

13. Case in which right salpingo-oöphorectomy, left salpingectomy, left ovarian resection, suspension of the uterus and repair of ventral hernia were carried out. Death on sixth day from sepsis.

14. Case in which salpingo-oöphorectomy and appendectomy were carried out. The tubes contained pus and there was septic peritonitis. The patient died of sepsis.

15. Case in which a large infected ovarian cyst communicating with the small intestine was removed. Septic peritonitis was present. Death from sepsis occurred in 32 hours.

16. Case in which pus tubes and diseased appendix were removed, septic peritonitis being present. Death took place from sepsis.

17 and 18. Cases similar to above. Death occurred.

19. Case in which the patient died on the operating table from failure of respiratory and cardiac activity due to the anesthetic, ether.

It thus appears that death took place in five patients as the result of the shock of operation or loss of blood, in two patients from pulmonary non-septic complications and in ten patients from septic peritonitis.

Of the patients dying from sepsis five had septic peritonitis at the time of operation and five presented no indication of sepsis.

In the total list of 1,000 cases it is therefore evident that a fatal result caused by infection during operation occurred only five times, representing a mortality of $\frac{1}{2}$ per cent.

Studying the mortality in relation to various groups of operative procedures the following facts are noted:

1. HYSTERECTOMY:

a. For fibromyoma of uterus—

Vaginal hysterectomy 31 cases, no deaths

Abdominal panhysterectomy 36 cases, 1 death

Abdominal supravaginal hysterectomy 36 cases, 1 death

Total number of hysterectomies 103, with a mortality slightly below 2 per cent.

b. For infective disease of uterus and appendages—

Vaginal panhysterectomy 33 cases, 1 death

Abdominal panhysterectomy 32 cases, no deaths

Total number of hysterectomies 65, with a mortality of about 1.7 per cent.

c. For malignant disease of uterus—

Vaginal panhysterectomy 40 cases, no deaths

Abdominal panhysterectomy 5 cases, no deaths

d. For proclitelia at or after the menopause—

Vaginal hysterectomy, combined

with anterior colporrhaphy and

colpoperineorrhaphy 24 cases, no deaths

Total number of non-obstetrical hysterectomies 237, with 3 deaths, being a mortality of about 1.27 per cent.

2. CESAREAN SECTION (ABDOMINAL):

Conservative operation 2 cases, no deaths

Porro-Cesarean 5 cases, 2 deaths

3. REMOVAL OF OVARIAN AND BROAD LIGAMENT TUMORS:

Abdominal operation 76 cases, 2 deaths

Being a mortality of 2.64 per cent.

4. WEBSTER'S ROUND LIGAMENT OPERATION:

Abdominal 104 cases, no deaths

Vaginal 8 cases, no deaths

5. SUSPENSION OF THE UTERUS:

Uncomplicated by procedures other

than curettage 26 cases, no deaths.

Complicated with other procedures 158 cases, 4 deaths

Total number of cases 180, with 4 deaths, being a mortality of 2.22 per cent.

6. MYOMECTOMY:

Vaginal 3 cases, no deaths.

Abdominal 37 cases, 1 death.

In the operation on the patient that died, suspension of the uterus, repair of ventral hernia and fixation of the kidney were also carried out. This death has also been included in the list of those occurring after suspension uteri.

7. SALPINGO-OÖPHORECTOMY FOR INFECTIVE DISEASE:

Unilateral 186 cases, bilateral 80 cases.

Vaginal 3 cases, no deaths.

Abdominal 263 cases, 7 deaths.

In four of the patients who died septic peritonitis was present. In one resection of the sigmoid flexure was carried out; in four appendectomy; in one suspension of the uterus, ovarian resection, salpingectomy and repair of ventral hernia. One of these deaths is also included in the list of those occurring after suspension of the uterus, another in those mentioned in connection with ovarian resection and another in connection with salpingectomy.

8. OVARIAN RESECTION:

Unilateral 147 cases, bilateral 120 cases.

Vaginal 3 cases, no deaths.

Abdominal 264 cases, 1 death.

In the operation on the patient who died the tubes were resected and the fatal infection was probably of salpingeal origin. This death is also included in the list of those following resection of the tubes.

9. RESECTION OF THE FALLOPIAN TUBES (ABDOMINAL):

Unilateral 11 cases, no deaths.

Bilateral 10 cases, 1 death.

In the patient who died resection of the ovaries and suspension of the uterus were also carried out. This death is also included in the list of those occurring after these operations.

NOTES.

Stitch abscess in the parietes developed in about 6 per cent. of the abdominal sections. The largest percentage occurred in a series of cases in which I employed buried chromic gut for the fascia and muscle.

In more than 98 per cent. of cases the abdominal incision was mesial; in less than 2 per cent. it was made vertically through a rectus muscle.

Drainage of the pelvis was carried out after the vaginal operations in about 4 per cent. of cases, being chiefly those in which removal of infected adnexa was performed with difficulty, complicated with the escape of pus regarding whose sterility there was doubt.

After abdominal section drainage through the abdominal incision was employed in about 1.3 per cent. of cases and vaginal drainage in about 6 per cent. In about 90 per cent. of abdominal operations normal saline solution was left in the peritoneal cavity at the time of closure of the incision.

In five cases local pelvic suppuration followed abdominal operation, necessitating the removal of pus through the vagina.

Only three patients have reported the development of hernia in the line of the abdominal incision after operation. In each of these there had been suppuration in the parietes during healing.

The bladder was accidentally opened only twice, once in the removal of a carcinomatous uterus by the vaginal route, once in the performance of abdominal hysterectomy for uterine fibroids. In each instance the wound was closed with continuous catgut suture and was followed by normal healing.

In no instance was there any accidental injury of the ureter or iliac vessels.

In thirty-five cases the separation of adherent intestine caused injury to the wall of the bowel to such an extent that closure of the wounded areas with catgut suture was necessary.

MEDIAN PERINEAL PROSTATECTOMY.*

GEORGE GOODFELLOW, M.D.

SAN FRANCISCO.

We are to discuss to-day some methods of operative medicine for the relief of symptoms caused by a disease concerning which, in the entire field of medicine, none other has had so many and such diverse modes of treatment recommended, i. e., enlarged prostate. To do more would require time not at our disposal; however, a scant anatomic and physiologic descriptive outline of the operative field seems requisite.

The prostate is usually described as a pear-shaped gland about the size of a horse-chestnut, with base directed upward toward the bladder, the apex downward and forward, with two lateral lobes and two commissures, the anterior joining the lateral lobes in front of, and the posterior—the lobulated portion of which is known as the third lobe—joining the lateral lobes behind the urethra. The first portion of the urethra with its musculature passes between the lobes of the prostate from base to apex behind the anterior commissure. The prostate is made up of muscular, glandular and connective tissue elements. The musculature is composed of a longitudinal layer from the urethra and from the cir-

* Read at the Thirteenth Annual Meeting of the Western Surgical and Gynecological Association, held at Denver.

cular layer of the bladder. The connective tissue of the gland spreads out to form the capsule. There is also a fascial sheath from the posterior layer of the triangular ligament surrounding the prostate which helps to form the pubo-prostatic ligament. To this has been given the name of prostatic capsule also. Anteriorly are the pubes; below and behind are the margins of the levatores ani, the rectum and the ejaculatory ducts. Whether the prostate has a true capsule or not is disputed. Walker, in his monograph on "Anatomy of the Prostate," seems to demonstrate that there is a capsule, and in the operations which I have had the good fortune to see made by others a capsule appeared to exist, but in all my operations I have been unable, not seeing the gland, to demonstrate conclusively to myself any such thing as a true capsule. The uses of the gland are uncertain, but are presumed to be connected with the sexual function, the secretion imparting motility to the spermatozoa. With the exception of malignant growths, enlargements of the prostate are usually physiologic until they become pathologic by obstructing the flow of urine. The causes ascribed for the enlargement are many, but none are satisfactory. The mechanism of the obstruction is now being studied; that is to say, the manner in which the prostate interrupts the flow of the urine. Presumably it does so by elevation of the vesical outlet and limiting vesical movement.

From time immemorial the prostate gland has been the seat of various ailments, the symptoms of which have been of more than passing interest, not alone to those afflicted therewith, but to those members of the "healing art" whose good or bad fortune it has been to treat them. Hippocrates says: "And when the belly is not hot nor the neck of the bladder very much contracted, all such persons pass water freely and no concretions form in the bladder; but those in whom the belly is hot, the bladder must be in the same condition, and when preternaturally heated, its neck becomes inflamed; and when these things happen the bladder does not expel the urine." The difficulty of urinating in the old (men) is also noted in various others of the early writers, and remedies suggested. Not until the past decade, however, have adequate remedial measures been devised; at least none that could offer more than the usual problematical results of all serious surgical operations. The catheter, with all the sufferings attendant, seemed to be the only means for producing euthanasia. Gradually, however, out of the chaos of operative methods recommended has been evolved a procedure which may be relied on as essentially curative in almost every case, at least should have no mortality as a result of the operation, i. e., removal of the gland through the perineum. The earliest modern mention known to me of the removal of the prostate per perineum is by the late Sir William Ferguson, who, in cutting for stone, said that he removed unintentionally the lower part of the prostate as readily as if it had been a stone. The patient not only recovered from the operation, but never afterward showed any signs of prostatic irritation.

Mr. Cadge reported a case where, during a lithotomy, he removed in the forceps between the joints of the blades, with no after complications, three masses which were found to be fibrous outgrowths of the prostate. Dr. C. Williams also mentions a case where he accidentally extirpated, between the forceps, an enlarged middle lobe of the prostate. In three weeks the patient was reported as recovered, seldom urinating more than once in the night. In all probability these cases were complete removals.

Following these inadvertent and unpremeditated partial or complete extirpations of the prostate numerous methods have been advised and practiced, chief among them being suprapubic and perineal section, respectively; the two combined; castration, single or double; vasectomy; puncture per rectum and through perineum; internal incision with divulsion, and division with electric knives. Systematic suprapubic prostatectomy was performed by Belfield and McGill in 1887; a perineal operation on the prostate was made by von Dittel in 1889, he removing a wedge-shaped portion from the under surface of one or both lateral lobes, through an incision extending from the median raphe round the sphincter and to the tip of the coccyx, the urethra and bladder being left intact. Nicoll, in 1894, made a combined suprapubic and perineal cystotomy, removing the prostate through the perineum. Alexander, about the same time, made a similar operation differing in slight details. About this time E. Fuller modified the McGill operation, as did also Keyes, who opened the membranous portion of the urethra and drained through the perineum. Division of a median obstruction of the gland was performed by Bottini by means of the galvano-cautery introduced through the urethra, or through a perineal urethrotomy as done by Wishard.

At the fifty-third annual meeting of the British Medical Association, in 1885, Reginald Harrison recommended the perineal route for exploration and incidental removal of tumors of the bladder. The perineal work which has been done during the past few years by various surgeons is familiar to all of you and I shall not delay by detailing it, as some of those gentlemen are present to speak for themselves. During the latter '80s I operated suprapubically and had what could be called good results, but the outcome—as I presume was the experience of most of those who adopted that method—was not satisfactory.

In 1891 I made a pure perineal prostatectomy, the first, so far as known to me, deliberately devised and carried out. Having in my student days and early professional life seen, assisted in, and made a considerable number of perineal stone operations, the technic followed was simply that of a median lithotomy, the steps of which, I presume, are unnecessary to detail, although to make clear the method followed I shall outline them. If required, a few days before the operation, urotropin in seven or ten grain doses are given twice or three times daily. No preliminary irrigation of the bladder is made. The usual pre-operative procedures are carried out, thorough cleansing, external and internal, the rectum being emptied by an enema a few hours before the operation. With the patient in the ordinary lithotomy position, the legs held by assistants, the bladder being empty or full, as the case may be, a lithotomy staff is introduced, the legs then elevated somewhat, a median incision from the base of the scrotum to the margin of the anus is made, and carried to the membranous urethra, which is entered with a straight lithotomy knife and the opening extended *into* the bladder. The finger is then introduced *into* the bladder, the staff removed, and the moderate flexion of the legs and thighs on the abdomen and the thorax increased to as great an extent as possible; then with the opposing hand over the hypogastrium the bladder is depressed, and the enucleation, beginning at the beak of the prostate below and working upward next to the bladder, or from above on either side downward, is carried on, the time consumed for complete enucleation rarely being over five or ten min-

utes, the resulting hemorrhage being virtually nothing. The gland may be removed entire or lobe by lobe. If the bladder has been full of pus sometimes it is washed out. No drainage of any kind, gauze, tube or catheter, is made, the perineal incision sufficing. In my earlier cases the practice was to pass a straight sound through the perineal wound into the bladder every other day for a week or more to keep free drainage, and in any complicated cases such course might still be adopted; but of late it has not been found needful. In all recent cases no instrumentation of any kind has been permitted, neither irrigation (except at time of operation), passage of sounds nor catheters; and all have done as well or better than under the older process. The patients are allowed to get up as soon as they feel like so doing, and the urethra is generally closed within eighteen to twenty-four days. Frequently some urine passes naturally within forty-eight to seventy-two hours, the quantity increasing as the wound closes, until all is voided by the urethra. What becomes of the prostatic urethra? has been asked. The answer is that part or all is removed with the gland, an incident that in no manner seems to affect the restoration or continuity of the urethra, nor the power of the bladder to regain and control its functions; nor is stricture or occlusion caused. The seminal ducts are not ligated, for this seems to me an irrational refinement, especially as many of my patients have (so they say), to a greater or less extent regained sexual vigor.

The points to be expressly emphasized are the position and the incision *into* the bladder. On these, in my opinion, rests the unvarying success. The former gives access to the gland and bladder, while the latter permits rapid ablation of the gland, also the viscus to be thoroughly explored with the finger or through the speculum, as could be the vagina in like position; and, obviously of equal importance, complete drainage is established with less traumatism than in other methods. In none of my operations have retractors, speculæ or other instruments been required to enable me to remove the gland, the finger serving all needs. I do not find it necessary now to use the knife to enter the urethra and bladder. After cutting to the urethra I am able with the finger to open it and get into the bladder by a boring movement. Then not having a cut through the commissure, I enucleate from above instead of from below as formerly. The method, however, is immaterial, although with the more recent plan a much smaller incision is made, one which will admit only the index finger.

With the foregoing ends the description of the operation devised and practiced by me for thirteen years.

Now should be discussed various matters of interest connected with the subject; indications and contraindications for operations; accidents and complications, perforation of the rectum and hemorrhage; sequelæ such as delayed healing or fistulæ; incontinence, temporary and permanent; epididymitis; impotence; mortality and ultimate result. Perforation of the rectum and hemorrhage are accidents that have not occurred to me.

The indications for operation are symptoms of obstruction with concomitant sufferings. There are no contraindications to operation unless the condition of the patient is such that no operation of any kind is warranted.

Delayed Healing or Fistulæ.—In all cases operated on there have been no permanent perineal fistulæ. The longest time the wound remained fistulous was between

seven and eight months. It was a patient seen only on the operating table, and not again until he returned—six or seven months later.

Incontinence, Temporary or Permanent.—Usually, at first complete control of the bladder is regained, but afterward, when the patient begins to get about, a partial incontinence supervenes, that is to say, there is inability to retain urine when the desire to urinate comes, with some dribbling afterward, and if the patient becomes tired, there is actual incontinence. In a number of cases this has lasted about four months, but usually in men of about 70. I have not found it in any much under that age.

Epididymitis.—Formerly I assumed that epididymitic troubles were due to instrumentation, especially because, having for a long time abandoned post-operative instrumentation, no cases occurred, but that opinion must be modified, for that sequel has succeeded in several cases where no instrumentation has been practiced.

Impotence.—This is a question difficult to determine. Pride of occupation will cause men to make misleading statements concerning power in that direction. In men of 65 and over it is hardly to be expected that a youthful condition will be the result of the operation. Under that age I am confident that many of the patients operated on have told me the truth in regard to their regaining sexual powers.

The Ultimate Results.—In all patients from whom I have been able to obtain reports, one seems to have a traumatic stricture, coming about once a month to have a sound passed. He is 72 years of age. The tumor was pronounced carcinoma. Whether the trouble is due to stricture, to a slowly growing fibrous neoplasm or a malignant recurrence, I do not know. A man of 76, operated on over a year ago, is having some difficulty, and the attending physician thinks it due to a stricture. One other case, a man of 77, operated on one year ago, has some contraction which may increase; however, a No. 9 soft sound passes without difficulty. Aside from these cases, I know of no others having symptoms of that sequel.

Little or no mortality should be the immediate result of the operation. Among the seventy-three patients operated on by me there have been two deaths directly following the operation and probably justly attributable thereto: One from sepsis after eleven days, the other after seven hours.

The first was a man of 73 or 74 years of age, afflicted for several years with bladder troubles necessitating the constant use of the catheter. The urethra finally becoming both impassable and impermeable, he was aspirated suprapubically two or three times daily for a week or more, then consented to radical operation. Slight temperature existed, but otherwise there seemed to be no serious contraindications to the operation; in fact, none. No accident of any kind occurred in the removal of a large gland. I did not see the patient for ten days, when I found him dying from sepsis.

The second was a man of 70, who had been suffering for years in a manner similar to the first. He had been in hospital for several months, had had a perineal section and was septic, his temperature ranging from 100 to 102. At the time of operation he was feeble, joints somewhat painful; but his sufferings were such and death so comparatively near, it seemed judicious to make a strong effort to alleviate his distress, if not to save his life, so the prostate was removed. He left the table in good condition, and I left him about an hour

after the operation. Owing to the condition of the bladder, contrary to my custom, a drainage tube had been inserted. About three hours later, summoned in haste, I found him in a collapsed condition. There had been free oozing, but no more than I had seen in many cases; no quantity that could account for his state at that time. Pulse rapid, almost imperceptible, gasping for breath, dilated pupils, skin clammy, etc. In spite of transfusions, stimulants, etc., he died some three or four hours later. Reasoning on the cause of death has aided little in solving the mystery. While he might not have ultimately recovered, in my opinion he should have had little or no difficulty in passing the immediate effects of the operative traumatism.

Both of these individuals were operated on since June, 1903.

NOTE.—Urotropin, of course, is a recent drug. In 1891 and as late as 1899 I irrigated the bladder, but since have ceased almost entirely so to do.

Special Article.

MEDICAL AND HYGIENIC EXHIBITS AT THE LOUISIANA PURCHASE EXPOSITION.

I. AMERICAN EXHIBITS.

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At no previous exposition has there been such a systematic display of the science and art of medicine as is found at the Louisiana Purchase Exposition at St. Louis. The visiting medical man is at once impressed with the magnificent exhibits in all matters relating to social economy.

SCHOOL AND COLLEGE EXHIBIT.

One of the largest buildings is devoted to education and social economy. Here the great universities, colleges and schools make exhibits that must be a great source of pride to every alumnus. Harvard University and the public schools and libraries of Massachusetts easily take first rank. A large model in plaster of the new buildings designed for the use of Harvard Medical School, at a projected cost of \$3,500,000, shows what is destined to be the most superb equipment of any medical school in the world. Methods of teaching are shown and among these are kinetoscopic devices for use in teaching physiology.

Johns Hopkins University makes a good display of its various departments. The number and high quality of the university publications are noteworthy. Among their medical illustrations we noticed Dr. Howard Kelly's original gynecologic drawings, although the author's name was not attached. Works by Osler, Bloodgood and Thayer, and the series of Johns Hopkins Hospital Reports show the great activity in medical research in Baltimore. One can not help tarrying to see the sections devoted to the great technical schools. The Massachusetts Institute of Technology and the Rensselaer (Troy) Polytechnic School make most interesting exhibits and point with pride to their distinguished graduates.

Washington University, St. Louis, and the public schools of St. Louis make a fine display. The new buildings of Washington University occupy a site of 110 acres in the World's Fair enclosure and are used for the executive offices of the exhibition. They are ten in number, are in the Tudor gothic style, of red Missouri granite, and cost a million and a quarter dollars. Their dignified appearance adds much to the architectural features of the grounds.

ANTHROPOLOGIC EXHIBIT.

The department of anthropology of the exhibition occupies one of the university buildings. Lectures on ethnology, with living subjects, are given, and a model school of 100 Indian

pupils provided by the United States government is an attractive feature. There is apparatus for measuring the body and the muscular strength, for testing the eyesight and for making other simple tests on the nervous system and mind, designed primarily for comparison of different races of mankind. There are, of course, exhibits of the work of the Indians as well as natives of Central Africa, Patagonia, the aborigines of Japan and the Filipinos. The results of these studies in anthropology will be issued after the exhibition, in a special volume, under the direction of Mr. F. W. Lehman, the commissioner, and Professor W. J. McGee.

The Smithsonian Institute makes an elaborate exhibit in the United States government building and the Indian display is intensely interesting. But the most enjoyable way to study the various races is along the "Pike," where they have been gathered from every quarter of the globe.

MARINE-HOSPITAL EXHIBIT.

The United States Public Health and Marine-Hospital Service has its exhibit in the section belonging to the Treasury Department. This has been arranged for popular instruction. Five life-size figures illustrating a surgical operation in progress in a marine hospital form a striking feature. The gowns, the instruments, the dressings and the usual hospital furniture are quite realistic. Their static machine and x-ray outfit attract attention. The Victor apparatus for Finsen rays as supplied to the marine hospitals is also shown. There is a model showing how a cesspool contaminates a neighboring well. Under Surgeon-General Wyman the service has undoubtedly been most efficient in its quarantine system in preventing the access of infectious diseases to this country from foreign ports. During the last year 857,000 immigrants were physically examined by officers of the service. The hygienic laboratory of the service is doing scientific work of permanent and practical value.

STATE AND MUNICIPAL EXHIBITS.

Under state and municipal sanitation one should note the fine exhibit of the Department of Health of New York City. Under Commissioner Darlington and the advisory board the best demonstration of a thoroughgoing health department may be seen. Their work for the prevention and treatment of tuberculosis is given a prominent place. The figures for 1903 show that 10,247 cases were reported to the department in New York City and that the deaths from that disease numbered 8,001; inspections, 12,514; renovations, 1,338; fumigations, 1,336; cases removed to hospital, 193. A map showing the location of recurrent cases of pulmonary tuberculosis is shown and correspondence showing how cases are reported and handled, if required, by the health authorities. The city of New York is fortunate in having such capable men to direct and carry out these vital undertakings for the public health.

The Department of Health of St. Paul, Minn., shows some remarkable figures. This claims to be the healthiest city in the world. Its population in 1900 was 163,065 and in 1903 it was estimated to have 180,000. Its death rate on this basis was 8.92 in 1903. Minneapolis was a close second with 9.79. These figures are about half those for New York City.

EXHIBITS ON THE SUBJECT OF TUBERCULOSIS.

The Manhattan State Hospital, East, on Ward's Island, shows a model of the system of tents and accessories to which the consumptive insane patients are assigned. The hospital is on an island in the East River, New York, and is one of the largest institutions for the insane in the United States. Dr. A. E. Macdonald, for many years physician in chief, began three years ago to treat the insane consumptives in this way and the results have been most satisfactory. The model prepared by patients in the hospital shops and sewing room consists of plain wall tents, with side extension, each having sixteen beds.

Models of tents and cabins specially constructed for the use of tuberculous patients are shown. Sanatoria for consumptives are represented by photographs of the Adirondack Cottage Sanitarium, the Gabriels Sanitarium, the Sharon Sanitarium, Massachusetts; the Pine Ridge Sanatorium, Rhode Island, and the Muskoka Sanatorium, Ontario, Canada. The