Save for slight collapse after the operation the patient made an uninterrupted recovery, and he has been well since, regulation of the bowels occasioning no trouble.

It will be noted that the probable period of strangulation in this case was a long one—not less than five days—from which, together with the condition of the bowel as found at the operation, it may be inferred that the strangulation was not complete, but was more of the nature of obstruction of the lumen of the bowel than of marked interference with the blood supply of the affected loop. It is a question whether the loop became strangulated immediately on entering the sac, or whether it had been present for some time previous, as the history of the sac, increasing markedly in size, seems to suggest. As the loop was perfectly free in the sac, and there was not even a constricting band at the neck, I am inclined to think that the loop had become strangulated immediately on its entrance into the sac five days previously.

One theory put forward as to the formation of W herniae is that a single large loop of bowel comes down into the sac, and that subsequently the central portion of the loop slips back into the abdomen, thus forming the W. In favour of this theory is the generally very large size of such herniae, and also the fact that in many cases the connecting loop of bowel, notwithstanding its position in the abdominal cavity, is damaged. If the connecting loop be not damaged while in the sac, how is the damage to be accounted for?

So far as the case under consideration is concerned, this mode of formation is definitely negatived. The one loop had undoubtedly been constantly present in the sac for many years—indeed, enveloped with omentum as it was, reduction would have been impossible, notwithstanding the large size of the ring—while the other loop had equally certainly only been present for a short period. The entire absence of pressure symptoms upon the bowel mass loop is probably to be accounted for by this very long presence in the sac, the bowel having become thickened and easily capable of resisting any pressure upon it. The loop of ileum, on the other hand, being composed of normal thin, easily compressible bowel, was completely obstructed more or less immediately, notwithstanding the absence of any constricting band. It is unfortunate that the patient's condition, and also the impossibility of pulling down the bowel leading from and to the bowel mass prevents a statement being made as to the probable amount of bowel forming the abdominal loop. It is a curious fact that, in a number of the cases reported, this middle loop has suffered severely, even perforation having occurred in it, without the portions of bowel in the sac having suffered proportionately. Lauenstein has performed many experiments on animals with the object of finding out why this should occur, from which it appears that neither undue distension of the intermediate loop, as suggested by de Beule, nor traction on the mesentery can alone be held responsible. Probably both have an effect in diminishing the blood supply to the loop, and of lowering its vitality, thereby permitting undue bacterial action. In the case now reported, apart from its scientific interest, there was little object in bringing out the entire intervening loop, as only one herniated loop was strangulated, and the bowel above it on both sides was quite normal.

Lauenstein suggests as aids to diagnosis in cases of double loop herniae (1) the size of the hernia, which is generally right-sided, scrotal, and of long standing; (2) signs depending upon the condition of the middle loop, such as marked asymmetry of the lower half of the abdomen where the loop is much distended; furrowing of the scrotal tumour, indicating the line of separation between the two loops, which may further yield differences in percussion (for example, one full of fluid, the other of gas); effusion of fluid into the abdominal cavity. In the present case the size and long duration of the condition were the only features present of these suggested, the tumour being uniform in contour (owing probably to its thick envelopes as compared with a scrotal hernia), and the abdomen uniform and free from effusion (owing to one loop only being affected, and there being thus no affection of the middle loop).

In conclusion, it may be stated that one of some three cases of herniae containing three loops of bowel has been reported by Pringle of Glasgow,⁴ and in this case one of

the loops was less affected by strangulation than the others.

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A CASE OF GLUTEAL ANEURYSM. TRANSPERITONEAL LIGATURE OF THE INTERNAL ILIAC.

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READING.

THE following case is of interest on account of the rarity of the condition and the fact that the treatment adopted involved an operation not often performed:

G. S., a farm labourer, aged 64, was admitted into the Wallingford Cottage Hospital in September last with a swelling of the right buttock.

History.

For six or seven years the patient had suffered from unilateral sciatica. The pain had been much more severe during the last two years, and for two weeks before admission had been almost insupportable. It was usually worse at night, and extended from the right buttock over the back of the thigh and calf of the leg down to the heel of the same side. On account of the pain the patient had been compelled to give up work and take to his bed. The swelling had been noticed in the buttock for about three years; it had been very slowly increasing in size during that time. Beyond the fact that the man remembered that when acting as shepherd some twenty years ago he had occasionally been butted in this region of the body by rams, there was no history of trauma, nor was there any of syphilis (though the latter fact is scarcely worth recording, since patients of his class undoubtedly often suffer from this disease in a mild form, and scarcely notice it till tertiary symptoms or nervous diseases supervene). His habits had always been temperate.

Condition on Admission.

A tense pulsating tumour was present in the right gluteal region. The pulsations were expansile, and a marked thrill could be detected at one point. Auscultation revealed a loud bruit. The centre of the swelling was situated above and a little to the outer side of the point of junction of the middle and lower thirds of a line drawn from the posterior superior iliac spine to the ischium. The tumour measured, roughly, 8 in. from above downwards, and 6 in. from side to side; it extended down to the gluteal fold, which was almost obliterated, and, apparently, deeply into the pelvis. The muscle over it was thinned, and the flexors of the thigh were a good deal atrophied (though this does not show well in the photograph). The hip-joint could not be fully extended. Rectal examination revealed the presence of a pulsating swelling in the pelvis. The arteries throughout the body showed slight atheromatous changes, but not to a greater degree than one would expect to find in a man of the patient's age and occupation. It was noted that the right femoral artery commenced 1 in. external to the mid-point between the anterior superior iliac spine and the pubic symphysis. The patient showed some interesting deformities. The thumb and index finger of the right hand were fused together, the middle and ring fingers of the same side were absent, though the metacarpals of each were present, that of the middle finger being, however, rudimentary; the little finger was represented by two complete digits articulating with a common metacarpal.

Owing to the severe pain and the possibility of rupture of the aneurysm, it was decided to tie the internal iliac artery.

Operation.

Having opened the abdomen by an incision 5 to 6 in. in length along the right linea semilunaris, I attempted to obtain an exposure of the division of the right common iliac vessels at the brim of the pelvis by holding the intestines aside with sponges and retractors. Though the arteries could, of course, be plainly

felt pulsating, I found it quite impossible to obtain sufficient view to enable me to pass a ligature. This difficulty was due largely, if not entirely, to the fact that we had been unable to get the patient into a proper Trendelenburg position. The table used had not the necessary adjustment for this position, and attempts to obtain it by raising the pelvis with sandbags and pillows had not been very successful since we did not like to apply much pressure in the neighbourhood of the aneurysm. Moreover, the flexion of the hip tilted up the thigh to an awkward angle when the pelvis was lifted to any great extent. Under the circumstances I was compelled to enlarge the wound by making a short transverse incision, and even then had to withdraw a good deal of intestine from the abdomen before I could obtain a view of the spot where the arteries lay beating behind the posterior peritoneum.

Here the second difficulty presented itself. I found that I was in considerable doubt as to which was the internal iliac artery owing to an abnormal arrangement of the vessels. After a good deal of trouble it was found that the anatomy of these was as follows: The right common iliac divided rather above the lumbo-sacral articulation into its two divisions. Of these, the true external iliac lay at first internal to the other, and disappeared almost at once into the pelvis. It soon reappeared, running forwards along the pelvic brim, and finally curved sharply outwards, almost at right angles, to Poupart's ligament, behind which, as already noted, it passed 1 in. external to its usual position. The true internal iliac was at first placed external to the external, and ran down along the inner border of the psoas above the pelvic brim. Shortly beyond the point at which the external artery appeared out of the pelvis, it crossed in front of this latter and continued its usual course down into the pelvis. All this was very puzzling to make out, as one was working at the bottom of a deep wound, and had to depend as much on one's sense of touch as that of sight. However, having at length ascertained the course of the vessels and confirmed this by noting the effects of compression on the pulsations of the femoral in the thigh, I snipped through the peritoneum covering the internal iliac artery, and with an aneurysm needle passed a double thread of No. 3 silk around it. This required some little care, so as to avoid wounding the vein. The ligature was then tied as tightly as I dared (the artery was somewhat calcareous and rigid), completely stopping pulsations below, though a curious thrill could be felt at the point of the ligature as if from a minute squirt of fluid. The little slit in the peritoneum was next roughly brought together by a single stitch, the intestines returned, and the abdomen closed in the usual way. Examination of the buttock showed that pulsations in the aneurysm had quite ceased.

There was some shock following, necessitating infusions by the rectum, but after the first twenty-four hours the patient's progress was uninterrupted. Recurrent pulsation in the aneurysm commenced, however, two days after the operation. This was almost to be expected in view of the freedom of the collateral circulation. These pulsations were never very marked, though persistent. The patient was given potassium iodide, and the aneurysmal swelling gradually became smaller, and—the most satisfactory point—increasingly harder. The pain was also considerably lessened. The patient left the hospital about six weeks after the operation.

I saw the man at his own home about four weeks later. He was then able to walk about his cottage comfortably, and said that the pain had quite left his thigh, and was only felt to a moderate degree along his leg and foot. The aneurysm could still be felt to pulsate, but not markedly. It was smaller than before the operation, and felt quite hard.

I have called this a case of gluteal aneurysm, though I am not prepared to assert that this vessel was involved rather than the sciatic. Indeed, from the rather low position of the most prominent part of the enlargement, and from the way in which it pressed upon the great sciatic nerve, a sciatic aneurysm is rather suggested. When, however, the swelling has reached the size that this had it is impossible to distinguish between the two, nor is there the least necessity to do so; and the term "gluteal" is a convenient one to apply to anything pertaining to this region.

The diagnosis of aneurysm in this position from a pulsating sarcoma may be quite impossible, but in this case the slow growth, the uniform consistency of the lump, and the marked thrill, made us feel pretty certain we were dealing with the former condition; this was confirmed by the result of the operation, though against this must be quoted a very instructive case recorded by Mr. Bernard Pitts, in which marked temporary improvement was brought about in a vascular pulsating sarcoma in the gluteal region by ligature of the internal iliac.¹

In performing the operation the transperitoneal method was selected (as, I should imagine, it would always be in these days), as being by far the simpler, easier, and safer way. As Sir Frederick Treves says: "The advantages of this method are obvious. The vessel is fully exposed, and the needle can be passed without risk to vein or ureter. The ligature can be applied accurately at the spot determined upon, and the condition of the artery and the surrounding parts can be made out."²

One of my difficulties was to obtain a clear view of the posterior peritoneum covering the vessels, owing to the bulging intestines. On the left side this difficulty might be increased if the sigmoid flexure were fixed by a narrow mesentery, for the mesentery would then have to be incised before exposure could be effected. The importance of the Trendelenburg position cannot, I think, be exaggerated.

The abnormal condition of the vessels which caused my other chief difficulty could not, of course, be guarded against. It must be remembered, however, that an abnormal arrangement of the iliac arteries is not very uncommon. Mr. Bernard Pitts, in operating on the case of sarcoma mentioned above,¹ says that he at first failed as he thought to find the internal iliac artery. He continues, "Having failed . . . I exposed and ligatured what I believed to be the common iliac, but after drawing the ligatures tight it was found that pulsations still continued in the femoral artery. Further examination showed that the external iliac artery was lying just outside the vessel ligatured. The common iliac was very short and the internal was correspondingly long and lying in almost the whole of its course above the brim of the pelvis parallel with the external vessel."

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AMPUTATION FOR DIABETIC GANGRENE.

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AMPUTATION for diabetic gangrene is an operation always attended with danger, and is a cause of much anxiety to the surgeon. The following case is reported as illustrating precautions which may be taken to ensure, as far as possible, a successful result.

A married woman, aged 62, was admitted to the Middlesex Hospital under the care of Mr. Sampson Handley on September 3rd, 1908. She was suffering from moist gangrene of the left lower extremity. The gangrene extended above the ankle, the skin had given way at many places, and there was considerable discharge of pus. She was extremely feeble, the pulse was 120, and the temperature 98° F. The arteries were rigid, and the pulse almost impalpable.

For the previous three years the patient had not had complete control over the bowels and bladder, and had suffered from troublesome vomiting. She had had a terrible thirst for three years, had complained of polyuria, and had wasted considerably. The urine had a specific gravity of 1030, and it contained albumen, some pus, and 2 per cent. of sugar.

When Mr. Handley saw the patient he suggested her removal to the ward reserved for septic cases, as he did not consider that she would stand an amputation of the limb, but later he consented to my attempting it, and kindly entrusted the case to my care. Under local anaesthesia I exposed the anterior crural nerve, and Mr. D. Ligat exposed the great sciatic. Into the sheaths of these nerves was injected a solution of novocain, and the incisions were sutured. Dr. F. E. Meadows then administered a mixture of nitrous oxide gas and oxygen for about eight minutes, and I amputated the limb at the junction of the lower and middle thirds of the thigh. The patient at once recovered from the anaesthetic, and was quite comfortable, complaining of no pain. Her pulse was certainly no worse, but, if anything, rather better than before the operation. Drachm doses of sodium bicarbonate were given per rectum as a prophylactic measure against the onset of coma.

There was nothing in the convalescence calling for special notice except that the site where a drainage tube had been inserted showed no attempt at healing for some time; in fact, it was not until October 26th—seven weeks after the amputation—that the stump could be said to be absolutely healed.

Under medical treatment the patient's general condition improved somewhat. Examination of the urine on October 14th showed that there was less than 1 per cent. of sugar, with some pus, and on October 19th that there was only a trace of sugar, though pus was still present.

The patient never recovered sufficient strength to use her crutches, and the circulation in the right lower extremity gave some cause for anxiety. She left hospital on November 11th for her own home, where she was to remain in bed. She was, I am informed, comfortable and happy at home for about three months, when she began to lose ground again. She died of coma on April 17th, 1909—over seven months after the amputation was performed.

NOTE BY MR. HANDLEY.—"The condition of this patient before operation appeared desperate, and the favourable issue of the case affords the clearest possible proof of the value of the methods employed."