all. On the other hand, if the tumor has not been detected more than a few months, and is still quite small and slowly enlarging, the operation is not yet to be performed.* Rapid growth is to be accepted as of unfavorable import at any age, though it is most common in young women (under twenty to twenty-two); since it is usually associated with a delicate constitution, or at any rate diminished

* In one of I. B. Brown's cases, the tumor had been detected eight weeks before, and had given some trouble for six weeks only. Died on ninth day, of peritonitis. London Lancet, April, 1863, p. 256.

power of recovery from the operation. Dr. McRuer of Maine* thinks that ovarian tumors of a medium duration and rate of development are the most favorable for the operation. I should say the longer the duration of the disease, *cæteris paribus*, the better; unless it has so reduced the general health as to endanger death from shock, collapse, or exhaustion.

2. In regard to the state of the patient's *general health* most favorable for the operation, directly opposite opinions are held by ovariotomists. T. Spencer Wells, Dr. Black, and I. Baker Brown, hold that the more robust and healthy the patient is, the better; and Mr. Hutchinson says the earlier you operate the better—a view opposed to the one I have just advanced. On the other hand, Dr. Tyler Smith, Dr. W. L. Atlee, and Mr. Erichsen, think the results are more favorable if we wait till the general health is somewhat impaired by the ovarian disease—in which opinion I fully coincide.

As this is a question of the highest practical importance, I shall examine the grounds on which, I think, it must be decided:

1st. If we delay till the health is somewhat impaired, and the patient is slightly anæmic (at least not having much pressure of blood in the vessels), we diminish the risk of peritonitis, which, we have seen, destroys one-fourth of all who die after the operation. Hæmorrhage is also less liable to occur. Dr. Black indeed remarks, in connexion with this subject, that there is "less predisposition to inflammation with strength than with weakness."† Unless he means extreme weakness—a condition no one would recommend—I think his statement entirely unfounded; and even with that qualification, it should be received with some degree of skepticism, since death after the operation in cases of great debility, generally results not from peritonitis but from shock or exhaustion, which together also destroy one-fourth of all who die. Dr. Black made the preceding remark in connexion with a successful operation of his on a patient who had had the tumor ten years without affecting the general health. Surely we cannot object to the result; but

* American Journal of Med. Sciences, July, 1859, p. 287.

† London Lancet, Oct. 1863, p. 650.

in another precisely similar case, I should delay for the preceding, and more especially for the following reasons:

2d. If the ovarian disease has not yet deranged the *general health*, the patient is certainly in no immediate danger from it. She may, and probably will live several months, and perhaps years, before she will be in danger. Is it right, therefore, for me to incur the risk of her dying in a few days in such circumstances? Certainly not, unless it can clearly be shown that the risk is constantly becoming greater from delay, and which I shall show is not necessarily the case. If, then, we are tolerably certain that the patient will live several months, or even some years, without the operation, let us make sure of that amount of life first, and operate when it becomes apparent that the operation is the only means of much further prolonging life.

3d. By deferring the operation so long as the patient remains comparatively comfortable, we gain time to perfect our diagnosis, if there be any special difficulty in the case. A single tapping will aid us very much in this respect; and frequently, also, the patient rallies after it, if quite weak before, and thus, also, we are enabled to postpone the operation of ovariotomy indefinitely. I should always prefer this course, if admissible, in every case.

4th. Those who operate in robust health do not have better success than those who wait for the general health to be somewhat impaired. Besides, some of the successes of T. S. Wells and I. B. Brown have been achieved by a free bleeding of their patients when inflammatory symptoms came on—doubtless a wise expedient if a patient *is* operated upon in full health, as it puts her on a par with one who had previously been somewhat anæmiated by the disease. I cannot, therefore, help regarding it as fortunate that most of every operator's patients do not come under his observation till the general health is impaired; so that, independently of his theory on the question under consideration, he is usually obliged to operate in this condition.

5th. Finally, certain comparative facts have an important bearing on this question. If we arrange all amputations under two classes—pathological amputations (those necessitated by diseases), and those of expediency (performed on account of tumors, elephantiasis, club-foot, &c.) we find that of amputations

of the lower extremity alone, forty per cent. of those of expediency prove fatal; while of the pathological amputations, only fifteen per cent. prove fatal.* If ovariotomy is performed while the patient is in full health, it becomes an operation of expediency; while if we delay till the health fails somewhat, it is analogous to the pathological amputation, and is therefore more successful. My statistics and my observation warrant me in asserting this principle as also applicable to ovariotomy.

My reasons, then, for delaying the operation till the general health is somewhat impaired, are—the danger of peritonitis and hæmorrhage is thus diminished; if the patient will probably live months, we should make sure to her a part of this period of life instead of at once risking her death within a few days; we may thus have time perhaps to tap the patient and to perfect our diagnosis, and shall, besides, have a better chance of success after all, as is shown by the relative success of pathological amputations and those of expediency. On the other hand, we are of course not to delay till the health is entirely broken down, lest death ensue from shock or exhaustion.

Except the slight debility of the patient, as just described, it is desirable that she should be as nearly healthy as possible at the time of the operation, and especially so far as the digestive function is concerned. And if this is deranged, time should first be taken to correct the derangement. If menstruation has also been arrested by the ovarian disease, I consider it a favorable condition. The uterus and ovaries being inactive, there is less danger of inflammation.

Let us now, on the other hand, consider the dangers and disadvantages, if any, which may result from delaying as I have recommended. We have to bear in mind that non-malignant ovarian tumors do harm only in two ways: (1) by exhausting the system, from the amount of the elements withdrawn from the blood; and (2) by mechanically interfering with the functions of the abdominal and the thoracic organs. I have cautioned against delaying so long as to risk extreme exhaustion; while I have also shown that a resort to simple tapping may often relieve for a time the other effects just mentioned, and

* London Lancet, May, 1859, p. 387.

thus enable us to defer ovariotomy for the present.* The strongest argument against delay is the assumption that, of course, the adhesions will thus become more extensive and increase the danger of the operation.

Certainly we must eliminate from this category all cases in which ascites is complicated with the ovarian tumor, since in such, few if any adhesions are formed at all, and can hardly increase after the fluid is abundant. Nor is it by any means certain that a tumor not thus complicated, which already distends the abdomen, and is probably already somewhat adherent, will be essentially more so a few months, or a year or two hence; but I return again to this point. The only case in which we can rationally assume that a delay will secure a decided increase of adhesions, is a case uncomplicated with ascites, of an ovarian tumor still small, and movable in the abdominal cavity. But shall we accept Mr. Hutchinson's rule, and operate as early as possible, lest there may be adhesions a year or two hence? I have given the reason for first securing this addition of a year or two to the patient's life, and then dealing with the case as we find it.

But suppose adhesions actually *do* become more extensive and more firm in case of a tumor already adherent, or of one now too small to be so, what practical importance really ought to be attached to their existence? Very little in most cases, and for the following reasons:

1st. These adhesions are almost always merely *physiological*, and not pathological; *i.e.* they are formed from an exudation poured out between the peritoneal surfaces brought into contact, and kept at rest in contact, after the tumor has attained to a large size, and for the purpose of supporting the tumor in that position; they are *not the result of inflammation.* The sac and the peritoneum over it sometimes become inflamed, but not so frequently as to justify the expectation that inflammatory adhesions exist in any given case, unless symptoms of inflammation have clearly pre-existed. Hence we expect to find large tumors adherent at the upper part (and probably also on the sides) as a matter of course, and equally if there have been no signs of inflammation. But unlike inflammatory

* See my paper before referred to, in Bulletin of Acad. of Med., March, 1864.

adhesions, the union is not very firm, and unless of very long standing, they are but very slightly vascular. Hence, they are also generally easily overcome, and do not lead to any troublesome hæmorrhage.

2d. But if they are very extensive and very firm (even if inflammatory), so as to require much force to overcome them, and to lead to hæmorrhage, demanding the application of ligatures—all this does not essentially modify the result of the operation. Even the danger of peritonitis is not perceptibly increased, as we might *à priori* expect would be the case. On the contrary, it appears rather to be diminished; for the peritoneum, where the surfaces were in contact, has lost its epithelium, and is no longer a serous membrane.

3d. Experience proves that recoveries are very frequent in cases of extensive adhesions. They existed in all of my own cases; in the last, more extensively than in any case I have seen reported; but no bad symptoms occurred which were referable to them. And I think it should be laid down as a *rule* that we should not be deterred from finishing the operation by the existence of adhesions.

There may, however, be two exceptions to this rule. (1.) If the adhesions are so extensive as very much to prolong the operation in case of a much debilitated patient, the risk of death from shock or collapse may induce us to desist. (2.) If the tumor is adherent to the liver, the bladder, the uterus, or the large intestine, and cannot be detached without injury to these organs respectively, we should desist. In most of such cases, however, the adherent portion of the sac may be cut out and left attached to the organ to which it adheres, without any subsequent inconvenience. I therefore fully concur with Dr. W. L. Atlee, who writes me: "I am never deterred from operating by adhesions. Unless they are visceral, I think they should not be regarded. Indeed, I think peritonitis is less likely to occur in these cases than when the peritoneum is wholly intact. Its character is entirely changed, and it is no longer a serous membrane." And in reference to the point last alluded to, he says: "I have left portions of the sac as large as the hand adhering to the viscera, when too firm to be removed—with good results."

Up to the present time, therefore, I should inculcate the rule— *Wait until the general health of the patient is somewhat impaired.*

3d. The *kind* of tumor, its *size*, and the condition of the walls of the abdomen, are important matters in this connexion. Monocystic tumors are far more favorable than the polycystic. If the tumor is pretty *large*,* the parietes have of course been distended; which is a decided advantage in three respects. (1.) The peritoneum having been stretched for a long time, has become less sensitive, as explained by Dr. Nelson of this city; and thus peritonitis is less likely to ensue. (2.) The walls collapsing after the operation, less mischief will result if tympanitis, coughing, or vomiting should follow.† (3.) The walls of the abdomen will of course be *thinner*. For, a considerable thickness of the abdominal walls (even over one inch) may render it impossible accurately to coapt the inner edges of the incision, and thus induce a fatal result. Of course the difference in thickness depends, aside from the thinning by the distension, upon the amount of adipose tissue under the skin; and which is seldom sufficient to give trouble, except below the umbilicus. Here, then, we find still another reason for delaying the operation till the flesh as well as the general health is somewhat reduced. My last patient was greatly endangered by this cause; the walls being, for about three inches, two inches thick.‡ As the incision was not perfectly closed internally, suppuration, inducing septicæmia, occurred; from which the patient, however, slowly recovered under a treatment hereinafter specified.

The complication, therefore, of *ascites* with ovarian tumors is favorable, inasmuch as it both distends and makes thinner the abdominal walls. It has already been stated that it also, to a great extent, prevents the formation of adhesions, while the tapping necessitated by it enables us to perfect our diagnosis, and often to ascertain the existence of adhesions. Does tapping itself for ascites increase the risks of ovariotomy after-

* *I. e.*, at least as large as the gravid uterus at eight or nine months.

† Either in preventing the incision from healing, or in producing a hernial protrusion through it, as in a case in which I extirpated the body of the uterus.

‡ Amer. Jour. of Med. Sciences, July, 1864, p. 50.

wards? I think not. But possibly the peritoneum, if ascites had coëxisted with the ovarian tumor, may secrete some amount of the same ascitic fluid after ovariotomy; this fluid may undergo decomposition instead of being reäbsorbed, and septicæmia may result. I think this a very rare occurrence; but I have seen two cases of septicæmia thus induced, both of which recovered.

In this connexion, also, the question is suggested whether previous tappings of the ovarian sac or sacs renders the operation of ovariotomy more dangerous. I. B. Brown states that those patients do badly who have been tapped very many times. But I suppose it is the exhaustion produced by the secretion from the blood of such large quantities of fluid as patients, very many times tapped, must have lost, that produced the bad result; and not the tapping. The latter is itself, however, by no means to be regarded as unattended with danger, especially when performed on a patient for the first time; since, of first tappings, at least one out of seven proves fatal.* It is remarked that adhesions are produced by tapping. But when this is the case, they are of slight extent around the punctured point; and when once formed, if the subsequent tappings are made at the same point, as they should be if practicable, the risk of the operation is thus quite effectually guarded against. On the other hand, the operation of tapping may, by collapsing the sac, prevent the formation of adhesions for the time, or even overcome to some extent those already formed. Finally, according to my own statistics, previous tappings do not materially increase the mortality after ovariotomy. Of fifty-seven who had been tapped from one to twelve times, twenty died after ovariotomy, or 35 per cent.; of twenty-two of the preceding, who had been tapped three to twelve times, eight or 36.3 per cent. died; and of thirty-five who had been tapped once or twice only, twelve or $34\frac{2}{7}$ per cent. died. A single patient who had been tapped twelve times, recovered. We notice, however, a higher mortality in those who had been tapped three times or more, than in those who had undergone the operation but once or twice. Single tappings gave a mortality of only 14.2 per cent.

* See my previous paper, already alluded to.

4th. If any grave *pathological condition is complicated* with the ovarian disease, as tuberculosis, organic heart disease, cancer, or any acute disease, ovariotomy is of course not to be attempted. But I wish especially to remark that albuminuria does not, as a matter of course, forbid it.

5th. The *age* of the patient has a very important bearing upon the operation of ovariotomy. Dr. Clay, of Manchester, states that the majority of those of his patients who died of shock and of peritonitis were young females; while those dying from prostration were chiefly elderly women. He, however, and I. B. Brown, think that age does not much influence the result; his success having been about equal from the age of 16 to 57 years.* In regard to extremes of age, I may remark that Dr. Atlee has operated on a patient of only 15 years; T. S. Wells, on one of 61 years; Mr. Hutchinson, of 65 years; Dr. Atlee, of 69 years; and Dr. Bennett, of 75 years—and they all recovered. My own statistics afford the following results in 99 recoveries:—

Under 20 years,	8	cases—	4	recovered—	50	per cent.
20 to 25 "	16	"	12	"	75	"
25 " 30 "	13	"	10	"	76.9	"
30 " 35 "	24	"	11	"	45.8	"
35 " 40 "	20	"	16	"	80	"
40 " 45 "	10	"	6	"	60	"
45 " 50 "	7	"	4	"	57.1	"
50 " 55 "	10	"	8	"	80	"
55 and upwards,	8	"	7	"	85	"
Age not stated,	34	"	21	"	61.7	"

Thus it appears that the most unfavorable epochs for ovariotomy are, under 20 years; from 30 to 35; and from 45 to 50—only ½ of all operated upon in these periods recovering. The most favorable epochs are, 35 to 40 years; and 50 years and more—the recoveries amounting to even 81$\frac{1}{11}$ per cent.; while 25 to 30 years, 20 to 25, and 40 to 50, are next in order in this respect. Perhaps an explanation of these results may be found in the following suggestions:

Women less than 20 years old have not the vigor to endure the shock of the operation, as they have during the following ten years. Those of 30 to 35 are, many of them, exhausted more

* London Lancet, June, 1863, p. 408.

or less by child-bearing; if not thus exhausted, woman attains her maximum of physical strength during the age of 35 to 40. Then ensue ten years of doubtful health, connected in part with the cessation of the catamenia. And these being past, and the uterus and ovaries henceforth inactive after 50 years, the operation is again as well borne (or better, perhaps) as at any earlier period. We have also seen that the arrest of menstruation by the progress of the ovarian disease, is a favorable condition.

6th. Another all-important element of success in ovariotomy is a sanguine *temperament*, and hopeful state of mind on the part of the patient. If, after comprehending all the risks of the operation, she confidently expects to recover from it, her mental state alone will enable her to triumph over much of its danger, and may secure its success. She should also feel that the operator selected is *the one* of all to save her. So important do I consider these matters, that I should decline to operate on a patient who despaired of recovering. A quiet, courageous, and amiable disposition is also a very important element of success; while a restless, irritable, timid, or very excitable woman is far less likely to recover. Any affliction or permanent cause of mental anxiety must also be taken into account. Far too little attention has, I think, been paid to these considerations in deciding whether or not to perform the operation in special cases.

7th. The condition of the patient as to being *married or single*, also affects the result of ovariotomy; and, as we would predict, the unmarried have the advantage. Of 116 of my collected cases, 64 were married, and 52 unmarried; the results being as follows:—

Of 52 single, 38 recovered—73$\frac{1}{3}$ per cent.
" 64 married, 28 " 59$\frac{3}{8}$ "

Here there is a difference of nearly 14 per cent. in favor of the unmarried. The majority of patients between 20 and 25 years mentioned on p. 28 (12 out of 16), were single; while the majority above 45 were married; except 7 patients between 45 and 50, of whom 5 were single. All the patients under 20 years were single; of whom, however, 50 per cent. died.

8th. The *diseases of the patient previously* to the invasion of ovarian disease should also be alluded to here; of course, however, as influencing the result of ovariotomy unfavorably. I have to mention here all acute inflammatory diseases, especially peritonitis, puerperal or otherwise; a tendency to inflammatory affections in general, or to high febrile reaction from slight causes; habitual torpidity of the kidneys; irritability of the stomach indicated by habitual nausea or vomiting; a tendency to diarrhœa; an habitually inactive state of the skin; and all that we generally include under a cachectic habit. All these should, according to their degree, dissuade from the operation. The fact that ovariotomy, or any other severe operation, has recently been performed,* should induce delay, at least. I. B. Brown also states, that if the fluid taken from an ovarian sac by tapping is found to be all albumen, the operation generally terminates fatally.†

9th. Finally, the *external circumstances* of the patient, including her social position, are also important as affecting her state of mind, and the comforts required after the operation. But the mere external surroundings of the patient being mainly under our control, will be specified under the head of Preparatory Treatment; this, as well as the after-treatment, having quite as much influence on the result of the operation as the circumstances I have specified.

B. *The Conditions forbidding the Operation of Ovariotomy.*

Some of the conditions specified under the head of previous diseases, if extreme, come also under this. We may add, great emaciation; prostration, with a small rapid pulse, red tongue, and diarrhœa; tuberculosis or cancerous deposit in any part; organic disease of heart, liver, brain, or kidneys; unwillingness to have the operation performed; and despair of recovery. I. B. Brown mentions any general skin disease, and a recent previous operation of ovariotomy, as forbidding the operation so long as these circumstances exist; and I add a recent at-

* T. S. Wells operated on a patient 8 months after she had been operated on by I. B. Brown. She died of septicæmia. Dr. Atlee operated successfully on one of Dr. Clay's patients sixteen years after the first operation.

† London Lancet, May, 1861, p. 110.

tack of peritonitis, or tenderness still remaining from such an attack.

Recapitulation.

1. *Conditions favorable for Ovariotomy.*—Slow progress and prolonged duration of disease (two to four years); health somewhat impaired by its progress; menses arrested by it; final cessation of menses; large size of tumor; walls of abdomen distended and thin; coëxistence of ascites; age of patient between 25 and 30, 35 and 40, or over 50 years; sanguine temperament; quiet, cheerful, and courageous disposition; confident expectation of recovery; desirable social position and external circumstances; not married; no previous diseases; no adhesions.

2. *Conditions not favorable, but not decidedly affecting the Result.*—Adhesions, unless visceral, or unless very extensive, in prostrated patients; ascites (in much debilitated patients); previous tappings of the tumor; albuminuria from renal congestion.

3. *Unfavorable conditions.*—Very robust health; rapid progress of disease; small size of tumor; thick abdominal walls (1½ to 2 inches); age of patient less than 20, between 30 and 35, or 45 and 50 years; married; previous diseases before specified; fluid of tumor being albumen entirely; melancholic temperament; excitable, irritable, timid, desponding disposition; doubtful of recovery; penury; visceral adhesions; decided emaciation, and debility.

4th. *Conditions forbidding the Operation.*—Excessive emaciation; great prostration, with the tongue and pulse as before described; colliquative diarrhœa; tubercular or cancerous deposit; organic disease in any important organ—especially Bright's disease; general skin disease; recent peritonitis; recent operation of ovariotomy; utter despair of recovery.

I believe, therefore, with Dr. Tyler Smith,* that we can now pretty accurately calculate the chances of recovery. But shall we always decline to operate in every case in which the conditions are unfavorable? By no means. If the conditions are not such as to forbid the operation, and the patient, after understanding all the risks in her case, insists on our giving her

* London Lancet, June, 1863, p. 392.

what little chance she may have of thus prolonging life, we are not at liberty to refuse to operate; it being done with a full understanding on the part of all interested, on what grounds it is undertaken. Thus we shall not have to regret our action even if we fail; while we will sometimes have the intense happiness of having saved one who was ready to perish.

III. HOW SHALL THE OPERATION OF OVARIOTOMY BE PERFORMED?

Though ovariotomy is the most formidable operation ever attempted, it has more frequently than any other important one been thoughtlessly undertaken and recklessly performed. It does not, however, require the highest degree of mere operative skill; but, from its many unforeseen complications, it demands experience, and the utmost cautiousness and care.* I next adduce the teachings of what I consider the most enlightened experience on:

A. *The preparatory management of the case.*

B. *The operation itself.*

A. Some operators undertake the operation without any regard to the circumstances I am about to specify, except, perhaps, that a laxative is given the evening before it; while others insist on some other points which to most would appear frivolous. My own impression is, that in performing the most formidable operation known to surgery, we are bound to take every possible precaution which commends itself on rational grounds, against an unfavorable result; and with this view I shall consider separately: (1) the preparatory treatment; and (2) the preparatory arrangements at the time of the operation; and shall sometimes quote my own experience, as the directest method of enforcing my own conclusions on disputed points.

1. *Preparatory Treatment.*—There is quite a diversity of opinion in regard to the amount and the kind of preparatory treatment required. I have already spoken of the importance of having the digestive organs in as healthy a condition as pos-

* "It does not require great surgical skill, but plenty of nerve."—*I. B. Brown.*

sible; and this secured, I have not thought it necessary to make any change in the habits of the patient till the second evening preceding the operation. At that time I have given a full dose of castor oil to evacuate the alimentary canal three or four times the day before the operation (expecting no further action of the bowels for six or seven days after it); and meantime giving the patient only milk porridge* as nourishment, and securing sleep by the administration of an opiate, if deemed necessary. I give preference to the porridge, because it does not form any gas in the intestines, and they are therefore found collapsed, and do not protrude to give trouble during the operation. Dr. W. L. Atlee, with an experience of more than one hundred operations, writes: "The only preparatory measures I adopt are, the administration of the perchloride of iron for ten to fourteen days before the operation; castor oil the day previous to it; and opium the night before, and again one hour before the operation."

I. B. Brown suggests a succession of warm baths for a week or ten days before the operation, to secure a more active state of the skin and to prevent internal congestion. Dr. Black gave acetate of ammonia for a week previously, with the same view; and twice during that week a powder of Hydrarg. cum creta and ox-gall.†

2. Under the *preparatory arrangements*, I have to consider the time, place, state of the atmosphere, preparation of the apartment, and of the patient herself.

1st. The most favorable *time* in the year excludes both the coldest and the hottest season. In regard to the menstrual cycle, the operation should not be performed under five or six days after it, nor less than eight or ten before it. The best time of *day* with this as other severe operations is, the afternoon, at such time that it may be finished by the daylight, and yet not many hours before the usual time of sleep for the patient.

2d. In regard to *place*, the country is more favorable than the city. If in the city, the operation should be performed at

* Equal parts of milk and water, boiled one hour, and thickened with flour.

† London Lancet, October, 1863, p. 548.

a private residence, or an Infirmary, with arrangements expressly for this operation; but never in a large hospital, unless in a room completely isolated from the rest of the establishment. The well known want of success of ovariotomy in the large London hospitals has not been due to a want of operative skill, but to the unfavorable influences of the hospital arrangements. This is now so well understood, that no surgeon operates unless the patient is isolated as just suggested; and the operation is deferred also, if there is any contagious disease or epidemic prevailing in the hospital at the time.

This last precaution must also be taken, even if the operation be performed in the country; especially if peritonitis, erysipelas, phlebitis, or dysentery is prevailing, or if the operator has made an autopsis of a patient who died of either of these diseases. Dr. T. Smith is of opinion that the peritonitis following ovariotomy is most frequently produced by malarious influences, and not by anything inherent in the operation itself; and that it is, therefore, preventible to a very great extent. He suggests that it is akin to puerperal fever, and perhaps subject to similar laws. The success of T. S. Wells and I. B. Brown is greatly due, doubtless, to their connexion respectively with two small hospitals with special arrangements for ovarian cases—the Samaritan Hospital, and the London Surgical Home.

3d. The state of the *atmosphere* (the weather) at the time should also be considered. The day should be bright and clear—at any rate not a stormy day, nor, in this latitude, with the wind from the north-east. I. B. Brown remarks that "the atmosphere must not, at the time, be charged with ozone."

The atmosphere of the apartment during the operation should be maintained at a temperature of seventy-eight to eighty degrees (Fahrenheit); and be kept moist, also, by the evaporation of water. Dr. Clay attributes much of his success to these precautions, and Dr. Atlee also adopts them; while T. S. Wells and Dr. Tanner think them unimportant. I. B. Brown thinks favorably of them if the operation is to be prolonged—a point we can very seldom settle beforehand. I shall continue to adopt them; for they certainly commend themselves on rational grounds as an element of success, though not

essential in every case. The peritoneum is naturally warm and moist; and it would be difficult for me to realize that it is just as safe to have it become cold (even chilled, perhaps) or dry, or both, when the peritoneal cavity is opened. Of course the high temperature and the moisture are not required after the incision is closed; but a pure air afterwards, and a temperature of sixty-eight to seventy degrees in the cold season.*

4th. The *apartment* should be large and airy, quiet, and well ventilated. Thorough ventilation is of the utmost importance. T. S. Wells attributes his remarkable success of late to the fact that he keeps a window of the room constantly open after the operation, irrespective of the season of the year. An *experienced nurse* is required after this operation, more perhaps than in any other case, to attend to these and to other particulars hereafter to be mentioned. All admit this in respect to a lying-in woman; but in these cases the importance of experience is often entirely overlooked.

5th. Among the arrangements for the operation I also include the artificial serum,† first used by me in 1855. It is intended to imitate the natural secretion of the peritoneum; and is kept at a blood heat, and used to thoroughly moisten the hands before they are introduced into the peritoneal cavity.

6th. Chloroform is almost invariably used in this operation in England; and ether most frequently in this country. Dr. Clay states that the former, after his operations, produces serious sickness, and doubts if it has contributed to his success on the whole. Dr. Black also reports a case in which it softened and disorganized the bronchial mucous membrane, and produced death in three days and seventeen hours.‡ Mr. Holt reports a case in which it produced fatal collapse, from which the patient did not rally at all.§ I have never seen Sulph. ether produce any sickness after this operation, or any other unpleasant effect,

* I. B. Brown has flannels applied to the abdomen during the operation to keep the air from entering the peritoneal cavity.

† Composed of chloride of sodium, ℥iv.; albumen (white of eggs), ℥vi.; water, Oiv.

‡ London Lancet, April, 1857, p. 312.

§ London Lancet, January, 1860, p. 47.

though it sometimes produces retching when first administered; and shall still prefer it.

7th. Dr. Simpson describes a table appropriate to this operation. We only need a strong one of proper height, four feet long and about twenty inches wide, and covered with a folded counterpane, and provided with pillows. Of the instruments required, I do not speak particularly. I. B. Brown uses flannel blankets to absorb the fluid from the peritoneal cavity, as well as to cover the patient during the operation, if required. Dr. T. Smith also uses warm blankets to keep the intestines from protruding during the operation. For the former use I should prefer a soft sponge.

8th. Finally, the patient, having evacuated the bladder, and being dressed* as required after the operation is finished, is placed upon the table; anæsthesia is produced; and we proceed to

B. The Operation Itself.

I shall also discuss this subject somewhat particularly, under the following heads:

1. Position of the patient.
2. The incision.
3. Overcoming adhesions, and removing the tumor.
4. Management of the pedicle.
5. Closure of the incision, and dressings required.

1. *Position of Patient on the Table.*—Dr. T. Smith at first placed his patients in a sitting or semi-recumbent position. T. S. Wells objects that thus there is a greater tendency to syncope from the chloroform, while the intestines are also more liable to escape.†

I should keep the patient upon the back till the moment arrives for lifting the tumor from the abdominal cavity, when she is turned on the side on which the tumor is attached, as first advised by Mr. Hutchinson,‡ and it falls out mainly by its

* She should have flannel drawers on during the operation, and a flannel vest.—*I. B. Brown, on Ovarian Dropsy*, p. 159.

† London Lancet, May, 1861, p. 437.

‡ Mr. Hutchinson, however, turns to the side *opposite* the attachment.

own weight. Besides, the fluid does not, in this position, fall into the peritoneal cavity; and, therefore, we may thus sometimes freely incise a polycystic tumor, in order to diminish its size, instead of stopping to tap it.

2. *Of the Incision.*—This is made in the linea alba, below the umbilicus; but whether the long (6 to 12 or more inches) or the short incision (5 down to even 2 inches) is preferable, is still undecided. Dr. Clay of Manchester, and Mr. Walne, always use the long incision; T. S. Wells, Dr. T. Smith, Mr. Lane, and Dr. F. Bird, have preferred the short one. Mr. Wells objects to the long incision, on the ground of its greater exposure of the intestines, and its being followed by many more serious symptoms and a more protracted recovery. He tends to the other extreme, and uses a *very short* incision—in one case only 1½ inches long.

Now since Dr. Clay's success compares favorably with that of those who adopt the short incision, I infer that its precise length is not a very essential point in the operation; though an avoidance of either extreme would doubtless be safest. Dr. Clay, however, explains that he does not make an incision incommensurate with the size of the tumor to pass through it. Still, if it be somewhat longer than actually required for that purpose, and it is well united, as usual, at the end of forty-eight hours, I cannot perceive how its mere length can have any agency in producing "many more serious symptoms, and a prolonged recovery;" though I have made incisions 12 inches and 14 inches long.

I therefore accord with Dr. Atlee and I. B. Brown, who commence with an opening in the peritoneal cavity of about 2 inches, and then increase it as the case may require. If the tumor is not adherent, and is small—or if not adherent and capable of being reduced to a small mass by tapping—a small incision (2 to 4 inches) may answer the purpose. But if there are extensive and firm adhesions (especially if visceral), the incision should be large enough to enable us to *see* them; and if the tumor is large and cannot be much diminished by tapping, the incision must be enlarged to allow its passage through it. I think the only rule is to make the incision *long enough to secure the objects I have enumerated, and no longer.* In six of

Mr. Wells's consecutive cases, no incision exceeded 5 inches. I think, however, that if we insist on this limit in some cases of very large polycystic tumors, the delay, with the hæmorrhage from breaking down the mass, will endanger the patient far more than a length of incision sufficient to admit of a prompt completion of the operation.

I should not, I think, here omit two remarks in regard to making the incision, viz. that the peritoneum should not be divided till *all* hæmorrhage from the parietal vessels has ceased; and that when divided, it should be done by *scissors* (on a grooved director) instead of a knife. I. B. Brown, in one of his cases, found a coil of intestine between the tumor and the parietal peritoneum, and says he certainly would have injured it had he used a knife.* The reason for the preceding rules is, that—

The incision should be regarded as merely explorative until it enables us to determine whether we are to complete the operation or not. For it is impossible to be *perfectly certain* in regard to its completion till we see the tumor and ascertain the amount and kind of adhesions. If we decide, on examination, *not* to remove the tumor, it is very desirable not to have let any blood fall into the peritoneal cavity; since it may be impossible entirely to remove it, and thus left, it may produce a fatal septicæmia. The bleeding vessels (mere veins) may be ligated to save time; and the ligatures subsequently removed when the incision is being closed.

Another rule also follows from the preceding, in regard to diminishing the tumor by tapping during the operation. If this is done before the question of removal is decided, always effect it by a small trocar; so that in case it is decided afterwards to leave the tumor, the puncture can easily be closed by a silk suture, cut short. If a very large instrument is used, and the tumor left, the fluid may still continue to flow into the peritoneal cavity (the trocar sometimes, also, producing copious hæmorrhage), after the incision is closed—with a fatal result. But when it is fully decided to remove the tumor, then the larger the trocar the better; even if one-half to three-fourths of an inch in diameter.

* London Lancet, May, 1863, p. 282.

If the tumor cannot be removed, the incision is closed, as directed further on. And here the question arises as to the danger of explorative incisions. Of course the danger is very much diminished by adhering to the rule I have given; since we proceed more cautiously if feeling that we may decide at any point to stop. They are quite dangerous only in the practice of inexperienced operators, as the following facts will show: Dr. R. Lee reported sixty cases in which gastrotomy only was performed; of which nineteen died.* Mr. John Clay includes one hundred and five cases in his statistics, in which the tumor was not extirpated; of which twenty-seven died.† Of thirteen cases in which the removal of the tumor had been abandoned in Ohio, up to Nov., 1859, seven proved fatal.‡ On the other hand, Dr. A. T. Barnes, of London, had had five cases in which the tumor could not be removed; and all the patients recovered from the operations. T. S. Wells had two similar cases, and both recovered.§ Dr. F. Bird made exploratory incisions in eighteen cases; all of whom recovered without injury.‖ I. B. Brown thinks the question of exploratory incisions has been unfairly treated by the profession. He had never seen a fatal result follow them, and thinks they should be commended and encouraged and not condemned.¶

3 *Detaching the adhesions and removing the tumor.*—I assume that unless the adhesions are very slight, or the tumor small and the incision comparatively large, there is no way to determine the extent and location of the adhesions without *passing the hand into the peritoneal cavity, and around the tumor in all directions.* And it is better to do this before tapping the tumor to diminish it; unless found impracticable from the distension of the abdominal walls by its large size, in which case use the *small* trocar at the least vascular portion visible. Before this is done, however, ascertain positively whether the tumor is ovarian or not, since uterine tumors sometimes cannot

* London Lancet, October, 1858, p. 286.
† London Lancet, April, 1861, p. 323.
‡ Amer. Jour. of Med. Sciences, April, 1860, p. 575.
§ Amer. Jour. of Med. Sciences, April, 1862, p. 551.
‖ T. S. Wells, History of Ovariotomy; Med. Chirurg. Transactions, vol. XLVI.
¶ London Lancet, June, 1863, p. 468.

be distinguished from the ovarian by the sight, or even by the sight and touch together. I think the best way, if any possibility of doubt exists, is to search for the *uterus* at once, and ascertain whether the tumor has any direct continuity with that organ or not.

Nor is there any objection whatever, so far as I am aware, to introducing the hand as just suggested; it being previously moistened with the artificial serum I have described, or with simple warm water. If, however, the portion presenting at the incision is a single, large, unadherent sac, it may be tapped with the small trocar and drawn out after it is collapsed, without introducing the hand at all.

Having decided to remove the tumor, though there are adhesions, the latter are next to be overcome; and if not very firm, this is best done by passing the hand freely around the tumor and breaking them up. In doing this, care should be taken to tear them off directly from the sac rather than from the surface to which they attached it; and this, also, without tearing the sac itself, since a copious hæmorrhage may thus result. Especial care must be taken when we attempt to detach adhesions from any viscus; and if firm and extensive, the incision should be elongated till we can bring the parts concerned into view. I have seen a tumor detached from the under surface of the liver, carry away a portion of the capsule of the liver with it, and thus expose a bleeding surface from which a fatal hæmorrhage took place. I do not know, indeed, how a hæmorrhage from such a surface could be artificially arrested. Almost equal precautions are necessary if the tumor adheres to the bladder, uterus, or any portion of the alimentary canal. If not to be detached from either viscus without great risk to the organ in question, the adherent portion of the sac should be cut out and left still adhering, as already frequently done by Dr. Atlee. Frequently bands are found too firm to be overcome by any amount of strength the operator can apply; and these are of course to be divided by the knife. The adhesions to the omentum are usually overcome without much difficulty; though at the risk of tearing that part.

Generally, adhesions *torn* away do not bleed; or if they do

at first, the hæmorrhage ceases on exposure to the air.* It is therefore a good rule not to ligate any bleeding vessel at once, since in a few minutes this may be found unnecessary. If, however, the oozing continues, the vessels may be ligated with fine silk, cut off short, and left in the peritoneal cavity. In my last case I thus applied twelve to fifteen ligatures, and no inconvenience followed. Not very seldom will we find the torn vessels of the omentum requiring this procedure. I. B. Brown uses silver wire in the same way.

If we expect to detach extensive adhesions without letting any blood fall into the peritoneal cavity, we shall almost certainly be disappointed. This is a matter of special import if the tumor is not to be removed, but of no importance if it is; since after the removal the blood is easily sponged out of the cavity.

The adhesions being overcome, the patient is turned on the side from which the tumor was developed, and the latter is lifted out of the peritoneal cavity and removed. Previously, however, to severing its attachment, we must have decided

4. *How to manage the Pedicle.*—The pedicle has been very differently treated by different operators; and even by the same at different times.

Dr. Clay, of Manchester, passes a double ligature of Indian hemp through the middle of the pedicle, ties one-half of it round each half of the latter, and brings the ends of the ligatures out through the lower end of the incision.

Dr. J. L. Atlee, of Lancaster, Pa., first (I think) applied the *ecraseur* to the pedicle in March, 1858. The patient, 61 years of age, made a rapid recovery.† His brother, W. L. Atlee, already often quoted, has since done this sixteen times.

Mr. Duffin, of London, in 1850, first applied the ligatures as Dr. Clay does; and then brought them and the pedicle out through the incision at the nearest point, and fixed it there by hare-lip pins.

Six or seven years ago, Mr. Hutchinson, of London, applied

* But if *cut*, they bleed. I. B. Brown had a patient die in three days after the operation, from bleeding, from an adhesion to the liver which he had cut off. London Lancet, April, 1859, p. 322.

† American Medical Monthly, August, 1858, p. 158.

a clamp to the pedicle, and fixed the latter in the incision; the clamp compressing the pedicle being placed externally across the incision.

Dr. Tanner, in one instance, tied the pedicle as above described, and left a portion of the tumor as large as the hand outside of the incision.*

I. B. Brown, in one case, applied silver wire to the pedicle and cut it close, and closed the incision. Patient died in 26 hours, of diarrhœa and vomiting. But he was, I think, the first to adopt the suggestion of Mr. Hutchinson; though he uses the common carpenter's callipers, as being lighter than the clamp. He removes the callipers generally on the third day (24 to 72 hours), and lets the pedicle fall back into the peritoneal cavity.†

T. Spencer Wells first adopted Dr. Clay's method; then Mr. Duffin's suggestion; then Mr. Hutchinson's clamp. After a few operations, however, he gave up the clamp, and returned to Mr. Duffin's method.‡ For the last six years he has used the clamp almost exclusively; removing it in 36 to 48 hours generally. In one case he was obliged to remove it in 4 hours, by the violent symptoms produced by its dragging upon the uterus. The patient did well.§

Dr. T. Smith first applied the double ligature like Dr. Clay. Next he cut it close, and closed up the incision, and the patient recovered. This had been done by Dr. D. S. Rogers, of New York, in 1829; by Dr. Billington, of New York, in 1835; by Siebold, of Darmstadt, in 1846; and recently by Mr. Fergusson of London. All these operations were successful; and very recently Dr. T. Smith has thus succeeded in 7 or 8 cases.‖

Dr. W. L. Atlee had, up to April 1, 1864, adopted Dr. Clay's method 41 times; had used the clamp 43 times; and the ecraseur 16 times, as already stated. He uses a ligature of three or four threads of saddler's silk, waxed but not twisted; and which I think preferable to the hemp ligature.

* London Lancet, February, 1861, p. 162.
† London Lancet, June, 1862, page 390.
‡ London Lancet, September, 1861, p. 182.
§ London Lancet, February, 1863, p, 139.
‖ London Lancet, May, 1864, p. 282.

It will be seen that the preceding methods may be reduced to five, viz.:

1. By the ecraseur.
2. By double ligature—Dr. Clay's method.
3. By double ligature, as modified by Mr. Duffin.
4. By double ligature cut short, as by Dr. T. Smith.
5. By the clamp.

Appreciation.—In appreciating the relative merits of the preceding methods, we must bear in mind that the first object in our treatment of the pedicle is to secure the patient against the risk of hæmorrhage therefrom. And, as I should not trust that essential and indispensable point to the doubtful hæmostatic effects upon the vessels, of the ecraseur, I shall eliminate that instrument from the calculation. On the other hand, no one can deny that the ligature affords the greatest possible assurance against hæmorrhage, it being always finally resorted to also when the clamp fails. In this respect, therefore, the ligature is to be preferred to the clamp.

But there are also two other incidental objects which demand attention in treating the pedicle, viz. to avoid any irritation in the peritoneal cavity which may lead to peritonitis or septicæmia; and to secure the closure of the incision as soon as possible. It is only in regard to these objects that the clamp becomes comparable with the ligature.

The *principle*, however, of the application of the clamp is the same as that of the application of the ligature by Mr. Duffin (the pedicle and ligatures being brought out through the incision and kept *externally* by a hare-lip pin till the pedicle sloughs off). Mr. Duffin's method, therefore, may also be dropped in the comparison; though it differs from the clamp inasmuch as it is safer against hæmorrhage, and the ligatures are not so conveniently removed, should we wish to remove them in two or three days.

There remain, then, for our appreciation, so far as the last mentioned two objects are concerned, but three methods—Dr. Clay's, Dr. T. Smith's, and the clamp. I pretermit Dr. Smith's method for the present, and compare the clamp with the use of

the ligature, as by Dr. Clay. And to do this intelligently, I have to consider:

1. The advantages, if any, of the clamp over the ligature.
2. The advantages, if any, of the ligature over the clamp.
3. The disadvantages of the clamp as compared with the ligature.
4. The disadvantages of the ligature as compared with the clamp.

1. The asserted advantages of the clamp over the ligature in regard to the two points above specified, are these: (1) It brings the constricted stump of the pedicle *outside the peritoneal cavity*; and (2) being removed in two or three days, the incision generally closes in its *whole extent in a few days* afterwards. T. S. Wells claims that the clamp "prevents absorption of the putrid matter from the sloughing stump, and the peritonitis connected with the effusion of fibrine around the latter. He hardly remembered any successful case in which peritonitis occurred, when the pedicle had been kept out." *

There can be no question that the clamp conduces to a more rapid closure of the incision than the ligature, and is in this respect to be preferred. But although it also brings the stump outside for a time, it does not thus necessarily prevent absorption and septicæmia, nor peritonitis. Mr. Wells's successful cases had not been attacked with peritonitis—an assertion many of those who use the ligature might also probably make, since peritonitis very often renders a case *unsuccessful*. He, however, had two cases of death from peritonitis out of 18 unsuccessful cases. I cannot agree with him that the fibrine exuded around the pedicle has any agency in *producing* peritonitis; and though the pedicle sloughs off and produces putrid matter when kept outside by the clamp, the assumption that this is equally the case when the ligature is applied and kept within, needs confirmation; and will be considered further on. Of 32 patients lost by Dr. Clay, 10 died of peritonitis; a fact attributable perhaps to the ligature, and perhaps to some other cause.

* L. Lancet, June, 1863, p. 409.

2. The advantages of the ligature over the clamp in regard to the two points now under consideration are, that it is applicable to every case, whatever the length or form of the pedicle; that it is easy of application, and does not give way, nor in any case or under any circumstances produce traction of the uterus, and its concomitant severe and sometimes fatal symptoms. These advantages I think more than counterbalance the single advantage of the clamp—its allowing a more rapid closure of the incision; unless the clamp does also prevent absorption of putrid matter as above quoted, while the ligature favors it—as I expect to show is not the case.

3. *Disadvantages of the Clamp.*—It cannot be used if the pedicle is quite short or very wide. I. B. Brown, however, in one case applied *four* clamps. It sometimes drags upon the uterus, producing headache, severe pain referred to the hip, vomiting, and other grave symptoms—even fatal collapse.* And if this traction is not made at first, it may occur at any time if tympanitis, vomiting, or cough should supervene.† The pedicle may also permanently adhere in the incision to the abdominal walls, and thus cause intestinal obstruction, as in one of Mr. Wells's cases.‡ This condition would probably interfere also with subsequent gestation. In two of I. B. Brown's cases, vicarious menstruation from the pedicle adhering in the incision, regularly recurred. § Besides, the pedicle when kept outside sometimes requires even twenty days to slough off, before the incision can at that point begin to close; as in Dr. Miller's case.—(*American Journal Medical Sciences*, April, 1859.)

4. *Disadvantages of the Ligature.*—The objections to the ligature are based on two asserted disadvantages: (1) It produces irritation in the peritoneal cavity and an exudation, and thus produces peritonitis; and (2) it causes the pedicle to slough off in the peritoneal cavity, thence to be absorbed as putrid matter, and thus produces septicæmia. It also of course prevents a rapid closure of the entire incision at the same time.

* As in Dr. Lyon's case; died in sixty-eight hours.—Lancet, November, 1863, p. 726.

† See four cases fatal from traction.—Lancet, April, 1861, p. 323.

‡ Lancet, July, 1860, p. 59.

§ Lancet, May, 1864, p. 282.

Admitting the last mentioned disadvantage only, let us see if the two preceding objections can really be substantiated.

1. On *à priori* grounds, we might expect that a ligature left in contact with a healthy peritoneum would produce irritation, and very likely peritonitis also. But in these cases the peritoneum is quite changed in its susceptibilities, as has already been explained. There is also an exudation of plasma around the ligatures and the pedicle.* But both irritation and exudation may occur without any symptom of peritonitis; and as a general rule certainly the latter does not occur. I have myself applied only 18 ligatures in this way; but not in a single instance were there any signs of peritonitis. We have seen that Dr. Clay, out of 32 fatal cases, had 10 of fatal peritonitis; while Mr. Wells had but 2 from peritonitis out of 18 fatal cases. But the difference could not have been due to the ligature. Very nearly one-fourth of all who die after ovariotomy, die of peritonitis; and Dr. T. Smith, who always uses the ligature, has had better success than those who use the clamp exclusively. It appears, therefore, that the first of the two objections to the ligature is not sustained by the facts. *Cæteris paribus*, however, the ligature would doubtless be more likely to irritate and produce peritonitis if the patient be operated on in robust health, as advised by Mr. Wells.

2. The assertion that the ligature produces a slough of the pedicle, which is separated and absorbed as putrid matter, equally needs confirmation. Dr. A. T. Barnes of London, says that no such sloughing takes place;† while Mr. Wells had a patient die in 30 *hours* after the operation from the absorption, as he believes, of putrid matter from the sloughing stump. Dr. Miller of Louisville, Ky., says "there is no reason to suppose that there is any difference" in the suppuration and sloughing, whether the pedicle is kept outside or left in the peritoneal cavity. I. B. Brown seems to admit the sloughing internally; but as he returns the pedicle into the peritoneal cavity on the second or third day, after slipping off the clamp —when the stump must of course be just as *dead* as if the liga-

* Dr. Black's case; copious exudation; no sloughing noted.—Lancet, April, 1857, p. 311.

† Lancet, 1861, p. 483.

ture had been in its place the same length of time (and more so, if there be any difference, from its exposure to the air)—he does not appear to fear any serious result from its sloughing and absorption. Indeed, he says there is as much danger from the air entering the peritoneal cavity as from the sloughing pedicle.*

Now I am unable to find the facts which sustain the idea either that any such sloughing of the pedicle, or therefore any such absorption of putrid matter, actually takes place from the use of the ligature—unless in very rare and exceptional cases. On the other hand, the considerations soon to be specified point to the opposite conclusion. In opposition, however, to Dr. Miller's idea, I think there "*is* a reason to suppose" that the suppuration and sloughing of the stump would *not* be precisely the same, if inclosed in a cavity of a uniform temperature and excluding the air, as if it were kept exposed externally. But the following facts seem to me to decide the question:

1. I have examined the reports of many fatal cases with special reference to this point; but in only a single instance is it stated that the stump was in a sloughy condition. In this case, however, the pedicle was kept outside, and was found "sloughing" 76 hours after the operation.

2. In a case in which I removed most of the body of the uterus, the patient died six days after, of strangulation of intestine through the incision, produced by violent cough. Here the *post-mortem* showed the stump included in the double ligature not to be sloughy; but, on the contrary, to be alive and nearly healed over by the exudation (just sufficient to afford the required amount of material) which had been poured out. Nor was there any trace of inflammation in the vicinity of the stump.

3. An experimental fact, quoted by Dr. Routh to show the great danger of septicæmia from sloughing of the pedicle if the ligature is applied, proves that no such sloughing occurs. He states that dead meat, even if fresh, when introduced into the abdominal cavity of an animal, produces putrid fever†—from absorption, of course, of putrid matter—the fresh meat becoming decomposed. But no such fever occurs when the ligature is used, as a general rule; therefore no such decomposition

* Lancet, April, 1859, p. 322.

† Lancet, September, 1861, p. 183.

or sloughing of the pedicle as is assumed occurs. Were there sloughing, the fever (from septicæmia) should be the rule and not the exception. Three of my own patients had septicæmia; but all from a source unconnected with the pedicle; though the ligatures were, in one case in which septicæmia did not occur, retained 18 weeks.

I am therefore compelled to conclude that the second objection also to the ligature—that it produces a putrid slough to be absorbed, and thus also septicæmia—is not sustained.

What then actually becomes of the constricted portion of the pedicle? As the portion of the femoral artery below the ligature in case of a flap amputation of the thigh that heals by first intention, is surrounded by exuded plasma and kept alive in spite of the constriction, so that when the ligature even cuts it off entirely by exciting ulceration, it does not slough, but becomes blended with the surrounding tissues and the organized exudation—so here, I suppose, the constricted portion of the pedicle is inclosed in the exudation and kept alive. In some cases, however, the pedicle seems merely to become atrophied and the ligature slips over the end. The former explanation is the more probable one in cases in which the ligature is retained a very long time. But if neither of these explanations be accepted, there is no fact to prove that the stump does not at any rate usually retain its vitality.

Conclusion.—Since the objection to the ligature as tending to produce peritonitis and septicæmia cannot be maintained as a general proposition, and since, if it sometimes does so (which is not proved), the clamp on the other hand, also, sometimes demonstrably produces even fatal effects—the clamp has no advantage over the ligature on the whole, with the single exception that it usually secures an early closure of the entire incision. The great superiority of the ligature over the clamp in preventing hæmorrhage more than counterbalances this advantage; and, therefore, I *still decidedly prefer the ligature to the clamp.**

* It has been remarked that Mr. Wells has had better success during the last six years, since he used the clamp. So has Dr. Clay during the same time, though he never uses it. Mr. Wells himself attributes his success to his after treatment, as will be seen.

I have examined this question at length, both on account of its great practical importance, and because I consider the principle on which the clamp is applied to be wrong in itself. I now again refer to Dr. Tyler Smith's method of treating the pedicle, viz. *applying the double ligature, cutting it close, leaving the stump in its natural relations, and entirely closing up the incision*, as the best of all methods; and the one to which all the others will, in my opinion, ere long give place.*

Having secured the pedicle, the other ovary is to be examined† (and removed if found to be similarly diseased); and the next inquiry is—

Shall fluid, if found in the peritoneal cavity, be removed before the incision is closed?

Shall all the *blood or dropsical fluid be removed from the peritoneal cavity* before the incision is closed? Certainly, if we would, so far as possible, secure the patient against septicæmia. Of 50 of the cases I have collated, in which the peritoneal cavity was carefully cleansed of fluid, 35, or 70 per cent., recovered; while of 18 cases in which it was not removed, only 10, or 55½ per cent., recovered. Some operators, however, remove any blood they can see on the intestines, but leave the rest and any dropsical fluid which may remain. I. B. Brown thinks the fluid left does no harm.‡ Mr. Wells and Dr. T. Smith remove *all* the fluid with care.

I. B. Brown removes it with flannel blankets applied to and among the intestines.§ Mr. Wells uses a soft sponge; and Dr. T. Smith also suggests a large one, that it may not be left and forgotten. Mr. Brown thinks he has seen the sponge do harm, as it does in the eye.

I should remove *all* the fluid in the peritoneal cavity, of both

* T. S. Wells objects to cutting the ligature close, since we "leave the ligature coming out to establish a channel through which the dead putrid remains of the tissues, strangulated by the ligature, might escape." Lancet, Sept. 1861, p. 183.

† A patient of Mr. H. Smith died on the 22d day after the operation, when the other ovary was found diseased and large as the first. Lancet, Nov. 1863, p. 719.

‡ Lancet, May, 1863, p. 338.

§ Lancet, May, 1863, p. 552–4.

kinds, with a soft sponge moistened in the artificial serum before mentioned; and to make sure that none is left, should examine every part of the alimentary canal implicated, under a strong light reflected into the peritoneal cavity by a mirror, after previously feeling for coagula and removing them with the hand. The fluid will, of course, mostly gravitate into the pelvis; and can be most easily found and removed if the patient be for the moment turned upon the side.* I have never seen any unpleasant results from the sponge or the manipulations just recommended.

Having thoroughly accomplished this object, we next attend to the—

5. *Closure and Dressings of the Incision.*

The incision should be closed as promptly as possible after the tumor is removed; and the first question here occurring is, Shall the sutures include the peritoneum also, as well as the other layers of the abdominal walls?

Dr. Clay† and Mr. Fergusson‡ do not include the peritoneum. I. B. Brown did not formerly, but now does sometimes; thinking it not important, since patients do just as well if it is not included.§ Dr. T. Smith thinks it will answer if the edges of the peritoneum touch each other. Mr. Wells always includes the peritoneum.

I have included the peritoneum (one-sixth to one-quarter of an inch in width) since my first operation in 1850, and consider this one of the most important points in the operation. If its edges are accurately brought into contact, as advised by Dr. T. Smith, and kept so, it doubtless answers every purpose; and his own and Dr. Clay's success may be greatly due to the fact that they have maintained this contact by their care in closing the incision. But I think the chances of success in this respect are very much increased by including the peritoneum in the

* In one case I turned the patient on the face in order rapidly to remove a considerable amount of dropsical fluid.

† Lancet, September, 1863, p. 608.

‡ Lancet, June, 1863, p. 398.

§ Lancet, February, 1861, p. 173.

sutures; and I am not aware that any undesirable result ever ensues. If the contact of the edges of the peritoneum is not maintained, the consequences may be very grave. The whole surface between its separated edges suppurates, and the pus falling into the peritoneum may produce septicæmia. This happened in one of my own cases; the abdominal walls being too thick to admit of a perfect adjustment of the peritoneal edges. Mr. Wells has also proved by experiments on dogs that if the edges of the peritoneum separate, the intestines become adherent to the whole surface denuded of this membrane. On the other hand, he has seen a case in which the incision suppurated through its whole length without any danger to the patient, since the peritoneum had been included in the sutures, and had united by first intention, and thus prevented the pus from entering the peritoneal cavity.

Dr. Atlee closes the incision by sutures of iron wire,* as also does I. B. Brown. Mr. Wells prefers hare-lip pins, as fixing the wounded surfaces more securely.† I have used silver sutures and pins at the same time, there being more of the latter if the abdominal walls are thick. If no portion is more than a half inch thick, perhaps sutures alone will answer; but even then I use two or three pins, as more reliable against distension, should it occur, from tympanitis; or against movements from vomiting or coughing. Each suture has another, or a pin, at a distance of a half inch from it. But instead of the common hare-lip pin, I prefer common steel needles of the required length, to which a small mass of common sealing-wax is attached as a temporary head. If very long ones are required, I have the middle portion annealed, and the needle somewhat curved. After they are introduced, the points are broken off, and they are fastened in the usual way.

Various *dressings* have been applied to the abdomen after the incision is closed. Dr. Black applied somewhat elaborate fomentations of poppy capsules, chamomile, etc., frequently changed, in one case,‡ and thought them very efficacious in

* His reasons for preferring iron to silver wire are to be found in the Amer. Journal of Med. Science. Jan. 1860.

† Lancet, January, 1860, p. 391.

‡ Lancet, October, 1863, p. 649.

conducing to the patient's recovery. Dr. Atlee and I. B. Brown apply the many-tailed flannel bandage. I have merely used a warm water-dressing, covered with oil-silk, and kept in place by a flannel bandage applied just tightly enough to be comfortable to the patient.

The patient is next put into bed and covered warmly. Before speaking, however, of the after-treatment, I will record some

Complications which may arise during the Operation.

I. B. Brown once tore one of the Fallopian tubes, at its junction with the uterus, while detaching adhesions to the latter. Free hæmorrhage occurring, he brought the separated surfaces together by two silver sutures and cut them close. The bleeding ceased and the patient recovered without a bad symptom. In his next case, his incision (six inches long) penetrated directly into the tumor, it being everywhere adherent in front; and twenty-two pints of albuminous fluid, tinged with blood, escaped. The callipers were applied; the patient was very sick after the operation; low peritonitis came on in the evening, and she died in twenty-four hours. The fluid, under heat, became all albumen.* In one instance he put four, and in another six sutures into a wound in the uterus, produced by detaching adhesions, and cut them short. The patients did well.† He put four clamps on a single pedicle in one case, and removed them in forty-eight hours; it being formed of bands extending to the sacrum, the pelvic fascia, and the top and sides of the uterus. He also peeled off adhesions six inches long from the bowel, and tied the vessels with silver sutures. Patient vomited bile but recovered.—A large adhesion was secured by a silver suture and then divided; no hemorrhage; recovery.† Whole omentum adherent in one case; tied a large portion with a silver suture and cut that portion off. Recovery.—Adhesions in all directions to intestines, which were also glued together by previous attacks of peritonitis. Omentum wholly adherent. Tied latter in three places with

* Lancet, August, 1861, p. 110.

† Lancet, April, 1863, p. 256; and his work on Ovarian Dropsy, p. 260.

silver wire, and cut a large piece off. Eight days after, fæces passed in large quantity through the lower part of the wound, and a large piece of sloughy intestine came away. A fistula remained for some time, but spontaneously closed. Recovery.* He has twice removed both ovaries with success. I have done so three times. The removal of the second ovary seems not essentially to increase the danger of the operation. In another case he tied a large portion of bleeding omentum and left it in the incision. A portion sloughed off in forty-eight hours, and a bleeding vessel was then tied. Portions still remained in the wound at the end of four weeks, but were gradually disappearing.†

Dr. T. Smith, in his sixth case, found the tumor (a single sac) in the broad ligament, with a broad pedicle. After tying the latter and dividing it, it bled freely from a rupture in it below and behind the ligature. Another ligature nearer the uterus arrested the bleeding. But peritonitis came on during the night, and the patient died in twenty-four hours. She had granular kidneys.‡

Mr. Wells having extensively torn the omentum, cut off a portion which did not appear healthy, tied four vessels with fine silk ligatures, and cut the latter short.§ Mr. Bryant also did the same, and the patient recovered.‖ In another of Mr. Wells's cases the proper pedicle could not be safely separated from the cæcum above, or the bladder below. He therefore put the clamp around the neck of the tumor, a large polycystic one, and removed it on the third day. The patient did well.¶

Mr. Simon tied two omental adhesions with silver wires cut short, and left them in the abdominal cavity. Recovery.*[2]

In my last case the omentum was everywhere adherent, and was much torn in separating it from the large polycystic tumor. I tied thirteen or fourteen vessels with fine silk ligatures and cut them short, returning the omentum into the abdominal cavity. Patient recovered.†[2]

* Lancet, April, 1863, p. 257.
† Lancet, April, 1863, p. 251.
‡ Lancet, September, 1861, p. 183.
§ Lancet, June, 1863, p. 399.
‖ Lancet, August, 1863, p. 528.
¶ Lancet, August, 1863, p. 530.
*[2] Lancet, August, 1863, p. 531.
†[2] Amer. Journal Med. Sciences, July, 1864, p. 50.

IV. WHAT IS THE APPROPRIATE TREATMENT AFTER OVARIOTOMY?

This is a question of the greatest importance. For, while the dangers of an operation carelessly performed may often be averted by the best management afterwards, no amount of operative skill or experience is likely to succeed if the patient is subsequently neglected or injudiciously treated. Impressed with this idea, I have uniformly refused to operate unless the patients were so situated as to remain under my care after the operation as long as might be necessary. Dr. Clay thinks the third, sixth, and ninth days after the operation are critical days ;* and agrees with I. B. Brown that success is determined more by the after-treatment than by the operation itself.†

The patient, having been covered warmly in bed, may take thirty to forty drops of McMunn's Elixir of Opium, or one to two grains of opium, as soon as she has begun to rally from the operation and can swallow it well ; and the catheter should be used every six hours, or oftener if the patient's sensations demand it. If vomiting occurs, Dr. Clay advises patience till the blood gets rid of the chloroform ; simple drink, and as little food as possible. I have not seen this symptom after ovariotomy under sulphuric ether.

The hygienic management consists in keeping the apartment quiet and well ventilated, and giving appropriate nourishment. T. S. Wells has more recently kept a window constantly open, even in the cold season, with a fire burning ; and to this precaution (not to the clamp nor his skill as an operator) he attributes his remarkable success ; having saved fourteen out of the last fifteen, at the time when he called attention to this practice. I think the best nourishment is milk porridge, or beef tea, or broth, during the first five to seven days ; no solid food to be given, as Dr. Clay advises, till asked for. It is not desi-

* London Lancet, June, 1863, p. 408.

† Up to April, 1863, Mr. Brown had operated nineteen times in the Surgical Home, and the same number of times in St. Mary's Hospital, and in private practice. Of the former, thirteen recovered ; and of the latter, only six. He attributes the difference to *skilled* nursing and the better organization of the Home.—*Lancet*, April, 1863, p. 256.

rable that the bowels be evacuated in less than six or seven days after the operation; and an enema of soap and water—unless a dose of castor oil is preferred—may accomplish that object for the first time.

Sometimes the preceding treatment is all that is required, the opiate being repeated perhaps two or three times every twenty-four hours, during the first two or three days; the patient going on to complete recovery without a bad symptom. Generally, however, more medical, and often also surgical treatment is required. But shall we uniformly give opiates in full doses, as some operators recommend? Dr. Clay gives four grains of opium to begin with, and two-grain doses afterwards. I. B. Brown has given up this practice, as a *rule*, since opium after chloroform produces sickness; but pain, he says, is a greater evil than opium.* Dr. T. Smith gives a moderate amount of opium; and stimulants on the third or fourth day, if not contra-indicated by the existence of inflammation. My own opinion is, that just enough of an opiate should be given to overcome pain and restlessness and secure sleep, *and no more.*† Under this rule we should in some cases give but one grain of opium once to three times in twenty-four hours, for two or three days; while others would demand, perhaps, four times as much for twice as long a time. Decided narcotism should always be avoided. T. S. Wells gives opium, and by the rectum; I. B. Brown by the mouth. I prefer the McMunn's Elixir of Opium, and give it by the mouth. But if any irritation of the stomach exists, I give it by rectum, as I do opium itself in all cases. In this condition the nourishment should also be given in the form of enema.

Peritonitis is less dangerous and more amenable to treatment when traumatic, than the idiopathic variety. Still it destroys about one-fourth, as has been shown, of all who die after ovariotomy. If, however, it occurs seven to ten days after the operation, it assumes the latter (or zymotic) form. Occurring in the first two or three days in a patient operated on in full

* Lancet, September, 1861, p. 183.

† The practice recently recommended, of keeping up the action of the anæsthetic after the operation by the hypodermic injection of a solution of acetate of morphia, should be discouraged.

health, blood should be abstracted by cupping or leeches, as deemed best;* and then the acetate of morphia (Magendie's Solution) may be given in quantity to overcome the pain and all malaise. If the other form of peritonitis presents, tonics and stimulants may afford the only chance of recovery; and if septicæmia also coëxist, the treatment soon to be specified may also be required.

One of Mr. Wells's patients had "an oppression of the heart and lungs, and a pulse of 130 to 140" the next day after the operation. She had lost no blood at the operation; and was relieved by the withdrawal of ℥ xvi. of blood, and recovered.† Another patient coughed suffocatingly till she lost ℥ iv. to ℥ vi. of blood from the pedicle, which the clamp did not properly control. A ligature was then applied; the patient recovered.‡

Query.—Would these symptoms probably have occurred, and have required the loss of blood, had the health of the patient been somewhat impaired before the operation was performed?

If *hæmorrhage* occurs from the pedicle, the latter being kept outside, a ligature is of course to be applied to the bleeding vessel. If the pedicle bleeds within the peritoneal cavity—a very rare thing if the *ligature* is applied—the incision must be re-opened, the vessel tied, all the blood removed from the cavity, and the wound re-closed. At any rate, this alone gives the patient any chance of life.

A slow oozing, however, of blood from the vessels of the omentum, or some surface to which the tumor had been attached, is not uncommon; and is to be prevented, if possible, or diminished if not so, by quiet of body and mind after the operation. The effused blood becoming decomposed, may lead to septicæmia, in which case the treatment next to be specified may be required.

Septicæmia (here improperly termed pyæmia) destroys over one-sixth of all who die after ovariotomy. It results from the absorption of a decomposed fluid from the peritoneal cavity,

* I. B. Brown has had good results in two or three cases from the abstraction of blood; while Dr. Clay does not deem it advisable.

† Lancet, February, 1863, p. 139. ‡ Lancet, June, 1863, p. 399.

and may be produced, (1) by oozing of blood, as just explained; (2) by fluid from the tumor, left in the peritoneal cavity; (3) by ascitic fluid in that cavity; and (4) by pus in the cavity, in case the edges of the peritoneum separate internally and leave a surface between them, behind the closed incision, to heal by suppuration and granulation. This last alone is literally pyæmia. Others admit septicæmia from the absorption of putrid matter from the slough produced by the application of a ligature to the pedicle, according to Dr. Clay's and Dr. T. Smith's methods. I think I have shown that such is very rarely if ever the fact.

Since time is required for the fluid to become decomposed, and the peritoneum does not absorb it rapidly,* the symptoms of septicæmia do not appear under four to seven days, and in one of my cases not till the eighteenth. I can hardly imagine death to occur in thirty hours after the operation from this cause, as supposed in one of Mr. Wells's cases already mentioned.

The symptoms of septicæmia are those of pyæmia, so called; loss of appetite; coated, dry, and then red or dark tongue; great debility not otherwise to be accounted for; rapid, small, weak pulse; dizziness, a tendency to sleep, and a typhoid expression of countenance. In some cases, also, an accumulation of fluid in the peritoneal cavity can be recognised.

If the quantity of fluid to be absorbed is large, its absorption will prove fatal; but if it can be seasonably removed, life may be preserved. Even if it can be diluted with water and partially removed, the patient's chances must be so far improved, and life will be at least prolonged.

Acting upon these convictions, I first injected a solution of chloride of sodium (℥j. to Oj.) into the peritoneal cavity of a patient much prostrated by septicæmia, in February, 1855. I

* As shown in my second case of septicæmia, Amer. Journal of Med. Sciences, April, 1863. One of Mr. H. Smith's patients lived thirteen days with an opening into the bladder large enough to admit two fingers, through which the urine constantly flowed into the peritoneal cavity, and thence through the incision. The flow of urine through the latter began on the eighth day after the operation. The opening in the bladder was doubtless produced by detaching an adhesion. During the first five days blood flowed by the side of the pedicle. Lancet, Nov. 1863, p. 719.

began with one quart of the solution, and then drew out the same amount of fluid with the syringe; though I soon found I could inject that or a larger amount (even two quarts) through a flexible bougie, and then, changing the position so as to bring the free extremity to a lower level than the one in the peritoneal cavity, convert it at once into a siphon through which all the fluid would freely flow out. The immediate relief from the first injection was very striking; the dizziness and stupor at once disappearing, though to return again in eight to twelve hours. I repeated the operation twice daily, and then once daily for a week, when the returned fluid no longer presented any odor of decomposition. When the fluid was unusually fœtid, I used a solution of the Liquor sodæ chlorinatæ (℥ ij. to Oj.). The patient recovered rapidly from the time when the fœtor of the fluid was overcome.

In September, 1862, I again resorted to the same practice in a second case of septicæmia after ovariotomy. Here, I at first used a solution of chloride of sodium and albumen in water, as more nearly resembling the natural secretion of the peritoneum. But soon finding that the albumen itself became decomposed by admixture with the fluid in the cavity, I afterwards used either pure water, or a solution of chloride of sodium, or of the Liquor sodæ chlorinatæ, according to circumstances. In this case I found it necessary to continue the injections twice daily, and then once daily for fifty-nine days in all, when the fœtor ceased and the patient thereafter convalesced. In these two cases septicæmia was caused by the absorption of ascitic fluid secreted after the operation. In the first case, the symptoms appeared on the sixth, and in the second, on the eighteenth day.

A third case of septicæmia, produced by blood oozing from the omental vessels after ovariotomy, occurred in my practice in September, 1863. The symptoms appeared in this case on the fourth day, and the injections were commenced on the seventh. The same kinds were used as in the preceding case—the solution of Liq. sodæ chlorinat., even ℥j. to ℥iv. of water sometimes; and it was found necessary to use them three times daily for twenty days, to keep the patient from sinking, then twice daily for twenty-one days, and once daily for thirty-three days more; making one hundred and thirty-five injections in all in seventy-

eight days.* I found it better to inject a large quantity rapidly and let it flow away immediately, usually injecting as much as the cavity would receive (one to two quarts at first). For the encouragement of others who may resort to this treatment, I should also add that it was persevered in, in the second case, for four weeks, and in the third for three weeks, before any amendment in the character of the decomposed fluid could be perceived.

In the last two cases I also administered the sulph. of quinine (one and a half to two grains every four to six hours), and the Liq. sodæ chlorinatæ (six drops, diluted, every four hours). The latter was used instead of the quinine whenever the tongue became brown or darker, and the breath offensive, and when the fluid removed became more fœtid for a day or two. The beneficial effects of both these remedies were very remarkable; and if discontinued for a few hours, the patient invariably got worse till they were again resumed.

I cannot doubt that the three patients above mentioned would have succumbed, had I not resorted to the treatment described. And it seems to me important to have demonstrated the practicability of thus rescuing a considerable proportion, I trust, from a condition which has hitherto destroyed over one-sixth of all who die after ovariotomy. A fair state of the general health is certainly not essential to its success; since two of the three patients were very much more reduced in strength before the operation, than I have indicated as conducing to a favorable result. (Page 21.)

Conclusions.

1. The success of ovariotomy in England and in the United States, unquestionably entitles it to be recognised as a legitimate surgical operation; the average of cures from all the operations being 61⅓ per cent.,† and of experienced operators 66⅔† per cent.; while some of the latter have recently saved more than 82 per cent. of their patients.

2. Ovariotomy is the only curative treatment in all cases of solid and polycystic ovarian tumors; and in cases of monocystic

* It having been omitted on four days during the last ten of the seventy-eight.

† *I. e.* 66 per ct. during the last four years; and 57.74 per ct. previously.

also, provided iodine injections have failed, or provided circumstances forbid both them, and the tapping per vaginam and leaving the canula *in situ*.

3. Certain conditions of the patient are favorable, and others are unfavorable to the operation; while others still entirely forbid it. These may now be definitively appreciated and stated. (See page 31.)

4. The incision should give an opening into the peritoneal cavity of only two or three inches to begin with, to be afterwards extended only as absolutely required, though in some cases to even twelve or fourteen inches.

5. Adhesions, however firm and extensive, do not forbid the operation, especially if parietal or omental. If visceral, they are a far more serious complication, and the adherent portion should sometimes be cut out of the sac and left in its contact with the viscus.

6. The objection to ligating the pedicle and leaving it in the peritoneal cavity, on the ground that the ligature produces a slough to be absorbed and produce septicæmia, is not sustained by facts. On the other hand, there are demonstrated objections to the clamp. The ligature is preferable to the latter; but it will probably soon be demonstrated that the best method of managing the pedicle is to ligate it, cut the ligatures close, and then entirely close the incision.

7. All fluid should be carefully and thoroughly removed from the peritoneal cavity by soft sponges, before the incision is closed.

8. The peritoneum should be included by the sutures in closing the incision.

9. The results of ovariotomy are very often determined far less by the operation itself than by the after-treatment, which should always be assumed by the operator himself.

10. Just enough of opiates should be given after the operation to control pain and restlessness and secure the proper amount of sleep—and *no more*.

11. If septicæmia occurs, the peritoneal cavity should be washed out by injections of warm water, or by a solution of the Liq. sodæ chlorinatæ, as required; this operation to be repeated from one to three times daily, as long as the fluid returns with an odor of decomposition.