

upproned the medinn line of the skull, involving the first temporo-sphenoidal convolution, which would account for the partial deafness, the supramarginal and angular convolutions, and possibly the cuneus hence the homonymous hemianopsia.

The conjugate deviation of the eyes is not easily explained if it is assumed that this phenomenon depends on injury to the second frontal convolution, as the wound was situated some distance behind and below this convolution. The third frontal convolution might have been involved in the lesion, so it seems fair in this case to attribute the conjugate deviation to injury of this convolution.

The loss of tactile sensation in the left hand, and to a less degree in the foot, was to be expected from injury to the posterior motor area. According to Starr, "the parts susceptible of the finest and most delicate movements, those directed by the most acute sensations—the lips, the fingers, and the toes—lie furthest back in the motor area, chiefly in the posterior central convolution. Lesions in this convolution almost always cause some loss of tactile sensation as well as paralysis."

As the patient was right-handed and the injury was on the right side there were no symptoms of aphasia—no interference with memory of any kind—as there would undoubtedly have been had the same lesion occurred on the left side.

## TUBERCULOSIS OF THE PORTIO VAGINALIS AND CERVIX UTERI; ITS PATHOLOGY, DIAGNOSIS, AND TREATMENT.<sup>1</sup>

BY HENRY D. BEYEA, M.D.,

ASSOCIATE SURGEON, GYNECEAN HOSPITAL; ASSISTANT GYNECOLOGIST, UNIVERSITY HOSPITAL;  
INSTRUCTOR IN GYNECOLOGY, UNIVERSITY OF PENNSYLVANIA.

TUBERCULOSIS of the female genital organs has been known to the medical profession for many years. Raymond, a French writer, and others, described lesions of these organs as early as 1831. Such studies, and those during more than fifty years following, were simply discoveries of far advanced lesions in subjects dying of phthisis or more or less general tuberculosis. They were of interest only to the pathologist. It was then believed, as was asserted by Lebert and Rokitansky, that the diagnosis of genital tuberculosis in the living female was not possible. The first publication worthy of notice which considered the disease in this part of the body from a clinical standpoint, fully warranting the contradiction of the above statement, was the monograph of Hegar (1886), entitled *Die Entstehung, Diagnose und chirurgische Behandlung der Genital tuberkulose des Weibes*. This work distinctly marks an epoch of advance in our knowledge of the early pathology, diagnosis, and treat-

<sup>1</sup> Read before the Thirteenth International Congress of Medicine, Paris.

ment of genital tuberculosis, and it has formed a groundwork for more accurate and extensive practical studies during the succeeding years. The collaboration of the literature and personal studies of tuberculosis of the Fallopian tubes, ovaries, and vagina are now frequently in evidence, and it may be said that at present their pathology and clinical significance is as well appreciated as that of tuberculosis in any other part of the body.

Tuberculosis of the portio vaginalis and cervix uteri, however, have not met with the same degree of consideration, though clinically at least of equal importance. Tubercular infection here is of very rare occurrence, but it has seemed to the writer that the pathology, symptomatology, and treatment of a sufficient number of cases have now been carefully described to afford deductions which are of practical value.

My studies in this direction, of which I can here offer only a short résumé of conclusions, was instigated by the clinical observation and pathological studies of one instance of the disease, followed by a careful survey of thirty-two post-mortem, twenty-two clinical, and fifteen clinical and post-mortem observations taken from the literature.

The case coming under my notice was admitted to the University Hospital on March 27, 1899. The patient was an American white woman, aged twenty-three years. Her previous personal and family history was good and free from tuberculosis. Her husband was healthy. She was married in October, 1893, but was never pregnant. Menstruation appeared at eighteen years of age, but was very slight in amount, and occurred only every two, three, or five months. She had not menstruated since marriage. Leucorrhœa, profuse and extremely offensive, had been present for three years. There was a slight discharge of blood on two occasions after sexual intercourse. Since puberty, unconnected with the menstrual period, she had experienced every month or two mild attacks of aching pain in the left inguinal region, which seemed to be induced by exercise. She believed her present illness to date from nineteen years of age, and since then she had gradually failed in health. Two weeks before coming under observation she was taken with severe pain in the left side of the abdomen, backache, frontal headache, and pain in the lower extremities, had fever and a rapid pulse, was much exhausted, and compelled to go to bed. After a few days' treatment for influenza she was better and able to be out of bed, but, because of continued pain in the left side and the presence of a profuse and offensive mucopurulent vaginal discharge, her physician suspected uterine and ovarian disease, and accordingly made a vaginal examination. He found the vaginal cervix hard and indurated and the seat of a growth which bled easily to touch. Considering these local symptoms highly suspicious of carcinoma of the cervix, he transferred the patient to my care.

On admission to the hospital the patient still complained of considerable pain in the left inguinal region, sacral backache, frontal headache, loss of strength, and general malaise. A careful study of the urine determined it to be microscopically and chemically normal.

**VAGINAL EXAMINATION.** The vaginal outlet and vagina were nulliparous and normal. The vaginal cervix was irregular in shape and very much hypertrophied, being nearly twice the normal size. The mucous membrane of the portio vaginalis for a distance of from 1 cm. to 2 cm. surrounding the external os was eroded and of a bright rose-red color. The whole surface of the cervix was hardened, indurated, and bled easily to touch, and in some respects resembled in appearance the beginning cauliflower-like epithelioma of the portio vaginalis. On making a closer examination the cervical canal was found dilated, admitting the tip of the index finger. The finger detected an irregular, papillary growth, the size of a hickory-nut, arising from the posterior wall of the cervical canal just within and without the external os. It grew from rather a broad surface, perhaps 1.5 cm. in diameter, filled and dilated the cervical canal, and protruded on to the vaginal surface of the posterior lip.

This growth was of the same character as the less extensive disease spoken of as erosion, which extended from the cervical canal and surrounded the external os in other directions. There were no ulcers or necrotic changes demonstrable to the naked eye. The disease was strictly limited to the cervical canal and portio vaginalis in a manner very similar to papillary erosion in the nulliparous cervix. The papillae were small, finger-like projections attached to a distinctly indurated underlying cervical tissue. They were not friable, but were elastic to touch. Although the whole cervix was hard and indurated, it was not as resisting as that in any form of carcinoma. The bleeding caused by palpation was slight and resembled that sometimes seen in the papillary erosion or laceration of the cervix. The uterus was retroverted to the second degree, slightly movable, and very small in size. The left ovary was found prolapsed and adherent behind the uterus. There were no nodules to be felt along the course of the tube, although it was distinctly determined to be hardened and diseased. The right tube and ovary were also strongly adherent and diseased, and were demonstrable in immediate relation with the lateral wall of the uterus.

From the above history and the appearance and structure of the diseased cervix the lesions were considered to be due to one of three rare diseases—tuberculosis of the cervix, malignant adenoma of the cervix, or syphilis of the cervix.

Because of the age of the patient, the history of amenorrhœa in a nulliparous woman, the fact that the growth grew from the mucous membrane of the cervical canal and not from the portio vaginalis, with

the absence of any tendency to friability and with the presence of a half-elastic feeling to the diseased tissue, we were at once thoroughly convinced that the disease was not the cauliflower-like epithelioma of the portio vaginalis, nor did it in any way resemble the other forms of carcinoma of this portion of the uterus.

Since there was no history of syphilis to be gained from the patient or her husband, nor local skin indication of this disease, and knowing the history of amenorrhœa and other symptoms antedating marriage would at least be more likely to be caused by tubercular disease, syphilis was almost wholly excluded.

The long-continued absence of the menstrual flow, with the presence of strongly adherent tubes and ovaries and a small uterus, were points against the diagnosis of malignant adenoma of the cervix, yet we were by no means convinced that this disease was not present, for the growth originated in the cervical mucous membrane.

The history of only fairly good health during a long period, amenorrhœa with complete absence of the menstrual flow for six months, the presence of a papillary growth from the cervical canal in a young, nulliparous woman, associated with a small uterus and demonstrably very chronic tubal disease, surrounded with dense adhesions, without history of origin, with also the satisfactory exclusion of the other diseases named, caused me to put down in the hospital record the probable diagnosis of tuberculosis of the cervix, retroversion of the uterus, and tuberculosis of the adnexa. Following our customary plan, however, a portion of the papillary tissue was excised and examined microscopically. This examination positively determined the disease to be the papillary form of tuberculosis, the specimen containing the characteristic miliary tubercles and Langhans' giant cells.

The operation of thorough curettement, high amputation of the cervix, and bilateral salpingo-oophorectomy was performed on March 29, 1899. The permission for a more radical operation could not be gained from the patient.

The convalescence was normal, and at the time of writing, sixteen months after operation, she had gained many pounds in weight, and no new symptoms had developed. A physical examination of the chest and abdomen determined nothing abnormal, there were no indications of remaining tubercular disease, and the patient was apparently perfectly healthy.

**MACROSCOPIC EXAMINATION.** The portion of the vaginal cervix removed by amputation presented a cut muscle surface, a smooth vaginal mucous membrane surface, and a surface covered with erosion or small papillary outgrowths. The papillary growth began about 1 cm. within the cervical canal, and extended out on the portio vaginalis as already described. It was most extensive and best developed on the

posterior cervical wall and posterior lip of the portio vaginalis, forming here a nodule the size of a small hickory-nut. The nodular growth was directly continuous with similar but less developed growths surrounding the cervical canal and external os. They were flat papillary growths, an excessive papillary erosion, composed of minute finger-like projections, rose-red in color, elastic yet firm in consistency, and showing no indication of degenerative changes. The Fallopian tubes were those of a chronic endosalpingitis. The ovaries were macroscopically normal.

**MICROSCOPIC EXAMINATION.** Microscopic sections were cut longitudinally, parallel with the direction of the cervical canal upon all sides, extending the length of the cervix amputated. In all of these sections the squamous epithelium of the portio vaginalis showed an inflammatory change, beginning by proliferation 1.5 cm. from the external os and progressing in some places to complete destruction at the external os. The cells were first distinctly outlined, then became a homogeneous mass, which gradually disappeared. Beneath the squamous epithelium there was generally distributed an extensive small round-celled infiltration, with many leucocytes, which to some extent infiltrated the squamous epithelium layer. The papillae spoken of as growing from the cervical canal beyond the external os were slender finger-like processes growing close together, covered with columnar and cuboidal epithelial cells. The stroma was infiltrated with small round cells, polymorphous leucocytes, and here and there a miliary tubercle, often containing a typical Langhans giant cell. The underlying endometrium and a considerable portion of the new cell tissue showed the same character of changes. No degenerative change was found in any section, but considerable fibrous change was always present, rather indicating a beginning chronic fibroid tuberculosis.

A microscopic examination of the corporeal endometrium and Fallopian tubes determined the same character and stage of tubercular disease. Sections from the cervix, corporeal endometrium, and Fallopian tubes were stained for tubercle bacilli, and in each a few bacilli were found after several had been prepared.

The primary seat of infection was not determinable, but it is probable this case was one of descending tuberculosis.

**DIAGNOSIS.** Chronic diffuse tuberculosis of the portio vaginalis, endometrium, and muscle tissue of the cervix (tubercular papillary hyperplastic endocervicitis), tuberculosis of the corporeal endometrium and Fallopian tubes.

From a study of the literature, as before said, I have been able to collect sixty-eight—adding my own, sixty-nine—cases of tubercular infection of the uterus below the internal os; thirty of these were post-mortem discoveries, associated with far advanced tubercular lesions in other

parts of the genital tract and distoot parts of the body; two were post-mortem discoveries of primary tuberculosis of the cervix (Friedlander and Knufmann); twenty-two were clinical observations alone—of these three were associated with lesions in other parts of the genital tract and distoot parts of the body; four with lesions in distoot parts of the body alone; six with lesions in other parts of the genital tract alone; and in nine the disease was localized to the cervix alone, or it is not stated as to whether other parts were infected. Fifteen cases were observed both clinically and post-mortem, all of which were associated with tuberculosis in other parts of the body.

The age of the patients was recorded in fifty-seven cases as follows: From seventeen to twenty years, 6; twenty-one to thirty, 27; thirty-one to forty, 9; forty-one to fifty, 5; fifty-one to sixty, 5; sixty-one to seventy, 3; seventy-one to seventy-nine, 3, showing very distinctly that the disease is most frequent during the period of sexual activity. There seems to be no relation between the character of tuberculosis and the age of the patient.

The disease was localized to the portio vaginalis in nineteen cases and to the cervical canal in six cases. In the remaining forty-four cases both the portio vaginalis and cervical canal were infected.

The clinical character of the disease is to be distinctly divided into three varieties: tubercular ulceration of the cervix, tubercular papillary hyperplastic endocervicitis, and miliary tuberculosis of the cervix.

*Ulcerative Form.* This variety appeared as single, large, or as multiple minute (size of a linseed) ulcers distributed over the portio vaginalis or cervical canal, or as an ulcerative process quite completely excavating the entire cervical canal and destroying the portio vaginalis. The ulcerative process commonly surrounded the external os, extending along the cervical canal and over the portio vaginalis. In other cases an ulcer was seen on the portio vaginalis, surrounded by normal mucous membrane. The ground of the ulcers was usually white to yellowish in color. When of any size they were excavated, with sharp edges. The cervix was often hypertrophied. Microscopically a necrotic surface was seen, beneath which were all of the usual tissue changes of chronic diffuse tuberculosis. This tubercular change was in the early cases localized to the mucous membrane and the immediate underlying muscle tissue of the cervix, but in the far advanced cases the muscle tissue was destroyed to extensive excavation, even to almost complete destruction of all cervical tissue. Bacilli were sought for and found in the tissue in sixteen cases, in the vaginal discharge in one case. In two instances they were diligently sought for, but could not be found.

*Tubercular Papillary Hyperplastic Endocervicitis.* This form of tuberculosis involved the cervical endometrium, particularly the lower

half of the endometrium, and extended out on to the portio vaginalis, as does the common papillary erosion. Such erosion, however, is excessively hyperplastic, and quite frequently forms a tumor, which in one instance reached the size of an apple (Emanuel). The cervix was always hypertrophied and usually irregular in shape. It was indurated, but elastic. The growth was composed of small, finger-like projections, rose-red in color. Rarely, slight indications of caseation were seen.

The microscopic pathology of some of the cases described shows there is much evidence that in the beginning the disease is here a tubercular catarrhal endocervicitis, extending to the gland structure, often causing excessive hypertrophy and hyperplasia of the gland cells, even to a change into epithelioid cells and miliary tubercles. At other times the gland cells were little changed, and the tubercular process was most pronounced in the stroma tissue. The stroma tissue was always more or less involved. The microscopical character was, except in two instances, a chronic diffuse tuberculosis. In these two cases it was a beginning chronic fibroid tuberculosis. From the various descriptions, and with the careful study of my own case, it would seem to me that, aside from the presence of tubercular tissue, the macroscopic character of this variety strongly resembles the papillary erosion of Ruge and Veit, with excessive hyperplasia of all structures, giving the macroscopic appearance of papillary or even small cauliflower-like outgrowths. It is not a vegetative or papillomatous growth, as described by Cornil, Vitrac, Fränkel, and others, but, in the sense of Ruge and Veit, an excessive papillary erosion caused by the infection of the tubercle bacillus.

Tubercle bacilli have been found in the tissue in eight of the fourteen cases reported. Bacilli were diligently sought for by Zweifel and Michaelis, but not found.

*Miliary Tuberculosis of the Cervix.* Two cases of this variety have been reported (Virchow and Rigal-Cornil). They are characterized by the presence of minute miliary tubercles scattered over the portio vaginalis, associated with extensive and advanced tuberculosis on other parts of the body.

The large majority of the cases of tuberculosis of the cervix thus far described have been secondary infections, there being only three positive instances where it was satisfactorily proved that no other organ or tissue was involved. (I refer to the cases of Friedlander, Kaufmann, and Michaelis.) Cases of possible primary infection of the cervix, with secondary infection of other parts of the genital tract or body, are those of Emanuel, Meyer, Zweigbaum, Derville, Vitrac, and Bouffe.

*Symptomatology.* The subjective symptoms of tuberculosis of the cervix are indefinite and in no way characteristic of the disease. In

most instances the symptoms have been referable to lesions in the uterus, tubes, or peritoneum. The patients were mostly well-nourished and in good physical condition. Rarely they were anæmic and had failed in health. Many complained of malaise, indefinite and irregular pains in the lower abdomen, a feeling of weight in the pelvis, and more or less sacral backache.

The most frequent symptom in those cases carefully observed has been an abnormally profuse purulent leucorrhœa, now and then tinged with blood. Leucorrhœa was a symptom in twenty-four of the thirty-seven cases observed clinically.

Menorrhagia was present in thirteen cases. In four of these the uterus was much enlarged; one contained a fibroid tumor, and in two retroversion of the uterus was present.

Amenorrhœa was present in twelve cases. In five of these the uterus was abnormally small and in one greatly enlarged.

In three cases where the menstruation was normal the uterus was of normal size.

It would seem that to a great extent menorrhagia and amenorrhagia in tuberculosis of the cervix were dependent upon the presence of hyperplasia and aplasia of the uterus or independent disease of the uterus.

The objective symptoms depend upon the form of the tubercular lesion, the appearance varying as described in the consideration of their pathology.

The two varieties of clinical importance are the tubercular papillary hyperplastic endocervicitis and the ulcerative form. The disease of the cervix in these cases, perhaps, at first sight resembles either the cauliflower epithelioma or the excavating crater-like carcinoma of the cervix; but taking my own experience in the first variety, and accepting the description of other authors in the second variety, I would very positively say that there are many distinct characteristics of difference between carcinoma and tuberculosis of the cervix. However, since the experience of any one observer of this disease has been narrow, I am unable to absolutely contradict the statement of Péan and others who have described such cases as having all of the objective symptoms of carcinoma; yet I believe, if a careful examination of the cervix is made by an experienced clinician, these diseases can generally be separated one from the other.

The papillary form of tuberculosis of the cervix bleeds to touch, but not so early or to the same extent as carcinoma of the cervix. The bleeding may be compared to that sometimes seen in papillary erosion of the lacerated cervix. The tissue in tuberculosis of the cervix is not easily broken or friable, but has an elastic, velvety feeling, which is never present in carcinoma. Induration is present, but it is not the



hard, resisting induration of adeaocarcinoma. On the other hand, the tissue is more resisting than that of epithelioma of the portio vaginalis. In most cases of the papillary variety the tissue of the portio vaginalis is lobulated, the vaginal cervix irregular in shape, and the papillary tissue usually fills and extends from the cervical canal. The ulcerative form is a more or less extensive necrosis, an ulcer or ulcers, with sharp, well-defined edges covered with caseous tissue. Here, too, the tissue has an elastic feeling. The friability of carcinomatous tissue is absent, and the induration differs distinctly from carcinoma. The history, age of patient, and duration of disease are important factors of diagnosis.

The tubercular papillary hyperplastic endocervicitis resembles in appearance and structure excessive non-tubercular papillary erosion of the cervix, and the presence of such an erosion with early bleeding—particularly where there is a history of tuberculosis—should be the cause for suspicion of tuberculosis and indicate microscopic examination before treatment is considered. The tubercular papillary erosion also resembles in appearance and structure the rare cases of malignant adenoma of the cervix.

Further, this form in many respects resembles the syphilitic condyloma of the cervix.

The ulcerative form resembles syphilitic chancre, chancroid ulcer rodens, or carcinoma of the cervix. The method of differential diagnosis in the first two instances will be apparent; in the latter instances by the objective symptoms and a microscopic examination.

As in early carcinoma of the cervix, a diagnosis of tuberculosis of the cervix must always be that of suspicion, made positive by microscopic examination of excised tissue. This was the method of diagnosis in ten of the cases referred to.

The clinical diagnosis in fifty-six of the cases reported in the literature was as follows: Carcinoma or suspected carcinoma, 14; sarcoma, 1; ulcer of cervix, 4; ulcer rodens, 1; vegetative growth of cervix, 1; indefinite disease of the cervix, 2; phthisis or tubercular peritonitis, 28; tubercular meningitis, 1; apoplexy, 1; abdominal tumor, 2; caries of spine, 1.

**TREATMENT.** The treatment of tuberculosis of the cervix must be to a very great extent identical with that of tuberculosis of the Fallopian tubes, ovaries, and uterine body—as a rule, operative. In those cases where there are extensive tubercular lesions in other parts of the body, or where the genital tuberculosis is only a minor cause of the patient's ill health, no treatment aside from local application or cauterization of the cervix is indicated. If there exists a latent tuberculosis in another part of the body which cannot be influenced to acute re-development by the necessary operative measures, and the lesions of the genitals are the chief cause of the patient's illness, then the treatment should be radical

operation—panhysterectomy. Should there be tuberculosis of the Fallopian tubes, ovaries, or uterus, with tuberculosis of the cervix, again panhysterectomy should be the operation of election, though, as in my own case, amputation of the cervix, curettement, and bilateral salpingo-oophorectomy has as well effected a cure. Tuberculosis localized to the cervix and corporeal endometrium is best treated by panhysterectomy, but curettement and amputation have effected a cure. Primary isolated tuberculosis of the cervix is to be treated in a similar manner, but panhysterectomy is less imperative. Local application and cauterization are at best only palliative, and should be condemned except in those cases where there is advanced tubercular disease in other parts of the body.

Fifteen of the cases referred to in this paper were treated by surgical means: Ten by panhysterectomy; one by curettement, amputation of the cervix, and bilateral salpingo-oophorectomy; and four by amputation of the cervix. Local applications were applied in eleven cases.

Where the operation was panhysterectomy, seven completely recovered; six are doing well after five and a half years; one after four months. Three died: one of shock following operation, one of phthisis, one of tubercular peritonitis. Where amputation of the cervix was the operation, two recovered and remained well, and two died of phthisis. In the case where bilateral salpingo-oophorectomy, curettement, and amputation of the cervix were performed the patient was healthy, apparently free from tuberculosis, sixteen months after operation. Where local application, cauterization, was the treatment, one is said to have recovered, five were temporarily improved, and in five the disease progressed.

I am indebted to Dr. H. L. Williams for the preparation of the microscopic sections and much assistance in their study. A complete report of this study of tuberculosis of the portio vaginalis and cervix uteri will appear at a later date.

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#### REMARKS ON THE DIAGNOSIS OF SOME FORMS OF OPHTHALMOPLEGIA.

By L. F. ADT, M.D.,

OPHTHALMOLOGIST TO THE TROY, N. Y., HOSPITAL.

I DESIRE to correct some errors in the rules laid down by certain authors which are supposed to guide us in locating lesions affecting the ocular muscles governed by the third nerve, more particularly those lesions involving the nucleus of the third nerve and those involving the root fibres of this nerve in the tegmentum of the crus cerebri.