

**Laparotomy in the treatment of spontaneous gluteal and sciatic aneurisms
/ by by [sic] Frederic S. Dennis.**

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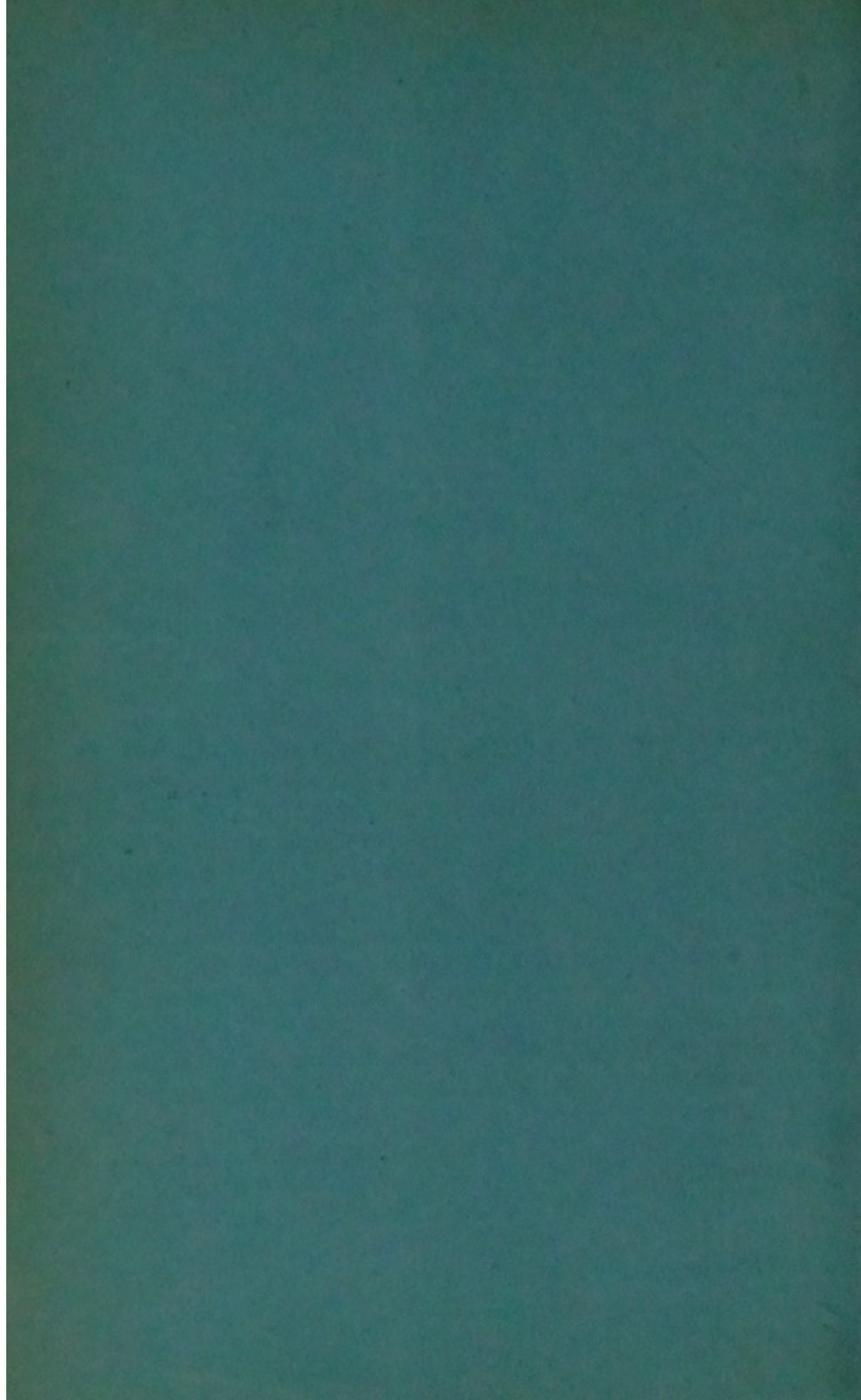
BY

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LAPAROTOMY IN THE TREATMENT OF
SPONTANEOUS GLUTEAL AND
SCIATIC ANEURISMS.

THE surgical treatment of spontaneous gluteal and sciatic aneurisms has always been extremely unsatisfactory. The results of the various operations for the cure of this special form of aneurism have been attended with a high rate of mortality. The reasons for failure and the fatality by the older operations were obviously due to causes which may be said to be avoidable at the present time. Among the obstacles to a successful issue in the treatment of gluteal aneurism by former methods may be mentioned the occurrence of secondary hemorrhage, the presence of purulent oedema of Pirogoff in the subperitoneal tissue, the puncture of the veins and injury to important structures owing to the limited space, the ligation of the ureter, the onset of peritonitis, the formation of pelvic cellulitis, and other like complications which made the mortality upward of fifty per cent.

The present unsettled opinion among surgeons as to treatment of this aneurism indicates that as yet no unanimity exists, and a review of the various methods which have been recommended, clearly demonstrates how wide is the breach. For example, Mr. Timothy Holmes in his college lectures claims that in gluteal aneurism the operation of Antyllus or Anel offers the best chances of success. In five

cases in which the operation of Antyllus was performed four recovered and one died, and of four cases in which the operation of Anel was performed two recovered and two died; thus showing a death-rate of thirty-three per cent.

Fischer, of Hanover, concludes that the operation by injecting perchloride of iron into the sac affords the best chance of success. In six cases in which this operation was resorted to, four recovered and two died, thus giving a death-rate of thirty-three per cent.

Ribert recommended proximal pressure on the aorta, and direct compression over the sac. This was tried in one case. The patient's condition improved; but in a few months the aneurism returned and the patient died.

Hamilton recommended ligation of the internal iliac artery by an incision parallel with Poupart's ligament, and pushing back the peritoneum. In eleven cases in which this operation was performed, six recovered and five died, thus giving us a rate of mortality of about forty-four per cent.

The plan of treatment by rest and expectancy has been suggested by several authors. This method was adopted in six cases, five of these died and one was cured, but only temporarily, as the aneurism returned in a short time.

Galvanopuncture has also been recommended, but in the one case in which this method was tried the case terminated fatally.

It is evident, therefore, from an examination of the treatment at present in vogue that much is to be desired in the way of perfecting a plan of treatment which will permanently cure the aneurism, and at the same time reduce the present high rate of

mortality. Nothing is to be expected from non-interference.

Gluteal aneurism, as a rule to which there is but one recorded exception, progresses steadily and rapidly to certain death from hemorrhage. Among all writers this opinion prevails, and among all the cases of gluteal aneurism which have been collected from various sources there is only one case in which a spontaneous cure has taken place. When the great difficulties of a positive diagnosis from other diseases is taken into consideration, the one recorded case of spontaneous cure admits of doubt; but still, on the other hand, it can be said that the anatomical relations of gluteal aneurism afford certain conditions favorable to the accomplishment of this object. Whether it is admitted or not that spontaneous cure ever occurs, no surgeon can place any reliance upon this process of cure, and refuse, on this account, to take active steps to cure the disease.

The performance of laparotomy as an initiative and necessary step in the ligation of the internal iliac artery seems to meet the exigencies of the case. That laparotomy may appear to be a severe measure as a preparatory step no one can deny; but, while it may seem a desperate measure, it must be remembered that the disease is a uniformly fatal one, and, therefore, calls for heroic measures to overcome the dangers which await the patient.

After carefully reviewing the literature of spontaneous gluteal aneurism, and investigating the high rate of mortality following the operations for the cure of this variety of aneurism, and after considering thoughtfully the unsatisfactory results and the causes which brought about these results, there seemed much to be desired in reference to an operation which would effect a permanent and radical

cure, and which would diminish the high rate of mortality. With these important questions in mind, a new operation was necessary to make the treatment of gluteal aneurism satisfactory.

With a view to the settlement of the first question, namely, the accomplishment of a permanent and a radical cure in gluteal aneurism, it would seem that the application of the principle of John Hunter in the treatment of aneurism in general would be especially adapted to this form of aneurism. The ligation of the main artery on the proximal side in healthy arterial tissue yields the best results. The principle of compression is not applicable here, though in the form of Esmarch's bandage in certain aneurisms this plan has met with most brilliant success. The injection of coagulating fluids into the sac, and all the other operations are obviously not suited to the gluteal aneurism. While in theory and practice the Hunterian method is the best operation in those forms of aneurism in which compression by elastic bandage is inadmissible, the same principle holds good in gluteal aneurism. If it can be shown that the ligation of the internal iliac on the proximal side of the aneurism can be performed with immunity from those accidents which have caused death, the difficult problem of a safe and permanent method of cure has been solved. It remains, therefore, to show that when the Hunterian operation has been performed the causes of death have been attributed to certain defects in the method of ligating the internal iliac artery, and that if any plan can be adopted which will not only effect a radical cure in the aneurism, but at the same time which will be free from danger to the patient, an ideal operation has been established for the treatment of this fatal disease.

An examination into the causes of death after ligation of the internal iliac artery, shows that in the majority of the cases death resulted from secondary hemorrhage, laceration of the peritoneum, wound of the contiguous vessels, tying the ureter, pelvic cellulitis, abscess, and purulent cedema. In other words, excluding uræmia, nearly all the deaths may be attributed to some fault in the method of operation in the surgeon's attempt to secure the internal iliac artery.

If now it can be demonstrated that the internal iliac artery can be reached and ligated without incurring the risks common to the older operation, of Abernethy or Cooper, the science of surgery can point to a means of saving life in these desperate cases, where heretofore human lives were sacrificed.

No argument is needed to prove that the internal iliac artery can be tied with safety and with no damage to the surrounding and adjacent structures, if the surgeon can pass the aneurism needle around the vessel with all the pelvic viscera removed. This is obvious; but the question upon which everything hinges is the safety of the opening of the peritoneal cavity and removal of its contents, in order to expose the artery. If this procedure can be proved to be free from danger, then the complete operation in each of its several stages will form a new method of cure for the relief of spontaneous gluteal aneurism, which cannot but commend itself to the sound judgment of every surgeon.

With regard to the proof of the safety of laparotomy, as a preparatory step to ligation of the internal iliac artery, for the application of the Hunterian principle in the treatment of spontaneous gluteal aneurism, it becomes necessary to study the

rate of mortality attending an ordinary laparotomy. A reference to the statistics of laparotomy will not afford reliable data from which to draw conclusions; because, if the laparotomy is performed for ovariectomy, the death-rate has become so low that it need not offer any barrier to the operation. A reference to Lawson Tait's one hundred and thirty-nine consecutive ovariectomies without a death, is corroborative of this statement. On the other hand, if the laparotomy is performed for gunshot wound, or stab wound, or intestinal obstruction, or malignant disease, the death-rate is comparatively high, and thus the mortality of laparotomy would preclude the adoption of this measure as a preparatory step to tying the internal iliac artery. A laparotomy in which the contents of the abdominal cavity are removed, is an operation of greater severity than most ovariectomies and of less severity than abdominal section would be in perforating wound of the abdomen, or in intestinal obstruction. Laparotomy for removal of a portion of the intestinal canal, however, has one very favorable condition, and that is the absence from shock, as is the case where abdominal section is attended with a high rate of mortality.

Laparotomy as a preparatory step to ligation of the internal iliac artery for the cure of spontaneous gluteal aneurism thus may be said to stand midway between these two extremes with regard to its mortality. In the future, as the technique of abdominal section improves, the small fractional death-rate which now attends the operation will be reduced to that of a simple oöphorectomy, which is practically no death-rate at all. In the laparotomies which I have performed I have never had a patient die during the operation; but, invariably, I have noticed that the

symptoms were improved after the operation. In the cases of perforating wound to which this statement is applicable, it must be remembered that shock existed before the laparotomy, and that in those cases where an exploratory laparotomy was performed without the presence of shock, the patients invariably reacted, and their condition was in every respect satisfactory as regards the reaction.

Laparotomy performed under suitable antiseptic precautions, and in a patient whose condition before the operation is in every way satisfactory, may be said, in the light of present statistics, to be free from any danger which would render it inexpedient to perform the abdominal section.

When the paramount advantages are considered in regard to the safe ligation of the iliac arteries, and with an immunity from all other accidents so common by the older methods, laparotomy as a preparatory step to securing safely the internal iliac artery in this special form of aneurism seems to be an ideal operation for the cure of a surgical disease which formerly was attended with a death-rate of nearly fifty per cent. The internal iliac artery has been tied four times for spontaneous gluteal aneurism; three of these aneurisms occurred in my hospital service during the past year, and one of which belonged to Dr. W. Locke Chew, of Alabama. The history of each of these operations will be given with remarks.

CASE I. *Double gluteal aneurism; laparotomy, and ligation of both internal iliac arteries simultaneously; death from suppression of urine on the fourth day.*—I. McC., æt. sixty, admitted to St. Vincent Hospital February 5, 1886. Patient was sent by Dr. Carpenter, of Boonton, New Jersey. Patient has always enjoyed good health until three years

previous to date, when she complained of pain along the course of the sciatic nerve upon the right side. The pain was not relieved by medication, either general or local. A year and a half later a swelling became apparent on this buttock, which was accompanied by throbbing, and the tumor steadily increased in size, with no abatement of the pain. As these symptoms increased, the patient began to lose flesh and strength. The diagnosis of gluteal aneurism was made by Dr. Carpenter.

Upon admission to St. Vincent Hospital there was found a large, tense, pulsating tumor occupying the entire gluteal region, and tapering down to the trochanter major of the right femur. The skin over it was natural in color, but very tense; a thrill was felt on palpation, and a distinct bruit heard on auscultation; pulsation very marked. Tumor measured thirteen inches from the tuberosity of the ischium to the trochanter major. On the opposite side, measurement from the same points seven inches. Right leg was somewhat swollen and cedematous. On the left buttock a slight tumor was found on palpation. It was situated along the course of the gluteal artery at about its middle. A distinct pulsation was here felt, accompanied by a bruit. Patient had pain here for a week before she was admitted to the hospital, and now feels a throbbing in the same situation. Good nourishment was given, and stimulants were administered according to indications.

February 15th, patient has improved somewhat in general health, but pain still continues.

Operation.—February 18, 1886, the abdomen, perineum, and thighs were thoroughly scrubbed with warm water and soap. After this ablution the parts were irrigated with a solution of bichloride of mer-

cury (1 : 1000). Especial attention was given to the purification of the umbilicus, which is most important to observe in all cases of abdominal surgery, as infection has been known to originate from a neglect of this precaution. The hair was cleanly shaven from the abdominal wall. A saturated solution of ether and iodoform was now poured over the abdomen, and the parts were thus made aseptic. Clean towels, wrung out in warm bichloride, were now placed over the abdomen, and the ether was administered.

In all capital operations requiring the patient to be kept under ether for any indefinite length of time, I have always adopted the rule of making the parts aseptic before the patient is anæsthetized. This saves the time during which it is necessary to keep the patient under ether, and in abdominal surgery especially this is important; because the surgeon can never form an idea of how long it may take to complete the operation. I have never found that the disinfection of the parts ever caused any discomfort to the patient; but, on the other hand, it often attracts the attention first before taking the ether. In this way the time during which the patient must take ether is shortened by an appreciable period of time.

The median incision was made, beginning at the umbilicus and extending downward to the symphysis pubis. Each layer was divided under continuous irrigation, and all vessels were ligatured, and the peritoneum was now exposed, which was carefully divided the length of the cutaneous incision. Everything was now in readiness for the removal of the intestine, and the hand was introduced into a warm solution of bichloride of mercury (1 : 5000). Towels and the elephant-ear flat sponges were now dipped into this mild warm antiseptic solution, and the con-

tents of the peritoneal cavity were removed outside of the wound and wrapped at once into these towels and sponges, which were renewed from time to time to keep up equable and uniform temperature. Having removed the pelvic viscera as far as was necessary, my index finger felt the pulsation of the aorta, then the common iliac, then the external and internal iliacs. The peritoneum and the sheath were scratched and divided only sufficiently to admit the point of the aneurism needle. With scarcely any disturbance of the parts, the ligature of twisted catgut was passed around the vessel from within outward, care being taken not to include the ureter, which was double upon this side, as well as other important structures. The same procedure was immediately performed with reference to the other internal iliac artery; a little iodoform was dusted over the ligatures, and the intestine was now carefully returned into its proper cavity, and the peritoneum, deep fascia, muscles, aponeurosis, and the two layers of superficial fascia, with the skin were united by catgut and silver sutures. The entire incision was then dusted over with a thin layer of iodoform, and the superficial drainage tubes were introduced; but no tube was used to drain the cavity. The patient was under ether only about thirty minutes. I am indebted to Dr. Charles Phelps for his kind assistance and advice during the operation. The patient was removed to an adjoining room, and placed in bed.

4 P. M. Patient has not come fully out from the ether, as yet; moans continually, and is very restless. Pulse fair force, temperature normal. External heat applied to body, and morph. given hypodermatically. During the evening reacted nicely from the shock.

19th. Patient in a condition of mild delirium;

temperature elevated; tongue dry; pulse rapid and feeble. Nutrient enemata given; morph. hypodermatically; water drawn by catheter.

20th. The dressings were removed and wound was perfectly aseptic. No tympanites; tongue dry and brown; temperature elevated. Peptonized milk given by enemata, also one drop tincture of digitalis every two hours.

21st. Patient sinking steadily, and vomited several times during day. The rectal temperature one degree lower than in the axilla.

22d. Patient died to-day.

Autopsy.—Rigor mortis well marked. On removing the dressing the abdominal wall had healed by primary intention. There was a little pus in the pelvis, about one of the ligatures, probably the result of her poorly nourished condition; the amount was very small, and there was lymph exudation. There was no peritonitis. The incision over the right buttock exposed the aneurismal sac extending from the origin of the gluteal from the internal iliac to a point below the trochanter major. An aneurism was found also upon the opposite hip. The aneurism upon the right side was very large, and was filled with laminae of fibrin. The sac had, previous to operation, ruptured upon its inner surface, and had produced erosion of the ilium. The aneurism upon the left side was fusiform in shape, and was about four inches in length. The iliac vessels were both occluded by thrombi, and the ligatures included nothing but the internal iliac vessels. The kidney upon the right side had two ureters extending to the bladder. The kidneys showed a mild grade of diffuse parenchymatous nephritis. The suppression of urine was in all probability due to the acute congestion produced by ligation of the internal iliac arteries, and

this condition was engrafted upon a chronic disease of these organs. The specimens are preserved in the museum of the Carnegie Laboratory.

Remarks.—There are some points of special interest connected with this case that seem to be worthy of consideration. The patient's mother, who is alive, is now considerably over one hundred years, and the patient herself was over sixty years. The aneurism was not single, as is the rule; but was double. This is the first case ever reported with both gluteal aneurisms developing simultaneously. The case is also the first one in which the internal iliac has ever been ligated with laparotomy as a preparatory step. It is also the first time in the history of surgery that both internal iliacs have been tied at the same time. The patient reacted nicely from the operation, thus showing that even in a patient of sixty years a laparotomy can be performed without serious shock.

Another clinical fact of interest in connection with this case is the perceptible diminution of temperature in the rectum, as compared with the axilla. This is due, without doubt, to the fact that all the pelvic organs were poorly supplied with blood in comparison with the amount previous to the ligation of the internal iliac arteries.

CASE II. *A case of spontaneous gluteal aneurism, diffused by manipulation; laparotomy; ligation of the internal iliac; cured.*—(By W. Locke Chew, M.D., of Birmingham, Ala.) W. T. S., a negro, aged forty-six years, a native of Georgia; residence for fourteen years in North Alabama; occupation an iron-ore workman, gives the history that seven months ago while going rapidly upstairs, felt a sudden stitch in the buttock and back part of the thigh. This pain was very intense at times, but never wholly absent. For the past seven weeks has been unable to walk, and the past four weeks

has been confined to bed. About two and a half months ago noticed a marked swelling of right gluteal region, which "thumped as if my heart beat there." Dr. Cooper was called to see the case, and treated it only palliatively. Suspecting the tumor to be aneurismal, I was called to see the case in consultation with Dr. Cooper, on the morning of June 14th, at 11.43 A.M., and found the patient as follows: Right thigh flexed on abdomen and leg on thigh, adducted, and toes everted, violent spasms of the muscles of the calf and foot, considerable spastic rigidity of same parts; less violent muscular spasms in the posterior portion of the thigh; gluteal region of right hip very much distended, tense, and firm. Tumor as large as a foetal head at sixth month. No increase in local warmth. On grasping tumor evenly with expanded hands, and making gentle pressure there was detected a very slight, indistinct, wavy expansion. Auscultation over tumor revealed an obscure bruit, but at the sacro-ischiatic notch and slightly lower a loud, grating bruit was noted. By pressure on the abdominal aorta both bruit and expansion could be readily stopped.

Dr. Cooper here gave the history that the swelling had been circumscribed, and thought it probable that it had been ruptured the day before by manipulation at the hands of a friend he had invited to see it. The diagnosis being arrived at, nothing more was done than to order the patient's bowels thoroughly opened by salts and warm enemata; the patient thoroughly washed, and clean linen placed on him and the bed; the room, a new one, was rendered as neat as possible. It had been necessary to administer twelve grains of morphia sulphate in the preceding twenty-four hours to secure the least quiet.

On the morning of June 15th, in the presence of Drs. Wheelan, Dozier, Dnnan, Wyman, Shoemaker, Drennan, Dr. Brice M. Hughes and myself assuming the case—which Dr. Cooper kindly proffered us—immediately proceeded to do a laparotomy to secure the internal iliac artery for relief and cure of the aneurism. The patient being anæsthetized, and the abdomen being

shaved and thoroughly cleansed, the usual curved, lateral incision was made. The muscles and fascia having been divided carefully, at the inferior angle of the incision, the epigastric artery, displaced a very little to the right, was seen pulsating strongly, which was doubly ligated before section. The peritoneum was carefully divided on the finger as a director, and the hand was passed into the abdomen. The arteries could be felt in their usual places pulsating strongly, trunks in good condition. That of the common iliac was normal, while that of the internal iliac was about two inches long, the trunk large, and the walls in fine condition. The aneurismal tumor did not extend into the pelvis. Such being the condition, we determined to place a strong silk ligature on the internal iliac. So violent were the efforts of the patient, and such the difficulty of manipulation within the cavity that a few coils of intestines were taken out and swaddled in cloth, saturated in a warm carbolized solution. While I exposed and guarded the parts, Dr. Hughes divided the arterial sheath, which I separated from the trunk as he passed the armed needle. The ligature was then tightened, and all present satisfied themselves that all blood-flow through the tumor was checked. The artery was then firmly ligated, and the peritoneum approximated over the ligature. The cavity was next thoroughly cleansed and closed by six deep silver-wire sutures and six small superficial catgut sutures. There were a few points in the divided muscles that gave us a little trouble from oozing, but this was controlled by warm water and torsion. The incision was dusted with iodoform, while adhesive strips to support suture, antiseptic cotton, and binder applied evenly constituted the dressing.

Progress of the Case.—Morphia sulphate in quarter-grain doses were administered every four hours subcutaneously. Crushed ice with a little milk was allowed during the first week; patient kept in the dorsal-decubitus position strictly. The temperature on the evening of the operation reached 100.5° , but never again reached that point; after the evening of the fifth day it was absolutely normal; pulse ranged from 90 to

108. The incision united by adhesion throughout, and the dressing, which was removed on the sixth day, was perfectly clean, except at a single point where there was a clot of dried blood as large as a split pea. Sutures removed on the ninth day, union firm. A free, natural movement of the bowels on the tenth day. A small abscess formed on the thirteenth day, a little to the right of the incision, due to the hemorrhage from the veins above mentioned, most probably; all pain immediately stopped in the tumor, and it has gradually diminished in size and tenseness. The condition of spastic rigidity never returned after recovery from the anæsthetic, nor did the muscular spasm; leg became freely movable after the tenth day. On the twentieth day tumor about one-third of original size. Patient walking on crutches, free from pain, cured.

In reviewing the history of this interesting case as it is given, it seems that the operator did not intend, before the operation, to do a laparotomy in the sense of removing the contents of the peritoneal cavity as a preparatory step to the ligation of the internal iliac, but that this most important feature of the whole plan was an after-thought, or the result of an accident. The incision which he mentions as "the usual curved lateral incision," must be either Sir Astley Cooper's or Abernethy's, as it is not the one which would be made if it were intended first to remove the intestine before ligating the artery. Later on the operator mentions, "so violent were the efforts of the patient, and such the difficulty of manipulation within the cavity, that a few coils of intestines were taken out," thus giving his readers to suppose that it was not his intention to remove the intestine, which is the main feature and first stage of the operation of tying the internal iliac artery by the new method. It is the intentional removal of the intestine by the median incision, for

the purpose of fully exposing the pelvic vessels, that laparotomy is recommended as a preparatory step. The case, however, stands as one of the few successful, and places on record another case of cure of a spontaneous gluteal aneurism by the application of the Hunterian principle.

The friendly criticism which I have offered in no way detracts from the credit due to the operator or to the successful issue of the operation, but it has been made only to impress clearly the fact that the great object of the laparotomy is to remove the contents of the peritoneal cavity, and thus enable the surgeon to ligate the vessel without incurring any of the risks so common by the older incisions and by the older methods.

As many of the causes of death in these cases of ligation of the internal iliac artery are due to the fact that the operation cannot so safely be performed without the removal of the intestine, it therefore follows that the removal of the intestine preparatory to ligating the vessel is an essential feature in the entire plan to be carried out in the treatment of gluteal aneurism.

CASE III. *Gluteal aneurism, associated with an aneurismal varix; laparotomy; ligation of left internal iliac artery; recovery.*—M. F., aet. eighteen, domestic; admitted to St. Vincent Hospital, August 26, 1886. Family history good and no evidence of specific disease. Patient has noticed for many years that her left buttock was much larger than the right, and that in this enlarged buttock she experienced a good deal of pain. Until three weeks previous to admittance to hospital, patient was able to work about; but at that time the skin became ulcerated over the left buttock. The patient now began to have great pain, and was unable to assume the sitting

posture. Whenever she tried to sit down she felt a throbbing in the tumor.

On admission patient is well nourished and muscular. Complains of heat, throbbing, and pain, but more especially of the latter, which is no longer localized, but shoots down toward the knee. She states that her bowels are usually constipated, but in other respects physical condition is good. Heart and lungs normal.

On examination the left buttock is found to be considerably enlarged, the ulcer mentioned above being situated about the centre of the tumor. The veins are visibly dilated, those situated at the most dependent part of the tumor are markedly engorged, and upon gentle palpation the blood is felt surging through the vessels, which shows that a communication exists between the artery and the vein. With each systole of the heart an expansile pulsation is quite evident. Upon auscultation a very loud bruit is heard, which follows closely upon the first sound of the heart.

Examination by the abdominal wall and rectum negative.

Aug. 27. Potassæ iodidi grs. xv t. i. d. ; liq. morph. n. s. ʒj, when needed.

Sept. 7. Examination of urine negative. Pil. colyc. co. iij. Light breakfast.

8th. Patient etherized. Abdomen thoroughly cleansed and shaved. An incision was made in the median line, starting at the umbilicus and extending downward to within two inches of the symphysis. Having dissected down to the peritoneum, all the vessels that required attention were ligatured. The peritoneum was now lifted up and snipped, a director being introduced, the membrane was divided upon it. The incision was not at first extended beyond

the umbilicus; but the abdominal walls were so very thick with adipose tissue that the original incision was extended some distance above the umbilicus. The contents of the peritoneal cavity were easily removed, and abundance of room was obtained for the subsequent steps of the operation.

In the first case of gluteal aneurism the patient was emaciated, and the walls could be drawn aside without extending the incision higher than the umbilicus. The intestine was removed outside of the abdomen sufficiently to allow the exposure of the vessel, the bowels being protected by the application of towels and flat zymoca sponges soaked in a warm, weak solution of bichloride of mercury. The index finger felt the pulsation of the common iliac, then its bifurcation, and the external and internal iliac. The ureter was drawn aside, the peritoneum and sheath opened sufficiently to admit the point of the aneurism needle, which was passed from within outward. A double twisted catgut ligature was employed, and the ends cut off, after which a thin layer of iodoform was dusted over the knot of the ligature. The intestine was carefully replaced, the peritoneum and the other structures were stitched. A small drainage tube was introduced between the lips of the wound, iodoform was sprinkled over the linear incision, and antiseptic dressings were then applied. In closing the abdominal wound deep and superficial sutures of catgut, and three interrupted sutures of silver wire were employed.

No nausea or vomiting followed the operation. At six o'clock patient had recovered from the shock and appeared to be in a most comfortable condition.

9th. Patient had a good night and slept after a hypodermatic injection of morphia was given. During the day patient complained of some pain, and there

was some tympanites. The ice coil was placed over the abdomen, and her pain was diminished. The urine was passed without the use of the catheter; it contained fifteen per cent. in bulk of albumen. The tongue was dry.

10th. Patient had another good night. Tongue cleared up and moist. The amount of urine passed during the day was nearly two pints, and it contained only a trace of albumen.

11th. The pulse and temperature to-day are below one hundred. Patient has been fed on peptonized milk, which was administered in the form of an enema during the first twenty-four hours subsequent to the operation. The urine contained no albumen and the quantity was normal.

12th. Dressings removed. Wound appeared healthy, with only a slight discharge upon the deep dressings.

13th. Patient had a normal movement from the bowels.

15th. Patient's condition is in every way satisfactory. The wound healed by primary intention, except near the centre for a little distance, where the incision healed by granulation. The bowels moved after the 13th instant at regular intervals, and with the exception of cramps occurring after the movement, there is nothing of importance to note.

Remarks.—This patient rallied quickly after the operation, and on the fifth day following the laparotomy the bowels moved, and continued after this time to assume their normal function. The albumen, which was not present in the urine previous to the operation, amounted to fifteen per cent. in bulk within twenty-four hours, but all traces of it quickly disappeared from the urine. This acute albuminuria

was due to congestion of the kidney, as a result of the ligation of the main trunk of the internal iliac.

With regard to the aneurism, no pulsation ever occurred after the ligature was applied. The aneurismal varix was also completely cured. The ulcer healed, and the parts returned to nearly their normal size and shape. The patient is now discharged from the hospital cured, and expresses herself as feeling perfectly well.

After recording in detail the history of these interesting cases, a final summary seems appropriate in regard to the advantages of this method of treatment over the older methods, restricting, of course, this method of operating to the cases of spontaneous gluteal aneurism.

First. Laparotomy in no way increases the dangers of the operation of ligation of the internal iliac artery.

Second. Laparotomy prevents a series of accidents which have occurred during the performance of the operation of ligation of the artery by the older methods. Among these accidents may be mentioned the division of the circumflex and epigastric arteries, wounding the vas deferens, including the ureter in the ligature, puncture of the iliac or circumflex veins, tying the genital branch of the genitocrural nerve, stripping up and tearing the peritoneum, injury to the subperitoneal connective tissue, and other accidents of a like nature.

Third. Laparotomy enables the surgeon to apply the ligature at a point of election, and affords him an opportunity of obtaining information as to the exact extent of disease in the main arterial trunk.

Fourth. Laparotomy averts the dangers which were likely to follow ligation of the internal iliac artery by the older operations, among which may

be cited peritonitis resulting from tearing up the peritoneum posteriorly, cellulitis, purulent oedema, pelvic abscess, septicæmia, and pyæmia.

Fifth. Laparotomy occupies much less time for its performance in order to expose the internal iliac artery than was occupied to reach the vessel by the incision of Abernethy or Sir Astley Cooper.

Finally, it may be said that the only real obstacle to the successful issue of the operation of ligation of the internal iliac artery for the cure of spontaneous aneurism of the gluteal artery lies in the prevention of acute albuminuria. To this point in the clinical history of the operation the attention of surgeons should be directed. The solution of the difficult problem is only to be obtained by experimental observations made upon the lower animals, and when measures are discovered that will obviate and remedy this unfavorable complication, the treatment of spontaneous gluteal aneurism by laparotomy and ligation of the internal iliac artery may be considered under the control of the surgeon.

