The fatal wound had evidently been made very rapidly, and with great force, as it is to be presumed that the edge of the knife used would hardly be so keen as that of a razor. The perfectly transverse nature of the wound was interesting, as indicating a sudden effort of very short duration; had the wound been an inch longer or more there is little doubt that one or both extremities would have been curved to some extent.

Post-mortem staining was quite distinct in the usual parts of the body posteriorly about 15 minutes after death. The body was allowed to lie on its back for 4 hours, and was then turned on its face. On the following morning, 24 hours after death, the *post-mortem* stains were entirely on the front of the body, and were well marked. In the right ventricle of the heart there was a large, well-formed, and adherent *post-mortem* clot, with the usual distinct division into two layers, one being light yellow in colour, and containing no red corpuscles; the other, very dark, and containing all the red corpuscles in the clot; the yellow layer, however, was placed anteriorly, and in view of the position of the *post-mortem* stains this showed that the position of the body had been reversed some time after death. As the blood in the capillaries was still fluid, the *post-mortem* stains, when the body was again turned on its back, rapidly faded from the front and reappeared posteriorly.

With the view of informing myself as to the production of ecchymosis in a body after death, I used a spine chisel to inflict several very severe blows on the prominence of each shoulder, also over the left iliac crest, in the latter case employing sufficient force to produce a very palpable depression of the bone. This was done 20 minutes after death, and next morning the following appearances were noted: On the shoulders there was no mark which could be detected, while over the iliac crest there was an almost invisible light-greenish coloration, corresponding to the depression of the bone, which would probably have escaped notice altogether had I not examined the part very carefully, with the knowledge of the blow which I had inflicted.

With regard to motive, there seemed none, and the deed was apparently the result of temporary alcoholic insanity. The body was exceptionally well nourished, the layer of fat in the abdominal wall being an inch and a quarter thick; the internal organs were anæmic, the liver enlarged and fatty, the spleen shrunken, and the kidneys cirrhotic.

A STUDY OF TWO HUNDRED CONSECUTIVE OPERATIONS FOR THE RADICAL CURE OF HERNIA.

By ARTHUR E. BARKER, F.R.C.S.,

Professor of the Principles and Practice of Surgery and Professor of
Clinical Surgery at University College, and Surgeon to
University College Hospital.

In a paper which I had the honour to read before the Royal Medical and Chirurgical Society in April, 1890, I analysed my first fifty cases of radical cure of hernia, and I venture to think that a brief study of a further 150 since consecutively operated on may have a certain value.

In the paper referred to three questions were taken as the basis of the inquiry upon which I hoped the 50 consecutive cases would furnish evidence:

1. Is the operation called for?
2. Is it safe (a) as regards the patient's life; (b) as regards the contents of the scrotum?
3. Does it secure against a return of the hernia?

In order to preserve a certain uniformity between the analysis of the succeeding 150 cases, these questions will be still taken as the text of the following inquiry, which in other respects as well will be made to follow the lines of the first communication as nearly as possible.

The first question now hardly needs an answer, if the operative interference be limited to the young after infancy, and to those who are debarr'd from this or that calling by reason of the hernia. So far most surgeons are agreed; and in all the cases before me there was good reason for the measure. In many other cases the operation was refused, because there

seemed to be very little special reason for its performance. In many cases, too, of strangulated hernia operated on during the same period, a radical cure was included in the procedure, but such are not recorded here, the inquiry being entirely confined to non-strangulated herniæ.

As to the risks of the operation for radical cure, if anything is learned from this series it is that the danger is small. Out of the 200 operations there were only three deaths. And when we consider that the procedure is a lengthy one, and that in many cases the conditions for which it was done were very complicated, and involved considerable risks even without operation, the mortality may be said to be low. And this point is further emphasised when we examine the cause of death in the three fatal cases.

One of these died of ether poisoning. The anæsthesia was begun with ether, which the patient took badly; then he was given chloroform, which was equally troublesome, and finally ether was again administered. Throughout the operation, which lasted 50 minutes, the patient showed considerable cyanosis and respiratory trouble, and just as I had finished, and was putting on the dressings, his breathing became more and more embarrassed, and finally ceased. Artificial respiration was unavailing, and death ensued. The man was 33 years of age, and was apparently healthy, and there was nothing unusual in the operation (Bassini's).

In both the other fatal cases it is a remarkable fact that I had to deal in each with a large irreducible inguinal hernia containing the sigmoid flexure of the colon, and in one of them (which had been irreducible for two years) the bladder was found in the sac with the sigmoid flexure, omentum, and large intestine.

In the first of these two, a man aged 61, I was unable to reduce the bowel, and simply closed the wound at once, and the patient died some days later with symptoms of intestinal obstruction like several previous attacks of the same kind for which no cause could be found *post mortem* by the then Surgical Registrar, Mr. Raymond Johnson. There was no peritonitis.

In the second the operation was very long and very difficult. The patient, aged 51, was a large, gross-looking man, with an enormous left inguinal hernia, irreducible for the last two years. On cutting down on it the sac and other coverings were found greatly thickened, and there was much fluid in the sac, besides which the latter was very irregular and loculated. It contained the bladder, sigmoid flexure, large intestine, and omentum. With great difficulty the bulk of the contents was reduced. Then the main part of the sac was cut away, and the rest stitched up, after which it was pushed with the bladder and sigmoid flexure into the abdomen. The opening was closed by Bassini's method. Extensive suppuration followed, and septic peritonitis, from which the patient died on the fourth day. It is quite possible that here the septic matter may have reached the raw surface of the wound through the part of the sigmoid uncovered by peritoneum, and as the latter had to be handled pretty freely, I think this explanation tallies with the appearance seen *post mortem*. Not that the bowel had been perforated, but there is good reason to believe that intestine whose vitality is lowered in any way is traversed by the organisms living in its interior. And if this be true of bowel still covered by peritoneum, it ought to be equally, perhaps more, possible for the same thing to happen where the viscus was not so covered.

These three are the only instances in which death followed the operation among these 200 consecutive cases. But further than this, in no other case had the patient's condition appeared at any time critical. The recognised wound infections were unknown. Indeed, the vast majority healed absolutely by first intention under one dressing. On this point I have examined the series critically, and find that among them all there were 26 cases in which it may be said that there was definite discharge from the wound, varying from slight turbid oozing from a stitch hole or an unclosed angle to plain suppuration. But strictly speaking, in almost all these cases the discharge was very trifling, and in many of them the healing was the nearest thing possible to first intention. The remaining cases may all be said to have united primarily. There may have been here and there a spot of moisture round a stitch or where the epidermal edges were not absolutely in contact when the first dressing was applied, but this is not

incompatible, I hold, with first intention. Within the last twelve months there are no instances of suppuration recorded in over 30 cases. In a considerable number where discharge was present the cause was plainly wetting of the dressing with urine either directly from the urethra or more commonly by tilting of the urinal during use. This is always a great trouble in these cases, especially in hospital, and will necessitate immediate removal of the dressings in spite of the apron of waterproof which is invariably put over the dressings at the conclusion of the operation. A little urine direct from the urethra percolating through an antiseptic dressing does not infect the wound as a rule, but that from a dirty urinal bottle running along the skin under the antiseptic fabric will do so, as has been found in some of these cases. It seems probable that in some of those who suppurated the cause was the patient's general condition. This struck me forcibly in the case of a man on whom I operated three times. On every occasion had bronchitis followed the operation, and two of the wounds suppurated in spite of the greatest care. I believe this was influenza in each case. Other cases illustrate the same point. One patient had marked diabetes, another cystitis.

Discharge, too, in several of the cases mentioned has been due to small effusions of blood and serum under the skin, which, owing to the fact that drains have been abandoned for a long time past for these operations, prevented the skin from uniting immediately with the deeper parts. But such cases gave as a rule, no trouble; a little serum or blood ran out of the stitch hole when the thread was removed, and soon leaked completely away.

If discharge of any kind occurred, one or more stitches were likely to come away in time. This was most noticed, of course, in those cases which suppurated. But even without the latter a perfectly aseptic stitch may, I believe, give rise to serous effusions. If it is tied too tightly round the fibrous structures of the inguinal rings, it may cause necrosis of the latter, especially if the wound have been long exposed, and more especially if any strong germicide fluids have been used in the wound during the operation. Of late I have always been careful not to put too much strain on the threads in closing the rings, and to avoid the germicides in sponging the tissues.

As a matter of figures I find that sutures came away, either in hospital or later at home, as far as can be ascertained, in 21 out of the 200 cases, but not one during the last year to my knowledge. This last fact is of interest, as silk has been used in all. I am inclined to attribute it to the greater care taken in not closing the sutures with too great pressure, and so avoiding strangulation and consequent aseptic necrosis. It may, however, be due to the absence of any suppuration during the same period.

As to the risks to the structures of the spermatic cord and testis, only two are recorded. In one I inadvertently snipped across the vas deferens, and in another while separating the sac it was broken across with my finger nail. In another case of a man aged 60, with the largest scrotal hernia I have ever, I think, seen, I designedly removed the testis and remains of the sac, after closing the hernial opening on account of a large hæmatoma which formed in the scrotum and subsequently suppurated. The patient had no suppurating in the hernial wound, and made otherwise a perfect recovery, and remained well until his death fifteen or eighteen months later of cerebral apoplexy.

There were no intercurrent troubles except bronchitis, influenza, tonsillitis, cystitis, and bad diarrhoea, gout, and diabetes. But, as mentioned, I believe these decidedly influenced the healing of the wounds in some cases. If these cases so affected were eliminated from the series, the latter would show very few cases of suppuration. The ages of the patients ranged from 3 months to over 70 years; 35 were under 20; 132 between 20 and 60 years of age. Altogether there were 178 patients operated on, 6 of whom were subjected to a second operation on account of recurrence of the hernia. The vast majority suffered from oblique inguinal hernia—155 out of 197, including 30 on both sides. Excluding the latter there were 86 right and 39 left inguinal. Of femoral herniæ there were 10, of umbilical 4, ventral 13.

Among the inguinal series there were several very interesting varieties. The cæcum was found in three right, the sig-

moid flexure in three left, inguinal; the bladder, too, in one of the latter.

In one right inguinal hernia the sac came directly through the fibres of the conjoined tendon, quite separate from the cord, which passed out of the abdomen by a very distinct and small internal ring. This is the only case in these inguinal herniæ and in many others operated on for strangulation in which I have found this condition of things. In one femoral case the sac came out between the anterior iliac spine and the femoral vessels by a large opening (Fig. 1). There were two

Fig. 1.

interstitial herniæ of the inguinal kind, the sac passing upwards and outwards between the external and internal oblique muscles. In one of these there was a second distinct sac

Fig. 2.

passing down into the labium. These sacs were separated at

their necks from one another by the deep epigastric vessels (Fig. 2).

The operations performed on the inguinal herniæ were various. In 79 cases I employed my own method, previously described; in 57, Bassini's method following very closely his original description in *Langenbeck's Archiv*, except in two small details, in which I venture to think I have introduced a slight improvement. In 7 cases Kocher's operation was done following his own modifications as he published them. In only 2 has Dr. Macewen's method been followed. The remaining 10 cases were operated on in the earlier days by irregular methods of suture of the rings before the operations became formulated.

In the femoral, umbilical, and ventral cases I have followed methods I described some years ago, and have only modified them so far as in the last 9 cases of ventral and umbilical cases to use deep buried silver sutures, following a practice from which I have seen very good results in the hands of Professor Max Schede, formerly of Hamburg, now at Bonn. The silver wires appear to me as to him to give a decided mechanical support not obtained by silk. In one case in which I had to operate for incarcerated umbilical hernia in a stout woman five months pregnant, I was greatly struck with the result. She went through her labour without any trouble in the hernia, and I saw her ten months later, with her 5 months' old baby, and could find no trace of the hernia or silver stitches. In one stout man who unfortunately was operated on for umbilical hernia a few hours after admission into hospital, and whose urine had not, by some mistake, been examined, it was found after operation that he had diabetes. Here the wound slowly suppurated, and the silver stitches had to be removed. This case, and one more of a neurotic woman, who thought that the silver stitches pinched her, are the only cases in which they have had to be removed. And to me they appear to have done good service. A larger experience will tell.

In almost every other case hard twist Chinese silk boiled in 1 to 20 absolute phenol was used, my earlier experiences with gut of all kinds not impressing me favourably. Some of these silk sutures, as has been said above, worked out to the surface; but, considering that about a thousand must have been used in the 200 operations the proportion was small.

(3) As to the last question put in regard to the immunity from recurrence after these operations, it is an extremely difficult one to answer. Most of these cases, of course, were hospital patients, and to follow them up has been next to impossible. But this much I can say, namely, that I constantly hear of my patients from various parts of the world in every profession and employment who are quite rid of all their troubles, and that I very rarely now hear of a recurrence. Whether this is due to the fact that Bassini's operation has been the method I cannot say, but I certainly regard it, when carefully carried out, as the best operation of any yet devised.

A CASE OF NOMA OF THE EAR.

By G. MUNRO SMITH, L.R.C.P.LOND., M.R.C.S.,
Surgeon to the Bristol Royal Infirmary.

THE unusual situation of the lesion in this case and the result of the bacteriological examination make it worthy of record.

HISTORY.

M. A. V., aged 2 years, a fairly well nourished but rather anæmic child, was admitted to the Bristol Royal Infirmary, September 15th, 1897. There was a history of occasional discharge from the left ear and eczema, otherwise she had been healthy. The mother had suffered from syphilis, and others of her children had been ill with enlarged glands in the neck, etc. No account of any local injury could be obtained.

On admission, the whole of the left auricle was swollen and red, and pus was exuding from the meatus; the cheek was oedematous. There was a small, clean-cut ulcer in the fossa of the antihelix, covered with a greenish grey, slightly adherent slough. The child's general condition was good, and it took its food well.

The ulcer was cleaned, antiseptic dressings were applied, and matters improved until September 25th, when the auricle began rapidly to swell and the patient became worse. On the 26th, an incision was made and a teaspoonful of pus evacuated. On October 1st the ulcer began to spread rapidly. Chloroform was administered, and the sloughing ulcer was scraped and cut away and strong carbolic applied. There was another improvement for a few days, but on October 4th the disease made a fresh start, and from this time onwards its ravages could only be temporarily checked by cutting away the necrosed tissues and swabbing with strong antiseptics. The condyle of the jaw and neighbouring parts became ex-

posed, and on October 27th symptoms of meningitis appeared, and the child died on the 29th.

At the necropsy the external ear was represented by a small, crescent-shaped mass, and a large irregular cavity, with sharply excavated sides, exposed the condyle of the jaw, with the auricular and mastoid portions of the temporal bone (see Fig. 1). The articulation was destroyed, but the

OCTOBER. 30th 1897

Fig. 1.—A, Remains of auricle. B, Mastoid. C, External auditory meatus. D, Condyle of lower jaw.

tympaanum had escaped. On opening the cranial cavity the vessels of the vertex of the brain were much congested, and the lateral sinus was blocked with white adherent clot. There was also a thrombus in the longitudinal sinus.

REMARKS.

The clinical features were fairly typical of noma, but there was an almost complete absence of the black slough generally found, and the situation was very unusual. I can find no record of the external ear being primarily attacked. The extensive thrombosis must be considered one of the features of the disease.

Various bacteriologists have found micro-organisms in the tissues involved in noma and in the clots in neighbouring veins, but their relation to the affection is not yet clearly defined. However, in 1889 Schimmelbusch described small bacilli with rounded ends which stained with aniline dyes, but not with Gram's method. Injections into mice and pigeons caused sloughing, etc.¹ Ranke in several cases found only cocci.²

Dr. Odery Symes, Honorary Bacteriologist to the Bristol Royal Infirmary, kindly undertook the bacteriological examination, and I am indebted to him for the following report and to the House Physician, Dr. Stack, for taking notes on the daily progress of the disease.

BACTERIOLOGICAL REPORT.

Dr. Stack inoculated an agar tube from the margin of the spreading ulcer on October 27th. After twenty-four hours incubation at 37° C., there was a growth of greyish-white colonies. Examined microscopically, there were a few staphylococci present, together with a short bacillus, non-motile, rounded at the ends, and staining easily with aniline dyes. The centre of the bacillus often remains unstained. The organisms are often in pairs or chains. On gelatine stroke cultures the growth is very slow, and does not liquefy;