Original Articles

THE PLACE OF SURGERY IN FIBROIDS OF THE UTERUS*

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FIBROIDS of the uterus have been known under other names since the time of Galen. During the drab and barren centuries that followed, three not unimportant observations became current: (1) Many of these tumors remained small, were symptomless or of slight symptoms and fortunately could well be left alone. (2) There were a considerable number of large, bleeding, degenerating and complicated tumors which furnished no small morbidity and mortality which it was difficult to check, and in which little could be done.

3. That many of these troublesome fibroids ceased to grow, receded in size, stopped bleeding and became decidedly less troublesome with the establishment of the fibroid menopause which was five, ten or fifteen years delayed. Oftentimes these looked for desirable results did not take place.

In 1872, Tait, one of the boldest and most prolific thinkers of his day, challenged by the hopelessness of observation No. 2 and stimulated by observation No. 3, undertook optional surgical castration to take the place of the delayed menopause. This was not ideal; it was not adequate. I cannot conceive that taking out normal ovaries and leaving a five, ten, fifteen or twenty pound tumor for the patient to struggle with as a foreign body appealed to the thoughtful and precise mind of Lawson Tait, but it was an opening wedge.

With repeated openings of the abdomen upon such pathological conditions, surgery could not but advance in time to the removal of the diseased uterus. Hysterectomy with removal of the tubes and ovaries followed. Total hysterectomy and supravaginal hysterectomy became matters of earnest discussion. Vaginal and abdominal hysterectomies were compared. Gynecologic surgery became ovary conscious and ovaries were left for internal secretion. Myomectomy was performed that all of the genital functions might be saved even to child bearing. While myomectomy had its advocates, it was thought by some to have a greater morbidity and mortality than hysterectomy. Mayo presented a series of cases followed by twenty-eight deliveries in twenty-three cases with five more pregnant. He made a strong plea backed by these results for the worthwhileness of this measure in suitable cases during the child bearing period. The value of preserving menstruation was reflected in the operation of fundectomy or partial hysterectomy, permitting this function to go undisturbed. Surgery had largely displaced medication, waiting for the menopause and electricity. In the first decade of this century it had fairly well met the test. It was removing large complicated tumors and saving functions when possible.

Between 1905 and 1920 continental Europe was visited with a devastating epidemic of irradiation castration. Kelly in this country at a meeting in Washington held high the torch, a capsule of radium, that he emphatically and dramatically

* Read before the Chicago Gynecological Society.

predicted would lead gynecology to the non-surgical treatment of fibroids. Many a man attended that meeting well content over the fibroid cases he had left at home and came away with an itching for 50 to 100 mg. of radium. Some procured 10, 15 or 25 mg. Some epigrammatist said fifteen cents worth of radium can do a million dollars worth of harm. We do not believe it. At the price then current the amount of radium would have been too small, but it shows the trend during those early years. Irradiation was supposed by some to have a selective action on the tumor, but it was found to be through the destruction of the ovaries that radium and *x*-ray influenced the fibroid. It was but a repetition of menopausal recession and the surgical castration of Tait of 1872.

But we were then a little too ovary conscious to accept generally this irradiation castration. Too much had been hoped for these radio-active substances to withdraw them, but we now entered a period of dividing the dose, hoping that it would kill the tumor and save the ovaries. Some enthusiasts claimed the ability to deliver just the dose that would produce a temporary sterility and predict just the time that ovulation and menstruation would return minus the evils of the tumor; but sometimes menstruation did not reappear and if so, the activity in the tumor returned. An urge was exhibited by some to have them effectual in not only small fibroids but in large degenerated and complicated fibroids.

Handley reported in 1913, that intensive doses of mesothorium destroyed all primordial follicles. Finch and others found the Graafian follicles extremely susceptible to irradiation. Matthews and others have shown that ovaries are more susceptible in mature animals than in young. Peck, McGreer, Kretzschmar and Brown, Burnam, Clark and Norris, and many others voice the opinion that there is no predictable ovarian conservation, and that if the ovaries survive the treatment, the tumor continues to grow. I think we have probably all seen young women treated with irradiation in which the promised return of menstruation never occurred, and in which a marked disappointment neurosis was present. These facts have led to limitations put upon irradiation during the menstrual age. Some have put the limiting age at thirty-five, some at forty, and some at forty-five. We are living in the age of recognition of the estrogenic function and I see no reason that this should be cut short ten years and the patient driven to the commercial laboratories if her own estrogenic laboratories can possibly be preserved.

The large tumor is reduced in size many times, but many times it is not. Burnam says 50 per cent of a series of cases were satisfactory. Kelly, reporting a series of large tumors, says a certain number reduced in size, but that no conclusions could be drawn as two years had not elapsed since the last treatment. So it seems that a patient must wait two years for an opinion as to the result of uncertain irradiation, when in the same class of cases surgery would remove the tumor and its complications in 100 per cent of cases.

A reference to the textbooks of 1915 to 1925 show a marked degree of confusion, an unwillingness to accept irradiation at its claimed value, and a reluctance to place it at its apparent value. During that time indications and limitations were urged which formulated would read as follows: A woman at the menopause, with a tumor which with the uterus makes a three to three and one-half months pregnancy size, slight to medium bleeding but with no other symptoms, degenerations, complications, associated conditions, malignancy and pregnancy definitely eliminated. This was approved by Clark, Graves, Lynch, Curtis, Danforth, Crossen, and others with slight variation, these referring mostly to a slight difference in size of the tumor and to age of limitations in which irradiation might be permitted. This was unequivocally supported by the sixty gynecologists answering the questionnaire. Some

included cases not good surgical risks, although W. J. Mayo was inclined to minimize this, having seen no cases that could not be gotten in condition for surgery.

In a thirty-two year experience in Cook County Hospital's large clinic and a longer period in a private clinic I have encountered no such case. In a poor risk fibroid case the tumor and its complications are the sole cause or a marked contributing cause of the disability, and in either case its removal once accomplished will be a marked factor in improvement. There are many patients not in good condition for operation when first seen, but there are aids to improvement much more efficacious than irradiation. I wish to make the point which seems very important that a patient, loaded with contraindications for irradiation, such as a very large tumor, complications, degenerations, does not have those contraindications removed by being a poor risk. Practically every patient can be gotten in condition for a skillful operation if they have vitality to live long enough to reap any benefit that irradiation could finally bring them. In low vitality patients irradiation has its risks.

To paraphrase a popular expression, "Time marches on," we have reached the time in which as never before the preservation of the estrogenic function is counted very important. Laboratories are busy trying to produce a biologic or synthetic product that will substitute for the decline or loss of function of the patient's own estrogenic laboratories.

In the ages before Tait, treatment was almost nil. Tait's ovarian castration was crude. During the next half century surgery was perfecting the treatment and undertaking when possible to save function. Then irradiation repeated the castration evil tenfold. Careful observers have worked out a formula of limitation by which we need not repeat the evils of the previous castration experiences.

Clark and Norris give us the following list of limitations: (1) Cases in which doubt exists as to accuracy of diagnosis; (2) the presence of intraperitoneal lesions other than the myomas which require surgical intervention; (3) rapid growth; (4) associated neoplasms such as fundal carcinoma or ovarian tumor; (5) pressure symptoms; (6) softening or degeneration of the tumor; (7) inflammatory lesions within the pelvis, especially the adnexa (other inflammations may be more important); (8) when the tumor and uterus is larger than a four months' pregnancy (too large); (9) submucous tumors, especially pedunculated; (10) young patients (limit not usually under forty-five); (11) marked anemia out of proportion to the symptoms and clinical findings; (12) obstructing tumors or malformations, and (13) radiophobia.

These are legitimate contraindications and if this is true, let me add that irradiation is contraindicated unless and until an adequate diagnosis can say that these contraindications do not exist, for a pus tube, a pregnancy, an ovarian tumor, an extra-uterine pregnancy irradiated without a diagnosis is just as bad a procedure as irradiation of such a condition with a diagnosis. Irradiation is not limited by surgery; it is limited by contraindications. It is not limited by what surgery can or cannot do. Its application is of such facility that it would easily displace surgery if it could do the work; but there are so many phases in which it should not be undertaken at all. It cannot remove even small tumors during the period before the menopause without ovarian castration. It is conceded for the small tumors at the menopause with no complications, not because surgery cannot do the work and do it well, but because of the greater ease to the patient of irradiation, and with all indications met it does not do much harm.

But after the menopause the ovarian castration has taken place, and irradiation has lost its leverage. In marked bleeding after the menopause there is usually a degeneration or malignancy causing the

bleeding; the one does not respond favorably to radium and it may do harm, and the other, cancer, is not helped by a fibroid tumor dose and so the harm of delay. In large tumors it fails in a considerable percentage of cases and if it fails in a considerable percentage of cases, as a therapeutic measure, it fails *in toto;* for surgery stands ready to remove them all and one to two years' irradiation is therefore contraindicated.

Then, too, large tumors and larger tumors have more degenerations, more complications, more pressure, more incarceration, more intra-abdominal associated growths in which, with any or all of these irradiation is decidedly contraindicated, while the larger the tumor and the more the complications the more surgery is indicated.

The method of treatment in large tumors should avoid making a living sarcophagus (Clark) for a dying tumor, or a dying sarcophagus for a living tumor.

Any given treatment is determined by what another treatment can or cannot do, having in mind the best interests of the patient. Before the menopause irradiation castrates and should not be employed. After the menopause the woman is already castrated and irradiation is ineffectual. All authorities agree that irradiation is uncertain in its effects upon the large tumors. In the degenerations, complications, associated conditions, pressures, incarcerations, etc., in which large tumors abound, irradiation fails flatly and may do much harm and is therefore contraindicated. Irradiation of large fibroids has one point in common with murder; it would be far more successful if it were not for the difficulty of the disposal of the "body."

Into this surgical field comes radiology. One radiologist heads his announcement "ad" by "*X*-ray Treatment of Fibroid." "Gauss, a well known gynecologist in Freiburg, has practically abandoned surgery in the treatment of fibroids." Again, a paper read in the Section of Radiology entitled, "Treatment of Fibroids of the Uterus" reports over 1,700 patients treated with irradiation, 262 of which were from four month pregnancy size up to full term. The author cautions about doing anything less than castration. He does not heed the precautions in regard to irradiation of women in the menstrual age or women with inflamed adnexa and many other complications. The Secretary coming to me said, "I don't see why you are opposed to these things. Why the treatment of fibroids is the biggest thing in radiology today." According to all testimony this means that castration of women under the menopause is the biggest thing in radiology today because it is through castration that radiology does its work. These expressions must not go unchallenged.

The tendency to ignore these indications and contraindications led me to undertake to find out the present day thought of gynecologists and *x*-ray men. The following questionnaire was sent to sixty gynecologists in Chicago, New York, Pittsburgh, Milwaukee, Toronto, etc., and to ten radiologists. The radiologists did not reply. One gynecologist with a radiologic institute connection replied.

1. About what proportion of fibroids do you treat surgically?
2. About what proportion do you treat with *x*-ray?
3. What would you consider proper indication for *x*-ray treatment of fibroids of the uterus?
   1. Size: of Walnut..... Yes No
      Orange..... Yes No
      Grapefruit..... Yes No
      Baby's head..... Yes No
      Full term pregnancy.. Yes No
      Three times size of full term pregnancy..... Yes No
   2. Location in the uterus:
      Intramural..... Yes No
      Subserous..... Yes No
      Submucous..... Yes No
   3. With pus tubes..... Yes No
   4. With beginning carcinoma... Yes No
   5. With pus cavity in fibroid... Yes No
   6. During child-bearing age.... Yes No
   7. With uterine fibroid polyp... Yes No

8. At menopause..... Yes No
9. Two to ten years after menopause..... Yes No
10. With pregnancy..... Yes No
11. With ovarian tumor..... Yes No
12. With marked anemia..... Yes No
13. With fatty degeneration of fibroid..... Yes No
14. With calcareous degeneration Yes No
15. With necrosis..... Yes No
16. With incarceration..... Yes No
17. With herniation..... Yes No
18. With pressure symptoms.... Yes No
19. With prolapse of uterus..... Yes No
20. With rapid enlargement..... Yes No

Signature————————

No names will be used but it seems rather important to check on a certain "X-Ray for Fibroid" advertisement which is being run, which implies that surgery for fibroids is obsolete.

Thanking you for your cooperation in this matter, I am

Very truly yours,
CHANNING W. BARRETT, M.D.

I cannot go into a complete analysis, but it will be seen that they were given a chance to say what they did with fibroids in general, what they would do with tumors of different size. All but two stopped with the orange sized tumor for radiation; one would go as high as a grapefruit and one as large as a baby's head. There was a strong consensus of opinion that only the intramural fibroid should be treated by radiation, but as most fibroids are multiple, some may be intramural while some may be submucous contraindicating radiation.

There was a uniformity of opinion that radiation should not be used during the age of menstrual life.

Nos. 3 to 20 list some very important questions which must be answered in almost every large tumor and in some small or medium sized ones.

With pus tubes universally "no."
With beginning carcinoma, with one exception "no."
With pus cavity in fibroid, "no."
During child-bearing age, overwhelmingly "no."
With uterine fibroid polyp, "no."
At menopause, mostly "yes."
Two to ten years after menopause, most, wisely, "no"; one, "yes."
With pregnancy, "no."
With marked anemia, mostly "no"; a few, "yes," as temporary measure.
With ovarian tumor, "no."
With fatty degeneration, "no."
With calcareous degeneration, "no."
With necrosis, "no."
With incarceration, "no."
With herniation, "no."
With pressure symptoms, "no."
With prolapse of uterus, "no."
With rapid enlargement, "no."

With a few radiation for fibroids was out of the question. Surgical treatment averaged close to 90 per cent; *x*-ray mostly from none to 10 per cent, three going higher. Some who used surgery in only about 75 per cent of cases, used radiation very little or none at all.

Dr. Heaney very sagely remarked, "The trouble is, we think we have ruled out these complications by examination and then at operation, we find them." If that is the experience of the gynecologist, what are the chances for the radiologist?

Dr. Danforth said, "Formerly we used to treat cases at the menopause with radiation, but in the last few years we treat cases of fibroid with displacement, prolapse, scarred cervix, degeneration, etc., by vaginal hysterectomy and our patients are much more comfortable." With both of the above opinions I fully agree.

These answers grouped reconstruct very definitely the contraindications to radium and *x*-ray therapy which have been accepted. They combat any idea that surgery has become or is becoming obsolete. In fact, they show that the specialty which has to deal most with fibroids is putting less and less weight upon radiation. We deprecate the sophistry of *x*-ray teaching which accepts or lays down contraindications and then in the presence of a tumor argues that a tumor of size and complica-

tions and difficult to diagnose can just as well take its chance with irradiation; because after all surgery does have a mortality and if irradiation fails after a long course of treatment and waiting, surgery can then have its inning. We deplore those tumor groups which are built around irradiation equipment, especially as our customs allow them to advertise their wares and aspirations.

At this day the so-called treatment of fibroids resolves itself into the treatment of fibroids and its associated conditions. In small tumors before the menopause the associated conditions are functioning pelvic organs which irradiation cannot save. In large tumors there are in addition to size, complications and associated conditions which irradiation cannot solve and may make much worse. Surgery can take these on successfully.

Not a few fibroids have complications which even though the tumor disappeared as claimed, would remain a surgical condition and perhaps logically a worse surgical condition, and many have degenerations that preclude their disappearance.

Surgery in hyperfunction or dysfunction of estrogenic production gives opportunity to combine myomectomy, fundectomy, or hysterectomy with removal of the least healthy looking ovary, much to the benefit oftentimes of excessive hormonal production.

Before the diagnosis, prognosis and treatment can be determined, many points must be considered:

1. Is there enlargement in the pelvis?

2. Is there ascites, fat, a displaced organ, or upper abdominal tumor?

2a. Is the enlargement, in the uterus or some condition outside of the uterus, or is there both?

3. Is the possible enlargement a pregnancy or a tumor, or might it be both?

4. If a pregnancy and tumor, are there disturbing symptoms?

4a. If there is pregnancy and a tumor, is the tumor a uterine tumor or adnexal?

5. Is the patient of child-bearing age or at the menopause?

6. If of child-bearing age, does the uterus have child-bearing possibilities, that is, can the tumor or tumors be removed and the uterus saved?

7. If the tumors are numerous, is fundectomy or/and preservation of menstruation feasible?

8. If the uterus must be removed, are the ovaries, or is one ovary or a part of an ovary savable, to keep up the important estrogenic function?

9. Are their active infections or complicating inflammatory masses?

10. As the tumor grows, are there pressure symptoms, are there bladder, bowel, kidney, ureteral or appendiceal disturbances?

11. Is the tumor large enough to offer disturbances of weight and deformity?

12. Is there pain in the legs and/or swelling due to pressure on the nerves and/or blood vessels?

13. Is there rapid enlargement and increased bleeding and cachexia, indicating degenerations, infections, hemorrhages, and circulatory disturbances?

14. Are there acute symptoms, indicating strangulation, rotation, or incarceration?

15. Are there evidences of disturbed kidney, liver, stomach, bowel, heart and/or lung function?

16. Pancreatic, spleen, thyroid and brain disturbances must be looked for in severe cases with large degenerated and complicated conditions.

17. Is the heart and circulatory system, the respiratory tract, the alimentary tract, the urinary and genital tract in as good working conditions as possible?

18. If they are not, how long a preparation will the patient need and the surgical necessity warrant? Is there an immediate emergency, such as torsion, internal hemorrhage, bowel obstruction, etc.?

These may not all go on paper, but the careful diagnosis, prognosis and treatment must not leave them out.

The diagnosis must not only say whether there is or is not a fibroid tumor, but whether there is some other condition simulating it, what associated conditions exist, what complications, what degenerations and what is the size, relations, and bearing the complication or uncomplicated tumor may have upon the prognosis and treatment. All of these conditions may not be diagnosed and surgery is needed to make a complete diagnosis and right the condition.

The prognosis must take into consideration not only the patient's chances to live, but frequently the question of whether there is or is not a child *in utero* that has a chance to live and be born, and of the nature of the birth. The prognosis should also consider the question of the woman's right to her womanhood, her child-bearing function, her menstrual function and her estrogenic function, or whether in the bid for freedom from the tumor and its complications, these functions can afford to be placed in the discard or whether the patient may have them saved.

I venture the following working program for fibroids of the uterus, knowing from the answers to this questionnaire that most gynecologists are in agreement up to date:

1. Most small fibroids at any time causing no symptoms may be kept under observation.

2. Small fibroids in the child-bearing period that show a tendency to grow even though causing no symptoms, may be removed by myomectomy to improve the patient's chances of keeping a useful uterus; especially is this emphasized if the fibroid is in the cervix. Such a fibroid close to the menopause may still be allowed to go untreated.

3. A small fibroid appearing at the cervix or in the uterine wall causing hemorrhage should be removed by myomectomy during the menstrual ages. At the menopause it may be irradiated if in the uterine wall, but not in the cervical canal.

4. Large or medium cervical polyps causing profuse symptoms, may be removed by myomectomy, but the uterus should not be removed at the same time as one is working in the presence of infection and risk would be taken unnecessarily.

5. Small submucous fibroids may be removed vaginally during the child-bearing age. Larger ones by vaginal hysterotomy if possible and still larger ones by abdominal hysterotomy.

6. Larger subserous, intramural, or intraligamentous tumors may be removed by abdominal myomectomy and the patient left child-bearing, without being obliged to resort to hysterectomy. But, if a hysterectomy is necessary, the ovaries or one ovary or a portion of ovary should be saved.

7. Multiple fibroids making saving of the uterus impossible may in favorable cases be treated by fundectomy during menstrual life with preservation of menstrual and ovarian function.

8. Tumors larger than three and one-half months' pregnancy size should be removed by hysterectomy at any age, with or without degenerations or complications, unless in the child-bearing age it is favorable for myomectomy.

9. Fibroids at or after the menopause, that begin to grow or bleed profusely, have either a degeneration or beginning malignancy and should be removed.

10. Large tumors are usually degenerated, complicated, adherent or/and causing symptoms of pressure and should be treated surgically.

11. Large to very large tumors, with possible pus tube complications, pressure on bladder, rectum, ovaries, ureters, kidneys, sigmoid, cecum, appendix, attached to bowels, omentum, transverse colon, gallbladder, with inflammatory massing of all or many structures, with anemia, kidney and heart insufficiency, must still be operated upon; but great care should be taken to have the patient in the best condition possible and in the hands of

the best available man, or surgery will be no better than radiation and radiation is worse than useless, but by following lines of cleavage, promptly, and without accident or delay, such a case may not be so difficult.

12. Fibroids with extra-uterine pregnancy, or twisted pedicle or bowel obstruction, or acute appendix or ovarian cyst with twisted pedicle or rupture, must be operated upon promptly in spite of an apparent desperate condition.

13. Fibroids with pregnancy should in practically all cases allow the pregnancy to continue if it will in spite of any apparent future impediment to delivery. As the uterus enlarges a given fibroid mass may draw out of the pelvis, leaving the pelvis clear for delivery.

14. A tumor with a twisted pedicle or causing severe annoyance during pregnancy may be removed by myomectomy, but this should not be undertaken lightly, as it may end up in hysterectomy or/and loss of the fetus.

15. In the case of a tumor occupying the pelvis at term, that is not readily drawn up at labor or that cannot be pushed up, cesarean section should be done before the patient is exhausted. A myomectomy or hysterectomy may follow.

It sometimes happens that a fibroid, bleeding or otherwise, presents in which the fibroid, the adnexa, the bowels, the omentum, the bladder and the lower abdominal wall furnish a large undifferentiated, infected and infiltrated mass, pelvis engorged and under tension, bowels distended and inactive, abdomen swollen, and increase in temperature and pulse rate are considerable. Such a patient should not be operated upon until all the acute symptoms have subsided, except in some condition of extreme urgency. Pelvic tension should subside, bowel distention should be relieved, so that pelvic contents can be individually recognized. The anemia should be combatted by transfusion. An orderly system of approach should be used. Several layers more or less complete are recognized, adherent, but more or less amenable to cleavage.

1. The abdominal wall should be opened rather high in the incision without attack upon the viscera. The omentum and adhering viscera should be carefully separated from above downward.

2. The omentum is now freed from below upward.

3. The bladder and bowels may now form an adherent layer over the tumor and uterus. The bladder should be pushed off from backward to forward and the small intestines, sigmoid and cecum, including the appendix, should be worked off from before, backward. If these structures are looked upon in any way as a part of the tumor mass or adnexal mass and worked out from backward to the fore, they run great risk of being separated from their mesenteric attachments.

4. The fibroid and uterus are now uncovered. The adnexa may be worked out of the cul-de-sac from backward, upward and forward.

5. The tumor and uterus now stand exposed or ready to be lifted out of the pelvis and out of the abdomen when it is frequently as readily subject to the four point clamp of blood vessels as is the less complicated case. At times the impacted, adherent tubes and ovaries are more readily removed after the large tumor and uterus have been removed.

CONCLUSIONS

1. Fibroids are very common, may be very disabling, and the large and disabling ones were once small, and the small ones should be handled if possible so that they never become the large complicated disabling ones.

2. Fibroids while having a relation to sterility and abortion, still leave the patient with possibilities in many cases for child-bearing, menstruation and ovarian function and no treatment should lightly take these functions away.

3. The patient's own estrogenic laboratories should be preserved instead of

causing her to fall back upon a commercial product.

4. Castration by surgery or radiation should be a matter to weigh seriously even as a last unavoidable resort.

5. Radiation without castration is admittedly not feasible.

6. Conservative surgery is the treatment of choice in women of the menstrual, child-bearing, ovarian function age.

7. Radiation may be used in small tumors at the menopause that present no complications and the only symptom is slight or moderate bleeding. Many of these small fibroid cases have complications that would be better served by surgery.

8. Surgery is the only treatment that can diagnose all the conditions, deal with all the complications, remove all of the tumor and other accompanying tumors, pus tubes, extra-uterine pregnancy and what not, and leave all that ought to be left.

9. To leave a degenerating ten or twenty pound tumor for the abdomen to struggle with is no more rational than to leave a lithopedian of the same size, and makes of the patient's abdomen a sarcophagus in which the more or less dead tumor dwells. All that is or can be claimed is that it may, or may not disappear, that it may or may not reduce in size, that it may or may not grow again, that it may or may not degenerate into a malignancy.

10. The gynecologist and the patient want more than "may or may not"; they want a certainty of removal of the large tumor with all its degenerating complications and pathological processes. The treatment of the gynecologist for the patient with a large fibroid tumor is surgical.

11. May I suggest that the consideration of all of the phases of fibroid tumors complicated and uncomplicated is a gynecologist's problem as the prostate is a urologist's problem, and not solved by the possession of 800,000 kilowats of deep *x*-ray and a pound of radium.

12. The greatest argument in favor of radiation was the pioneer surgery of the time of Gauss and his followers. The more finished surgery of the present day leaves no room for the function-destroying radiation except with the indications stated.

13. The claim of ovarian conservation with radiation destruction of the tumor has not been verified, so that surgery must be depended upon.