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ARTERIAL LIGATION, WITH LYMPHATIC BLOCK, IN THE TREATMENT OF ADVANCED CANCER OF THE PELVIC ORGANS—WITH A REPORT OF FIFTY-SIX CASES.

BY

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New York City

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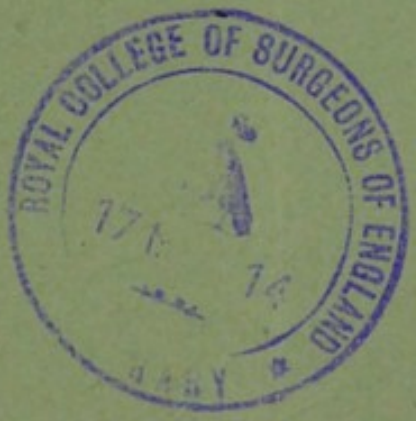

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ARTERIAL LIGATION, WITH LYMPHATIC BLOCK, IN THE TREATMENT OF ADVANCED CANCER OF THE PELVIC ORGANS—A REPORT OF FIFTY-SIX CASES.*

BY

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INTRODUCTORY REMARKS.

No more serious problem in the treatment of malignant disease presents itself to the surgeon than the management of those cases of cancer of the pelvic organs which are commonly placed in the category of the "inoperable, irremovable, and incurable." Unfortunately, a large proportion of patients seek relief when the disease has progressed beyond the Wertheim operation. The presence of enlarged glands in the pelvis renders them, in the opinion of the majority of surgeons, unsuitable cases for this procedure. They are, therefore, consigned to their pitiable fate, with absolutely no hope of cure, and with little prospect of appreciable relief.

I beg to dissent from this opinion, and from this method of dealing with these advanced cases of cancer of the pelvic organs. In the first place, it must be remembered that in many cases enlarged glands are of a purely hyperplastic character, and not cancerous. Lymphatic dissemination through attempt at removal of such glands is not a deterrent factor, and certainly such patients should not be denied the possibility of relief by operation. In the second place, even when there are enlarged cancerous glands in the pelvis, it is sometimes possible, by arterial ligation, to remove these glands *en masse*, and to proceed to do the Wertheim operation, which seemed absolutely impossible before the abdomen was opened. Furthermore, by lessening the blood supply to the cancerous tissue, and by blocking the avenues of lymphatic absorption, the progress of the disease may be re-

*Presented before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists, Providence, R. I., September, 1913.

tarded, pressure and other symptoms mitigated, and the danger of death from hemorrhage removed, where removal of the cancer mass is impossible. In addition to this, there is a possibility of correcting other conditions which may be superimposed upon, or which may complicate, the cancer.

Arterial ligation, with lymphatic block, in my opinion, is always to be considered in advanced cancer of the pelvic organs, before pronouncing the case inoperable. In a previous communication* I outlined briefly the history of arterial ligation, tracing the evolution of the procedure as applied to advanced pelvic cancer. The technic, as I have adapted and amplified it, was given, and a series of twenty-four cases tabulated. Since the publication of that report I have continued to test the method whenever it seemed to be indicated. The present communication is in the nature of a further report, with additional cases.

INDICATIONS.

It is not to be inferred that arterial ligation with lymphatic block is advocated in all cases of advanced cancer which are no longer amenable to the usual surgical methods for the removal of cancer of the pelvic organs. It may be indicated under the following circumstances:

(1) When hemorrhage, which threatens death, cannot be controlled by other measures.

(2) When hemorrhage has been sufficiently severe or frequent to warrant the fear of fatal return at any time.

(3) When hemorrhage is sufficient to cause a constant drain on the patient's vitality.

(4) When the disease is so extensive as to render curettage dangerous because of hemorrhage.

(5) When there is reason to believe that by controlling, to a certain extent, the progress of the disease, the pain, fetor and discharge may be lessened.

(6) When it is possible, by this means, to relieve various pressure symptoms.

(7) When, in the presence of advanced cancer of the pelvic organs, other conditions which may not be directly due to the cancer call for exploratory laparotomy.

(8) When, in cases seemingly too far advanced for total extirpation with hope of permanent cure, there is yet a possi-

*Arterial Ligation for Irremovable Cancer of Pelvic Organs—Technic Adapted and Amplified. *Woman's Med. Jour.*, April, 1911.

bility that life may be prolonged and suffering relieved, and in some cases radical cure effected. Case 26 is an illustration of this.

(9) When all other measures have failed to give any relief from the symptoms in the given case, when the patient demands that something more be done, and when there is any hope of mitigating suffering or prolonging life.

PURPOSES OF THE OPERATION

The particular application of arterial ligation under discussion is made only in cases of irremovable cancer, and is not to be confounded with ligation employed solely for the purpose of controlling hemorrhage in removable cancers of the pelvis. The term "starvation ligature" has been applied to the procedure when instituted for the starvation of maligant tissue which cannot be safely removed. To the starvation by the cutting off or reduction of the blood supply to the diseased area has been added thorough and complete lymphatic block, which further aids in checking the ravages of the disease. The essential purposes of the combined procedure are:

(1) *To diminish the blood supply to the area of cancerous involvement* by the ligation of the following vessels, or such of them as the individual case seems to require: (a) internal iliacs; (b) ovarians; (c) sacra media. In this way the malignant process is retarded and the bulk of diseased tissue tends to lessen in size in consequence of the decreased blood supply.

(2) *To shut off the avenues of absorption of cancer cells and toxic material* by removing the lymphatic glands and vessels from the receptaculum chyli to the obturator foramen on both sides. The dissemination of the cancer may thus be checked and cachexia delayed or greatly diminished.

In addition to these, the following subsidiary purposes render the operation advantageous:

(3) *To establish positively whether or not a case of advanced cancer is of the irremovable type,* or whether complications, not of a cancerous nature, render the malignant factor seemingly more serious than it is *per se.*

(4) *To remove ovaries and parovarian tissue,* thus eliminating organs, which in themselves, when diseased, quite apart from the cancer, may give many of the symptoms associated with advanced cancer of the pelvic organs.

(5) *To correct complications,* such as kinking of the intestines, adhesions of an inflammatory or evolutionary origin, which may act as mechanical obstructions, etc.

(6) *To correct, if possible, malposition of the uterus,* should this exist. When the uterus is out of position it may, by pressure, cause the symptoms of cancer to be greatly increased in severity.

(7) *To free the ureters,* from the brim of the true pelvis down to the bladder. Sometimes, because of adhesions, beginning hydronephrosis will be found and relieved by freeing the ureters.

(8) *To render more advantageous the application of adjuvant and palliative measures.* With other conditions corrected, the uterus may be curetted, thermocoagulation, thermoradiotherapy, electrocautery, acetone, etc., may be employed.

TECHNIC.

The steps of the operation may be given categorically, as they apply to the average case:

(1) *Laparotomy.*—The abdomen is opened by an incision made a little to the right or left of the median line, the cut being carried quickly through all the tissues, except the rectus, which is drawn to one side, down to the peritoneum. The abdominal cavity having been opened, the patient is placed in the Trendelenburg position. The intestines are displaced toward the diaphragm, in order to give free access to the pelvis, being dyked off with warm pads.

(2) *Ligation of Ovarian Arteries, with Double Oophorectomy.*—The ovarian arteries are ligated just above the brim of the pelvis, one place being sufficient. Pagenstecher thread or strong silk is used for this purpose. The upper part of the broad ligament close to the uterus, with the Fallopian tube, is tied off as well. The ovary, tube and upper part of the broad ligament, including the parovarian tissue, are exsected.

(3) *Incision of Peritoneum on Posterior Wall of Abdomen.*—This is accomplished by a curved incision extending from one internal iliac artery to the other, with the convexity upward, and prolonged downward along the top of the broad ligament, already divided in the preceding step of the operation. As a rule this gives free access to all the retroperitoneal structures in the pelvis.

(4) *Ligation of Internal Iliac Arteries.*—The internal iliac artery of each side is ligated in turn. The artery is carefully

separated from its vein and ligated in two places. The first ligature is placed just below the bifurcation of the common iliac, and the second is placed half an inch below the first. With a large plain clamp the artery is crushed between the two ligatures.

(5) *Ligation of the Common Iliac Artery.*—One may be forced, unexpectedly, to ligate the common iliac artery. An advanced atheromatous condition of the vessel, with beginning erosion due to softening of the glands at the bifurcation, may render it necessary to ligate the common iliac just above this point in order to obviate the danger of rupture. This procedure, of course, is to be resorted to only in such unforeseen emergencies. In Cases 12 and 24 of my first series the common iliac of the right and left sides, respectively, was ligated just above the bifurcation, with no unfavorable symptoms in either case.

(6) *Ligation of the Uterine Arteries.*—If it can be accomplished without cutting into cancerous tissue, the uterine arteries may be ligated.

(7) *Ligation of the Obturator.*—What has been said with reference to the uterine applies likewise to the obturator.

(8) *Ligation of the Sacra Media.*—If large enough to warrant it the sacra media is next ligated. One ligature is sufficient for this.

(9) *Lymphatic Block.*—Either before or after this ligation operation the glands along the iliacs are removed *en masse,* if possible, from the receptaculum chyli to the obturator foramen. The glands situated within and around the obturator foramen are removed. I have without difficulty removed the glands in this locality, taking them out *en masse* and placing a hot pad over the area. If any of the glands are so softened that there is danger of breaking them and soiling the peritoneum, the operator must choose between the two evils—leaving them to early break down themselves, or taking them out and running the risk of rupturing them, thus soiling the peritoneum. The danger of this contamination is slight if one is careful to pad off the rest of the peritoneum, and to carefully approximate the edges of the peritoneal wound, covering over the raw surfaces.

(10) *Correction of Accompanying Pathological Conditions.*—After completion of the ligation and removal of the lymph structures, all accompanying pathological conditions are corrected as far as possible and in proper sequence. A great deal more can

sometimes be accomplished surgically than seemed possible before opening the abdomen. The uterus may be extirpated in some cases where such a procedure seemed impossible before laparotomy. Volvulus, "kinks" and other abnormal conditions of the intestine, causing obstructive and other symptoms, may be discovered and corrected upon opening the abdomen for purposes of ligation. In many cases the victim of cancer may suffer coincidentally with non-malignant disease of the ovaries and tubes. Removal of these diseased structures may relieve the symptoms, the patient having cancer but not as yet suffering directly from it. There is no reason why a woman should be handicapped by displacement or disease of the ovaries and tubes just because she is the victim of cancer. She should be relieved if possible of these conditions despite the cancer. The ovaries, therefore, should be removed. This is done for the following reasons: (1) In accordance with Beatson's theory of the presumptive influence of ovarian irritation upon the cancer process. (2) An otherwise normal ovary may be subjected to a degenerative process as a result of pressure irritation by the cancer, or by adhesions later in the course of the disease, giving rise to additional preventable discomfort. (3) By cutting away the upper part of the broad ligament, in the removal of the ovary, a certain amount of collateral circulation is shut off, thus facilitating the lessening of the blood supply to the cancer.

(11) *Closure of the Abdominal Wall.*—The posterior layer of peritoneum is closed, the intestines and omentum are replaced in position, and the anterior layer of peritoneum is brought together with a few simple stitches. The abdominal wall is then closed with through-and-through sutures of silkworm-gut or silk thread, *en masse,* for purposes of expedition.

(12) *Curettage.*—After the abdomen is closed the patient is placed in the lithotomy position and thorough curettage, by the Byrne or other method, may be resorted to when circumstances warrant. With the arteries ligated as above described, the uterus may be curetted to a shell without danger of hemorrhage. Zinc chloride or acetone may be applied to the interior of the uterine cavity, or, if feasible, thermocoagulation may be employed.*

*Bainbridge: (1) "The de Keating-Hart Method of Fulguration and Thermo-radiotherapy," *Medical Record,* July 6 and 20, 1912; (2) "Fulguration and Thermo-radiotherapy." *The Jour. of Advanced Therapeutics,* January, 1913.

See also *The International Clinics,* September, 1913, and the *Reference Handbook of Medical Sciences,* September, 1913.

Curettage and the adjuvant measures mentioned may be employed immediately after the ligation operation, or a week or ten days later, by which time the tissues will be much more contracted. I prefer the latter.

SPECIAL POINTS TO BE OBSERVED.

Success or failure in arterial ligation with lymphatic block is dependent upon various factors—the extent of the disease, the patient's general state, and the complicating pathological conditions. Aside from all these, however, success is largely dependent upon certain points of technic which should be borne in mind:

(1) *Adhesions.*—If cancerous adhesions are very extensive, so that it is necessary to break them up in order to reach and ligate the vessels, the operation is contraindicated. Extensive adhesions sometimes result from old inflammation, and may have no relation to the cancer so far as their origin is concerned. Inflammatory adhesions may be safely dealt with and the vessels ligated. It is important, therefore, to differentiate between malignant and non-malignant adhesions.

(2) *Cicatricial Contractions.*—Cicatricial contractions in the diseased tissue frequently cause pressure upon the ureter, which otherwise may not be involved in the malignant process. In such event the ureter may be stripped up, without breaking the cancerous adhesions, thus relieving the pressure in the neighborhood. If the ureter is directly involved in the cancer this does not apply. Separation of the ureter is accomplished by inserting the finger or an instrument between it and the connective tissue which lies over the cancerous tissue, carefully working the ureter free.

(3) *Occlusion of Ligated Artery.*—The entire success of the operation may be nullified by failure to occlude the vessels ligated. Complete closure is rendered certain by ligating in two places and crushing the artery between the two ligatures.

(4) *Hemostasis.*—Absolute hemostasis is important. Oozing from the veins may be controlled with pads dipped in hot saline solution and left in place on one side while attending to the other.

(5) *Removal of Glands.*—In dealing with suspicious glands situated directly in contact with large blood-vessels, one must

be careful to ascertain whether they are softened underneath, while apparently normal on the surface. Failure to note such conditions may lead to rupture of an underlying or contiguous blood-vessel, or to the soiling of the peritoneum by the breaking of such softened glands.

(6) *Injury to Iliac Vein.*—Care must be taken not to injure the internal iliac vein, which lies just to the mesial side and behind the artery. This is the greatest danger of the operation.

CLINICAL APPLICATION.

As previously stated, the operation of arterial ligation with lymphatic block is distinctly a procedure for advanced cancer of the pelvic organs, in which the disease has progressed to such a stage that complete removal is impossible. However, if the method were employed earlier in the course of malignant development better results would doubtless be obtained. Latterly I have had recourse to this procedure earlier than formerly, and in such cases the results have been very satisfactory. When the cancer has become disseminated, especially when it has progressed to the stage characterized by vesicovaginal or rectovaginal fistula, it is too late to hope for very much. In Case 43, however, a patient with vesicovaginal fistula was alive and able to work seven months after operation. The tendency should be toward an earlier rather than a later application of the method.

Cases of advanced cancer in the wards at the New York Skin and Cancer Hospital in which ligation has been employed have been compared with others at the same time in which it has not been resorted to, and it has been found that in the former the patients are far more comfortable, and progress much more satisfactorily than the latter.

CASES.

The appended table completes a series of fifty-six cases in which arterial ligation with lymphatic block has been employed in advanced cancer of the pelvic organs. The first series of twenty-four cases is summarized here, as previously published.* It is to be remembered that the majority have had their death warrant read to them, so to speak, more than once, that they are stupified with sedative drugs, and that they are practically left without hope of relief except that which comes with death.

*Op. cit.

SUMMARY OF RESULTS IN THE FIRST SERIES OF TWENTY-FOUR CASES

Case number	I. Length of life after operation.	II. Effect upon symptoms	III. Apparent effect upon growth	IV. Effect upon hemorrhage	Remarks
1	Four years, four months	Improved	Retarded	None present	I. Barring three patients who died within four days of the operation, and three who were not seen after discharge from hospital, the length of life varied from seven weeks to four years and four months; eight of this number living eight months and more.
2	Seven weeks	Improved	Doubtful	None present	
3	Six months	Improved	Retarded	None present	
4	Three days	Negative	Negative	Controlled	
5	Seven months	Improved	Retarded	None present	
6	Five months	Improved	Doubtful	None present	
7	Six months	Improved	Retarded	None present	
8	Six months	Improved	Retarded	Controlled	
9	Ten months	Improved	Doubtful	Controlled (after second operation.)	
10	Ten months	Improved	Retarded	Controlled	
11	Five months	Improved	Retarded	Controlled	
12	Unknown	Improved	Doubtful	None present	
13	Two months	Improved	Doubtful	Controlled	
14	Ten months	Improved	Doubtful	Controlled	II. In twenty cases there was improvement in symptoms.
15	Fifteen months	Improved	Retarded	Controlled (slight hemorrhage toward last.)	
16	Four days	Negative	Negative	None present	III. Growth was apparently retarded in ten cases doubtful in nine cases; negative in four cases.
17	Eight months	Improved	Doubtful	Controlled (considerable hemorrhage one month before death.)	
18	Three months	Improved	Negative	Controlled	
19	Eleven months	Improved	Retarded	Controlled	IV. Hemorrhage was not present in 10 cases; controlled in fourteen cases.
20	Eleven months	Improved	Retarded	Controlled	
21	Five months	Improved	Retarded	Controlled	
22	Four days	Negative	Negative	None present	
23	Unknown	Improved	Doubtful	Controlled	—
24	Unknown	Improved	Doubtful	None present	

Note.—Of the above series four patients were traced up to 1911. Of these, No. 1, operated September 26, 1906, was alive and well* March 12, 1911; No. 19, operated March 12, 1910, was alive and well March 12, 1911; No. 20, operated upon March 14, 1910, was alive March 6, 1911, but has died since; No. 21, operated March 14, 1910, was alive and well February 24, 1911. Attempts made in December, 1912, to trace these patients proved futile except in No. 20.

*Unless otherwise indicated, "well" refers to the condition as reported by the patients. They are kept as nearly as possible ignorant of the real condition, and in many cases so far as they know are "well."

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks.
25	Mrs. G. H.	34	Private	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 19, 1910	Carcinoma of uterus; extension to other pelvic organs Panhysterectomy (Wertheim).	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Nov. 2, 1911	General condition improved for months.
26	Mrs. C. S.	56	Private	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 26, 1910	Extensive cancer of uterus. Enlargement of pelvic glands. Chronic appendicitis. Panhysterectomy (Wertheim); appendectomy.	Internal iliacs. Ovarians. Sacra media.	1. Entirely relieved 2. Checked entirely 3. Checked entirely 4. Controlled. 5. Apparently cured. 6. Markedly improved.	Discharged, Dec. 26, 1910. Living, July 1, 1913.	Complete abatement of symptoms. Has gained 20 pounds in weight. Perfectly well at present time.
27	Miss I. R.	54	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 7, 1910	Seemingly too advanced for the Wertheim operation. Pelvic glands involved.	Internal iliacs. Ovarians. Uterines.	1. Entirely relieved 2. Entirely checked 3. Entirely checked 4. Completely controlled.	Discharged, Jan. 21, 1911. Living, July 1, 1913.	Amputation of breast and removal of axillary glands three weeks after ligation

						Coincidental cancer of left breast, with enlarged glands in axilla. After ligation and lymphatic block, panhysterectomy (Wertheim).		5. Apparently cured. 6. Markedly improved.		operation. All symptoms abated. Well after two years and a half.
28	Mrs. G. D.	63	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 10, 1910	Carcinoma of uterus. Sigmoid adherent to broad ligament. After ligation and lymphatic block it was possible to perform the Wertheim operation.	Internal iliacs. Ovarians.	1. Negative. 2. Negative 3. Negative. 4. Negative except venous oozing. 5. Negative. 6. Negative.	Died, Dec. 12, 1910.	Died of pneumonia and nephritis. Cause of death entirely independent of cancer. Condition of abdomen perfectly satisfactory.
29	Mrs. B. I.	32	Skin and Cancer.	1. Carcinoma of pelvic viscera. (recurrent). 2. Carcinoma.	Jan. 16, 1911	Very advanced recurrent carcinoma of pelvic viscera; contraction, causing obstruction of both ureters. By stripping up the ureters beginning hydronephrosis was relieved. Panhysterectomy (Wertheim) previously performed.	Internal iliacs.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Doubtful. 6. Improved.	Discharged, Feb. 1, 1911. Moved away, not heard from since.	Discharged in very much better condition than when admitted to hospital. Diseased parts very much contracted. Pain in back, over kidneys, entirely relieved.

*The technic, including double oophorectomy, was performed as per description unless otherwise specified.
An inventory was taken of the cases July 1, 1913. Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks.
30	Mrs. A. K.	68	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Jan. 21, 1911	Carcinoma of cervix and body of uterus. Panhysterectomy (Wertheim).	Internal iliacs. Ovarians.	1. Negative. 2. Lessened. 3. Lessened. 4. Controlled. 5. Negative. 6. Negative.	Died, Jan. 30, 1911.	Considerable shock; died of nephritis and endocarditis. Surgical condition entirely satisfactory.
31	Mrs. A. L.	47	Skin and Cancer.	1. Carcinoma of uterus, ovaries, tubes. 2. Carcinoma.	Mar. 27, 1911	Carcinoma of uterus irremovable. Both ovaries badly cystic.	Internal iliacs. Ovarians. Sacra media.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked 6. Improved until few weeks before death.	Died, Nov. 5, 1911.	Considerable hemorrhage before operation; none after operation. Lived seven months and nine days in comparative comfort.
32	Mrs. A. R.	35	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 3, 1911	Cancer of uterus. Cervix and walls of vagina involved.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Apr. 27, 1911. Living, May 15, 1912. Lost sight of.	Marked improvement in all symptoms. Living in comparative comfort, when last seen, one year after operation.

33	Mrs. M. F.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 24, 1911	Extensive carcinoma of pelvic organs with hyperplasia of glands. Both ovaries the seat of noncancerous inflammation evidently causing great deal of pain.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Sept. 25, 1911.	Patient was rendered more comfortable after operation, particularly with regard to pain.
34	Mrs. A. F.	61	Skin and Cancer.	1. Carcinoma of pelvic viscera with extension to abdominal viscera. 2. Carcinoma.	Feb. 8, 1912	Extensive involvement of pelvic organs. Irremovable.	Internal iliacs. Ovarians.	1. Negative. 2. Lessened. 3. Lessened. 4. Controlled. 5. Negative. 6. Negative.	Died, Feb. 11, 1912.	Died of pneumonia. Too advanced for operation, but patient begged that operation be done as nothing else gave her relief.
35	Mrs. L. F.	54	Skin and Cancer.	1. Carcinoma of uterus, ovaries, tubes and broad ligaments. 2. Carcinoma.	Feb. 15, 1912	Irremovable cancer of uterus; large ulcerating mass in pelvis.	Internal iliacs. Ovarians.	1. Controlled. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Jan. 25, 1913.	Patient lived about a year after operation. Died not knowing she had cancer.
36	Mrs. J. P.	54	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 1, 1912	Irremovable carcinoma of uterus and contiguous structures. Bladder and rectum involved.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, May 24, 1912.	Considerable bladder pain, with almost continuous hemorrhage. Operation imperative on account of hemorrhage.

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks.
37	Mrs. T. K.	44	Skin and Cancer.	1. Carcinoma of pelvic viscera. 2. Carcinoma.	Apr. 15, 1912	Extensive involvement of pelvic viscera. Carcinoma right groin. Ovaries and appendix badly diseased (noncancerous). Ovaries and appendix removed.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died latter part of May, 1913.	Lived in fair condition. Able to be up and about for more than a year.
38	Mrs. B. P.	50	Skin and Cancer	1. Carcinoma of uterus, cervix, broad ligaments and intestine. 2. Carcinoma.	May 3, 1912	A large carcinomatous mass involving uterus, cervix, broad ligaments and intestine. Irremovable.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. None present. 5. Negative. 6. Negative.	Died, May 13, 1912.	Died of pneumonia and nephritis.
39	Mrs. R. G.	51	Skin and Cancer.	1. Carcinoma of uterus.	June 25, 1912	Irremovable carcinoma of uterus.	Internal iliacs. Ovarians.	1. Relieved. 2. Lessened.	Discharged, July 18, 1912.	Living one year after operation.

				2. Carcinoma.		Both ovaries involved in adhesions of inflammatory character.		3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Living, July 1, 1913.	Able, July 1, 1913, to do light housework.
40	Mrs. H. S.	41	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	June 30, 1912	Extensive involvement of uterus and contiguous structures. Irremovable. Left ovary badly diseased; noncancerous adhesions.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, July 9, 1912. Living, Jan. 1, 1913. Lost sight of.	Discharged in good condition. Living six months after operation, feeling very well. So far as patient knows is free from cancer.
41	Mrs. A. McC.	35	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 14, 1912	Extension of carcinoma to broad ligaments. Pelvic glands greatly enlarged. Ovaries and tubes badly diseased (noncancerous).	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. No change.	Died, Feb. 23, 1913.	Confirmed morphine habit before admission. Few weeks before death became insane and was removed to Bellevue Hospital.
42	Mrs. J. B.	38	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 18, 1912	Irremovable carcinoma of uterus. Marked obstruction of ascending colon. Obstructions corrected.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Dec. 16, 1912. Living, July 1, 1913.	Patient better in every way. Hemorrhage ceased. At present doing light housework.

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks.
43	Mrs. D. C.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 25, 1912	Advanced cancer of uterus. Metastasis in bladder, broad ligaments, and pelvic lymphatic nodes. Vesicovaginal fistula. Ovaries diseased.	Internal iliacs. Ovarians. Sacra Media.	1. Entirely relieved. 2. Practically controlled. 3. Practically controlled. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Dec. 25, 1912. Living, July 1, 1913.	General condition excellent; has gained in weight, able to go to work, wearing a support, since leaving hospital. Comfortable excepting for leakage from bladder. Persistent in desire to have urine controlled. Marked cachexia entirely gone.
44	Mrs. S. M.	52	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 30, 1912	Irremovable carcinoma of uterus. Adhesions between uterus and sigmoid corrected.	Internal iliacs. Ovarians.	1. Mitigated. 2. None present. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Discharged, Jan. 25, 1913. Living, July 1, 1913.	General condition very much improved after operation.

45	Mrs. C. D.	36	Skin and Cancer.	1. Pronouncedly malignant tumor (carcinoma?) in cul-de-sac of Douglas, involving uterus and rectum. 2. Studied by several pathologists; classification to be determined; several tentative opinions.	Jan. 9, 1913	Tumor filled cul-de-sac of Douglas, involving rectum and cervix. Small intestine adherent to uterus. Intestine freed and raw surfaces turned in. Panhysterectomy, removing an inch and a half of vagina and a small portion of anterior wall of rectum size of silver dollar. Enlarged glands in pelvis removed.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Entirely relieved. 3. Entirely relieved. 4. None present. 5. Checked, apparently. 6. Greatly improved.	Discharged, Feb. 13, 1913. Living, July 1, 1913.	Patient feels "perfectly well," has gained in weight, all symptoms have disappeared, and there are no signs of recurrence.
46	Mrs. A. F.	40	Private	1. Carcinoma of rectum. 2. Character not determined; studied by several pathologists; several tentative opinions given. (Malignant adenoma?)	Jan. 21, 1912	Mass size of hen's egg in cul-de-sac of Douglas, involving cervix in front and rectal wall behind. Piece of anterior wall of rectum about two inches square removed. Wertheim operation.	Internal iliacs Ovarians.	1. Entirely relieved. 2. None present. 3. Checked. 4. Controlled. 5. Checked. 6. Markedly improved.	Living, July 1,	Perfectly well at the present time.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks
47	Mrs. F. C.	62	Skin and Cancer.	1. Carcinoma of pelvic viscera. 2. Carcinoma.	Jan. 23, 1913	Carcinoma of pelvic contents. Uterus irremovable. Ovaries and tubes previously removed.	Internal iliacs	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Unchanged.	Discharged, Mar. 22, 1913. Living, July 1, 1913.	Some abatement of symptoms, but general condition about the same.
48	Mrs. G.M.W.	55	Skin and Cancer.	1. Carcinoma of uterus and bladder. 2. Carcinoma.	Feb. 3, 1913	Carcinoma of uterus base of bladder. Sigmoid, which was attached to cancerous mass below, dissected away, and a piece about 1 1-2 inches in diameter removed.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Doubtful. 6. Unchanged.	Discharged, Mar. 16, 1913. Living, July 1, 1913.	Some abatement of symptoms, but general condition about the same.

49	Mrs. M. D.	52	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 6, 1913	Uterus hard and firmly fixed; irremovable.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Mar. 20, 1913. Living, July 1, 1913.	Able to be up and to do light housework.
50	Miss I. S.	52	Skin and Cancer.	1. Carcinoma of rectum; fibroid of uterus. 2. Carcinoma of rectum; fibroid of uterus.	Feb. 17, 1913	Extensive carcinoma of rectum; fibroid of uterus. Panhysterectomy. Resection of rectum and sigmoid.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Living, July 1, 1913.	In Hospital at present time, July 1, 1913. Up and about; gaining slowly. Some incontinence of feces, but no fetor or discharge due to cancer.
51	Mrs. E. McL.	47	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 20, 1913	Carcinomatous mass involving vagina, base of bladder and pelvic viscera.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Mar. 10, 1913. Living, July 1, 1913.	Bed-ridden before operation; now able to be up and to do light housework.
52	Mrs. E. M.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 24, 1913	Irremovable cancer of uterus, adherent to bladder and rectum. Tubes. ovaries and appendix badly diseased, but not with cancer. Removed.	Internal iliacs Ovarians.	1. Entirely removed. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, May 29, 1913. Living July 1, 1913.	"Well,' at the present time. Does not know she has cancer.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block.	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks
53	Mrs. V. B.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Mar. 27, 1913	Irremovable carcinoma involving vagina, rectum and broad ligaments. Many abdominal adhesions. Almost complete intestinal obstruction.	Internal iliacs. Ovarians.	Negative.	Died, Mar. 30, 1913.	Died of nephritis, uremia, and endocarditis.
54	Mrs. G. S.	55	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 21, 1913	Advanced carcinoma of uterus, base of bladder and broad ligaments. Irremovable.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, May 22, 1913. Living, July 1, 1913.	Perfectly "well" at present time, so far as patient knows.

55	Mrs. I. C.	56	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 28, 1913	Advanced carcinoma of uterus and pelvic glands; cystic ovary; intestinal adhesions; involvement of base of bladder and walls of vagina.	Internal iliacs Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Discharged, May 15, 1913. Living, July 1, 1913.	Patient has returned to work, in very much better condition than before operation.
56	Mrs. M. W.	68	Private	1. Carcinoma of uterus. 2. Carcinoma.	May 10, 1913	Inoperable cancer of uterus; various adhesions ligated and divided. Appendectomy.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Living, July 1, 1913.	Elevation of temperature before operation due to septic absorption. Now very much better.

SUMMARY OF RESULTS.

Case number	Length of life after operation	Effect upon symptoms	Apparent effect upon growth	Effect upon hemorrhage
25	One year	Improved	Retarded	Controlled.
26	Two years and six months.	Entirely relieved	Retarded	Controlled.
27	Two years	Entirely relieved	Retarded	Controlled.
28	Two days	Negative	Negative	Negative.
29	Five months	Improved	Doubtful	Controlled.
30	Nine days	Doubtful	Negative	Controlled.
31	Seven months	Improved	Retarded	Controlled.
32	One year	Improved	Retarded	Controlled.
33	Five months	Improved	Retarded	Controlled.
34	Three days	Doubtful	Negative	Controlled.
35	Eleven months	Improved	Retarded	Controlled.
36	Two months	Improved	Retarded	Controlled.
37	Thirteen months	Improved	Retarded	Controlled.
38	Ten days	Improved	Negative	None present.
39	One year	Improved	Retarded	Controlled.
40	One year	Improved	Retarded	Controlled.
41	Two months	Improved	Retarded	Controlled.
42	Seven months	Improved	Retarded	Controlled.
43	Seven months	Entirely relieved	Retarded	Controlled.
44	Six months	Improved	Retarded	None present.
45	Six months	Improved	Retarded	None present.
46	Five months	Entirely relieved	Retarded	Controlled.
47	Five months	Improved	Retarded	Controlled.
48	Four months	Improved	Doubtful	Controlled.
49	Four months	Improved	Retarded	Controlled.
50	Four months	Improved	Retarded	Controlled.
51	Four months	Improved	Retarded	Controlled.
52	Four months	Improved	Retarded	Controlled.
53	Three days	Negative	Negative	Negative.
54	Two months	Improved	Retarded	Controlled.
55	Two months	Improved	Retarded	None present.
56	Six weeks	Improved	Retarded	None present.

REMARKS.

I. Barring five patients who died within from two to ten days after the operation, the length of life varied from two months to two years and six months. Two lived two years; five lived one year and more.

II. The effect upon the symptoms was negative in two cases; improved in twenty-four; doubtful in two; entirely relieved in four.

III. The growth was apparently retarded in twenty-five cases; doubtful in two; negative in five.

IV. Hemorrhage was controlled in twenty-five cases; negative in two; none present in five. In the cases in which the result was negative there was slight venous oozing, but no real hemorrhage.

Note.—Of the thirty-two cases comprising the second series twelve died, three were lost sight of, and seventeen were living July 1, 1913.