

And most of all, I have seen findings similar to those found in proven cases of cancer and of ulcer marked findings considered typical of these conditions, where no organic lesion of the stomach was present, as proven by operation and opening of the stomach.

I have seen sometimes a whole typical picture of, and often some of the signs of, organic stomach disease, as incisura, pylorospasm, a six-hour residue, in gallstone cases, appendix cases, syphilis of the stomach, syphilis of the cord.

The method is of very great value in connection with the diagnosis of the existence of the stomach conditions, but as a rule positive diagnosis of the existence of such conditions should never be made by x-ray examination alone, unconfirmed by other clinical findings, as tube findings, or feces findings, or at least by a very typical history.

This is a point which has been emphasized to most of us by costly experiences. Abnormal x-ray findings, while perhaps more constantly positive, in conditions of ulcer and cancer, that is, more universally present in the whole run of cases, than other clinical findings, as tube findings or feces findings, have the one deleterious feature, that they may be present, where no organic stomach lesion exists. Tube findings, for example, may show no definite abnormality in many cases of gastric ulcer, where x-ray findings give positive evidence, but the former never give definite, so-called diagnostic findings, where no lesion exists.

I call particular attention to this misleading quality of the x-ray method because it is a habit today among many physicians and surgeons to utilize x-ray examination to the exclusion of the more thorough method of investigation, and to abide too much by the x-ray finding or its interpretation in diagnosis.

The value of x-ray examination as a means of excluding by negative findings the presence of organic lesion, cannot be absolutely determined, since we have no way of judging at present exactly how many cases of cancer or ulcer we overlook.

We do know, however, that both cancer and ulcer may be entirely overlooked by the method. This is particularly the case with fresh bleeding ulcers, diagnosis proven by haematemesis, or tube findings, or stool examination, or by later operation, and is undoubtedly true of early stages of cancer. I have seen cases of ulcer showing blood by tube, or blood by feces, later operated upon and found, with negative x-ray findings upon repeated trials. And I have seen cases with symptoms showing a negative finding, return within a year and show a positive finding of cancer both by x-ray and operation findings.

I do, however, take a good deal of satisfaction in the use of the method for probable exclusion of cancer or ulcer in certain cases, as, for example, cases with tube findings of chronic gastritis associated with hypochlorhydria where it is important to determine whether the gastritis

finding is an associate of cancer or not, or cases with hypersecretion and hyperchlorhydria where it is important to determine whether we are dealing with simple hypersecretion or hypersecretion associated with ulcer.

Negative x-ray findings are not absolutely exclusive in such cases, but they are reassuring.

The use of the x-ray method of investigation in the study of stomach cases is not, of course, necessary in all cases, since a positive diagnosis is often made as a result of the study of the other routine methods of examination without resort to this ordinarily more expensive method of investigation. It is necessary in all cases where the findings by the other methods indicate or strongly suggest the presence of some serious pathological process, without giving evidence for positive diagnosis of the condition.

How far we should go in the employment of the x-ray method of study in the investigation of these cases with stomach symptoms not showing any definite evidence of the existence of disease elsewhere, as gall stones, appendix, etc., as a cause of symptoms, and not showing a definite abnormality in the tube finding for diagnosis of stomach disease, is a point which cannot be settled by any general rule. We should like an x-ray examination in all such cases, partly because x-ray examination does in many cases give definite evidence of a pathological process where other methods of examination fail to do so, and partly because, though absence of x-ray findings does not absolutely rule out the presence of cancer or ulcer, it gives us one more argument for excluding these conditions. But under present circumstances we cannot have the desideratum.

(To be continued.)

PLASTIC SURGERY IN PROCIDENTIA, WITH REPORT OF TWENTY-FIVE CASES.*

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As we get some degree of prolapsus in practically all lacerated and over-stretched cases which come to us for repair, we will leave the first degree out of this paper, and consider only the cases of complete or incomplete procidentia, where there is an extrusion of cervix or fundus from the vulvo-vaginal opening with, or without, eversion of the vaginal walls.

Four of my cases occurred in single women with a nulliparous cervix and a stretched, rather than a lacerated, condition of the vaginal outlet. I am thoroughly convinced after a careful study

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of this subject, that the shape and length of the cervix is the most important factor in the great majority of cases, and that this is often accounted for by heredity. Nowhere in the literature can I find the statement that this condition runs in families, which apparently is principally due to the length and shape of the cervix, and contributed to, no doubt, by slender ligaments and perineal muscles.

I have in mind two sisters, both nulliparae, one of them being unmarried, who came to me with a complete procidentia and marked eversion of the vagina. The unmarried sister had a fibroid, which added weight and pressure, and after an abdominal hysterectomy, where the cervix was removed by special request, there was an eversion of the entire vagina, probably partly owing to the fact that I did not fasten the vaginal wall to the round ligaments at the time of the first operation for hysterectomy, and after six months the prolapse recurred suddenly during a fit of coughing. I did a plastic operation, which up to this time is entirely satisfactory. Both these cases were long past the menopause; the second sister, being too old and frail for operation, is able to wear a pessary.

In another of my cases there is a history of a patient's mother and sister having the same trouble, and in still another the patient's mother has "falling of the womb" and two sisters have some trouble. In married women, most of my cases gave a history of normal labors. Several had only one child, and it seemed in their case a cause of one-child sterility, due probably to the posterior position of the uterus. In almost all the cases the uterine canal was longer than normal, often no doubt brought about by increased weight and subsequent stretching and elongation of the supra-vaginal cervix, but many of them, I am firmly convinced, were congenital. We all know that certain mental and physical characteristics may be transmitted by heredity. Why not, then, the shape and strength of the pelvic viscera? The shape of the bony pelvis also varies in patients and its relation to the abdominal axis, causing a vast difference in intra-abdominal pressure. The uterus is a freely movable body, and its relation to the vaginal canal varies, being chiefly regulated by the length and strength of its attachments, especially the anterior, round, and utero-sacral ligaments. Short posterior ligaments predispose to retro-positions, and are an important factor in procidentia. A short anterior lip, in many cases due to a low implantation of the anterior vaginal wall, is apt to maintain its axis in the pelvis by an ante flexion. Retrocession may complicate either condition, and gradual descent from intra-abdominal pressure will follow, if it comes on the upper, instead of the posterior, surface of the fundus. Increased weight of the uterus, as in sub-involution or tumors, tends to stretch and weaken the round and broad ligaments, and permit descent. Increased intra-abdominal pres-

sure, from whatever cause, is an important factor, especially if the relation of the axis of the uterus to the pelvis has been changed, so that the pressure is exerted in the direction of the outlet. This varies to a limited degree by a full bladder or rectum, and is aggravated by straining, coughing, and lifting; indeed, the latter are often given in the history as active causes. Overstretching from repeated pregnancies with lacerations of the birth canal is one of the most common causes of procidentia, though the patient may have no discomfort or knowledge of the fact for years, frequently not until after the menopause. We often see severe lacerations of the cervix and perineum with cystocele and rectocele, but if the uterus is in the right axis to the pelvis and vagina, there is at most only a slight degree of prolapse. A generally poor physical condition with a loss of tone and elasticity of muscles is an important predisposing cause of any prolapse, especially if long continued and aided by gravity, and is an important factor in these cases. A fall or strain at this time may cause a sudden stretching of the ligaments, with insufficient elasticity for rebound and replacement, especially if we have a wedge-like cervix with favorable conditions for its rapid elongation, even if not already present by heredity or other causes. You will notice that one of my series occurred in an unmarried woman past the menopause, after a carriage accident. In none of my cases was there a complete tear of the perineum or loss of sphincteric control of the anus. A great majority of them, however, have been constipated, complaining of a lack of expelling force, especially where the abdominal muscles had been overstretched as well.

These patients are usually most uncomfortable, though few of them have severe pain unless they suffer from accompanying hemorrhoids. They complain of a sensation of weight and dragging; many of them have cystitis varying in severity, often due to a pocketing of the bladder, with decomposition of a residual urine; sometimes they are infected with the colon bacillus.

In washing out the bladders of these cases, it is not unusual to catheterize them, and find the argyrol left in the day before. The older patients have usually tried all kinds of pessaries; many of them have had previous repair operations. Their general condition is apt to be poor, and they feel depressed, weak, and discouraged. They often have backache, and sometimes headache and dizziness. Many of them have systolic murmurs, which seem to be due to lack of muscular tone, and may clear up later with rest and tonic treatment. Some of them are fat and bulky; exercise makes them more uncomfortable and they take as little of it as possible. There may be high blood pressure and arteriosclerosis.

Diagnosis. Locally we may find a complete or incomplete extrusion of the uterus, according to the length of the cervix, the degree of laceration

or stretching of the vaginal walls and perineum, and the size of the fundus. If there is much descent, there may be incontinence of urine or leucorrhœal discharge, and we are apt to find erosions or friction sores on the cervix. If the vagina is everted it is usually dry, corrugated, and hard. If partially everted the moist areas may be ulcerated. If there is a large cystocele there is almost certain to be an accompanying cystitis, and it is well to obtain a catheterized specimen of urine. The passage of the catheter may give useful information regarding the presence of stone, pus, or blood, and the direction and length of the urethra. I hear that one of my cases died a year after the plastic operation, from an operation for abscess of the left kidney, and several of them *still* complain of bladder trouble. Fibroids or malignant tumors should be looked for in all cases, both in the fundus, or protruding from the cervix or vulva. In fibroid polypi the question is settled by finding the os externus. Vaginal tumors or a cyst may be present in the incomplete cases, or may exist alone.

Treatment. If aged or tired and depressed, especially if there is any heart lesion, I try to give these patients absolute rest in bed for a few days with a bland nourishing diet, plenty of water, and antiseptic diuretics if necessary. The bowels are thoroughly and regularly moved with cathartics, and if cystitis is present, a daily irrigation of boric acid, or weak permanganate solution if the colon bacillus is present. I then leave about an ounce of a ten per cent. solution of argyrol in the bladder. In all my cases but the first, I used preliminary scopolamine and morphine anesthesia. Either one, one and a half, or two doses, according to the age and blood pressure of the patient, and the judgment of the anesthetist. After the patient has been moved to the operating room she is disturbed, and a little ether may be necessary to begin with, especially if the cervix is to be dilated. I make a routine practice of this, and either use the curette or apply tincture of iodine to the canal, or both. In one patient of sixty-two I found a very tight internal os. Dilatation was followed by a discharge of pus, but as the patient was under the anesthetic I determined to proceed. The result was a moderate infection of the perineum, which rapidly cleared up under treatment, and in no wise affected the result; so I explore every uterine cavity, and always disinfect it with iodine. In cases of low implantation of the anterior vaginal wall one has to be careful not to cut into the bladder; I have seen it as low as the edge of the anterior cervical lip; less care is needed posteriorly. I usually make a circular incision and peel both walls back to the desired length by measurement. Once or twice I have gone through into the peritoneal cavity in a complete case, with no untoward result. I usually tie the lower uterine vessels except in women in the child-bearing period. I then re-

move the denuded cervix, being careful to retain the distal edges with an instrument, otherwise the fundus may disappear from your sight and cause some difficulty and delay in the operation. The vaginal edges are now sewn to the cervical edges with three stitches anteriorly and posteriorly, making a new os. The lateral edges are approximated to each other, being careful not to leave any raw surface, as vaginal adhesions are very liable to form in these cases. I use ordinary chromicized catgut, and leave the middle ends long enough to hold the anterior wall firmly during the operation for cystocele. In my first cases I used the oval denudation, later the triangular, often with some return of the cystocele with both methods. It was in a dissatisfied frame of mind that I went to Chicago and saw Dr. Bertha Van Hoozen do a central flap operation, which she thought was contra-indicated by trachelorrhaphy, but which I have not found to be the case. A straight incision is made in the median line of the cystocele, both flaps are turned back to a pillar of the deep perineal fascia, shown by a white line pointed out by her. The two fascial lines are brought together by interrupted catgut sutures, pushing up the bladder as they are tied, treating it as a hernia. The mucous membrane is now dissected back as far as convenient for easy coaptation, and sewn over the first line of sutures with a continuous catgut stitch. The next consideration is the posterior wall, which often forms a large rectocele. I usually do the Emmet M-shaped denudation, but carry the two angles up as high as possible and attach them to the deep perineal fascia at the sides of the vagina, forming very long arms to the Y when finished. The perineal muscles are brought together and sewn with interrupted stitches of 40-day chromicized catgut. It is essential that these stitches hold for at least two, better three or four, weeks. I seldom remove anything but a few irritating knots during convalescence. Catgut does not cut the skin like silkworm gut. The after-care is easier, is less painful, and does not require removal, a process which is often painful and a source of dread to the patient. If the general condition permits, I remove any hemorrhoids present, but this combination greatly increases the suffering, and it is not my custom to do it unless it is absolutely necessary, especially in the aged.

After-care. I use an ice bag for the first forty-eight hours, with hamamelis or dry gauze on the stitches. Great care is required with regard to the regulation of the bowels and bladder, and irrigation for cleanliness. Where there has been a cystitis I continue my treatment by irrigation and injection into the bladder of a ten per cent. solution of argyrol, with some antiseptic diuretic by mouth. Usually catheterization is necessary. The bladder should be emptied every six or seven hours, oftener if the patient complains of pain. There may be incontinence of urine from the overflow of a full blad-

der, or the patient may squeeze out a few drops from spasm, so in any case use a catheter if there is pain or distention. I have never used a permanent catheter in these cases; it is almost sure to cause an irritation in cystitis in my experience. In two or three of my cases I excised hemorrhoids, and noticed a decided increase of urinary symptoms from this source of nervous irritation and pain. The bowels should be moved in forty-eight hours. I usually give an oil enema just before defecation for the first few days. If there are hemorrhoids, I sometimes mix the oil with lime water, if not, plain or with soapsuds. After peristalsis is well established I find cascara is apt to give painful spasms of the anus, and prefer a milder cathartic. The salines give watery movements and make it harder to keep the perineum clean. Constipation, or a low enema for rapid expulsion, may tear the perineum apart and is to be avoided, especially in the second week when the stitches begin to dissolve. I find that the stronger antiseptics irritate and apparently decrease the vitality of the already depleted tissues, so use nothing stronger than sterile water or boracic acid solution. If the stitches irritate, argyrol gives relief. In some severe cases, a sloughing of parts of the posterior wall or perineum may take place, especially if the stitches have been tied too tightly, or there has been much post-operative edema. If the strong forty-day catgut has been used this has not been serious in my cases, and with care, the after-effect has been quite satisfactory; indeed, one of the best results I have seen was in a case of this kind. After the sloughs came out the tissues closed down into a solid muscular perineum. This patient had a large rectocele the size of a fetal head, and the tissues were thin and much depleted. You must, however, make sure that your fascia holds. I regard the fascial attachment as important as the muscular, there is less strain on it and no elasticity except in the vaginal walls, which give to strain and relax very easily. I formerly kept these patients in bed twenty days. Now I judge according to the case and the age of the patient; at least two weeks is necessary, sometimes three, and if there is any sloughing it may require four. In elderly patients a second operation is often a very serious matter, and no care or pains should be too much for surgeon or nurse. These women are usually veterans of the child-bearing period who have done their duty to state and country, and I feel it a privilege to do my part toward their comfort and restoration to health. They demand our best care in every case; eternal vigilance is their due. Tonics are usually needed during convalescence. The digestion is generally impaired, and careful feeding is sometimes necessary, especially with regard to the gas-producing foods, as starches and sugars. I have seen serious symptoms in one or two of my cases from the pressure of gas on a fatty heart in a stout

and bulky patient. As soon as the patient is up, it is advisable for her to wear some abdominal support, either a belt or front laced corset, as they prefer or the case demands. If not too aged or bulky I find the corset holds up the intestines and decreases the intra-abdominal pressure if worn correctly, having in mind the ptosis which often exists in these cases. In this way it improves the digestion and general health; but if the patient is stout or old, or has never worn corsets, it is a source of irritation to them, and a good fitting belt is better, though not to be worn tightly. In hospital work social service is very valuable, to see that proper hygienic care is given, or followed out. Many of them have a return of cystitis, which could have been prevented or stopped in the early stages. There may be a gradual extension of the infection through the ureters to the kidneys, as in one of my cases. These patients get constipated in spite of all your advice, and by constant straining may bring about more or less return of their original trouble, especially if bloated, or any other cause of increased intra-abdominal pressure exists. When aged their intellect is often not as keen as it used to be, and they need intelligent supervision.

CASE 1. Mrs. L., 69 Widow, American. Operation in May, 1908. This was a case of complete procidentia with erosion of cervix. She was unable to wear a pessary and complained of feeling tired all the time, with numbness of thighs and general lameness. Frequent micturition. Mother of eight children. Widow two years. Menopause twenty years before. After four days' rest in bed with preliminary treatment the operation was performed under ether anesthesia. The internal os was closed, and a gush of pus followed the introduction of the uterine sound. The canal was dilated and disinfected with tincture of iodine. It measured four inches. I removed two inches of the cervix, tying the lower uterine vessels. Oval denudation for large cystocele. Y-shaped colpo-perineorrhaphy. Convalescence interrupted by inflammation of perineal wound, which, however, did not break down and she was discharged in good condition at the end of four weeks. I saw this patient twice, at the end of the first and second years following the operation. She is in good condition, feels well, and perfectly comfortable; she is now 75 years old.

CASE 2. Miss F., 29. Born in N. B. I first saw this patient in April, 1909. She was complaining of attacks of nausea and vomiting, with epigastric pain referred from right side. There was tenderness and rigidity over MacBurney's point. The cervix was long and snout shaped, and protruded from the vulva about half an inch. The uterus was retro-curved, but easily replacable. She refused operation, so a pessary was fitted and she was referred to another physician for medical treatment. In August of the same year she had an acute attack of appendicitis and was sent to the hospital. After the acute stage had passed the appendix was removed and the uterus suspended with kangaroo tendon by another surgeon. I did not see the patient again for six months, when she returned with the following history: She had felt better till the past

two or three weeks when she developed a cold and cough and now felt as uncomfortable as before the operation. Examination showed an extrusion of the cervix worse than before. The uterus was in the axis of the vagina and there was a separation of the recti muscles. A pessary was worn without much comfort for a year, the patient in the meantime trying to do house work. In June, 1911, the condition getting worse, she consented to further operation. The uterine canal measured four and a half inches. After a thorough dilatation and curettage one and a half inches of the cervix was removed. The abdomen was then opened through the scar, at the same time dissecting it out. No traces of the former suspension were found, and the round, anterior, and broad, ligaments were much relaxed. A Gilliam suspension was done, taking care not to wound the fundus, and the abdomen closed in layers. This girl looked strong and healthy and yet her musculature was very poor; it required much searching to find the two very slender recti muscles. Her convalescence was uninterrupted and she left the hospital in good condition in about three weeks. I hear from her occasionally. She is well and working hard.

CASE 3. Mrs. G., 42, married. Born in Austria. Has had four children and two miscarriages, the last one eighteen months ago. Operated on two years ago for prolapse, with irregular and profuse menstruation. She refused hysterectomy at that time and plastic work was done. Three months later the prolapse recurred and the patient felt no better. I operated on her in September, 1910. Nothing was done to the cervix. An oval denudation was done for the cystocele, followed by a high colpo-perineorrhaphy. Whether flat, or Y-shaped, is not given in the records, and no attachment to the fascia is mentioned. I hear from this patient that she is not well. She has trouble in holding her water and something comes down. She also has some discharge.

CASE 4. Mrs. W., a widow of 60. Operation in September, 1910. Has had five children. The first instrumental, the third craniotomy, no miscarriages. Menopause at 45. History of heavy lifting followed by prolapse two months ago. The cervix was lacerated. Length of canal not given. The cervix was amputated and an oval denudation was done for the cystocele followed by a flap perineorrhaphy. I have heard nothing from this patient.

CASE 5. Miss N., 68. Born in America. Menopause at 50. Operation in March, 1912. First noticed a dragging sensation fifteen months before. Has worn a pessary for the past year. Examination showed a coconut-sized tumor, attached to the fundus and freely movable. Cervix long and eroded. Complete procidentia. I did a total hysterectomy, the cervix being removed by request. Convalescence was uninterrupted and the patient was comfortable for about four months when she developed a cough and cold. Suddenly after a fit of coughing the whole vagina came through the outlet in complete eversion. A pessary proved useless and the patient was again operated upon. An oval denudation was made anteriorly and the edges brought together, posteriorly an M-shaped denudation was done, carrying the arms up to the old scar, the middle tongue of vaginal tissue being attached to the deep perineal fascia on both sides. The slender

perineal muscles were dissected out and sewn tightly together with interrupted 40-day catgut, leaving an opening sufficient for drainage and irrigation. She was discharged in three weeks in good condition and is perfectly comfortable since the last operation two and a half years ago.

CASE 6. Mrs. M., 42, married. Born in Prince Edward Island. Sent to the hospital for procidentia. Length of uterine canal not given. High amputation of cervix, oval anterior colporrhaphy, and high Y-shaped perineorrhaphy, attaching the sides to the deep perineal fascia. Discharged in four weeks in good condition. This patient writes that she has some difficulty in holding her water and is suffering from piles.

CASE 7. Mrs. L., 62, married. Born in America. History of one child, no miscarriages. Feels tired, weak and depressed, trace of albumen in the urine; accentuation of second aortic, heart otherwise normal. Examination showed a complete procidentia, with a sharply retroflexed uterus, and long eroded cervix. Operation in May, 1912. Dilatation shows tight contractile internal os with a pus-like discharge; canal four and a quarter inches, disinfected with iodine. A circular incision was made round the cervix, the vaginal walls were dissected up to the peritoneal attachment above the flexion, the lower uterine vessels were tied and the denuded cervix removed. An oval denudation of the cystocele was followed by a long Y-shaped colpo-perineorrhaphy with attachment of fascia. I also removed two hemorrhoids by dissection and continuous suture. This patient had a long and slow convalescence owing to her depressed and nervous condition, but was discharged in good condition at the end of four or five weeks. She had a severe fall the next year, but tells me she is well and perfectly comfortable during the day. She gets up once or twice at night to empty the bladder.

CASE 8. Mrs. S., 53, married. Portuguese. Mother of ten children. Comes for complete procidentia. Operation in June, 1912. Length of uterine canal not given, nor date of menopause. High amputation of cervix, oval anterior colporrhaphy, and long Y-shaped colpo-perineorrhaphy. Discharged in good condition in twenty-two days. This patient's daughter writes to tell me that her mother was perfectly comfortable after the first operation, but that she died two years later following an operation for abscess of the left kidney. Kelly of Baltimore speaks of the great frequency of kidney complications in these cases due to an ascending infection from the cystitis, this, however, is the only one of my cases where I have known it to occur.

CASE 9. Mrs. S., 65, widow. History of one child, no miscarriages. Had a previous plastic operation one year ago. I found a senile uterus with much scar tissue from the previous operation especially on the perineum. A large triangular denudation was made on the anterior wall and sewn with continuous catgut. A long Y-shaped colpo-perineorrhaphy followed, extending the arms of the Y up to the cervical junction, and attaching both sides to the fascia. Discharged in three weeks in good condition. I hear from this patient that she feels well and nothing comes down, but that she has some

trouble in holding her water and is often up several times at night.

CASE 10. Miss N., 32. Born in N. B. Came to see me complaining of backache, bearing-down pain, dysmenorrhoea, and irregular menstruation. Examination showed a prolapse of about two inches of cervix during expulsive efforts; prolapse had been noticed by her for over a year. I operated in February, 1913. The uterine canal measured practically five inches, more than half of which was due to a hypertrophied cervix. I removed two inches of the cervix, after a thorough curettage for endometritis, and made an application of iodine; the uterus was packed anteriorly until the next day, in case of vomiting or straining. Nothing was done to the vaginal walls or perineum. She was discharged in three weeks after a slightly painful menstruation. When I saw this patient a year later she had been practically free from dysmenorrhoea, her periods were regular with less amount, the uterus was anterior, and she had been perfectly comfortable except once after heavy lifting, when there was a sense of weight and fullness for a few days. The ligaments seemed quite able to hold the lighter uterus in good position, though the vaginal walls were somewhat relaxed.

CASE 11. Mrs. G., 40, married. Born in England. Mother of seven children, no miscarriages. History of irregular menstruation for two years. Her general condition was poor, she was stout and bulky, and had a systolic murmur. She was very uncomfortable and often unable to walk. Examination showed a large uterus but no fibroids. Operation in May, 1913. Length of canal not given; much tissue removed by the curette, showing a hyperplastic endometritis. I removed one and a half inches of the cervix, and did an oval denudation of the anterior wall for cystocele, followed by a high Y-shaped colpo-perineorrhaphy. She was discharged three weeks later in good condition. Now she writes to tell me she doesn't feel very well, as she is two or three months pregnant, is constipated, and suffering from incontinence of urine.

CASE 12. Mrs. C., 43, married. Born in N. S. Has had two children, both labors normal. One miscarriage. Comes for irregular and profuse menstruation, prolapse noticed for six months, painful the last two weeks. Has leucorrhoea. Operation in March, 1913. Uterine canal four inches. Considerable tissue removed with curette and canal disinfected with iodine. One and a half inches of cervix removed, nothing done to the anterior wall, Y-shaped colpo-perineorrhaphy. Discharged in three weeks in good condition. I have heard nothing of her since.

CASE 13. Mrs. H., 45, married. Mother of seven children, all normal labors. Two miscarriages, last one six years ago. Operation in March, 1913. Canal four inches. One and a half inches removed, after a curettage and disinfection with iodine. Y-shaped perineorrhaphy. Nothing was done to the anterior vaginal wall, as there was no marked cystocele. She was discharged in twenty-six days in good condition. This patient writes to tell me she is constipated, and the bladder comes down, though she has no difficulty in holding or passing her water.

CASE 14. Mrs. K., 63, widow. Born in N. B. Mother of six children, last one twenty-four years

ago; all normal labors. No miscarriages. Has noticed falling of the womb for two years. Examination showed a complete procidentia with an eroded cervix. The uterine canal measured three and three-quarter inches, fifteen years after the menopause. I removed one and a half inches of eroded cervix, tying off the lower branches of the uterine vessels. I used a triangular shaped denudation on the anterior vaginal wall, and a high Y-shaped perineorrhaphy, attaching the fascia on either side. The patient was discharged after five weeks, according to the records, in fair condition, but she writes to tell me she feels perfectly well, is doing general housework, has no trouble with urination, no discharge and no prolapse. She has, however, a slight lack of sphincteric control of the anus. She is a most happy and appreciative patient, according to her letter.

CASE 15. Mrs. J., 48, married. Born in Sweden. Operation in April, 1913. History of two previous plastic operations nine and one years ago at another hospital. Has had two children, the first an instrumental delivery. Irregular menstruation past two years. Uterine canal measures four inches, cervix small and hard to dilate. Much scar tissue from previous operations. One and a half inches of cervix were removed, the uterus pushed well anterior, and a high Y-shaped colpo-perineorrhaphy done, after dissection of scar tissue. Discharged in twenty-six days, condition recorded as fairly good. I saw this woman a few days ago. The uterus was high in the pelvis and very small; there was no cystocele, but an egg-sized rectocele, starting high above the fascial attachments. A small movable body, apparently a cyst, seems to have prevented the proper healing of the perineal muscles and is still present under the perineal scar. She suffers no discomfort, but is persuaded to try again.

CASE 16. Mrs. J., 60, widow. Menopause seventeen years ago. Has had two children, both normal labors, but torn with the first one, 39 years before. No miscarriages. Has noticed "falling of the womb" for about ten years. Examination shows complete procidentia. General condition poor. Feels weak and tired, and is suffering much pain from hemorrhoids. Has an irregular pulse, and a systolic murmur. After five days' rest in bed with preliminary treatment, the patient was operated upon in April, 1912. The uterine canal measured three and a half inches seventeen years after the menopause, and yet the uterus felt small. I removed the cervix up to the peritoneal attachment, did a triangular anterior colporrhaphy, and a long Y-shaped colpo-perineorrhaphy; I also removed the hemorrhoids at the request of her physician. She was discharged in twenty-four days in good condition, and looked well six weeks later. I hear she continues well, is active, and has perfect comfort. The systolic murmur has disappeared and the pulse has become regular.

CASE 17. Mrs. F., 40, married. American. Menopause three years ago. Has had two children, youngest three, both normal labors. No miscarriages. History of lifting something heavy two and a half years ago; later a bunch appeared at the vulva with pain in the left side and backache. Stout heavy woman with systolic murmur and accentuated second sound of the heart. Operation in April, 1913. Procidentia almost complete. Canal

three and a half inches. Cervix amputated; Y-shaped perineorrhaphy with removal of much scar tissue, also excision of hemorrhoids. Discharged in twenty days in good condition, and I have heard nothing further from her since.

CASE 18. Mrs. C., widow of 71. Born in N. S. Came to the hospital with complete procidentia and eroded cervix. Menopause 31 years ago. She was tired and felt weak, had arteriosclerosis, high blood pressure, and varicose veins of lower limbs. After rest and treatment she was operated upon in April, 1914. Uterine canal measured three and a quarter inches, thirty-one years after the menopause. One and a half to two inches of the cervix were removed, tying the lower branches of the uterine vessels. Straight flap anterior colporrhaphy, high Y-shaped colpo-perineorrhaphy. Discharged in twenty-five days, result not given in the records. She writes to tell me, however, that she feels better than for many years, nothing comes down, she has no trouble with the bladder, but is very constipated.

CASE 19. Mrs. L., 55, widow. Mother of five children, all normal deliveries, though the first was slow and hard. Menopause four years ago. Procidentia past six months. Is now complete. Length of canal not given, but after amputation of the cervix it measured one and three-quarters inches. Operation in April, 1914. Cervix amputated, straight flap operation for cystocele, high Y-shaped colpo-perineorrhaphy. Discharged in twenty-six days in good condition. Patient writes that she is very constipated, and has some trouble in holding her water, but that nothing comes down. She has no discharge, and feels well if she does not overwork.

CASE 20. Mrs. P., 48, married. Born in America. Comes for procidentia, noticed the past year. One child nineteen years old, normal labor. Menstruation irregular for a year. Cervix cystic. Uterine canal three and a half inches. Much tissue removed with curette, showing hyperplastic endometritis. One and a half inches of cervix removed, straight flap operation for cystocele, high Y-shaped colpo-perineorrhaphy. Discharged in twenty-three days in good condition. I hear from this patient that she has felt fine since she recovered from the immediate effects of the operation in April, 1914, and that she has more comfort in standing and walking than for years. She has no trouble with the bladder, no leucorrhea, and is menstruating regularly.

CASE 21. Mrs. L., 58, widow. Born in Russia. Mother of eight children, all normal labors. Two miscarriages, one after last child seventeen years ago. Menopause three years ago. Is short and stout, with a pendulous abdomen. Feels tired all the time, with a dragging sensation of the pelvis, and backache. She also has sciatica. Has noticed prolapse for over a year; bladder trouble on and off for ten years, worse the past three years. Frequent and painful micturition. Examination showed a complete procidentia with eroded cervix. Has been unable to wear a pessary. I did a high amputation of the cervix on this case, tying the lower uterine vessels. A straight flap anterior colporrhaphy was done, and a high Y-shaped colpo-perineorrhaphy, with attachment to the deep fascia. She developed an acute attack of cystitis after the

operation, but quickly recovered under treatment, and was discharged in twenty-three days in good condition. I saw this patient a week or two ago, when she had a slight attack of cystitis, but the mechanical cure was complete. The catheter passed through a straight urethra, there is a good perineum, and no bulging of the vaginal walls.

CASE 22. Mrs. F., 59, married. Born in America. Has had nine children, all normal labors; torn twenty-two years ago with fourth child. Two miscarriages. Comes for "falling of the womb," worse since an attack of bronchitis two years ago. Examination showed complete procidentia, a rectocele the size of a small fetal head, and a moderate sized cystocele. Stout and bulky, with pendulous abdomen. Heart irregular and intermittent; high blood pressure. Complaints of feeling weak and tired, with a dragging sensation in the pelvis. Operation in June, 1914. Canal three inches. Many scars holding the uterus, so only about one inch amputated from the cervix, at the same time repairing old lacerations in the vaginal wall. Oval denudation of small cystocele with continuous catgut suture. Large rectocele denuded, puckered, and incorporated into the fascia at the sides of the vagina. High Y-shaped perineorrhaphy. Discharged from the hospital in six and a half weeks. Convalescence interrupted by sloughing of small areas in perineum and posterior vaginal wall, but owing to the 40-day catgut sutures, the muscles and fascia held well, and the end result was good. She also had an acute attack of cystitis after the operation in spite of preliminary treatment. The bladder was capacious and pocketed, argyrol injected one day was often passed in the catheter the following day. I saw this patient about three weeks ago, and she is perfectly comfortable, quite active about her house, and the mechanical result is very good. She has recovered from her sciatica and the cystitis. These patients are a long time in the dorsal position on the operating table, and if there is an old sciatica or lame back, it is quite liable to start up a fresh attack.

CASE 23. Miss C., 50. American. Menopause six years before, after a carriage accident. Has no pain, but a feeling of weight and discomfort in the pelvis. Has noticed prolapse the past six months, with incontinence of urine. No family history of malignancy. Examination showed a complete procidentia. Cervical lips eroded and much thickened, with a small polypus presented at the external os. I did a high amputation of the cervix, opening slightly into the peritoneal cavity. Length of canal three and a half inches, two inches of which were removed. The uterus was pushed anteriorly, and a long posterior colporrhaphy done, extending to the vaginal vault. The overstretched and slender perineal muscles were brought tightly together, and sewn with interrupted 40-day chromicized catgut. Convalescence was uninterrupted, and she was discharged in twenty-two days in good condition. I hear from her occasionally, and she continues well and comfortable.

CASE 24. Mrs. F., 45, married. Born in Ireland. Has had three children, first and last being instrumental deliveries. No miscarriages. Complaints of a feeling of weight and dragging in the pelvis, present three years since the birth of her last child, and gradually getting worse. Has dizzy spells. Ex-

amination showed procidentia not quite complete, with a fibrous growth on the posterior cervical lip about the size of a walnut. Canal three and a half inches. Amputation of one inch, after a thorough curettage. Anterior colporrhaphy by a straight flap method, perineorrhaphy by the flap method. Discharged in three weeks in good condition. I have not heard from this patient since she left the hospital two months ago.

CASE 25. Mrs. F., widow. Born in Ireland. Has had two children, first labor instrumental. Menopause fifteen years ago. Sensation of weight and dragging in the pelvis for the past six months. Operation in September, 1914. Complete procidentia past two months. Canal three and a half inches. One inch amputation, anterior colporrhaphy by straight flap method, high Y-shaped colpo-perineorrhaphy. Discharged in twenty-seven days well healed.

Here we have 25 cases to consider which extend over a period of six years. It is noticeable that most of the patients give a history of normal labors, and the one absolute failure was in a case that had been operated on before and the cervix was not amputated either time. I maintain that the removal of the cervical wedge is a very important part of the operation, and I generally find the length of the canal almost double the normal, even in a senile uterus which feels small. We also have to consider the deep perineal fascia which extends from the pubes to the perineal body and ischial spines, with openings for the urethra and vagina. I make use of this fascia in my vaginal work and regard it almost as important as the perineal muscles; where they are atrophied or slender, even more so. I have only used the straight flap method on the anterior wall during the past year. Though it does not stop the cystitis I have not as yet seen any return of the cystocele, and the urethra has been straight in every case to the passage of the catheter. With regard to the bladder symptoms, there has been some return of incontinence in 6 cases, 14 have no further trouble, and 5 have not been heard from. There has been a slight return of cystitis in 2 cases, and 2 have a cystocele which annoys them, though at the time of operation it did not appear necessary to do an anterior colporrhaphy. In one of the cases of incontinence the patient is pregnant, and does not say how she was before she became so. In three cases there is a return of the cystocele after the oval and triangular methods of denudation, and there is some return of the cystocele in two cases where there is no incontinence.

Cystocele of itself then does not necessarily cause incontinence; it is due to lack of sphincteric control. If you pass the dilators into the urethra of these cases you will find them so relaxed that they admit the largest size with slight, if any, resistance, and yet during convalescence they may suffer from retention. After they go home and are more on their feet, the difficulty in holding the water returns, though in

none of the cases has there been complete incontinence afterward. I prefer this method to abdominal fixation or suspension, as in my experience the latter does not cure, unless combined with plastic work. In the aged with a very small fundus, the after-effects are not always comfortable after suspension, due to a dragging on the new anterior ligament, which eventually stretches under intra-abdominal pressure and relaxed outlet, and permits renewed descent. The combined operation is long, and the risk much greater in these patients of lowered vitality, both from sepsis and shock. The few vaginal hysterectomies I have done have not been a cure, unless accompanied by plastic work, even with a vaginal attachment to the round ligaments, and the shock was much greater to the patient. I fail to see any advantage in this, over the high amputation, where eight ligaments have a small piece of fundus to retain, compared to the round and broad ligament attachment to the vaginal walls after hysterectomy, unless there is a question of malignancy or tumor.

Contra-indications. Contra-indications are serious heart and kidney lesions, glycosuria, malignant disease, fibroids, and diseased adnexa. In the patient of child-bearing age, there is no contra-indication if you leave the internal os intact, and allow for involution. I have carefully followed four cases and personally delivered two, where the labor was quick and easy for the first time. One of my patients had borne two previous children with slow hard labors, and the other had given birth to one. Both of them, however, needed extra care afterwards, owing to the tendency to retroversion. I do not tie the lower uterine vessels in these patients, which makes a difference in involution. In the cases of pseudo prolapsus it is not usually necessary to operate on the vaginal walls or perineum if the patient is young, comes to operation in time, and there is no marked retroversion. There must of necessity be a retrocession in these cases, due to the overstretching of the anterior ligaments on account of weight, plus the wedge. If it seems necessary, a retroversion pessary may be worn by the patient for a few months until the tone of the tissue is restored; it will then be found that the ligaments can well take care of the lighter uterus. At first there is involution, followed by a slight broadening of the uterine body. In one of my cases in a young married woman I left a three-inch canal, and three months later the measurement was two and a half inches, so I allow at least half an inch for involution and broadening; more if there is an accompanying endometritis, as the involution will be greater.

Do not in any way decrease the blood supply to the uterus in these cases; they usually need more development. The main thing to guard against is retroversion. When once established, it is often impossible for the patient to wear a pessary to advantage, and some kind of suspension may become necessary. After childbirth the same care is required in all amputated cer-

vices; be on your guard against the increased tendency to retroversion. It has been necessary in two of my cases for the patient to wear a support for the increased weight of the uterus during the first three or four months of pregnancy, until it is well out of the pelvis, on account of the dragging on the already weakened supports of the bladder. In these women there is less question of postoperative shock, but they are often stout, with fat abdominal walls, and a suspension is not always necessary if skilful plastic work is done. The recovery is quicker and there is more subsequent comfort. In some cases a suspension may become a fixation with future trouble for the obstetrician and danger for the patient. Last, but often not least, is the personal dread of some patients to the scar, and they positively refuse anything abdominal on this account.

SOME OBSERVATIONS UPON DIVERTICULUM OF THE BLADDER.*

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THE subject of diverticulum of the bladder, has, on the whole, attracted less attention, until very recent times, than its importance would justify. Of course, little or nothing was known of these conditions until the routine use of the cystoscope led to their discovery, before such time as they produced recognizable symptoms. There can be no doubt they are a factor of extreme importance because, though they may occasionally exist throughout life without producing important damage to the urinary apparatus, this is the result not at all to be expected, and they are capable of producing an amount of damage which leads to the death of the individual.

Different Types of So-called Diverticula. Some confusion has arisen through failure to separate the different types of pouches or diverticula which are found in the urinary bladder. Thus the small hernial protrusions between the muscular fibres which occur in the subjects of chronic urethral obstruction bear no relation to true diverticula. They are simply the result of weakness of the bladder wall when put under strain; are directly due to the obstruction and lose their importance when that obstruction is removed. The pouch connecting with the vertex of the bladder, due to failure of closure of the urachus, should also be distinguished from the type of diverticula of which I wish to speak here, since it is in and of itself a perfectly definite failure of development, occupies a constant position and is comparatively unimportant in

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the surgery of the bladder. The word "diverticulum" should, I think, be confined to those cases of pouches, always of congenital origin, occurring most frequently in certain positions but occasionally seen in almost any portion of the bladder and not due to defective development or lack of closure of any recognized structure. I cannot agree with the view expressed by Chute in a recent paper, that they originate in the little pouches normally seen just above the ureteric orifice, and that they become important only when this pouch is exaggerated as the result of obstructive pressure. My reason for disagreeing lies in the fact that they are so frequently found in individuals in whom obstruction is totally absent, in whom in fact the symptoms of obstruction are due, not to any obstruction, but to the diverticulum. I incline to the view that when found in individuals with urinary obstruction, they are an accidental finding and of no etiological significance. That they are due to some embryonic defect is clear, but I have as yet seen no adequate explanation of their formation beyond the fact that they are associated with peculiarities of the closure of the cloaca, perhaps with a tendency to budding from this structure. It is to be hoped that some of our embryological brethren will produce an adequate explanation.

Congenital Diverticula. These diverticula are covered by the normal coats of the bladder, though the contractility of their muscular fibres is at times certainly defective. The position of election seems to be in the immediate neighborhood of the ureteral openings, and it is to this fact that they owe their greatest potentiality for harm. They are also seen on other portions of the base of the bladder, on the sides and even near the vertex, but those occurring on the upper segment of the bladder can do less damage and are, therefore, less important.

Effects upon the Urinary Apparatus. These effects are largely from two sources: First, those arising from pressure upon the ureter; and second, those arising from the inability of the diverticulum to empty itself completely, and therefore its great liability to infection. The importance of diverticula in the production of hydronephrosis has not, I think, been sufficiently emphasized. The frequency with which they occur in relation to the ureter and the tendency of the ureter orifices to lie in the diverticulum or to be drawn into it, at once puts the integrity of the kidney upon that side in jeopardy. The distention of the diverticulum will always put abnormal pressure upon the ureter, and should that structure follow the lower border of the diverticulum (as is not infrequently the case) a valve-like arrangement results which will in time largely or completely obstruct the ureter. I present herewith a specimen of double diverticulum in which this condition has gone on to such an extent as to produce the death of the individual. The history is as follows: