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## ORIGINAL ARTICLES.

### TREATMENT OF UTERINE FIBROIDS — ERGOT.

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The *physiologic actions* of ergot are accounted for by its effects upon unstripped muscular fiber. It contracts blood vessels everywhere, thereby increasing the blood tension. The uterus, formed as it is by an enormous proportion of smooth muscular structure, is particularly susceptible to the peculiar action of ergot. It acts upon the uterus in four ways:

1. It decreases the whole bulk of the organ by producing a steady tonic contraction of all its muscular fibers; 2, it decreases the whole bulk of the organ by decreasing the amount of blood in its walls, as a result of contracting its blood vessels; 3, by decreasing the amount of blood in the uterus (by contracting its muscular bulk and by contracting its blood vessels) it modifies materially its nutrition and decreases the amount of the menstrual flow of blood; 4, when given in large doses it not only produces tonic contractions of the muscular fibers of the uterus, but, by instituting clonic contraction of its fibers, expulsion of natural and foreign bodies from its walls and cavity is effected.

Upon these thoroughly demonstrated effects of ergot has grown up a rational and very successful medical treatment of fibroids of the uterus. Before surgery and electricity found favor in the experience of gynecologists, as remedies which did their work with greater expedition, if not with more certain results, ergot for many years was depended upon, not only as a symptomatic remedy for fibroids but as a valuable curative agent.

The *mode of action* of ergot on fibroids of the uterus when considered in the light of its effect upon the normal uterus, can be easily understood.

An *interstitial fibroid* is affected by ergot in three ways: First, by the pressure exerted on the uniformly distributed fibro-myomatous fibers by the normal uterine tissue which everywhere surrounds them which has been stimulated to firm contraction by the drug; second, by a tendency of the hypertrophied fibro-myomatous fibers themselves to firmly contract under the abnormal stimulant. The result of this pressure upon the abnormal tissue is to produce atrophy. A third effect of ergot upon an interstitial fibroid of the uterus which favors its atrophy and decreases uterine hemorrhage, is the diminution of its blood supply from the contraction of its arterioles.

*Intramural fibroids* are also affected in three ways: 1, pressure atrophy from the firm contractions of the normal uterine tissue surrounding the masses; 2, atrophy and decrease of uterine hemorrhage, diminution of their blood supply as a direct result of

contraction of the arterioles; 3, a tendency for them to be expelled from the walls or the uterus in the direction of least resistance, as a result of the persistent contraction of the normal uterine tissue surrounding the masses.

*Submucous fibroids*, which are but a form of the intramural variety, are influenced in the same manner by ergot as is the simple intramural, while its cure is also sometimes effected by the expulsive contractions of the uterus, which force it first beneath the mucous membrane as a pedunculated mass, and finally expel it bodily from its cavity.

*Subperitoneal fibroids*, which also are but a form of the intramural variety, are influenced practically the same as that class, except that the influence of muscular contraction diminishes as the tumors become more subperitoneal and more pedunculated. The expulsion of the subperitoneal variety is not aided by the expulsive power of the uterus.

#### INDICATIONS FOR ERGOTIN TREATMENT.

The most favorable case for ergotin treatment in which a complete cure may be looked for is the intramural variety which consists of one or few centers of development, with these centers situated in close proximity to the mucous membrane. The uterus in such a case is considerably enlarged, the canal is long and tortuous, the symptom of uterine hemorrhage is conspicuous and the normal muscular tissue of the uterus is hypertrophied. Ergot given in such a case in large doses, continued for some weeks, will cause the hypertrophied muscles of the uterus to contract and to gradually squeeze the fibromatous center first toward the mucous membrane, then beneath the mucous membrane and finally into the uterine cavity, where the uterine expulsive pains will effect its deliverance. The enucleation of such a tumor can be materially assisted, as it should be, by incising its capsule as it begins to protrude beneath the mucous membrane.

When such a center or centers are expelled effectually the uterine pains will cease, the hemorrhage will lessen and the uterus will soon be found of normal size.

*Pedicated fibroids* are somewhat differently affected by ergot when they are submucous than when subperitoneal. If the uterus is considerably enlarged and the normal muscular tissue of the organ is hypertrophied, there is some hope that the pedicle of a subperitoneal pedicated fibroid will gradually become restricted by the uterine contractions, the nourishment of the tumor supplied by the pedicle be diminished thereby, and as a consequence a gradual atrophy of the stranded mass. While this *may* occur with a subperitoneal tumor, it may be counted on much more surely if the tumor is submucous.

In the *submucous pedicated* fibroid the nourishment of the pendant tumor is not only impaired by the constriction of its pedicle's base, but the expul-

sive effort of the uterus itself will, in its effort to rid itself of the foreign body, stretch and thin its pedicle until its blood vessels are eradicated and its tumor decreases from starvation. Sometimes the decrease is only partial from some small amount of blood still gaining access to the mass. Under either circumstances it remains but to catch the growth in a forceps and to twist it from its weak stem. The uterus then contracts to its normal state if there are no other centers of development.

A true interstitial fibroid is seldom, if ever, cured by ergot. While the muscular fibers of the uterus are often enormously developed, there are no distinct masses for them to work on when stimulated to contraction; nothing for them to get rid of but their fellow fibers. In this they may partially succeed by producing atrophy of one another by pressure, and by lessening the blood supply by contracting their blood vessels. This, however, experience has taught us is a slow method of diminishing a fibroid tumor. If large doses are systematically administered for a long time menorrhagia can often be materially benefited, but seldom permanently relieved.

Prof. W. H. Byford, who was the first in this country to publish results from the treatment of fibroid tumors by ergot, after Hilderbrondt had published his work in this line in Europe, begins his chapter on the subject as follows: "1. When properly administered, ergot frequently greatly ameliorates some of the troublesome and even dangerous symptoms of fibrous tumors of the uterus, *e. g.*, hemorrhage and copious leucorrhœa. 2. It often arrests their growth and checks hemorrhage. 3. In many instances it causes the absorption of the tumor, occasionally without giving the patient any inconvenience; at other times removal of the tumor by absorption is attended by painful contractions and tenderness of the uterus. 4. By inducing uterine contraction it causes the expulsion of the polypoid variety. 5. In the same way it causes the disruption and discharge of the submucous tumor."

#### METHOD OF ADMINISTRATION.

According to the physician seeks a mild or an active effect of ergot should he regulate his dose. In the first instance ergot is administered in doses just sufficiently large to maintain a tonic contraction of the arterioles and of the uterine tissue without producing the pain which is a constant accompaniment of the violent clonic contractions of the uterus. When the active effects of ergot are sought, large and often repeated doses are administered in such a manner as to obtain prompt and full physiologic effects of the drug.

When mild effects are sought ergot can usually be administered by the stomach. For this purpose I usually employ the purified extract called ergotin, administered in the form of capsules. Capsules containing from three to five grains each, given at intervals of four to six hours, will seldom disagree with the patient. Intervals of six hours, unless active effects are desired, are short enough. Frequently the dose of five grains will be too large for a simple tonic potion. I frequently give the ergotin in two-grain doses in capsule combined with one-fourth of a grain of the extract of *nux vomica*, distributing the doses so that they are taken before meals and at bedtime. Ergot can be given with good results in mild doses in rectal suppositories. Occasionally it will be tolerated in the form of the fluid extract by the mouth. There

is very little occasion, however, if a patient can take a capsule, for submitting them to this nauseating dose.

When we desire to obtain the active effects of ergot some management is necessary in order to get into the system of an ordinary woman a sufficient dose of the drug, without at the same time disturbing the functions of the digestive organs.

Ergotin in capsules, in five and ten grain doses, frequently will be tolerated by the stomach almost indefinitely. Occasionally a much smaller dose will be utterly rejected. Ergotin then may be administered in eight to ten or fifteen grain rectal suppositories. The physiologic effects, in a decided manner, may frequently be obtained in this manner. The lower bowel should be kept clear of all fecal matter and the suppository placed high. They may be administered as often as every six hours. Suppository tubes may be employed to advantage for the purpose of placing the suppository mixture higher in the bowel than is possible with the ordinary suppository. Small rectal enemas of the fluid extract may be employed as a means of obtaining the active effects of the drug.

Hypodermic injections of fluid preparations of ergot succeed in obtaining the promptest and most efficient physiologic effects of the drug, while they possess the objection of producing not a little pain and occasionally abscesses. The abscesses may be avoided by attention to aseptic principles, and the pain can be materially avoided by selecting non-sensitive portions of the skin combined with deep injections, and by the employment of a mixture containing one of the less harmful sedatives, as chloral hydrate or belladonna.

Pozzi recommends the following formula for hypodermic use:

R.	Ergotin . . . . .	gr. lxxv
	Chloral hydrate . . . . .	gr. xv
	Aqua distil . . . . .	ad ʒ iii

Sig. Twelve minims injected daily.

W. H. Byford says: "Most American practitioners now use Dr. Squibb's preparation (purified solid extract), some of them by dissolving it in pure water, while others add to the water a small amount of pure glycerin. Dr. Squibb recommends a solution of this extract as follows: Dissolve two hundred grains of the extract in two hundred and fifty minims of water by stirring; filter the solution through paper, and make up to three hundred minims by washing the residue on the filter with a little water. Each minim of this solution represents six grains of ergot in powder. Of this solution from ten to twenty minims are injected once daily or once in two days. This is the only preparation I have used in hypodermic injections, and I believe it is the best we can at present procure." It has been several years since I have used ergot hypodermically; the last that I did employ was prepared practically as given in Dr. Byford's formula.

#### DURATION OF TREATMENT.

As ergot at best can scarcely be termed an actual curative agent for fibroid of the uterus (except in rare instances) it follows that the duration of treatment must vary entirely with the case in hand, the results sought, and the judgment of the particular physician treating the case.

If the case is an ordinary bleeding interstitial fibroid of uniform contour, in which there seems to be no sub-mucous projections which we might hope to expell by means of heroic doses of ergot, small doses of from two to five grains each of ergotin in capsules

might be given three times a day for several months. The effect sought being a general vasomotor tonic action with a special predilection for uterine vasoconstriction, and uterine shrinkage due to long continued tonic muscular contraction of the organ. The subjective results being diminution of the menstrual discharge, pressure symptoms lessened and an improvement in flesh and strength.

If the case is a sub-mucous fibroid in which the attempt is to be made to accomplish the expulsion of the mass by contraction of the uterus stimulated by heroic doses, ergotin in form of large suppositories, or better, in hypodermic injections will be administered until the result is accomplished. When the tumor is expelled the remedy is immediately suspended.

If the case is one of interstitial bleeding fibroid and the object is to control or to modify the monthly flow of blood, ergot in good full doses, either by capsules, suppository, or hypodermic injections, should be commenced a few days before the menstrual period, and be continued until the flow has ceased, when it can be discontinued until a week before the next menstruation.

So that one must take into consideration the physiologic effects of the drug, under its varying doses, take into consideration the variety and character of the tumor and with these well in hand he must exercise his judgment in making his application in each individual case.

#### RESULTS.

The results obtained in the treatment of fibroid tumors of the uterus by ergot, depends much upon the sincerity and persistency of the physician who is conducting the treatment. If he is sincerely desirous of exhausting the resources of ergot in these cases before resorting to more radical means, or better, if he is opposed to any more radical treatment than the ergot treatment for fibroids, combined of course with rational hygienic and general tonic treatment, he will be sure to benefit a large percentage of his cases, and possibly a small percentage will become actually cured. Unfortunately now, in the light of the more precise and comparatively safe surgical procedures, and the more accurate, agreeable, if not more efficient electrical treatment, the slower, more disagreeable and painful medical treatment by ergot, is, I am afraid, too much slighted by practitioners. As the treatment is old, but one of the meritorious relics of pre-surgical days, I can only indicate its real value by quoting some of the statistics gathered by those who practiced it enthusiastically if not almost exclusively.

One of the last statistical papers of value written on this subject was one read at the Ninth International Medical Congress, held at Washington in 1887, by Prof. D. T. Nelson, of Chicago. In that paper he reported 153 cases treated by ergot, representing the reports of about one hundred physicians. The method of administering the drug was seldom described by the reporters. As a circular letter was sent to over 4,000 physicians, and that the 100 physicians replying almost invariably reported successes, there may be grounds for believing that had many more reported the answer might not have been so uniformly favorable. The following is a brief summary of the 153 cases, as given in Dr. Nelson's words:

"The small number of cases as not affected by ergot is quite remarkable, but two of the 153 cases. All the 153 cases were benefited by the ergot, more or less, except these two. Seventy-nine were cured,

tumor absorbed or expelled. In 61 other cases the tumors are smaller and their growth controlled, and there is every promise, with ergot, and perhaps without, that they will not again endanger life." There were 11 deaths in the 153 cases. "In cases 12, 13 and 17 ergot seemed to control the disease, and had it been continued favorable results were to be expected. Cases 16 and 29 died of septicemia after the expulsion of the tumor; such cases in future it is hoped, by improved methods, we may usually save. Cases 53 and 59 died only indirectly from the tumor, perhaps from embolism, the ergot having expelled or absorbed the tumor before death. In cases 79 and 123 pregnancy was an important factor in the unfavorable result." Cases 93 and 143 also died. Thus of the 153 cases, 140 remain cured or benefited.

Prof. W. H. Byford reports in his "Diseases of Women" 101 cases, including 27 of Hilderbrand's, 9 of his own, 14 of White's of Buffalo, and the remainder from a score of physicians. He summarizes them as follows:

"The total number of cases here cited is 101. Twenty-two of them are reported cured. In 39 more the tumors were diminished in size and the hemorrhage and other disagreeable symptoms removed. Nineteen of the remainder were benefited by the relief of the hemorrhages and leucorrhœal discharges, while the size and other conditions of the tumors were unchanged. Out of the whole number only 21 cases entirely resisted the treatment. This shows results decidedly favorable in 80 of the 101 cases."

#### MEMBRANOUS DYSMENORRHEA.

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The diversity of opinion which exists as to the causes of membranous dysmenorrhœa, with its comparative rarity, makes each case an object of interest to the gynecologist. During the past eighteen months I have had under observation a case of more than ordinary severity and obstinacy. The principal facts in the case are briefly these:

Mrs. L. age 26, married and sterile, menstruated first when 13½ years of age. Menstruation was painless and regular up to the age of 18. At that time the flow suddenly stopped after continuing two days, the cessation being followed by the usual symptoms of pelvic disturbance. One year later patient had an attack of what was probably a vaginitis accompanied by cystitis. There was heat and burning in the vagina, a profuse leucorrhœa, and frequent desire to urinate, the act being accompanied by smarting and burning. The painful menstruation, however, dates from the 18th year. Soon after its beginning the coming away of the membrane was noticed. The size of the membrane, according to the patient, increased from month to month for a year or more, and has never been absent from the beginning. In August, 1894, soon after the patient came under my observation, I obtained an entire membrane, including the uterine glands, and recently I obtained another almost as complete.

Physical examination showed a small os filled with granulations, the result of a mild cervical catarrh, uterus enlarged, nearly three and a half inches deep, and very sensitive. Region of ovaries sensitive to deep pressure; a more sensitive point, however, was over the solar plexus.