ON TETANUS AS A COMPLICATION OF OVARIOTOMY.

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Received October 7th, 1891—Read January 12th, 1892.

THIS formidable disease has many times been treated of as a complication of surgical cases and the lying-in state, but only twice before has it received any individual attention when connected with ovariectomy. Theophilus Parvin¹ relates such a case, and gives a table of thirteen others; while Olshausen² quotes thirty-eight cases and devotes a few lines to the discussion of this complication. With a knowledge of these facts, and having had the misfortune to meet with a case in my own practice, I felt that sufficient excuse existed for bringing this subject before the Society.

My first object was to obtain, if possible, the statistics of ovariectomies (excluding hysterectomies) from the various specialists in Europe and elsewhere, and their opinions as to the causation and pathology of tetanus. I accordingly addressed a series of questions to the more important university towns in Europe, sending out 81 letters, viz. to Germany 38, Austria 12, Italy 10, Switzer-

¹ 'American Gynecolog. Trans.,' 1877, vol. ii, p. 317, and Chart, pp. 322, 323.

² 'Krankheiten der Ovarien,' 1886, s. 369.

land 7, Russia and France 6 each, and Belgium 2. I received 68 answers, 28 of which were of little or no importance, giving only negative evidence; I found, however, that 40 were of extreme value, being written by men of high repute and of undoubted experience. Many of them returned long written opinions on the matter, which I have incorporated in the following paper.

Letters were also addressed to 67 operators in Great Britain and Ireland, viz. in London 30, England 16, Scotland 11, and Ireland 10: as a result I received 48 answers, containing much additional evidence. The replies from America and Australia were so meagre and unsatisfactory, that I have confined my investigations to Europe.

The statistics as obtained above, together with the results of a minute search through the literature on the subject, have enabled me to collect 64 cases, of which fairly full details have been given in 57 in Table A, while the 7 other cases are given in the appendix, more complete details not being obtainable.

I will first relate a few particulars of the case which occurred under my own care, and then proceed to a review of the whole number.

Mrs. B—, married, 2-para, æt. 35. I first saw her in consultation with my friend Mr. H. F. Bailey, of Blackheath, on September 8th, 1888, when she had symptoms of an anomalous character with emaciation and irregular and profuse menstruation. The only physical sign then discovered was a thickening in the posterior cul-de-sac with impaired uterine mobility.

December 27th, 1888.—The thickening had increased, and was evidently the base of a swelling of indefinite size; the uterus was fixed and ascites present; progressive emaciation.

January 7th, 1889.—On opening the abdomen about half a gallon of yellowish-green ascitic fluid escaped; a villous mass about the size of a cocoa-nut with a hardened base was found in the posterior cul-de-sac; it broke

away easily when handled, and was whitish in colour. The intestines and surfaces of the right broad ligament were studded with similar small growths about the size of peas. The ovaries were apparently healthy; as much as possible of the new growths was removed by the hand and sponges, and the abdomen closed. The patient made an excellent recovery, put on flesh, and was able to walk three or four miles daily without fatigue.

October 2nd, 1890.—The patient was seen again. The thickening in the posterior cul-de-sac had quite disappeared, but a hardish rounded mass the size of an orange, mobile, and not attached to the uterus, could be felt occupying the right side of the pelvic cavity.

January 21st, 1891.—The patient's general health has begun to suffer, the swelling has increased rapidly, and ascites is present. On opening the abdomen ascitic fluid, similar to that observed in the first operation, escaped. The tumour was a multilocular cyst, each cyst containing papillomatous growths; there were dense adhesions, especially to the abdominal parietes; three of the cysts were tapped, permitting the escape of a thick creamy fluid, mixed with sago-like bodies; the pedicle was broad and thick, and was tied in four sections with carbolic silk ligature; the stump oozed a little, and a second ligature was passed encircling the whole pedicle. In the right broad ligament, near the uterus, a swelling the size of a pigeon's egg was found; on incising the capsule, sago-grain material escaped. A glass drain-tube was inserted, and carbolic sutures were used to close the incision.

23rd.—Sickness troublesome, but relieved by Cocainæ Hydrochlor., gr. $\frac{1}{2}$; Acid. Hydrocyan. dil., mij ; Aq. ad 3j , given at intervals.

26th.—Was restless last night; this was attributed to her having seen her husband for a few minutes; at 5 p.m. slight stiff neck and sore throat; in the evening she could not open her mouth as wide as usual. A mixture of chloral gr. xv, and bromide of potassium gr. xxx, was

given at once by the mouth. This was repeated at intervals by the rectum as the spasm of the masseters increased.

27th.—The spasms have become general, and risus sardonius is well marked; feeding entirely by rectum. Chloroform inhalations when the spasms become very violent. Extr. Physostigmat. fab. gr. $\frac{1}{8}$ injected subcutaneously every two hours, with no apparent result. Death took place after twenty-six hours' illness.

A partial post-mortem only was allowed; the spinal cord was sent to my colleague, Professor Crookshank, who found nothing noteworthy in the naked eye appearances. The parts were not fresh enough to allow of experiments with the tetanus bacillus.

The stump was perfectly healthy, no peritonitis. No tension on the stitches of the incision wound; the omentum was adherent to the anterior parietal wall, but normal in appearance. No fluid in peritoneal cavity.

Remarks.—The tetanus must here have arisen *de novo*; no case had ever been seen by the practitioners in and around Blackheath, and I can say the same for myself. The operation was done in a house on the top of a hill and surrounded by gardens; several abdominal operations had been performed by myself in the same room during the previous year; they had all recovered, having run normal courses. The strictest antiseptic precautions were taken. I think, then, the questions of sepsis, epidemic, and endemic influence can be excluded.

I am obliged, therefore, to fall back upon three other causes as possible, viz.—

1. The number and firmness of the adhesions broken down;

2. The necessity of the second ligature to the pedicle;

3. The low diet after operation;

—all acting in a patient of extremely nervous habit.

Sir George Humphry tells me that he considers the third of these causes a strong factor, and relates his own and Dr. Meadow's cases as instances.

All treatment seemed useless in my case. The rectal

administrations brought on severe spasms, which even the *Physostigmatis faba* injections did not allay in any way.

TEMPERATURE CHART, showing absence of all indications of sepsis.

I must now call your attention to Table A, where there is a list of 63 other cases of tetanus in addition to my own, with all the more important particulars of each case given; it will be seen that several operators have met with more than one case, viz.—

Stilling	7	†*Kimball	
Savage	5	Olshausen	
Thiriar	4	Kaltenbach	
*Boinet	} 3	Zweifel	} 2
*Boye		Schroeder	
Spencer Wells		†*Uhde	
		Underhill	

* Operators deceased and no further particulars obtainable.

† Kimball really met with 5 cases in 267 ovariectomies, but particulars of 2 only could be secured.

‡ In 15 cases of ovariectomy.

I propose to point out any important points in the series of each of these observers and comment thereon.

Stilling's cases (7).—In the 'Deutsche Klinik' Stilling gives a series of 28 ovariectomies, which he describes with the greatest minuteness and wearisome detail, occurring between 1864 and 1872, a period of eight years. Seven of these cases were attacked with tetanus, and six died.

The ninth of this series he performed at the women's Klinik at Cassel, September 2nd, 1865, the clamp treatment being adopted; a normal course ensued, and recovery took place; no signs of sepsis.

The tenth (Table A, Case 6) was on November 6th, 1865, in a private house at Cassel, ran a septic course, and died of tetanus on the twelfth day after operation. This was Stilling's first case of tetanus.

The eleventh (Table A, Case 7) was on August 15th, 1866, nine months afterwards, at the town of Gotha, more than sixty miles from Cassel; ran a septic course, but the patient was convalescent when she was seized with tetanus on the fifteenth day, and died.

The twelfth (Table A, Case 8) was performed seven days later at a private house in Cassel, pursued a normal course, but was seized with tetanus on the ninth day, and died. This was Stilling's third consecutive case.

The sixteenth (Table A, Case 9) did not occur until April 13th, 1868, and in a private house at Oldenburg, at least 150 miles from Cassel. Intense septic peritonitis ensued owing to the stump slipping into the peritoneal cavity; tetanus appeared on the seventh day, and she succumbed in a few hours.

The nineteenth (Table A, Case 11) occurred at Cassel with a similar result.

The twenty-fourth (Table A, Case 13), nearly three years afterwards performed in a private house at Helsa, near Cassel, terminated fatally in a few hours.

The twenty-sixth (Table A, Case 14) was attacked with chronic tetanus, but recovered.

I have purposely gone somewhat into detail here in order to discover the origin of this appalling series of disasters. How the first arose is not evident; Stilling's previous case was not septic, and there were no other tetanic cases in Cassel at the time. I think the other six are clearly due to contagion; in no other way can one explain the appearance of tetanus at 60 and 150 miles distance respectively from the original site of outbreak. Evidently the hands or the instruments of the operators were at fault, probably the latter.

Dr. Savage's cases (35, 41, 46, 52, 56) are very difficult to understand. In the fifth only was there anything tangible as a cause, and in that at the post-mortem (Case 56) the distal end of the stump was found gangrenous. Long intervals occurred between the cases, and the operations were performed in different localities; moreover during the intervals many other patients recovered without any complications; these five occurred in a series of 1134 ovariectomies.

Thiriar's cases (40, 43, 45, 47).—He himself considers that his first case (40) was caused entirely by the chill; the patient when warm in a heated room was subjected to a draught, and in six hours' time she exhibited signs of tetanus. No history of any chill could be found in the other three cases (43, 45, 47). It will be observed that all the operations were exceptionally easy, there being no adhesions, and the abdominal cavity was open only for a short time. At Nivelles, where the last case occurred, Thiriar found there had been an epidemic of tetanus for two years. It is quite certain that in eighteen months in that neighbourhood there were eight cases of tetanus including Thiriar's, and under four different observers. Brussels, Waterloo, Braine l'Alleud, and Nivelles are all in a line, and not far distant from each other. It appears, however, that by some means Thiriar suspected his hæmostatic forceps as the cause of the mischief; he had these thoroughly disinfected by heat, and never met with a case of tetanus afterwards. Here, I think, is ample proof that

tetanus was epidemic and possibly endemic in addition to being carried by contagion.

Sir Spencer Wells' cases.—His ninth, twelfth, and thirty-fifth cases (Table A, 2, 3, 4) were attacked with it, and then he had a clear run of 850 cases without an attack.¹ He tells me that about the same time he had a case of tetanus after perinæorrhaphy, and also saw another in consultation arising from a pitchfork wound. The urine of his first patient produced tetanus in frogs when injected under the skin by Richardson.

Underhill's cases (30, 33).—Dr. Underhill operated upon a male patient who had been seized with tetanus, and died on March 8th, 1880. On the 17th he performed ovariectomy on Case 30, who succumbed in like manner; there was no sepsis. Case 33 occurred June 22nd, 1880; the patient was well aware of the existence of the disease, and of the fate of Case 30. The operation was apparently simple, and ran a normal course up to the date of onset of the complication. Another case of tetanus occurred under the same operator in August, 1880. Here, again, contagion was probably the secret of the spread of the disease, although nervous dread in the second case might have been a predisposing cause.

In considering *Zweifel's and Schroeder's cases* (26, 28, 20, and 21) another theory is put forward. Zweifel is of opinion that his cases were infected by the plaster on the newly done-up walls of the operating room. Both occurred during the first half-year after the removal of the Frauenklinik to a newly built pavilion at Erlangen in 1878, and, moreover, they were consecutive cases. Schroeder, his predecessor, experienced the same misfortune. In the autumn of 1874 a new pavilion (not the same as that used by Zweifel) was built for ovariectomies at Schroeder's request; he operated in it, and lost his first two with tetanus.

Zweifel remarks that the Erlangen subsoil consists of a granular dolomite sand, which lies under a considerable

¹ The total number now reaches over 1000 cases.

layer of garden mould ("humus"). The mortar for the pavilion was formed by digging for the dolomite and mixing it with the lime.

It should be remembered in support of this ingenious but somewhat peculiar theory that the identity of the tetanus bacillus and that found in garden mould (Nicolaier's) was demonstrated in Koch's laboratory, April 10th, 1887.¹

Olshausen's cases (32, 38) were the ninetyeth and hundred and thirty-sixth in a long series, and he is quite at a loss to understand their occurrence except by irregularity of ligature, upon which he lays great stress.

Kaltenbach (17, 18) is himself uncertain about proper ligature in his cases: in one the pedicle was very thick, and not a proper one for the clamp treatment; in the other (17), after falling off of the clamp, a blackish eschar was found, under which was a bright white filament; when this was seized with the forceps the woman, who was an insensitive person as a rule, shrank back in great pain; two days later the first signs of trismus appeared. Nerve irritation was here probably the cause, while contagion was acting in Case 18.

All *clamp cases* necessarily have the bruising, crushing, and tearing elements present, tending to the production of tetanus by nerve-irritation. *Olshausen* thinks that because 27 out of his 38 collected cases were treated extra-peritoneally, there must be some serious element of danger in the method. There are certain indications that in several of the 27 cases the clamp was either insufficient or unequal. *Stilling* saw in three of his cases secondary hæmorrhage from the pedicle, which could only be stayed by further tightening. My tables (vide Table D) show that there are more intra-peritoneal than extra-peritoneal cases recorded, viz. 35 to 29, which somewhat weakens *Olshausen's* theory, although of course a much larger number of operations are performed now than then.

¹ 'Principles of Surgery,' Senn, p. 383.

In a case related by Rose,¹ at the end of the second week, the pedicle, which had been pierced by a long needle, was twisted tighter and tighter each day; the patient, when apparently convalescent, was seized with tetanus and died. Here the torsion might well be considered as the exciting cause. In many cases it will be found that the omentum was either enclosed in the pedicle, or torn, or over-stretched. Such an injury might without doubt be a source of tetanus from nerve-irritation.

Krassowski's two cases of trismus during operation (Table B) in a series of 128 ovariectomies are of extreme interest, and the cause must have been some part of the operation, *i. e.* tearing of adhesions, or tying of pedicles.

Hennig's case (53), occurring shortly after closure of the wound, might have been due to a similar cause or to the pre-existing gangrene of the tumours.

In Champneys' case (49) tension was the most important cause, the gangrene being secondary.

The "tendency" to tetanus in Thornton's case (37) is of considerable interest, as the actual disease occurred as a sequence of the more formidable operation later on.

Whether *sepsis* is a cause of tetanus or not is, I think, at present uncertain. In the 57 cases given in Table A sepsis was evident during life or post mortem in 7 cases only, it was certainly absent in 33, while no mention is made of its existence or not in 17 cases. Saboia, of Rio Janeiro, says that before 1877 tetanus was one of the most frequent complications of wounds; since the introduction by him of antiseptics the affection has become much more rare. Dr. More Madden, alluding to trismus nascentium, tells me that in the Dublin Lying-in Hospital from 1757 to 1783, out of 17,650 children born, 2944 died of tetanus, while during the first twenty-five years of the hospital's existence every sixth child died thus. The introduction of antiseptics has entirely changed this. I think we can conclude that sepsis certainly promotes the

¹ Pitha und Billroth, Bd. i, Abtheil. ii, A. Abschn., ii, 5, s. 51.

spread of tetanus, but that tetanus can arise without any suspicion of sepsis. More than one well-known operator, although entirely discarding antiseptics, has never met with a case of tetanus; while others, who take the most minute precautions in the antiseptic treatment, have had the misfortune to encounter one of these formidable cases.

Low diet after operation seems to be a possible factor in the causation of tetanus. Sir George Humphry tells me that both in his own case (Table A, 1) and that of Dr. Meadows (Addendum to Table A) the diet was of a very unnourishing kind for some days after the operation; this was, I suppose, owing to the former dread of vomiting, and which is now often successfully combated by purgation and nourishing food.

Certain localities appear to have been peculiarly exempt from this disease: according to all the leading operators in Scotland, it has never been met with in that country; the same may be said of Ireland and the south-west of England. Dr. W. J. Sinclair informs me that he has been operating for twelve years at Manchester, and has neither met with a case of tetanus nor heard of one.

Dr. Blanc remarks that, at Bombay, tetanus rages with a greater intensity during the months when the cholera is most fatal; he thinks that tetanus is carried by water in the same way as cholera.

Verneuil¹ has very ably advocated the "equine" origin of tetanus. According to this theory, the earth which causes the disease and which contains the tetanogenic germs is especially that which has received the dejecta of the horse.

The date of origin and duration of tetanus after ovariotomy.—It will be found that 38 cases began on the fifth, sixth, seventh, eighth, or ninth day; while in 2, although the date was certainly one of these, it is not given in the clinical history. Six cases began on the tenth, eleventh, or twelfth day, and 11 cases after the twelfth day. The duration of the disease in the majority of the cases was

¹ "L'origine et la pathogénie du tetanos," 'Rev. de Chirurgie,' 1887, p. 759.
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from one to four days ; it was noted as taking a chronic course in 5 cases (2, 7, 10, 14, 17). I think these facts are in accordance with the course of tetanus when complicating any surgical operation.

Although this is essentially a clinical paper, I cannot but allude to the most recent bacteriological researches on tetanus. Kitasato¹ has proved that the bacillus of tetanus can be carried by pus. He found that the bacilli were of a most resistant nature ; moist heat at 100° for five months did not destroy them ; ten hours' exposure to a 5 per cent. carbolic acid solution left them still very virulent, but they became inert in fifteen hours' time. Three hours in a 1 per cent. solution of sublimate was fatal to them. He also discovered that these organisms are never found at any distance from the wound. It is also well known that the ptomaines of the tetanus bacillus cause tetanic convulsions.²

Treatment.—Table A will indicate that every possible remedy was resorted to in the various cases, and with an almost uniform result—failure. It seems to me that the discoveries alluded to above are likely to turn our attention more particularly to the local treatment of tetanus. If the tetanus bacillus causes all the familiar phenomena of tetanus, and if, as is I think proved, this organism is never found far away from the wound, surely our efforts should be first and chiefly directed towards its removal. I believe it is asserted that iodoform possesses the desired germicide power. Certainly at once, on the first symptoms of tetanus showing themselves, all sutures should be removed ; and if the pedicle be very thick or broad, it should be examined for a cutting or over-tight ligature. Palliative and general treatment may then be thought of.

The object of this paper has been twofold : firstly, that

¹ "Über den Tetanus Bacillus," 'Zeitschrift für Hygiene,' 1889, Bd. vii, s. 225.

² Brieger, in 'Deutsche med. Wochenschrift,' 1887, No. 15, S. 303 ; and Roswell Park's "Mütter" Lectures, in 'Annals of Surgery,' 1891, vol. xiv, p. 138.

it might act as a work of reference to future workers ; I have, therefore, given facts at full length and in detail : secondly, that it might elicit from others their own experience in a discussion which I trust may result in some definite addition to our knowledge of this terrible disease.

Conclusions.

1. That the operation of ovariectomy has elements in it which are conducive to the production of tetanus by nerve irritation, *i. e.* tearing of adhesions and ligature of pedicle ; but that tetanus in these cases does not deviate from the usual series of symptoms which are observed when it complicates other surgical operations.

2. That although some cases of tetanus arise *de novo*, and without necessarily the presence of sepsis, yet the usual manner of spreading is by contagion, and is aided by sepsis.

3. That although the "garden-mould" theory of causation is not established, yet that there is sufficient evidence to recommend avoidance of operating in a room recently plastered, or situated near lately disturbed garden mould.

4. That on the first symptoms of tetanus arising, a strict local search should be made for an irritating cause before proceeding to general treatment.

5. That folding over a broad pedicle which has already been ligatured, and then applying a second ligature, is not to be recommended.

6. That the only means of disinfecting instruments is by boiling them for at least an hour.

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TABLES AND CHART.

Case No.	Operator.	Hospital or Private House.	Date and Locality of Operation.	Age. M. S. W.	Ch.	Previous History.	Nature of Tumour.	Date of Onset and Termination of Tetanus.
i	G. M. Humphry	P. H.	18, vii, 1855. Barrington, near Cambridge, England	27 m.	3	Tumour in side, rapidly growing 14 months	Left unilocular cystoma, with solid portions	8th day 12th "
ii	Spencer Wells	P. H.	6, x, 1859. London	41 m.	10	Two previous tap- pings	Multilocular ovarian cyst; 18 pints of fluid, weight 38 lbs.	15th-30th
iii	Spencer Wells	P. H.	28, x, 1859. London	38 m.	?	Markedly hysteri- cal and neurotic	Multilocular ovarian cyst; weight 53 lbs.	7th-10th
iv	Spencer Wells	H.	9, v, 1862. Samaritan Free, London	30 s.	0	Tumour, 6 mos. duration; 2 at- tacks peritonitis previous	Unilocular ovarian cyst	12th-14th
v	Nélaton	P. H.	17, vi, 1862. Paris	26 s.	0	Tumour, 1 year's growth. Pallia- tive tapping 1 mo. before; re- filled in 10 days	Multilocular ovarian cyst; 8 litres fluid	After 14th-21st
vi	B. Stilling	P. H.	6, xi, 1865. Noon. Cassel, Germany	45 m., w. 10 yrs.	4	Tumour, 1½ years, 7 tappings; last 25 days interval; first 8 months before	Left unilocular ovarian cyst; colloid material in pelvis	9th-12th
vii	B. Stilling	H.	15, viii, 1866. Gotha, Germany	33 m.	1	Tumour, 4 years; rapid increase; pain, dyspnoea	Left unilocular ovarian cyst	15th-22nd
viii	B. Stilling	P. H.	22, viii, 1866. Cassel, Germany	35 m.	2	Tumour, 2½ years; in left side	Left multilocular ova- rian cyst, with colloid degeneration; weight of fluid, 48 lbs.	9th-10th
ix	B. Stilling	P. H.	13, iv, 1868. 9 a.m. Oldenberg, Germany	36 m.	5	Much ascites; tu- mour, 9 months; tapping 6 days before operation	Large sarcoma, right ovary; left ovary healthy	7th-8th
x	Gilman Kimball	P. H.	2, viii, 1868. Lawrence, Mass., U.S.A.	35 m.	3	Tumour, 1 year; pain excessive; dyspnoea and swollen legs 6-7 weeks	Multilocular ovarian cyst; weight 35 lbs.	10th-20th
xi	B. Stilling	P. H.	27, v, 1869. 5 p.m. Cassel, Germany	56 m.	1	Ovarian swelling 23 years; 37 tap- pings	Cystoma of both ovaries	7th-9th
xii	C. W. F. Uhde	H.	29, xi, 1869. Braunschweig, Germany	20 s.	0	Irregular men- struation; ascites	Single cyst, right ovary	? -12th

Operation, Treatment of Pedicle, &c.	Treatment.	Result and Duration of Disease.	Remarks.	Post Mortem.	Reference.
Incision 3 inch, then 4 inch. Pedicle broad, tied in three places, brought out at wound; no clamp	Extr. Belladon., gr. iv; Ext. Cann. Ind., gr. iv, per rectum; morphia, p. r. n.	D.	Disease commenced with trismus; temp. normal, and pulse under 100 up to attack	Stump healthy; mesentery adherent to wound; no peritonitis	'Association M. J.,' 1856, pp. 121, 123, and Priv. Com.
5-inch incision; four vessels tied in omentum. Clamp; broad pedicle; came away 9th day; ligatures 12th. Harelip pins, abdominal incision	Woorara hypodermic, gr. $\frac{1}{2}$; solution applied to blisters on neck, 6 gr. in all (gr. ii ad $\frac{3}{4}$)	R.	4th day of operation slight trismus; re-appearance 15th day; confined 13 months after	—	'Diseases of the Ovaries,' 1865, p. 35
4-inch incision; parietal and omental adhesions; short pedicle, clamped with difficulty	Woorara and assa-fetida, dose (?)	D. 56 hrs.	Wound healed first intention; bedding changed during a profuse diaphoresis	One pint of blood (fluid) in pelvis	'Diseases of the Ovaries,' 1865, p. 46.
5-inch incision; intestinal and omental adhesions. Clamp, which came away 3rd day; omentum fixed into wound by 2 needles	Turpentine enemata; CHCl_3 inhalation; tracheotomy	D.	Temp. not given; no irritated nerve found in cicatrix	Wound united; pedicle and omentum adherent to scar; no peritonitis	'Diseases of the Ovaries,' 1865, p. 105.
Adhesions with omentum and bowel. Clamp came away 4th day. Silver wire sutures for incision	—	D.	Sutures removed 5th day; purgative 7th; pulse never above 96	Cicatrix quite healthy	'Gazette Hebdomadaire,' 1862, t. ix, pp. 401, 483.
Few adhesions; clamp to short pedicle; operation lasted half-hour	Quinine subcutaneous	D. 3 days	Disease began with feeling of constriction at neck; br. pneum. 3rd day; sepsis.	Uterus dragged by stump; no peritonitis	'Deutsche Klinik,' 1866, Bd. xviii, Fall 10, S. 38.
Incision $4\frac{1}{2}$ inches. Many adhesions to viscera. Pedicle $1\frac{1}{2}$ inches thick, fastened by lancet pins, passing through middle to wound edges	Morphia subcutaneous, gr. $\frac{1}{2}$	D. 7 days	Disease began left maxilla; stump not separated; patient convalescent	Stump adherent to cicatrix; two collections pus in stump; ileum perforated	'Deutsche Klinik,' 1867, Bd. xix, Fall 11, S. 97, 112, 144.
Navel to pubes incision; pedicle ligatured in two and united to wound, as in case vii. Metallic "constrictor"	Pneumonia treated, trismus not	D. 36 hrs.	8th day severe fright; normal up to onset of attack	Stump loose; firm cicatrix; omentum firmly adherent	'Deutsche Klinik,' 1867, Bd. xix, Fall 12, S. 204, 213, 227.
4-inch incision. Wire ecraseur round finger-thick pedicle; wire sutures; glass tube beside pedicle; removed 2nd day. Ferri perchlor. to stump	Curari suggested, but not procurable	D. 16 hrs.	Intense peritonitis 3rd day; ecraseur and stump slipped into cavity 3rd day; attack began with stiffness in neck and jaws	Peritonitis	'Deutsche Klinik,' 1868, Bd. xx, Fall 16, S. 181-4.
7-inch incision. Omentum ligatured <i>en masse</i> and brought into wound. Pedicle short, brought through to vagina	Potass. Bromid.; chloroform	D. 10 days	Putrid discharge from vagina 2nd day; attack began with swollen tongue; stiff jaws	—	'Boston Med. and Surgical Journ.,' 1874, vol. xc, p. 521.
8-9-inch incision; right pedicle thick and vascular, left smaller; right burnt through, and ligatured in two places; ditto left. Stumps attached to wound edges	Morphia subcutaneous; solutio curari subcutaneous, gr. $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$ into neck and near wound	D. 60 hrs.	Was exposed to draught 6th day; right stump cut through 4th; slight redness of fauces left side	Firm cicatrix; small piece of omentum adherent lower angle of wound	'Deutsche Klinik,' 1869, Bd. xxi, Fall 19, S. 241-3.
No adhesions. Pedicle ligatured, clamp applied. Five wire sutures	?	D. ?	No blood or ovarian fluid escaped into abdominal cavity	Negative	'Deutsche medic. Wochenschrift,' 1880 Jahrg. vi, S. 50.

Case No.	Operator.	Hospital or Private House.	Date and Locality of Operation.	Age. M. S. W.	Ch.	Previous History.	Nature of Tumour.	Date of Onset and Termination of Tetanus.
xiii	B. Stilling	P. H.	25, iv, 1873. Helsa, near Cassel	50 ?	0	Rapidly growing tumour; right side 1 year; 7 pints fluid drawn off 8 days previous to operation for rapid emaciation and dyspnoea	Right multilocular cyst of ovary	5th-6th
xiv	B. Stilling	H.	29, v, 1873. Klinik, Cassel	56 w.	11	Tumour in right side 18 months	Multilocular ovarian cyst, right ovary; colloid degeneration; weight 50-60 lbs.	16th-42nd
xv	Tod Helmuth	P. H.	19, x, 1872. Brooklyn, U.S.A.	38 ?	?	Much pain in right side	Multilocular cyst, right ovary	12th-13th
xvi	C. W. F. Uhde	H.	19, xi, 1873. Braunschweig, Germany	37 m.	2	Ascites (?)	Cystoma, left ovary	? -7th
xvii	R. Kaltenbach	H.	? viii, 1873. Freiburg	35 m.	2	Tumour observed during last pregnancy	Small unilocular ovarian cyst	16th-24th
xviii	R. Kaltenbach	H.	? viii, 1873. Freiburg	38 m.	4	Severe abdominal pain	Multilocular ovarian cyst; papillary condition of cyst wall	7th-8th
xix	E. H. Gregory	?	? x, 1874. ? U.S.A.	26 s.	0	?	Multilocular ovarian cyst	4th-5th
xx	Schroeder	H.	? ? 1874. Gynaekolog. Klin., Erlangen	?	?	?	Ovarian cystoma	9th-12th
xxi	Schroeder	H.	? ? 1874. Gynaek. Klinik, Erlangen	?	?	?	Ovarian cystoma	? -15th
xxii	Howitz	H.	? ? 1874. Copenhagen	47 m.	?	Swelling in abdomen 2 years	Right ovarian cyst; solid tumour left ovary	7th-10th
xxiii	Gilman	?	? vi, 1877. U.S.A.	47 m.	?	?	Multilocular ovarian cyst	3rd-5th
xxiv	Kimball Theophilus Parvin	P. H.	5, v, 1877. Seymour, U.S.A.	36 m.	8	Tumour 5 years, and with 3 pregnancies; tapped a month before operation	Multilocular ovarian cyst; weight 40 lbs.	5th-6th
xxv	Use of operator's name not permitted	H.	31, v, 1878. Frauenklinik, Leipzig	?	?	Two ovarian cystomata; repeated peritonitis	Cystomata of both ovaries	? -14th
xxvi	Zweifel	H.	? xi, 1878. Frauenklinik, Erlangen	40 m.	?	Hard abdominal swelling; diagnostic tapping	Dermoid ovarian cyst	6th-7th
xxvii	K. Slawjansky	H.	7, xi, 1878. Klinik of Medical Academy, St. Petersburg	26 m.	1	Tumour noticed 6 months	Proliferating glandular cystoma; larger than foetal head	3rd-5th
xxviii	Zweifel	H.	? iv, 1879. Frauenklinik, Erlangen	27 s.	0	Tumour noticed 1 year; diagnostic tapping	Large unilocular right ovarian cyst	10th-13th

Operation, Treatment of Pedicle, &c.	Treatment.	Result and Duration of Disease.	Remarks.	Post Mortem.	Reference.
5-6-inch incision; many adhesions. Short pedicle, tied with hemp and dropped into peritoneal cavity. No tube; seven button sutures	Chloral Hydrat. per rectum	D. 21 hrs.	Trismus, never tetanus, beginning with dysphagia; septic peritonitis	—	'Deutsche Klinik,' 1872, Bd. xxiv, Fall. 25, S. 396-7.
16-cm. incision. Five catgut ligatures to pedicle; dropped in	Quiniaz Sulph.	R.	Trismus; tetanus of abdominal muscles and diaphragm; albumen and sugar	—	'Deutsche Klinik,' 1872, Bd. xxiv, Fall. 27, S. 418, &c.
Dense adhesions to omentum, liver, intestines, spleen. Ecraseur round whole mass	None special	D. 24 hrs.	Intensely cold weather; fire allowed to go out	—	'Homoeopathic Journ. Obstet.,' 1884, p. 14, Case IV.
No adhesions; long pedicle, clamped after ligature. Liq. ferri to stump. Six silver wires	?	D.	Listerism in all details; occupied different ward from Case X; no tetanus between 1869 and 1872 in Klinik	Negative	'Deutsche medic. Wochenschrift,' 1880, Jahrg. vi, S. 50.
No adhesions; clamp; thin pedicle	Chloral per rectum; morphia, chloral, chloroform	D. 8 days	Wound quite healed; non-febrile course to 4th day; last day 42° C.	Negative; no peritonitis	Priv. comm. direct from operator.
Many adhesions; divided by cautery; broad, thick pedicle. Clamp	Morphia, chloral, chloroform	D. 24 hrs.	Non-febrile course after 4th day	Negative; no peritonitis	Priv. comm. direct from operator.
Adhesions numerous; intra-peritoneal treatment of stump. Silver wire to incision	None special	D. 36 hrs.	?	—	Parvin's list, 'Amer. Gyn. Trans.,' vol. ii, 1877, p. 317.
Extensive adhesions between tumour and anterior abdominal wall. Clamp	?	D.	?	No peritonitis; wound healed	'Sitzber. der Med. Soc. zu Erlangen,' 1875, Hft. vii, S. 82.
Firm but not extensive adhesions; large amount oozing. Clamp; no drain-tube	?	D.	Fever first day; normal 8 days; no sepsis (?)	Fibrinous flakes on intestines; pus in various cavities	'Sitzber. der Med. Soc. zu Erlangen,' 1875, Hft. ii, S. 83.
Enucleation of tumour; short, broad pedicle. Clamp; left side untouched	?	D.	All symptoms normal up to 7th day	—	Virchow and Hirsch, 'Jahresbericht der Med.' for 1875, ii, S. 570.
Adhesion to colon. Clamp	Chloral per rectum; morphine	D. 48 hrs.	—	—	Parvin's list.
Considerable omental and parietal adhesions; long and thin pedicle. Clamp	Opium, morphine, chloroform	D. 36 hrs.	Difficulty in producing anaesthesia; attack began with pain in neck; extreme cold; open windows.	—	'Amer. Gynec. Trans.,' vol. ii, 1877, p. 317.
Firm adhesions to uterus; ovaries removed by "écrasement," and stumps dropped in. Wire and short sutures	?	D.	Trismus was of short duration	No sepsis	Private comm. from Prof. Carl Hennig.
Carbolic spray; pedicle pierced and tied with double thread; intra-peritoneal; sutures carbolicised	Morphia	D. 24 hrs.	One half of pedicle cut into by ligature; slight fever during convalescence	No peritonitis; omentum much stretched	'Berlin. klin. Wochen.,' 1881, Jahrg. xxviii, S. 307, and private comm.
Silk ligature; stump fastened into abdominal wound	Hydrate of chloral per rectum	R.	Trismus well marked; tetanus very slight	—	Private comm. direct from operator.
Omental adhesions; pedicle pierced and tied with silk; intra-peritoneal	Curari, '015 grm. and morphia; finally chloroform	D.	Disease began in neck and back muscles; a febrile course up to 10th	Omentum tensely stretched; stump healthy; no sepsis	'Berlin. klin. Wochen.,' 1881, Jahrg. xviii, S. 327, and private comm.

Case No.	Operator.	Hospital or Private House.	Date and Locality of Operation.	Age. M. S. W.	Ch.	Previous History.	Nature of Tumour.	Date of Onset and Termination of Tetanus.
xxix	Granville Bantock	H.	28, xi, 1879. Samaritan Hospital, London	24 s.	1	<i>Vide</i> 'Med.-Chir. Trans.,' vol. lxiv, p. 130; chart	Unilocular parovarian cyst, right ovary; weight 3 lbs.	7th-8th
xxx	Thomas Underhill	H.	17, iii, 1880. Guest Hospital, Dudley	? 40	?	Tumour 7 years	Large right unilocular cyst; 560 oz. fluid. Small left ovarian cyst	6th-7th
xxxi	Werth	H.	23, iii, 1880. Frauenklinik, Kiel	? ?	?	?	Large unilocular cyst, right ovary	6th-8th
xxxii	R. Olshausen	H.	27, iv, 1880. Frauenklinik, Halle a/S	54 m.	?	?	Proliferating ovarian cystoma; 4½ lbs. weight	11th-18th
xxxiii	Thomas Underhill	H.	22, vi, 1880. Guest Hospital, Dudley	21 s.	0	Intense dysmenorrhoea; unable to follow occupation	Right ovary prolapsed and tender	5th-7th
xxxiv	Salmon	P. H.	12, xi, 1880. Yermenonville, near Chartres, France	26 m.	?	?	Multilocular ovarian cyst	6th-7th
xxxv	Thomas Savage	H.	14, xii, 1880. Hospital for Women, Birmingham, England	51 m.	11	?	Large right cystoma	7th-9th
xxxvi	E. Malins	P. H.	1, iii, 1881. Birmingham, England	60 s.	0	Increasing tumour; under observation 18 mos.	Multilocular ovarian cyst	8th-10th
xxxvii	Knowsley Thornton	P. H.	? iii, 1881. ? England	53 s.	0	Cyst ruptured, and tapping previously; followed by "slight threatening of tetanus"	Semi-solid left ovarian cyst; weight 25 lbs.	? -6th
xxxviii	R. Olshausen	H.	3, viii, 1881. Frauenklinik, Halle a/S	27 m.	?	?	Small proliferating cystoma	17th-19th
xxxix	James M. Bennett	H.	10, viii, 1881. Liverpool	41 ?	?	Tumour 8 years; three tappings previous to operation	Left multilocular ovarian cyst, containing 69 pints. Right ovary cystic	15th-18th

Operation, Treatment of Pedicle, &c.	Treatment.	Result and Duration of Disease.	Remarks.	Post Mortem.	Reference.
Twisted pedicle; single ligature; intra-peritoneal; pelvic adhesions	Chloroform; chloral, gr. 60; Tinct. Cannab. Ind., 3ij by enema; Ext. Physostig. fab., gr. $\frac{1}{2}$ hypoderm.	D.	4th day after operation removed to another ward; placed in strong draught	Stump undergoing normal changes; ligature tight; proximal and distal bulging	'Trans. Path. Soc., 1880, vol. xxxi, p. 7, and private comm.
Extensive adhesions to back and fundus of uterus; pedicle tied with catgut. Wire to incision	?	D. 28 hrs.	Wound healed 5th day; attack began with nausea and twitchings	Wound healthy; no peritonitis	'British Med. Journ.,' 1881, i, p. 807, and private comm.
No adhesions; catgut to long pedicle in two parts; intra-peritoneal	?	D.	Trismus first appeared in masseters	No sepsis	'Register Kiel Journ.,' 9598, 49, private comm.
No adhesions; pedicle screwed up with wire tightener; ligatured in two halves with silk; intra-peritoneal	?	D.	?	Negative	'Klin. Beiträge zur Gynæk. und Geburt,' 1884; Stuttgart, "Ovariectomien Tabelle," Fall. 90, and private comm.
3-inch incision. No adhesions; catgut to pedicle; intra-peritoneal	?	D. 40 hrs.	?	No peritonitis; wound healed; wandering leucocytes in cervical cord	'British Med. Journ.,' 1881, i, p. 808, and private comm.
Operation two days before menstruation; no adhesions; pedicle tied in two, then <i>en masse</i> and dropped in. Two harelip pins in abdomen; wound. Seven superficial sutures	?	D. 24 hrs.	Pins removed; wound quite healed; spray and Listerian precautions	No sepsis	Maunowry, in Thiriar's paper, p. 102 (<i>vide</i> Case XL).
3-inch incision. Pedicle ligatured; dropped into cavity	?	D.	No septic cases or cases of tetanus in operator's practice at time	No peritonitis; pedicle adherent to small intestine and sigmoid flexure; no changes in cord	Private comm. direct from operator.
No adhesions; broad pedicle, tied in three divisions; silk; stitches removed 6th day	Chloral, gr. xx, and morphia, gr. $\frac{1}{2}$ repeated	D. 48 hrs.	Three other cases in same locality in three months	—	'British Med. Journ.,' 1881, i, p. 509.
Omental and intestinal adhesions; ligatures to pedicle	None special	D.	Cold windy weather; violent gust of wind first started spasms	—	'Med.-Chirurg. Trans.,' 1887, vol. lxx, p. 53, and chart, Case 231.
Intimate adhesions to abdominal wall and intestines. Torsion, then ligature of stump, with silk in two portions; intra-peritoneal	?	D.	?	In stump, an abscess, size of a nut, with sweet pus	'Klin. Beiträge zur Gyn. und Geburt,' 1884, Stuttgart, Fall. 136.
Both pedicles ligatured by transfixion, and dropped into abdomen	Opium and quinine; Atrop. Sulph., gr. $\frac{1}{16}$ subcutaneous (3 doses); Extr. Physostig. fab., gr. $\frac{1}{2}$ (6); chloroform mixture, gr. ij	D. 72 hrs.	Attack ushered in with shivering; slight sore throat; erythematous blush over arms and legs; temp. 107.2°	Firm cicatrix	'Lancet,' 1881, vol. ii, p. 947.

Case No.	Operator.	Hospital or Private House.	Date and Locality of Operation.	Age M. S. W.	Ch.	Previous History.	Nature of Tumour.	Date of Onset and Termination of Tetanus.
xl	J. Thiriar	H.	13, vii, 1883. L'Hôpital St. Jean, Bruxelles	18 s.	0	—	Small unilocular ovarian cyst	6th-8th
xli	Thomas Savage	P. H.	24, v, 1884. Warwickshire	34 m.	?	—	Right ovary cystic. bleeding myoma, size of cricket ball	6th-8th
xlii	G. Consentino	H.	1, vi, 1884. Ospedale Civico, Palermo, Sicily	50 m.	5	Cessation of menstruation three years before from fright. Much pain. Tumour noticed soon after. One tapping	Multilocular cyst of left ovary, size of eight months' pregnancy	5th-7th
xlili	J. Thiriar	P.	17, xii, 1885. Brussels	45 ?	?	—	—	6th-7th
xliv	E. Börner	P. H.	? ? 1886. Gratz, Upper Styria, Austria	50 m.	?	?	Intra-ligamentous ovarian cysts	8th-9th
xl v	J. Thiriar	H.	29, vi, 1886. L'Hôpital St. Jean, Bruxelles	23 s.	0	?	Unilocular ovarian cyst	7th-8th
xlvi	Thomas Savage	H.	3, vii, 1886. Staffordshire	29 s.	0	?	Large left ovarian cystoma	17th-23rd
xl vii	J. Thiriar	P. H.	31, vii, 1886. Nivelles, Brabant, Belgium	45 s.	0	?	Multilocular ovarian cyst	6th
xl viii	Schatz	H.	7, x, 1886. Frauenklinik, Rostock, Germany	34 m.	3	Repeated attacks of hæmatocoele	Hæmatosalpinx and hæmatocoele	14th-18th
xl ix	F. H. Champneys	H.	9, xii, 1886. St. George's Hospital, London	30 s.	0	In 1881. Enucleation two fibroids; two smaller by ligature. Present tumour noticed 2 years	Nodular fibroid tumour of uterus	4th-5th
l	P. Müller	P. H.	23, vii, 1887. Berne	46 s.	0	Catamenia more copious 4 years. Metrorrhagia 2 years. Violent colic, strangury, and constipation	Intra-mural fibroid, size of foetal head	8th-9th
li	J. Kötschau	Private Ward	2, ix, 1887. Köln a/Rh., Germany	50 w.	5	Menorrhagia 5 years; acute pain 18 mos.; tumour increasing; cystitis	Fibroid size of foetal head	4th-5th
lii	Thomas Savage	P. H.	4, i, 1888. Birmingham	32 m.	0	Repeated attacks of ovaritis	Small myoma of fundus, with chronic ovaritis and tender ovaries	8th-11th
lii i	Carl Hennig	P. H.	13, viii, 1888. Privat Klinik, Leipzig	34 m.	4	Vomiting 6 mos. before. Menstrual irregularity	Two flattened colloids left ovary, incarcerated in cleft broad ligament	Immediately on closure of wound

Operation, Treatment of Pedicle, &c.	Treatment.	Result and Duration of Disease.	Remarks.	Post Mortem.	Reference.
Operation easy; no complications; intra-peritoneal	Chloral and opium; chloroform.	D. 36 hrs.	On 6th day at 10 a.m. exposed to a strong cold draught; stiffness of neck and jaws 4 p.m.	—	'Comptes Rendus du Congrès français de Chirurgie,' Paris, 2nd Session, 1886, p. 97, Obs. 1.
Short incision; left ovary small and shrivelled; both removed; intra-peritoneal	Chloral, Potass. Brom.	D.	No cases of sepsis or tetanus at time in the practice of operator	—	Private comm. direct from operator.
Firm adhesions to uterus, bladder, and floor; excision of cyst wall; edges sewn to wound. Three drain-tubes	Chloral, morphia; hot baths	D. 36 hrs.	Sutures removed 5th day; febrile course up to 3rd day; temp. then 103°; normal after	—	'Annali di Ostetricia Gin. e Ped.,' 1885, p. 389.
Ovaries removed; no difficulties; operation twenty-five minutes; intra-peritoneal	Morphia, chloral	D. 12 hrs.	Normal progress up to evening of 6th day	?	'Comptes Rendus, &c.' (Case XL), p. 98, Obs. 2.
Partial removal; clamp; no adhesions; total enucleation impossible	?	D. 24 hrs.	Normal convalescence up to 7th day	—	Private comm. direct from operator.
No adhesions; operation fifteen minutes; intra-peritoneal	Cocaine repeated frequently subcutaneously, and combined with morphia	D. 18 hrs.	Attack began with dyspnoea; great relief from cocaine	—	<i>Vide</i> Case XL, pp. 98, 99, Obs. 3.
Short incision; no adhesions; ligature to pedicle	?	D.	Left hospital 15th day well; died within week; no sepsis or tetanus in operator's practice	—	Private comm. direct from operator.
No adhesions; operation thirty minutes; intra-peritoneal	Pilocarpine injected shortly after breathing became embarrassed	D. 7 hrs.	Condition up to 6th day good	—	<i>Vide</i> Case XL, p. 99, Obs. 4.
Many adhesions; both tubes and ovaries removed; silk ligature to pedicle	Chloral and Pot. Brom.	D.	Phlegmasia after first child	—	Private comm. direct from operator.
Many adhesions; incision to left of old one; ovaries indistinguishable; abdomen closed; difficulty with sutures from muscular irritability	Morphia and Ext. Physostigm. fab. hypod.	D. about 30 hrs.	When wound was dressed shortly before death the whole central part sloughed; (?) tension; full antiseptics and spray	Organs normal; kidneys healthy, but congested	Private comm. and Hosp. Register, P. M. No. 382.
Ovaries removed; no adhesions. Ovaries normal; intra-peritoneal	Morphia as required	D. 20 hrs.	Three bad attacks; the trismus and opisthotonos most marked left side	—	Private comm. from operator's private assistant (Dr. Krumborg).
Healthy ovaries removed; silk ligatures to pedicles; stumps sprinkled with iodoform; intra-peritoneal; Listerism	Potass. Bromid.; chloroform narcosis	D. 24 hrs.	Hallucinations 4th day; trismus same evening	No peritonitis; stumps normal; visceral petechial hæmorrhages	Münchener med. Wochenschr., 1887, xxxiv, s. 855-6.
Appendages very adherent; ovaries contained small cysts; drainage-tube	Eserine	D.	Operation very difficult. No other cases of tetanus at same time	—	Private comm. direct from operator
Many adhesions; tumours gangrenous, slightly torn. India-rubber tube round base; pedicle pierced, tied. Intra-peritoneal	Oil of camphor subcutaneously	D. 6 hrs.	Trismus appeared immediately. Fæcal vomiting	—	Private comm. direct from operator

Case No.	Operator.	Hospital or Private House.	Date and Locality of Operation.	Age. M. S. W.	Ch.	Previous History.	Nature of Tumour.	Date of Onset and Termination of Tetanus.
liv	Nieberding	H.	13, xii, 1888. Riedinger's Klinik, Würzburg	? s.	?	?	Generally adherent. Right ovarian cyst. Retroverted uterus and small fibroid	9th-13th
lv	P. Horrocks	H.	4, xi, 1890. Guy's Hospital, London	46 m.	7	Increase in size 3-4 yrs. Much left-sided pain lately. Menor- rhagia	Ovarian cyst, containing cartilaginous material in cavity	7th-9th
lvi	Thomas Savage	P. H.	9, xi, 1890. Leamington	46 w.	11	?	Large left ovarian cystoma	5th-7th
lvii	John Phillips	Private Ward	21, i, 1891. Lewisham	35 m.	2	Previous operation 7, i, 1889, for (?) malignant growth and ascites; much improved	Large multilocular papillomatous cystoma right ovary. Ascites	5th-6th

Operation, Treatment of Pedicle, &c.	Treatment.	Result and Duration of Disease.	Remarks.	Post Mortem.	Reference.
Many adhesions. Rupture of cyst, but no escape of contents; right pedicle tied with silk; intra-peritoneal	Chloral (large doses) no effect. Physostigmine, with good effect at first, then cardiac failure	D.	Sutures removed 8th day; normal convalescence; tetanus followed trismus	Negative	Schmid. Inaug. Diss. 'Ueber Ovariectomie,' S. 10, 11, 16, 17, and private comm.
Omentum generally adherent over tumour; piece of omentum ligatured into pedicle; intra-peritoneal	Morphia, gr. $\frac{1}{2}$ every two hours	D. 36 hrs.	No case of tetanus inwards; attack began by numbness at occiput	Wound healed. Stump and viscera quite healthy	Private comm. direct from operator
3-inch incision; some ascites; no adhesions; ligature close to uterus; intra-peritoneal drainage-tube	Extr. physostigmat.; eserine	D.	Wound quite healed. Temperature, pulse, and general condition normal up to 5th	Distal end of pedicle gangrenous	Private comm. direct from operator
Many adhesions; stump very thick, pierced, and tied in four places, carbolic silk; intra-peritoneal. Drain-tube	Chloral; Potass. Bromid. chloroform. Extr. Physostig. fab. gr. $\frac{1}{2}$ three times subcutaneously	D. 26 hrs.	Pulse, temperature, and general condition normal up to onset of tetanus. Attack commenced with slight sore throat and stiffness left side	Wound firmly healed; stump healthy. No peritonitis; no sepsis	Present communication

ADDENDUM TO TABLE A.

*A List of Seven Cases in which full particulars as above could not be obtained.**Boinet*.¹—3 cases in a series of 77 ovariectomies.

Case lviii (2, x, 1865).—Æt. 41. Multilocular ovarian cyst; strong adhesions; clamp; death from tetanus 6th day. (Case 9 in series.)

,, lix (21, ix, 1873).—Æt. 42. Multilocular ovarian cyst; many adhesions; clamp. (Case 52 in series.)

,, lx (8, x, 1874).—Æt. 30. Performed in Paris; numerous adhesions; clamp and ligature; multilocular ovarian cyst. (Case 64 in series.)

J. Boye.²—3 cases in a series of 23 ovariectomies (1876–78).

Case lxi.—Æt. 52. No adhesions or hæmorrhage; multilocular cyst, with medium long pedicle; clamp; no drain-tube; died of tetanus on 8th day. (Case 2 in series.)

,, lxii.—Æt. 26. Adhesions. Cyst with purulent contents; long pedicle; catgut ligature, intra-peritoneal; drain-tube in lower angle of wound: died of tetanus 15th day. (Case 9 in series.)

,, lxiii.—Æt. 30. Simple cyst with serous contents; long, thick pedicle; clamp; died of tetanus 9th day. (Case 12 in series.)

Meadows.³—

Case lxiv (1884).—Æt. 49. Cyst removed without difficulty, intra-peritoneal; for 5 days kept on ice and water diet; wound healed; became restless; died on 8th day.

In 64 cases there were 61 deaths and 3 recoveries, or a mortality of 95·31 per cent.

¹ 'Maladies des Ovaries,' 1877, 2nd edition, table, p. 577.² 'Gynækologiske og Obstet. Meddelelser,' Andet Bind, 1879, p. 1.³ Private communication from Sir George Humphry.

TABLE B.
Cases in which Trismus occurred during operation.

Operator.	Date and locality.	Age.	M. S. W.	Nature of tumour.	Operation, adhesions, &c.	Result.	Remarks.	Reference.
A. J. Krasowski	Feb. 22, 1865. Frauen. Spital der Med. Chir. Acad., St. Petersburg	35	S.	Multilocular colloid cyst of left ovary	Incision 20 c.m. Pedicle short and fibrous, liga- tured in two with silk; intrapertitoneal	Died 3rd day; hæmorrhage	1 attack, trismus during operation	St. Petersburg Med. Wochensh., 1884, s. 142-3, F. 3
"	Aug. 27, 1868. Frauen. Spital der Med. Chir. Acad., St. Petersburg	35	M.	Left ovary cystic colloid; right ovary cystic	Incision 22 c.m. Pedicle fairly long, thin, and not vascular; burnt through; deep perito- neal sutures and super- ficial metal sutures	Died 4th day; entero- peritonitis	2 attacks, trismus during operation	St. Petersburg Med. Wochensh., 1884, s. 191, F. 35.

TABLE C.

A Classification of the Possible Causes of Tetanus in the 64 Cases.

1. Nerve-irritation, produced by—
 - The clamp.
 - Over-tight or irregular ligature.
 - Tension of stitches in abdominal wound, whether silk, wire, or button sutures.
 - Stretching, tearing, or ligaturing omentum.
 - "Torsion" treatment of pedicle.
 - Tearing through old and firm adhesions during operation.
 - Cicatricial contraction (more especially in connection with chronic tetanus).
2. Contagion—
 - Direct from another case of tetanus.
 - By "garden-mould" bacillus.
3. Sepsis.
4. Epidemic.
5. Endemic.
6. Miscellaneous—
 - "Tendency" to disease.
 - Predisposing nervous condition of patient.
 - Sudden nervous shock, *i. e.* noise, bad news.
 - Cold draught playing on to patient.
 - Alternating extremes of cold and hot weather.
 - Low diet after operation.

TABLE D.

*Summary of Treatment of Pedicle in 64 Cases.*I. *Extra-peritoneal:*

	Cases.
(1) Clamp to stump in Cases ii, iii, v, vi, xii, xvi, xvii, xx, xxi, xxii, xxiii, xxiv, xliv	= 13
(2) Stump fastened to wound edges in Cases i, vii, viii, xxvii	= 4
(3) Stump fastened to wound edges with application of cautery in Case xi	= 1
(4) Cyst-walls sewn to edges of wound in Case xlii	= 1
(5) Wire <i>écraseur</i> to stump in Cases ix, xv	= 2
(6) Stump brought down into vagina in Case x	= 1
(7) Combination of clamp and fastening omentum to wound in Case iv	= 1
(8) Combination of clamp with cautery to stump in Case xviii	= 1
	<hr/>
Boinet's 3 cases, lviii, lix, lx }	5
Boye's 2 cases, lxi, lxiii }	2
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	29

II. *Intra-peritoneal:*

(1) Pedicle ligatured and dropped into peritoneal cavity	= 29
(2) <i>Écrasement</i> of pedicle and then dropped into peritoneal cavity, Cases xxv, xxxii, xxxviii	= 3
(3) Exploratory incision in Case xlix	= 1
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	33
Boye's Case, lxii }	= 2
Meadows' Case, lxiv }	1
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TABLE E.

Indicating the Proportion of Ovariectomies to Cases of Tetanus occurring among European Operators.

	Total Ovariectomies.	Cases of Tetanus.
Ahlfeld (Marburg)	105	0
Börner (Gratz)	200	1
Bergesio (Turin)	38	1
Braun, Gustav (Vienna)	801	0
Conrad (Bern)	15	0
Credé (Leipzig)	30	0
Cuzzi (Pavia)	80	0
Dohrn (Königsberg)	300	0
Dolèris (Paris)	102	0
Droysen (Gottingen)	102	0
Fehling (Basle)	100	0
Fraenkel (Breslau)	125	0
Fritsch (Breslau)	710	0
Gusserow (Berlin)	450	0
Hennig (Leipzig)	30	1
Herff (Halle a/S)	10	0
Hegar (Freiburg)	600	0
Hergott (Nancy)	15	0
Hofmeier (Würzburg)	100	0
Jeannel (Toulouse)	114	0
Kochs (Bonn)	17	0
Kaltenbach (Freiburg)	400	2
Laroyenne (Lyons)	320	0
Löhlein (Giessen)	120	0
Müller, P. (Bern)	210	1
Münster (Königsberg)	48	0
Nieberding (Würzburg)	25	1
Olshausen (Berlin)	950	2
Pernice (Griefswald)	243	0
Rokitansky (Vienna)	129	0
Schauta (Prague)	300	0
Säxinger (Tübingen)	211	0
Schatz (Rostock)	200	1
Slawjansky (Petersburg)	205	1
Tibone (Turin)	30	0
Veit (Bonn)	450	0
Werth (Kiel)	229	1
Winckel (Munich)	500	0
Wyder (Zurich)	60	0
Zweifel (Erlangen)	460	2
	9134	14

The proportion of tetanus cases among ovariectomies in Europe (excluding the British Isles) is 1 in 652.43.

CHART.

Indicating the Number of Cases occurring Annually for Thirty-six years.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. iv, p. 47.)