pulls up easily, and the intestines fall back into the abdomen; usually no packing is required.

The injection, of course, adds to the duration of the operation, but, when once accustomed to it, it can rarely add more than five, or at the most ten, minutes. Part of this time is regained by the ease of operating, and in any case it is of no consequence, for the patient's condition is improved by it. There has been, however, one exception to this: An elderly woman of very poor fibre, weakened by six months of haemorrhage, needed panhysterectomy. The anaesthetist was, for some reason, unable to keep the airway clear, and from the start she took the anaesthetic badly. She was deeply cyanosed and strained all through the operation, which was long and difficult. She suffered severely from shock and never picked up, dying on the fourth day. She was the only patient that suffered any degree of shock.

When the operation is over, there is a quick and comfortable recovery; usually no pain at all is complained of, sickness is reduced to a minimum, and the patient usually sleeps well from the first night onwards.

Another marked effect, probably due to the scopolamine, is that, though patients may talk sensibly just before and soon after the operation, they frequently have no recollection of what has happened during most of that day when questioned afterwards, and it is a great advantage to have no unpleasant memories.

Ward and Home Sisters, who started by being sceptical, are now quite convinced of the advantages of anoci-association, and declare that such patients are no trouble after operation.

In two amputations through the thigh in old people, in addition to the usual novocain infiltration, the sciatic nerve was injected with quinine and urea, and there was no shock and practically no after-pain.

One girl of 17 years had a large one-sided goitre, which caused great pain and dyspnoea. The operation for removal was conducted without the slightest anxiety, and recovery was normal and rapid. The patient was subsequently operated upon by another surgeon for enucleation of the tonsils, and died under the anaesthetic. At the *post-mortem* examination status lymphaticus was found. It seems possible that it was anoci-association which saved her from disaster on the occasion of the first operation.

We have had no trouble in the healing of wounds, but there is no doubt that the infiltration must increase the chances of sepsis; and the method should therefore not be used unless the surgeon is sure of himself and his surroundings. Crile has pointed out that it is inadmissible to infiltrate tissues which are the seat of either acute inflammation or cancer.

The comfort of the patient and his pleased surprise at the absence of discomfort would repay the trouble entailed, even if the operation mortality were not lowered. Crile's mortality has diminished from 40 to 8 per 1,000 since he has used anoci-association.

REFERENCES.

¹ *Lancet*, September, 1913. ² *Ibid.*, September 6th, 1913. ³ *BRITISH MEDICAL JOURNAL*, July 26th, 1913, p. 169.

RADICAL CURE OF INGUINAL HERNIA.

BY

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It is not with any desire for innovation that I wish to invite attention to a method which I have lately devised, for I feel certain that any surgeon, like myself, who has performed a thousand hernial operations, must frequently have been struck by the difficulty of preventing the fibres of the inner shelf of Poupart's ligament splitting when inserting the necessary approximation sutures. It is obvious that such splitting must act detrimentally by weakening the first and principal line of defence. In order to avoid it I have tried various forms of needles, but found little difference in result, except that on two occasions, when using sharp curved ones, I wounded the external iliac vein (Chopart amputation of the foot followed in one, no penalty in the other).

The operation which I am about to describe has for its object the elimination of such "regrettable incidents," and

the fulfilment of the anatomical conditions which form the basis of such thorough procedures as that of Halsted and Bassini.

As to the skin incision, I should recommend every one not to forget Mr. Lockwood's advice, that in order to find the correct line it is essential to begin by invaginating the scrotum with the finger into the external ring. I have seen this elementary precaution often omitted, the inguinal canal missed altogether, and a fumbling excision made into the femoral region. I employ a long incision, extending from the level of the pubic spine to a point about one inch below and internal to the anterior superior iliac spine. The superficial epigastric and superior external pudic vessels are seized with forceps, divided between, and ligated, and the aponeurosis of the external oblique thoroughly exposed. The intercolumnar fibres of the external ring are then snipped with scissors, and with the handle of the scalpel the aponeurosis is split, parallel to its fibres, to the upper limit of the incision. The divided aponeurotic "leaves" are next seized on each side by pressure forceps, which act as tractors, and considerably facilitate the thorough separation of the former, by blunt dissector, from the underlying structures. I wish to lay

Fig. 1.—A, Poupart's ligament. B, Conjoined tendon. C, Aponeurosis of the external oblique. D, Cord retracted inwards and lying superficial to external oblique.

particular stress on the necessity of thoroughly executing this manoeuvre at this stage in order to prevent subsequent anatomical obfuscation, and the avoidance of what I have occasionally witnessed in clinics—the suturing of something to anything.

Once the inner shelf of Poupart is brought into clear perspective, and the fibres of Gimbernat can be readily felt, on the outer side, and the conjoint tendon with the rectus sheath exposed, on the inner, it becomes a very simple matter to free and isolate the cord, and to distinguish, separate, incise, and remove the hernial sac, and to suture the opening flush with the peritoneal cavity.

This completed, the cord is raised up and placed well out of range of injury behind the two tractor forceps attached to the edge of the internal leaf of the divided aponeurosis (Fig. 1).

I now come to the principal part in this operation. The external leaf is drawn firmly downwards and outwards by tractor forceps until the inner shelf of Poupart's ligament comes well into view. Taking this exposed shelf as level, a curved hernia needle is passed from without inwards right through the reflected aponeurosis—the lower one embracing in transit some fibres of Gimbernat's ligament (Fig. 2)—passed across the floor of Hesselbach's triangle, and made to emerge through the substance of the conjoint tendon. The needle is now threaded with strong catgut, one end grasped by an assistant, and the needle withdrawn. The unthreaded needle is again similarly introduced about half an inch above the former, and a mattress suture completed. Three more similar ones are inserted through the above level, and sufficient room is left at the upper angle for the passage of the cord (Fig. 1).

When these four sutures are tied (Fig. 3), the anatomy of the part is considerably transformed, the inner shelf of Poupart's ligament being firmly approximated to the conjoint tendon. Hesselbach's triangle is completely obliterated. In some patients, with ill-developed or flabby conjoint tendons, I have obtained benefit by passing the

Fig. 2.—Insertion of first stitch through Gimbernat's ligament and conjoint tendon. A, Poupart's ligament. B, Conjoined tendon. D, Cord retracted inwards. E, External oblique.

hernia needle further inwards through the adjoining sheath of the rectus, so as to afford a good purchase for the loop of the mattress suture.

Finally, the two aponeurotic leaves are united by a continuous catgut suture, and in doing this I make it a rule to insert the point of the needle deep enough to catch hold of underlying muscle in order that no intermuscular dead space may be left. The cord, of course, is left, as in Halsted's operation, superficial to the external oblique.

Fig. 3.—A, Poupart's ligament (lower shelf). B, Conjoined tendon. D, Cord retracted inwards. E, External oblique—external leaf. F, External oblique—internal leaf.

I find this makes an extremely firm barrier, and is equally useful for the radical cure of oblique or direct hernia.

It is obvious that this operation only differs from that of others in the manner of introduction of deep sutures, but I am convinced the modification is important, in that it affords a simple and absolutely safe method of approximating somewhat delicate tissue in a rather dangerous zone.

I wish to acknowledge my indebtedness to my friend Dr. K. Macfarlane Walker for drawings.

A CASE OF URÆMIA WITH AN UNUSUAL DEGREE OF UREA RETENTION.

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I.—Clinical Note by Dr. H. B. Day.

AN Egyptian fireman, aged 36, was admitted to hospital to undergo treatment for scabies in the skin section. He did not complain of any urinary symptoms, but the routine examination of urine revealed a high degree of albuminuria, varying from 0.275 to 0.225 per cent. The specific gravity was low—1008—and the reaction acid. The patient was put on milk diet, and discharged in ten days cured of his scabies.

A month later (January 5th, 1914) he was readmitted to the medical wards for oedema of the feet and eyelids with some cough of ten days' duration. The urine was now found to be alkaline in reaction, with a deposit of pus and phosphates. Albumin was present to the same degree as before; the specific gravity was 1010. The bladder was sounded, with a negative result, and the patient was treated for nephritis and cystitis.

A fortnight later the patient's condition caused uneasiness, although all the oedema had disappeared. He had become weak and apathetic, with a fixed staring expression, though responding readily to questions. The amount of urine averaged 1,000 c.cm. a day, but continued of the same low density. In spite of active treatment, the patient became gradually weaker and less responsive. A week later (January 28th) chattering movements of the jaws set in, the tendon reflexes were exaggerated, clonus, being easily elicited. The pupils were equal and moderately contracted. The urine showed no further alteration in composition and quantity.

Lumbar puncture was performed and a free flow of clear fluid obtained. No albumin was present (nitric acid test), but the quantity of urea was found by Doremus's ureometer to amount to the extraordinary percentage of 0.75, whereas the normal is 0.03 to 0.04. I was naturally sceptical of such a reading, and repeated the estimation twice again, but with a similar result. I therefore requested Dr. W. H. Wilson to estimate the amount of urea present in the blood. He kindly took samples on two occasions and also collected material at the necropsy. His report forms the second part of this paper.

In spite of rectal injections of saline and cupping to the loins, the patient rapidly grew worse and died three days later (January 31st).

Necropsy.

Dr. A. R. Ferguson, Professor of Pathology, made the necropsy and reported as follows:

"The left ventricle was hypertrophied, the right dilated. The lungs were congested and the liver enlarged, but of normal appearance. The brain showed a recent small patch of subdural hæmorrhage on the left side; the ventricles were somewhat dilated and the cerebro-spinal fluid excessive in amount. The bladder was thin-walled and pouched, showing several areas of hæmorrhage in the mucous membrane, both old and recent. There were signs of bilharziosis around the opening of the urethra, but no stricture was present. The openings of the ureters in the bladder were lax and patent, but the ureters themselves were dilated. Both kidneys were largely destroyed by pyonephrosis. The residual renal tissue showed acute inflammation."

II.—Note by Dr. W. H. Wilson.

At the request of Dr. Day an estimation of the urea content of the blood was made. I also examined the blood and cerebro-spinal fluid obtained *post mortem*; and kindly supplied by Professor A. R. Ferguson.

The method employed was that described by Barcroft,¹ with slight modifications, the apparatus, however, being different. For the samples of which larger quantities were available (c, d, e, f), the dried alcoholic extracts were taken up in 20 per cent. NaOH, and decomposed with hypobromite of sodium in an apparatus of the Dupré type; the usual corrections for temperature and pressure were