

TWO HUNDRED AND TEN FIBROID TUMORS TREATED BY RADIUM¹

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THE life history of a uterine fibroid tumor has been the object of many careful studies and is well known. These tumors possess three striking clinical characteristics: they can nearly always be labeled benign; they usually give trouble either by compressing the neighboring organs, or by hæmorrhage, which is common; the incidence of malignancy is small, and the presence of carcinomatous or sarcomatous changes can almost always be excluded by a thorough curettage and the microscope.

We find also sometimes complicating diseases of the uterine tubes and the ovaries, or some other incidental abdominal abnormality, such as appendicitis, gall-stones, gastric ulcer, etc. These complications are revealed by a thorough examination and a careful consideration of the history. In cases of persistent pain or disturbance of function in some abdominal organ, a complication can be assumed. We conclude, therefore, that in a vast majority of cases, it is not difficult to determine by a careful preliminary investigation when we are dealing with a fibroid growth of the uterus, pure and simple.

The only effective method of treating fibroid tumors until recently has been the surgical, developed with such care through two generations from the days of Burnam,

Kimball, Atlee, Stimson, Baer, Keith, and Price, down to the present, until the operation has become in skilled hands one of the safest of our major procedures. Taking an average of all operations, however, throughout the country, as they are handled by the skilled and the unskilled, the risk to life and health is still considerable even in the simple cases; it is greatly increased in infected sloughing tumors, and somewhat enhanced where the hæmoglobin is below 30 per cent. In both skilled and unskilled hands there is the ever-present dread of cardiac embolism, often occurring about the time the patient is superintending the packing of her grip, happy in the anticipation of the home welcome; truly a tragic ending. With skill or without it, in lesser or in greater degree, hysterectomy is followed in a considerable proportion of cases by a protracted convalescence and untoward sequelæ in the shape of post-operative suppurations, adhesions, hæmatomata, infections of the cervical stump, ventral hernias, and prolapse of the vaginal vault.

Even where there is no complication following the hysterectomy, there still remains the disagreeable and painful hospital experience, while it is rare for the patient to be able to take up her routine burdens of life under several months. This, coupled with

¹ Presented before the American Gynecological Society, Philadelphia, May 16-18, 1918.

the unavoidable indictment that it is after all a mutilating operation, tends to make welcome some better substitute procedure.

With these objections in mind, my position in the past in the matter of the surgical treatment of these tumors has been not to interfere, when the growth was not causing pain or discomfort through pressure, nor reducing the patient through hæmorrhage, but to wait and watch. When the tumors grew rapidly and bled excessively, or where pain and pressure symptoms were pronounced, I have recommended operation.

In this way I have operated upon about two thousand women. If then, I have radically changed my viewpoint, and come before you with another non-surgical method of treatment, you will realize that I must at least be under the conviction that I have discovered a better and a safer course.

I present today a list of all cases, which Curtis F. Burnam and I have treated with radium, with the declaration that it has favorably affected almost every uncomplicated fibroid tumor of whatever size we have had to deal with.

Let me state the contentions of my thesis dogmatically, and declare that we have accomplished by the radium treatment:

1. Control of hæmorrhage and the checking of menstruation.
2. The shrinkage of the tumors.
3. In many instances the disappearance of the tumors.
4. In some cases (even after two years) the return of menstruation, either normal or scanty.

There has been no mortality causally associated with our 210 consecutive radium treated cases; and 21 of these patients could not have been operated on without great danger owing to serious systemic complications. Tuberculosis was present in 2; nephritis in 4; heart disease in 9; profound anæmia in 4; diabetes in 1; bronchiectasis in 1. Some instances of extreme corpulency might be added to this list.

As justifying these claims, I present the following 210 cases of uterine fibroid treated with radium between March 23, 1913, and January 12, 1918.

Of the 210, 146 were 40 years of age and over, and 64 were under 40. Let me note that, contrary to the experience of X-ray therapists, we find it just as easy to treat effectively young women as those who are older.

In addition to this list of 210, there were 45 patients admitted to the hospital during the same period where a surgical operation was elected. A few of the earlier patients, although there were no contra-indications to radiation, demanded operation; or the physician chose operation, owing to the comparative novelty and uncertainty as to final result of the radium treatment. In the remainder there was some complicating condition. The cases excluded from radiation were:

Ovarian cyst.....	9
Appendicitis.....	7
Pelvis choked by big tumor, and intra-uterine radiation impossible.....	6
Severe pain.....	5
Adhesions.....	4
Operation preferred.....	4
Myomectomy to preserve uterus, menstruation, and the possibility of conception in young women.....	2
Gall-stones.....	2
Pelvic inflammatory disease.....	2
Cæsarean section.....	1
Right inguinal hernia.....	1
Prolapse.....	1
Extra-uterine pregnancy suspected.....	1
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Total.....	45

Today in the light of our greater experience not all of these 45 would be excluded from radiation. It is now always possible, for instance, to treat through the abdomen the large tumors, which choke the pelvis and make an intra-uterine radiation difficult or impossible. Many cases complicated by adhesions and pain are relieved of these symptoms as well as of the tumor and the bleeding. A minor operation, such as the repair of an outlet or even the removal of an appendix, can be carried out in conjunction with the radiation. Then, too, in a young woman it is sometimes possible to radiate away a fibroid and still preserve the possibility of conception.

Where there is doubt about the diagnosis, operation is to be elected as preferable to radiation.

ANALYSIS OF GROUPS

Group 1. Taking up the first group of 146 patients, who were 40 years of age and over, with uterine fibroid tumors, 66 are at the present time cured, in the sense that the tumor has either completely disappeared, or is shrunken to such an insignificant size as to be negligible.

In 48 the tumor has markedly diminished and the symptoms, such as pressure, hæmorrhage or pain, have been relieved. This second division of our group is not static, as with the lapse of time its more recent members are constantly passing over into the first division; it is two-thirds made up of recent cases, occurring within the past two years, where radium has not had time to exert its full effect.

Nine of the patients are symptomatically so well that they refuse re-examination.

One is reported unimproved. A fibroid tumor reaching three-quarters way to the umbilicus was complicated with gall-stones; an operation for both conditions was advised and refused. A single intra-uterine treatment was then given and the patient, never examined again, still complained. As her distress was mainly due to gall-stones, naturally she was not relieved. A second case in this group, which has proved resistant to treatment, had had many X-ray treatments in Munich, between February and May, 1914. She was treated June 6, 1916, with 524 milligrams, intra-uterine, for 2 hours and 40 minutes, and with 2433 milligrams for 7 hours abdominally. In February she was given 9 treatments totalling 27 hours with the following amounts: 996, 1466, 1877, 1491, 831, 1089, 1313, 4466, 1066 milligrams. In May, 1917, there was still some bleeding and no reduction in the size of the tumor.

In three instances operation was done after radiation: one for a complicating ovarian abscess; one because the patient continued to worry in spite of the fact that the tumor was greatly reduced and bleeding had ceased; and one because a sciatica developed — thought to be due to the fibroid, but unrelieved by its removal.

Although the radium treatment of fibroid

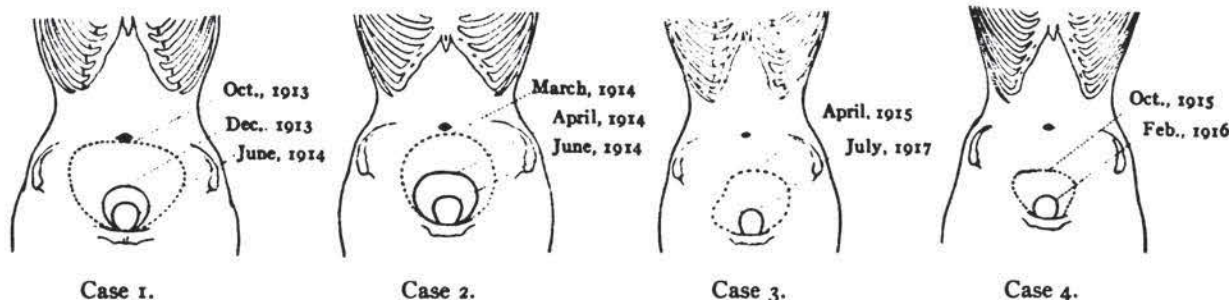
tumors has never caused the death of a patient, this first group includes two patients dying shortly afterward from other causes; one, a woman of 45, who died of apoplexy at her home about a month after her treatment, and another, an exsanguinated patient who died after inside and outside radiation two days after her arrival at the hospital.

When we add those who did not return for additional necessary treatment (4 cases), those lost sight of (8 cases), and those where treatment is too recent to report results (8 cases), the total of 146 is made up.

In résumé, setting aside sixteen where data are insufficient, and the 2 patients dying from other causes, we have 128 left; in 123 of these radium has made the tumor disappear or diminished it markedly, or robbed it of all clinical significance. In two shrinkage took place but an operation was done in one case because the patient continued to worry and in one case because of sciatica. Two were complicated by gall-stones and ovarian cyst, and one was recalcitrant to treatment. (The ovarian abscess occurred two years after radiation and had apparently no connection with it.)

The most obvious result of radiation is its effect on menstruation. In Group 1, 28 did not menstruate after treatment; 48 menstruated once; 31 menstruated twice or more before amenorrhœa was established. In 2 menstruation previously excessive became normal; in 7 the menopause had arrived before treatment. In 10 bleeding did not cease, and treatment had to be repeated several months later to secure amenorrhœa. In 3 operations were done; in 9 no accurate data as to cessation were obtainable; 8 are too recent to report results.

Menopausal symptoms during amenorrhœa caused by radium treatment are not severe as a rule. In 54 no symptoms were mentioned; in 32 they were moderate, causing no particular inconvenience; in 25 they were distinct and definite. In 7 the menopause was reached before treatment; in 6 the menopause was not induced; and in 3 an operation was performed. These with 11 in which there was no report, and 8 too early to report results, make up the 146.



Group 2. This series includes 64 fibroid tumor patients under 40 years of age treated with radium, and presents slightly different results, as such patients under exactly equal dosage are more likely to have a return of menstruation after a period of amenorrhœa of a year or more.

In 28 out of the 64, the tumor has either disappeared or has practically gone. In 4 of this group menstruation is known to have returned and is either scanty or normal. It may have returned in others and not have been reported, as these patients are well and have not kept up correspondence. About one-half are still too recent for menstruation to have returned.

In 16 instances the tumor has decreased in size. Four of these are menstruating; in two the menstruation has returned and two have not ceased to menstruate.

Menstruation has stopped or has been reduced in four who feel well and refuse an examination; two are not menstruating; menstrual periods in one are scanty, and in one normal.

Operation was done after radiation in six. In one the tumor did not diminish and a calcified fibroid was found. In two, bleeding not being controlled by one treatment, an operation was requested; a submucous myoma was found in each case. In two operation was necessary because of complicating ovarian trouble. In one case an operation was done elsewhere simply because the patient insisted; this was unnecessary as she was on the road to recovery.

To these should be added three from whom we have received no report, two withdrawing from treatment, and five too recent to report results.

If we aggregate and summarize Groups 1 and 2, we have a grand total of 210 cases of uterine fibroid treated between March, 1913, and January, 1918. The average age of all these patients was 43 years, the oldest was, 67 and the youngest 26. Menorrhagia, metrorrhagia, or both were symptoms in 160 cases, while 50 cases did not have bleeding as a symptom.

	Cases
Tumor gone or practically gone.....	94
Tumor diminished.....	64
Symptomatically well, no examination.....	13
Unimproved (1 complicated).....	2
Operation after radiation.....	9
Died other causes.....	2
Did not complete treatment.....	6
No report.....	7
Too early for report.....	13
Total.....	210

If we put aside the last four groups (28 cases) in which the data are insufficient, we have left 182. Radium alone was sufficient in all but 11 of these to relieve the patient. In 5 of the 11 there was some other complicating condition, and in 2 operation was elected. In 3 operation proved to have been unnecessary, and one proved utterly resistant to treatment.

A word about the seven withdrawing from treatment. In three of these a reduction of the tumor had been secured and a favorable outcome was to be expected had the treatment been persevered in. In 2 amenorrhœa had been obtained for several months, in 2 the reports are vague and unsatisfactory but menstruation was apparently not stopped.

Where menstruation is not stopped by the treatment, or where menstruation returns before the fibroid is gone, the tumor is likely to continue to grow. If menstruation stops

but returns while the tumor is still present and the tumor starts to increase in size, it is always possible to continue radiation, stop menstruation, and again check the growth. We have never seen a tumor grow during a radium amenorrhœa.

TECHNIQUE

Our technique has been a gradual development. In the beginning we had no fixed notions as to dosage and method, and looking backward I cannot but congratulate myself that we have had no permanent serious sequelæ.

Certain general conclusions as to effectual treatment may be stated, but in actual practice no cut and dried plan is applicable. The treatment of a small differs from that of a large tumor. Where submucous fibroids obstruct the canal and prevent the ready introduction of the radium into the uterine cavity, a different plan must be employed from that used in the ordinary case with a patulous cervix. Where a submucous fibroid is sloughing and others are present, it is advisable first to remove the sloughing growth vaginally, and then to treat the remainder by radium. Where a return of menstruation is desirable, it is important to locate the ovaries and to protect them during the treatment.

It is best to produce an amenorrhœa which shall last until the fibroid is gone. It is not uncommon to see the tumor begin to grow again when menstruation is not stopped. We know from our pathological examinations and our clinical experience that the chief effect of the radium falls directly on the fibroid cells and that the shrinkage of the growth is dependent to a much less degree on the cessation of the ovarian function; nevertheless, amenorrhœa is an excellent guide as to adequate dosage.

As a rule, a single intra-uterine dose of 1500 millicurie hours is sufficient to produce an amenorrhœa and shrinkage or complete disappearance of the tumor. An equal effect is producible by a radiation with a gram of radium, at a distance of 4 inches from the skin, distributed at various points over the tumor for 24 hours. Either of these

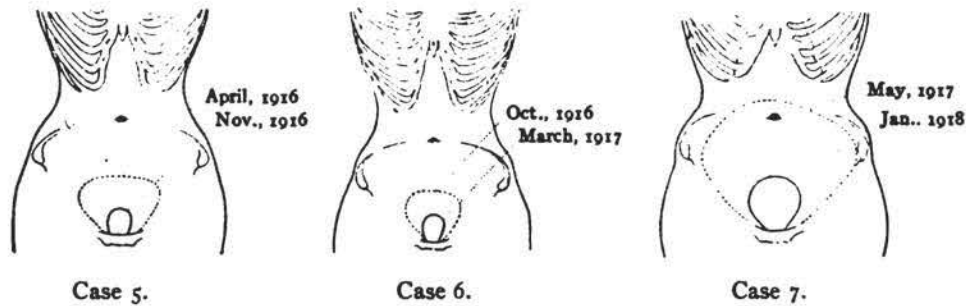
methods may be selected, or they may be advantageously combined. The amenorrhœa usually lasts from a few months to two years; in some it is not secured, and in some it is permanent.

It is, as a rule, not advisable to give more than 1500 millicurie hours inside the uterus, for overdosage results in local injuries leading to persistent discharges and an occasional arthritis; there is also a great deal more discomfort from overdosage, for days and sometimes for weeks, following treatment. There is, however, no such limitation on outside dosage. By using a number of portals, the treatment can be made ten times as strong as this average normal dose without any injury to the skin. A deep radium skin burn is a disagreeable complication. It was seen but once in this group and called for excision. An ideal treatment ought not to provoke even a slight erythema.

Again before taking up the details of the treatment, I wish to emphasize the importance of a careful general, as well as local, examination in each individual case. A preliminary curettage should be done, to rule out malignancy and to remove any polypi. Calcified fibroids, which are naturally not responsive to treatment, can be excluded by an X-ray examination, desirable in all cases.

For an inside application of 3 hours with 500 millicuries of emanation, a minute glass bulb is set in the end of a short metal tube which is thick enough to screen off all but the γ -rays. This is then screwed onto the end of an ordinary uterine sound and covered by a rubber cot. Either with or without anæsthesia, the cervix is dilated and the sound introduced to the fundus. This little operation may be done on the patient's bed, and she is then kept in one position by means of knee pillows and sandbags. The intra-uterine applicator remains not longer than half an hour on each spot, and an average of six changes is made by turning once from right to left and then by withdrawing the sound 1 centimeter at a time.

In the external treatments, in order to shorten the time, we use from 4 to 5 grams of radium, and give the entire treatment



in from 5 to 6 hours. It is equally effectual to treat for an hour or an hour and a half on successive days until the desired amount of radiation is given.

In any one case, the treatments internal and external can be given individually or combined in varying dosage. At least seven weeks should pass before a second treatment, and it should be omitted if amenorrhœa is already secured. Usually the second treatment should be an external one.

While some fibroids show marked decrease in one month or two, others disappear much more gradually. From one treatment we have seen a gradual disappearance extending over a year before its completion. At intervals of 3 or 4 months, a treatment should be given to maintain amenorrhœa and to cause complete disappearance; this is important. We now feel that if treatments are continued long enough, the chances are that a larger proportion of complete disappearances will take place. This has not, however, been tested out as yet by actual experience in many cases.

CONCLUSION

In conclusion, we surgeons ought not to be less self-sacrificing than the wise physician who struggles to put an end to the era of drugs, toxins, and vaccines, by sanitation and hygiene. While it is our imperative duty to continue building up our surgical technique, making operations safer and carrying surgery to a successful issue in new fields, nevertheless, all of us, I am sure, are willing and anxious wherever we can do so, to commit an honorable suicide, a sort of a *hara-kiri* of which posterity will be proud, by introducing, wherever it is possible,

newer methods which are better and safer than surgery.

Beginning back in the fifties of the last century, our predecessors, at infinite cost in life and pains built up the operation of hysteromyomectomy by which so many lives have since been saved, and to which also so many have been sacrificed. As long as it can be shown that an operation in a given series of cases will not only give better health, but also save lives, we can contemplate with mingled regret and satisfaction the necessary mutilations. This attitude of mind, however, is now no longer tenable, for now that we have a simpler, safer procedure at our disposal, every death in the fibroid group becomes an indictment.

Let me also emphasize the fact that if radium fails, the operation has simply been postponed without detriment. Surely the logic of the facts presented proves that henceforth radium rightly demands the first place in a determination of the best method in a given case.

ILLUSTRATIVE CASES

Twelve typical cases are appended, in some detail. The first six consist of uncomplicated fibroid tumors of the uterus; the last six consist of cases with some serious systemic complication, such as heart disease, diabetes, Bright's disease, etc.

CASE 1 (No. 334). Mrs. C. E. D., age 40, admitted October 20, 1913. Diagnosis: uterine fibroids; slight menorrhagia.

Examination revealed a large fibroid tumor outlined on crinolin reaching to the umbilicus. It had been noted for 2 years and had been growing rather rapidly. There had been a slight increase in menstruation but no other disturbance.

On October 20, 1913, 60 milligrams radium

element were applied within the uterus for 26 hours; 60 milligrams of radium element on the abdomen for 11½ hours. The patient suffered the usual nausea and discomforts for 24 hours. In November she had a regular menstrual period, a little less than normal, no pain; no period in December, none in January. December 29, she was examined by her physician who found the uterus as big as a medium-sized orange and entirely within the pelvis. On June 23, 1914, examination showed the following: "There is still, perhaps, a small fibroid present, but certainly nothing that can give any trouble."

CASE 2 (No. 681). Miss B. S., age 29, admitted March 16, 1914. Diagnosis: uterine fibroid; menorrhagia.

Examination showed the uterus to be the site of a multinodular fibroid mass reaching to within 1 centimeter of the umbilicus. The growth is 15 centimeters in longitudinal axis, and approximately the same in the other axes. It was first noticed October, 1913.

The menstrual periods are more frequent than formerly, last longer, and are more excessive.

On March 17, 1914, 300 milligrams radium element were applied within the uterus for 1½ hours; April 24, 1914, 1371 milligrams radium element on abdomen for 2½ hours.

The patient was nauseated 24 hours from the first application, and had soreness in abdomen for 10 days. She had a scant period for 5 days in April, scant period for 3 days in May, normal periods for 3 days in June. April 25, 1914, examination showed the uterus to be one-half the original size. June 18, 1914, the uterus was normal and the function of the ovaries intact.

CASE 3 (No. 1552). Mrs. D. T., age 35, admitted April 8, 1915. Diagnosis: multiple fibroids of uterus; menorrhagia.

The patient had suffered from excessive menstruation and frequency of urination.

Examination disclosed multiple uterine fibroids, extending two-thirds of the way to the umbilicus. The tumor was known to have existed 3 years.

On April 8, 1915, 510 milligrams of radium were left in the uterus for three hours.

Menstruation stopped and had not returned when July 9, 1917, she wrote that her doctor had examined her and found no tumor. She was well but suffering with severe hot flushes.

CASE 4 (No. 1964). Mrs. F. S., age 43, admitted October 11, 1915. Diagnosis: uterine fibroid; menorrhagia, the last period lasting 20 days and still continuing.

Examination disclosed a fibroid reaching half way to the umbilicus. She had had a vaginal myomectomy several years before.

On October 20, 1915, 271 milligrams were placed in the uterus and left for 2 hours. On December 21, 1915, 435 milligrams were given for 2 hours within the uterus.

The bleeding continued after the first treatment but was stopped by the second. On February 11,

1916, the patient was examined and no tumor found. She complained of hot flushes.

CASE 5 (No. 2421). Miss S. E. H., age 40, was admitted April 14, 1916. Diagnosis: uterine fibroid; slight increase in menstruation.

The menstrual periods used to last 4 to 5 days, but they now last 1 to 2 days longer. She is very nervous.

Examination disclosed a fibroid reaching one-half way to the umbilicus.

On April 15, 1916, 532 milligrams were given intrauterinely for 3 hours, and 698 milligrams on the abdomen for 3 hours.

There was one free flow after radiation, one partial, none since. November 18, 1916, the patient was examined and no tumor found. On July 16, 1917, she was in excellent health, engaged in active work, and had no menopausal symptoms.

CASE 6 (No. 2845). Mrs. J. E. M., age 51, admitted October 12, 1916. Diagnosis: uterine fibroid; menorrhagia.

Eighteen months ago menstruation became irregular and too frequent; is nervous.

A multinodular fibroid uterus extending one-half way to umbilicus was found on examination.

On October 12, 1916, 700 milligrams were placed within the uterus and left for 1 hour and 20 minutes; 1067 milligrams applied to right side of abdomen for 13 hours; 1608 milligrams to left side of abdomen for 8 hours.

There was one menstrual period after radiation and then none. On March 1, 1917, she was examined and the fibroids were found to have disappeared. She complains of hot flushes and nervousness.

CASE 7 (No. 940). Mrs. J. H. B., age 43, admitted June 26, 1914. Diagnosis: uterine fibroid; *anæmia*.

The patient has had excessive menstrual flow for 2 years. She rarely goes a week without bleeding and passes large clots. She is markedly pale and weak.

Examination disclosed a fibroid extending 4 centimeters above the pubis. The hæmoglobin is 20 per cent.

On June 26, 1914, 544 milligrams were applied within the uterus for 3 hours. July 26, 1914, 544 milligrams for 2 hours. Also X-ray treatments were given abdominally.

On July 26, 1914, the uterus was about one-third its original size; July 17, her hæmoglobin was 65 per cent. January 1, 1918 she wrote that she was in splendid health and no symptoms of the fibroid had returned. She does her own housework and anything else she wants to; she has hot flushes.

CASE 8 (No. 1815). Miss B. M., age 40, admitted July 23, 1915. Diagnosis: uterine fibroid with excessive bleeding; *valvular heart disease*.

For 4 years she has had excessive bleeding at the menstrual period. For more than 2 years she has felt an abdominal tumor; it has grown 4 times as large since then.

A fibroid tumor about 10 inches in diameter,

round, globular, and freely movable reached exactly to the umbilicus.

On July 23, 1915, 200 milligrams were applied within the uterus for 10 hours; 200 milligrams to one area of the abdomen for $2\frac{1}{4}$ hours and 1909 milligrams to 3 areas for a total of 3 hours. December 27, 1915, 2388 milligrams to 4 areas of abdomen for a total of 6 hours.

Excessive hæmorrhage and severe reaction followed the first treatment. By November, 1915, the tumor had diminished one-half, she was working and feeling well. In December, 1917, her physician wrote that the tumor was hardly to be made out on examination and her old heart murmur seemed to have disappeared. She had occasional hot flushes but these were not annoying; menstruation had never returned and she was in perfect health.

CASE 9. (No. 2547). Mrs. J. H. B., age 48, admitted May 26, 1916. Diagnosis: fibroid uterus; *diabetes*. The patient has had periods almost amounting to hæmorrhages. In April, 1915, sugar was found in the urine.

Examination shows a fibroid uterus extending nearly half way to umbilicus.

On June 3, 1916, 507 milligrams were applied for $4\frac{1}{2}$ hours within the uterus; 2961 milligrams for two hours above pubes, January 15, 1917, 2547 milligrams for 3 hours and 10 minutes on abdomen, November 24, 1917, 1208 milligrams for 6 hours over pubes.

September 16, 1916, the patient's physician reported that she had a period in July but none since; the tumor was one-half the original size. On July 10, 1917, she was examined and the entire uterus and fibroid were found not larger than a 6 weeks' pregnancy. She had had one or two mild menstrual periods.

CASE 10 (No. 2728). Mrs. M. H., age 54, admitted August 22, 1916. Diagnosis: uterine fibroid, *Bright's disease*.

The patient had excessive menstrual flow, and uræmic convulsions which began two years before admission.

An indefinite mass rises out of the pelvis, probably a fibroid; an attempt was made to trace it on crinolin but the margins could not be outlined clearly.

On August 23, 1916, 698 milligrams were administered within the uterus for 3 hours; May 25, 1917, 435 milligrams for 2 hours.

On December 12, 1916, her physician wrote that there had been no bleeding since September and that the tumor was one-half its original size. May 25, 1917, no tumor could be made out; however, as she had had one bleeding of moderate amount it was thought wise to treat again.

CASE 11 (No. 3291). Miss R. B., age 37, was admitted May 22, 1917. Diagnosis: large fibroid tumor of the uterus; hæmorrhages; double *mitral murmur* and dilated heart with frequent attacks of tachycardia.

The symptoms began 2 years ago with hæmorrhage. The periods came every 4 weeks lasting 10 to 12 days, with a brownish discharge between periods. On examination a fibroid tumor was found reaching 1 inch above the umbilicus.

The treatments given were entirely abdominal: May 22, 1917, 537 milligrams., 600 milligrams., and 1125 milligrams for 3 hours. May 24, 1917, 1588 milligrams for 5 hours.

May 26, 1917, 1191 milligrams for 5 hours.

May 27, 1917, 1043 milligrams for 6 hours.

May 28, 1917, 1481 milligrams for 6 hours.

May 31, 1817, 917 milligrams for 4 hours.

June 1, 1917, 820 milligrams for 3 hours.

July 25, 1917, 1400-1965 milligrams for 4 hours.

July 26, 1917, 3418 milligrams for 4 hours.

July 27, 1917, 2376 milligrams for 4 hours.

July 28, 1917, 1780 milligrams for 3 hours.

July 30, 1917, 2066 milligrams for 4 hours.

Results: The first series of treatments reduced the periods and the bleeding. A second series was given. January 2, 1918, the patient showed marked improvement in the cardiac condition; the entire uterus and fibroid were reduced to the size of a large orange and there was no irritation of the skin.

CASE 12 (No. 3486). Mrs. W. T. B., age 55, admitted September 10, 1917. Diagnosis: uterine fibroid, menorrhagia; *bronchiectasis*.

The patient had excessive bleeding at the menstrual periods as well as hæmorrhage and discharge from lung ulcers. On examination a fibroid of the uterus was found. The uterus was 3 times normal size.

September 10, 1917, 1150 milligrams of radium element was applied for 2 hours within the uterus. The patient had one menstrual period after treatment then amenorrhœa. December 3, 1917, the husband wrote that she had no further bleeding and seemed cured; although she still suffered from the lung condition.