X-RAY AS A REMEDY IN BENIGN DISEASES OF WOMEN: A REVIEW OF 455 CASES—COVERING 10½ YEARS.

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To report in a few minutes 455 cases covering ten and a half years' work is impossible. However, a statement of the practical aspect of x-ray may be undertaken with the hope that this brief survey may result in a better appreciation of x-ray as a benignly efficient agent in the nonsurgical treatment of women's diseases. I am convinced that certain pathologies in the generative organs of a woman belong to the x-ray therapist and that, exclusive of cancer, these diseases are better treated with the low voltage and fractional doses. This technique being more deliberate, gives, as Nature does, abundant time for readjustment. It is also the safest, most conservative method, and may be so applied that it is free from undesirable results. There is no injury to tissues adjacent to the pathology under treatment and no "x-ray sickness." The patient can immediately and continuously go about her business. There are no detrimental blood changes, no secondary sex manifestations such as obesity, loss of normal sex impulse, etc., because the endocrine balance is not disturbed. When the menopause does follow it is not so precipitate and stormy, as after radical operation.

Another important reason for preferring low voltage, and small doses gradually applied is that in younger women the x-ray effect may be limited in most cases so that the pathology is reduced without profoundly influencing ovarian functions and the menses. Until recently I have not accepted the younger women for x-ray so I have only nine cases in which the menses were resumed in from four months to three years. One conceived and bore a normal child at full term. Of the possibility of pregnancy I cannot judge, however, because five were unmarried. I have recently been strongly upheld in this effort with younger women by reports from Newcomet (1) of Presbyterian Hospital of Philadelphia and Knox of St. Luke's, New York (2),

the latter stating that even in women of twenty-five years of age the menstrual function may be impaired only temporarily. I have had 40 cases under 40 years of age. Twenty were less than 35 and the youngest 26.

What is the effect of small doses of x-ray on the tissues? A brief answer to this question follows:

1. X-ray inhibits ovarian stimulation. The ripened follicles and the ripening follicles are usually destroyed but the primordial follicles, if x-ray is discreetly applied, will later develop (3).

2. The internal secretion is apparently not influenced by the conservative application of x-ray (4).

3. The blood vessels are reduced in size by the effect on the endothelial lining of the capillaries, thus limiting the too abundant blood supply (5).

4. The glandular tissues both in the body of the uterus and in the cervix are directly influenced. They become less in size and function, thus adding to the increasingly normal picture.

5. The fibroid tumor cells gradually disintegrate in a regular order, and in favorable cases are finally carried away by the leucocytes.[6]

In the average case all these changes are necessary to recovery, and if the x-ray operator has the judgment to stop when his work is done, nature at her best is imitated and no harm results.

The pathology most frequently presented for x-ray treatment is fibroid tumor of the uterus, of which we have treated 286 cases. For practical purposes these fall into three groups. First, those unfavorable to x-ray that should not be accepted because of serious complications or because of symptoms suggesting necrosis, cystic degeneration or cancer; second, those less favorable, who for sufficient reasons should be accepted. This group includes women who are not good surgical risks at the time of treatment but who may later become so because of improved general health. In some cases, however, surgery will probably never be possible and the x-ray therapist can here offer a definite relief. This group may include those who cannot turn aside from compelling responsibilities at home or in business, and also those who refuse to submit to surgery.

From this group, however, we have had some surprising successes, and from this group also may come an occasional disappointment, as will be seen later. The third group and the best, are those of the intramural type of tumor that are hemorrhagic. These are most favorable to x-ray and yield 100 per cent in satisfaction. The great majority of these tumors disappear, and fortunately this favorable type occurs in 75 per cent of all cases. They are ideal cases when the fibroid is situated below the umbilicus, is not seriously complicated and occurs in a woman of 38 years or more.

Apropos of the above question of selection, I find that as my experience grows and my judgment in diagnosis, prognosis, technique and management becomes more reliable, I am accepting cases that I would have once refused. This is possible because I find that a much larger percentage respond to treatment and return to health than I at first thought possible.

Here, in fairness to the subject, I must include a paragraph of my failures that came to operation. As I look back I see that they have come mainly through errors in diagnosis.

The first was a myxomyoma. That is rare, almost never diagnosed until after operation. Next came a fibrocystic tumor of the ovary in median position. Then a cancer of the fundus uteri was accepted after a negative hospital report. The next was a fibroid tumor closely associated with a dermoid tumor. The fibroid disappeared, the dermoid remained. The next case gave me great anxiety and regret. She was a very poor surgical risk and also was unsuited to x-ray. The tumor was large, multiple and hemorrhagic to an unusual degree. The complication was one of the worst cases of exophthalmic goitre I ever saw. X-ray shrank the tumor, reduced the hemorrhage and so improved general health that the goitre gradually subsided. But the hemorrhage would recur. Radium was finally applied the third time before hemorrhage disappeared. Five years of good health followed. Then a papillomatous cyst of the ovary required operation. The small fibroid remaining seemed so innocuous that it was not removed, because of the risk of too long an operation. Again she became

well and resumed her work. But a year later, seven years after treatment began, she died of a malignant growth the nature of which was not determined. This case is reported more in detail because it is my only case of cancer which developed after a thorough irradiation.

Submucous fibroids are a complication that may defeat the ideal result and they often escape early diagnosis. These are said to occur in about 10 per cent of the cases. Eight per cent usually recover with the fibroid. Two per cent either prolong the hemorrhage, which finally ceases, or they may require curettage to complete the cure, or as in one of my cases, by developing a suspicion of malignancy may lead to operation. Not one of my group, however, has been malignant. Béclère reports seven of these failures out of 700 cases (7). This corresponds to my own experience. One case in which the large tumor had disappeared was curetted and cured—one was operated upon. This was a very complicated case, at first a poor surgical risk which became under x-ray a good risk. The tumor and adhesions were much reduced but bleeding occasionally recurred. The health, however, was greatly improved and the patient was then operated upon successfully. Another case was so improved under x-ray that a dangerous and radical operation was changed to a simple non-mutillating one.

Beside fibroid tumors x-ray remedies the following:

The menopause often plays the part of a bad citizen or an outlaw. We deal with these cases when hemorrhage is the principal offense, or when, with a multiplicity of smaller offenses, the patient becomes a nervous wreck, her general health suffers and her whole family becomes discordant. The hemorrhage may become a serious matter even though gross pathology may not be demonstrable. There is, however, as Samuel Geist has well established, a histologic picture in the endometrium that is pretty constant. He finds hypertrophy of the mucosa, edema of the stroma and enlarged glands which may be cystic (8). Though these changes are comparatively small and not palpable, I contend they are pathologic and should be dealt with. My 20 cases have all responded to x-ray after a few weeks and good order again reigns in the small community.

The ovaries, when they present the small follicular cysts, should not be patched or removed. These cysts may grow to the size of a lemon, but under x-ray they recover promptly with the fibroid tumor. I have a list of 63 cases that are well.

The large ovarian tumors are always surgical. They are not caused, nor prevented, nor cured by x-ray.

The cervix uteri, where cancer prefers to attack, should be cured long before that tragedy. In cases of cystic degeneration of cervical glands, with erosions that are sometimes extensive and threatening, and the resulting leucorrhea, the x-ray is a dependable remedy, and the response to treatment is prompt and satisfactory. To date no case of cervicitis has developed cancer, though we have had several that required follow-up treatment. We have treated 68 cases.

Dysmenorrhea, the type that resists all measures, that incapacitates the sufferer, that makes of her a haunted invalid throughout the month, should be ended with x-ray. These cases, 18 in number, have come so promptly into good health that they have given great satisfaction.

Adhesions generally yield with the rest as do also indurated and inelastic tissues. After a free reparative circulation is established, the tumor usually becomes freely movable and later the uterus, which was held down by tumor weight and adhesions, may resume a normal position, to which it naturally inclines (9). This has occurred often enough so that we now entertain a reasonable hope for that result. The reduction of adhesions was one of the earliest observations made by the earliest x-ray therapists.

General management includes attention to the individual needs and a flexible régime for the woman who does not conform to the general rule. In order to estimate what the rule may be, we have a large card printed with regard to convenience and precision of detail on which we record so exactly the technique of each treatment that today we can repeat in every respect a treatment given ten years ago today. On this card is also noted the results of the check-up examinations. If there is less improvement than there should be a search is immediately made to find why the stasis.

Improvement is very soon apparent in a well selected case, and errors in diagnosis are promptly discovered. After treatments are finished it is our practice to urge the patient to report periodically to her physician or to myself for the follow-up estimation of her condition. In this way only can we draw reliable conclusions and attain accuracy as to results. Because the above named details are so important, I object to a technician, untrained in diagnosis and in the requirements of these cases. He should not be put in full charge even though he is under the so-called "direction" of a physician who is himself often untrained in exact gynecologic estimation and in x-ray possibilities. We should remember that x-ray is at once the most dangerous and the most benign of all the therapeutic agents. Because of these discrepancies in management, x-ray as a remedy in women's diseases has not come into full recognition. It has been in this special field more neglected, more misunderstood and more trifled with than has any other scientific measure.

Doubtless questions have arisen in your minds in the course of this paper. Some of those commonly asked I shall now endeavor to answer.

Q. Why are not normal tissues injured while pathologic tissues are remedied? Ans. They should not be if x-ray is not given too long and too strong. They are not changed during a brief application and with the low voltage technique because the pathologies we have discussed are all influenced by smaller doses than are muscle, nerve and other tissues (10).

Q. Is there not danger of x-ray burns? Ans. There is, always. But if in ten and one half years we have managed to avoid burns and other accidents, it follows that it can be done. It is, however, the one thing that makes x-ray therapy a most exacting business. In each of the ten cases of x-ray burns that I have known about in outside laboratories there was either ignorance or carelessness or a gambler's disposition to take chances.

Q. Does x-ray affect a woman sexually? Ans. It does not, under moderate application, if treatments are ended when the work is done. My women are, in a large majority, unchanged in this respect, except for the better. This is

the result of improved health and freedom from pain and discomfort during coition. The results are better under moderate x-ray than from radical surgery. Bride, of London, reports that 39 per cent of his operated cases are disturbed as to sex relations (11). Fear and psychic instability here enter into the problem, and these are favorably influenced if a woman knows that her generative organs are intact, as after x-ray.

Q. Is the danger of cancer greater if the pathology is not removed surgically? Ans. No. This fallacy should have been exploded long ago. During my ten and a half years only one died of cancer and that was seven years after treatment. Throughout the world of x-ray therapy there is the belief that x-ray helps to prevent cancer by relieving the precancer pathology and by the return of normal circulation. Franque, the famous x-ray therapist of Paris, reported 200 cases of fibroid with one cancer following (12). According to accepted statistics, he was entitled to six. The same is true of my own series.

Q. Why do you prefer x-ray to radium or surgery? Ans. I do, in selected cases only. When I get a case suitable to x-ray I prefer it for the following reasons:

1. There is no danger to life. Both radium (13) and surgery have an admitted mortality.

2. X-ray requires no loss of time, no hospitalization, and is therefore less expensive.

3. X-ray covers a wider field, includes more possible outlying pathology, stimulates more actively circulation of lymph and blood.

4. X-ray more easily reduces the large tumor than can radium.

In closing I wish to urge that Time and Nature are two almost invincible allies; that x-ray in remedial doses, not destructive doses, reduces the pathology and the adhesions, establishes a free circulation—after which more treatment is not often required; that health is conserved by methods free from shock and prostration and by leaving a woman's pelvis intact and functioning if possible; that the universal acceptance of x-ray depends upon an accurate

estimation of the case before, during and after treatment, careful records, a cautious disposition and a less amount of x-ray rather than more.

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