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PART I.

ORIGINAL COMMUNICATIONS.

ART. IX.—*Three Cases of Popliteal Aneurism (two of the Patients having been previously surgically treated for pre-existent Aneurism of the fellow-limb); Amputation in one case followed by recovery; the other cases cured respectively by Compression and Deligation of the Femoral Artery.* By MR. EDWARD STAMER O'GRADY, Ch.M., M.B., A.B., Univ. Dub.; Surgeon to Mercer's Hospital; Fellow and Member of the Surgical Court of Examiners, R.C.S.; Licentiate of King and Queen's College of Physicians; formerly Lecturer on Surgical Anatomy at the Carmichael School of Medicine, &c., &c.

CASE I.—*Popliteal Aneurism; prolonged Digital and Instrumental Pressure unsuccessful; Amputation of the thigh; Recovery.*

X. X. (No. 880), aged twenty-eight, a man of unusual intelligence, who, in early life, had been a wild, dare-devil kind of fellow, and of late had followed the occupation of a clerk, was admitted to hospital June 2nd, 1871. He had always considered himself to be a hardy, healthy man, though, according to his statement, there was a history of previous syphilis, contracted whilst serving in the Fourth Dragoons. About nine weeks ago he first felt pain in the right knee, and coincidentally observed that there was a pulsating swelling behind the joint. This pain commenced quite suddenly, and, so far as the patient knows, did not follow

any sprain or injury. It soon became the source of constant and terrible suffering. Relief was sought at the Limerick work-house, where Dr. T. R. Phayre, then the able resident officer of that institution, applied instrumental pressure along the artery. This treatment was followed by so much benefit that after fourteen days the patient took his discharge and went "on a spree" of some days' duration, at the end of which he found his limb worse than ever. X. X. now determined to come to Dublin. He complained bitterly of persistent numbness of the foot, associated with constant pain over the region of the inner ankle. Spasms and cramps in the calf of the leg were of frequent occurrence. The knee was slightly flexed. Any attempt to alter its position in the least degree caused much suffering. In the popliteal space was a tumour, fully equal to an orange in size. [The measurements of the right knee, on a level with the centre of the patella, were $15\frac{1}{2}$ inches, of the left $14\frac{1}{4}$.] It pulsated strongly both behind and laterally, the wave of blood feeling as if immediately beneath the skin. The sac collapsed considerably when firm pressure was made on the femoral artery. Some cedema of foot and leg was also present. There was considerable cardiac irritability; but no marked lesion of that organ or of the larger vessels, though, in the opinion of some of those who saw the case, there was a more or less general tendency to atheromatous degeneration. The remaining viscera seemed quite healthy.

The morning after admission to hospital the limb was uniformly supported by tails, made of a smooth, soft fabric, and laid in a soft gutter of pillows. A Read's lever-compressor being adjusted in position, its pad was easily made to command the artery in the groin, whilst a hoop tourniquet enabled the vessel to be compressed lower down. On this and the following day pressure was commenced at 10 a.m. and maintained uninterruptedly until 10 p.m. The instruments were tended to with the most sedulous attention, each being alternately brought into play before the action of its fellow was suspended, and were worked so as to entirely arrest the current of blood in the artery. Along the line of instrumental pressure the integument was occasionally washed with camph. spts. of wine, and perfectly fresh folds of the softest chamois kept between it and the pads of the compressors. There was thus very little cutaneous irritation set up. On both days, whilst the instruments were in use, the pain and spasms in the calf of the leg became intensely aggravated, the suffering at times being such that the patient was almost delirious. The local use of aconite and the free

administration of opium and chloral failed to afford substantial relief. At the end of the second day's compression no change of any kind could be observed in the limb. Each night relief was obtained with the removal of the instruments, and a fair amount of sleep subsequently obtained.

On the morning of the 5th, through the kind aid of several of the senior students,^a who, according to a previously regulated roster, relieved each other in pairs every two hours, digital pressure was commenced at ten o'clock, and uninterruptedly persevered with for thirty-six consecutive hours. During the entire of this period I believe that every precaution was taken by the gentlemen named, as each relieved the other, to insure that the pressure on the artery remained continuous. The same violent paroxysms of pain and spasm that characterised the previous two days continued to recur. It was only by the occasional exhibition of stimulants, to give him heart, as he said, that the patient could be coaxed into permitting a continuance of the treatment. At 10 a.m. on the 6th the pressure was suspended, to allow of an undisturbed night's rest. On examination the tumour was found still to pulsate strongly—though it seemed as if the arterial wave was further from the finger, and that the sac did not collapse so much on stopping the blood-current above. Two grains of opium were given in pill, and were followed by a fairly quiet night.

On the 7th the same instrumental appliances as first used were again had recourse to, and the patient, who understood their manipulation well, and was able to manage them with accuracy, was directed to apply the pressure as agreeable to his feelings. He "kept it on"^b with much adroitness for several hours at different periods during the day, but towards night had a paroxysm of the cramps and spasms, on this occasion so severe that he removed the instruments, and resolutely refused to allow any further pressure. Persisting in this determination next day, it was decided, on consultation, to try forced flexure of the limb; accordingly the leg, having been

^a Messrs. Lockwood (since unfortunately a victim to dysentery in India), Hamilton, *Morgan, *Furnell, *Drew, *Hanlon, *Porter, *Dixon, *W. Morgan, *Tighe, Carpenter, Flood, Panter Ffrench, Lampey, Murray, Young, Wilkinson, Mason, Raverty, Collier, Eaton, Keelan, and Lyster. Those gentlemen whose names are prefixed with an asterisk each took a second and, in four cases, a third turn at the work.

^b Whilst pressure was "on" the effect was constantly checked by an experienced pupil, who, however, seldom found it necessary to touch the instruments; indeed, as a rule, X. X. applied them far more effectually than any of us could.

evenly bandaged as far as the knee, was slowly flexed on the thigh, the movement being gradually continued till the heel was within a few inches of the back of the thigh. No pad was placed in the popliteal space on account of the great sensitiveness that existed to pressure or manipulation of any kind there. A suitably applied bandage secured the limb in the position indicated; this was maintained for twelve hours, during which there were several paroxysms of suffering and pain, similar in character to those of the preceding days, and necessitating the free use of opium—altogether 7 grains of the powdered drug and 90 drops of the tincture were used during the day. Sleep immediately supervened on the limb being let down (no change could be detected in the condition of the aneurism) and continued uninterrupted for the entire night, the patient awakening late on the morning of the 9th free from pain; he was now in better humour, and allowed the instruments to be readjusted. During the day he controlled them with his habitual dexterity, and effectually checked the stream of blood. He suffered but little this day from pain, and required no opiates. When pressure was, at 10 o'clock, left off for the night, it was evident that a considerable amount of consolidation had taken place in the aneurism. Encouraged by this success, the pressure treatment was sedulously carried out for the ensuing nine days, from 8 a.m. till 10 p.m.—*i.e.*, for 14 hours daily. As formerly, the two instruments were used and kept in alternate action. Each night on their removal an opium pill was given, and two or three grains of the drug usually secured a fair night's rest. The aneurism now seemed to have become partially filled with solid blood, but, *pari passu* with increasing firmness, it had also expanded laterally, and so increased somewhat in size.

On the 19th the upper instrument having got deranged, digital pressure was again adopted for 12 hours.* The next day the pressure, both digital and instrumental, had unavoidably to be omitted.

21st.—A smart rigor took place early in the morning; this was followed by much reaction for the ensuing three days. X. X. continued feverish and sick; there was loss of appetite, accelerated pulse, dry and glazed tongue; bitter complaint was made of burning pain along the front of the tibia of the diseased limb, and extending to the inner side of the ankle. This pain was incessant,

* Messrs. Lockwood, Hudson, Drew, J. Morgan, W. Morgan, M'Grane, Carpenter, Eaton, Young, White, and Philips, kindly acted on this occasion, and carrying out details as on the first time.

though varying somewhat in intensity from hour to hour, and remained almost, if not entirely, unrelieved by opiates given internally, or by the use of various local applications. Ice placed for a few minutes on the seat of its greatest intensity seemed to assuage its violence more than anything else. A quinine and muriate tincture of iron mixture was also given, and, it was thought, with some benefit. During the next ensuing days occasional and severe rigors occurred, the pain remaining constant until the night of the 23rd, when, without any obvious cause, the patient, who during the day had taken 10 grains of powdered opium—his general condition also necessitating the free use of stimulants—suddenly got relief, and slept well for the remainder of the night.

24th.—It was found that during the night the region of the knee had become considerably enlarged; the aneurismal sac, also, which late the night before pulsated distinctly, had now almost entirely ceased to do so; it was observed too, that the inner side of the leg and foot felt to the hand much colder than the outer. In the evening the paroxysmal pains returned again, and lasted some hours.

On the 25th X. X. again resolved to abandon the pressure treatment. The ferruginous bottle previously quoted was directed to be discontinued, and instead thereof a pill composed of 2 grains of quinine and 1 of pulv. opii made up with ext. hyoscyamus, to be given every third hour, as also an ounce of brandy.

26th.—Since the suspension on yesterday of the pressure the aneurismal tumour had perceptibly increased, the circumference of the joint on measurement being now $16\frac{3}{4}$ inches. Pulsation, too, had largely returned, and increasing oedema of the leg was present. The temperature on both sides of the leg became equalised, and the same as that of the fellow limb (97°). For several succeeding days no local treatment whatever of the limb was permitted.

X. X. usually lay in part turned over to the right side, with the leg flexed on the thigh and resting, too, on the right or outer side. The pills were taken regularly and more frequently than originally prescribed—usually every second hour.

In a week the tumour had consolidated so much that pulsation, either lateral or posterior, could scarcely be detected. Meanwhile the man's general condition was the reverse of satisfactory; there were oft-recurring and prolonged paroxysms of pain of the intensest character—these greatly interfered with his rest. The pulse, too, usually exceeded 120, and there was hurried breathing, with pain

on the right side of the chest; this was relieved by free and repeated dry cupping. Though, as a rule, he ate well and with a good appetite, yet he was visibly emaciating—with some difficulty he was induced to take cod-liver oil at night. Subcutaneous injection of morphia, which was thoroughly tried, gave but partial and uncertain relief at his periods of suffering.

Against the middle of July the tumour had again become very fluid, and pulsation therein correspondingly distinct; flesh was appreciably being lost, and the countenance wore an habitually anxious expression. The man's now debilitated state required the regular administration of stimulants, 6 to 10 ozs. of spirits or wine being given daily. Though considerable diminution had occurred in the *intensity* of his sufferings, yet a very unpleasant sensation of "pins and needles," almost constantly present in the patient's foot, incommoded him much, his annoyances being further increased by an irritable ulcer in the perinæum. This had formed after a scratch, and was now the seat of much pain. Ligature of the femoral artery was at this time recommended to, and the proposal willingly accepted by, the patient; but on the 16th, the day fixed for the operation, he, at the last moment, summarily insisted on its postponement till, as he said, he tried the effect of "another shot at the pressure." This mode of treatment was at once resumed with the same care and precautions as when first adopted.

On the early morning of the 18th, before the pressure for the day was commenced, it was observed that the external side of the foot was markedly œdematous; the integument over the outer malleolus being quite dark, as if a bed-sore was about to form there; the temperature between the toes was under 90° * (in the same locality the thermometer usually stood at 97.5° , which was the last noted register on the 16th); in the ham the instrument stood at 95° , and under the tongue 98.2° . Pulse, 130, jerky. The spot on the ankle was painted with a 60-grain solution of nitrate of silver, and protected by a suitably shaped piece of soft leather spread thickly with soap plaster.

August 23rd.—Some local improvement had been gained. Unfortunately, just at this juncture, X. X. heard accidentally of the death of a favourite sister (a circumstance that, in consideration of his own state, had, for some time, been successfully kept concealed from him); he at once became greatly depressed, said he did not now

* The thermometer was not marked for any lower degrees.

care what happened to him, removed the instruments, and would not permit their use any further.

On the 9th August it was observed that the posterior tibial artery could not be felt beating. The aneurism still pulsated as at the time of the last report; the œdema of the foot had decidedly lessened under gentle support by bandages and elevation on pillows. The threatened mischief on the external malleolus had progressed no further, but the ulcer in the perinæum had continued to be a source of much annoyance; it had remained irritable, painful, and indisposed to heal under frequently varied applications. That which soothed it most was a strong solution of watery extract of opium in black wash.

It was not until the 12th that he could be persuaded to allow the resumption of pressure—in detail, it was carried out as before. During the twenty days of total abstinence from it he had improved in appearance, and his face had, to a large extent, lost the anxious expression it had long borne. Some improvement was manifest now too in the perineal trouble, the ulcer looked far less angry, and had begun to cicatrise at its edges; altogether the patient looked, and he said he felt, stronger and better. Advantage had been taken of his improving condition to reduce to 4 ozs. the allowance of stimulants that for so long a time had been imperatively required. At the suggestion of a colleague, the aneurismal tumour, now again pulsating freely, was kept frequently painted with a saturated solution of iodide of potash in water. In a week there was recurrent and increasing œdema of the foot, the amount of this was now but little influenced by bandaging or elevation of the limb.

Again, with the resumed compression of the vessel, the aneurismal tumour began once more to grow firm; day by day the pulsation therein became feebler; against the 27th it seemed to have become quite solid. Simultaneously with this change the leg had gradually flexed itself more and more on the thigh till the angle of flexure nearly equalled a right angle. To rectify this, a well-padded iron splint (furnished with a rack and pinion movement at the part corresponding to the articulation), brought to a suitable angle, was applied to the flexed limb, without force or strain, and then carefully secured to it by bandages; morning and evening, on each occasion, by an almost imperceptible amount, the splint was extended by the key, and thus the limb painlessly brought down; so slowly and cautiously was this done that against the 25th of

September the daily movements had not yet brought it down quite straight. Occasionally during this interval it had been necessary to readjust the padding of the splint, which was then immediately reapplied to the limb; it was now seen that, since the last such rearrangement, there had occurred a vast lateral expansion of the aneurism—the circumference of the diseased limb, through the centre of the patella, was now increased to $17\frac{1}{2}$ as against $14\frac{1}{4}$ inches on the sound side. On the lateral aspects the aneurism felt hard and firm, whilst it was soft and nodulated posteriorly; the integuments covering it were of a dark red, lurid hue, giving to the ham an ugly and threatening look. There had been now, for some time, complete absence of local pain, and the general health had held up fairly. Throughout the tedious and prolonged treatment that has been sketched, unwearied attention had all along been paid to hygienic matters, the patient being sometimes shifted from one ward to another, and an occasional warm bath given; this latter was a source of much comfort. The limb was now placed on a well-padded gutter splint with notches at the situation of the aneurismal expansions, and the use of the two compressors persevered in; but, in spite of the most sedulous care in their management, it was only too evident, on each successive day, that the aneurismal dilation continued to increase, especially the “knob,” behind, which became softer and more prominent. The patient now, at last, came to realise his precarious state, and, some days later on, urgently sought that relief from operation he had hitherto declined.

October 10th.—In view of, if possible, getting a chance to save the limb by securing the vessel above and below the aneurismal dilatation, after the patient was placed under chloroform, and whilst steady pressure was kept on the femoral at the groin, the tumour was laid freely open on its posterior aspect, and a bowlful of black-currant-jam-like coagulum (the softer central portion being invested with an involucre of laminated fibrine, very thick and firm laterally, nearly absent behind, ill-marked and soft on the articular aspect) turned out by the hand. On passing the fingers far into the emptied sac, the artery proved to be dilated and diseased up into the femoral; its condition afforded no choice but to amputate the thigh; this was done by a long anterior and short posterior rectangular flap, analogous to the mode of Mr. Teale; curtains of periosteum of a size amply sufficient to cover the divided end of the bone were also reflected, by means of a Langenbeck's raspatory,

from its anterior and posterior surfaces before it was cut.^a Mr. Ledwich commanded the artery with the best effect, unusually little blood being lost; six large vessels were secured by silk ligatures;^b these were brought through the inner angle of the wound. Five hours after the amputation the cut surfaces were well "glazed," and the edges of the stump were brought loosely together by a few points of carbolised catgut suture. Prompt reaction followed the operation, and the progress of the stump to recovery was satisfactory. On the 23rd the ligature on the femoral came away, followed by two of the others on the 24th and 26th. One ligature held fast till November 16th, the stump being then several days healed, except for its track. On the 29th of that month the patient left hospital, being now strong and healthy, unless for a slight ulceration behind the left ear, and a patch of dark copper-coloured eruption about the size of half a crown over the right hip; both these troubles were looked on as being syphilitic; the perineal ulcer remained well and soundly healed.

It may be summarised here that—independent of the pressure practised at Limerick Workhouse, under Dr. Phayre's able direction and superintendence, and which seemed likely enough, were it not for the patient's own indiscretion, to have eventuated successfully—the carefully kept "notes" of the case, whilst he was in Mercer's Hospital, show that the combined different periods during which instrumental pressure was practised there, came to a gross total of 720 hours; to these must be added the two epochs of digital pressure, together amounting to 48 hours. It is important to state that the pressure was almost always such as completely to check the circulation; on various occasions it was attempted to gauge the degree of compression and allow a slender stream of

^a In all major amputations, except, of course, disarticulations through joints, it has invariably been the writer's custom to adopt this mode. The very numerous instances in which he has now practised it warrant him in speaking with confidence and authority as to the good effects of doing so, both as regards the diminution of the dangers of the operation in consequence of the early adhesions of the periosteal flaps, and also as to the ulterior serviceability of stumps so formed. The few minutes consumed by the division and separation of the periosteum are, indeed, well spent.

^b Probably had carbolised catgut ligatures been used for securing the vessels, the healing of the stump would have been accomplished considerably sooner than it occurred. At that time the writer had not the same confidence in this substance that subsequent larger experience has given him; more recently he has used it for securing vessels in all cases of amputation, even in those through the hip and shoulder joints, also for the deligation of vessels in continuity, the vessel being tied with a tightly-drawn reef knot, and the ends of the ligature cut off about half an inch from it.

blood to pass, but, on each such attempt, the pain complained of during the pressure was intense, insupportable, and relieved by further tightening the apparatus so as to completely stop the current. The manipulation of the instruments, and shifting duty from one to the other, was, after the first few days, attended to, and most adroitly too by the patient himself, though all through the treatment, as a precautionary measure, it was never omitted to constantly superintend the play of the instruments.

CASE II.—Femoro-popliteal Aneurism occurring in an individual whose opposite thigh had been already amputated for aneurismal disease; treatment by Pressure, and Recovery.

M. M. (No. 928), aged thirty-seven, a pensioner, lately discharged from the "Scots Greys," was admitted September 2nd, 1871. He stated that he had always been a sober man, and free from any illness or delicacy unless a cataract, which was patent in the left eye. Though such was not acknowledged in so many words, yet, from his mode of answering, there seemed fair grounds to conclude that in early life he had syphilis. About thirteen months previously, whilst still in the service, the left lower extremity was amputated through the thigh for aneurismal disease. A good stump resulted. Neither the former nor the existing aneurism can be traced to injury. The existing affection was first observed by accident some six months ago, and has since been gradually increasing in size, and "throbbing" more violently—the growth, however, being quite unattended with pain. Notwithstanding the bitter experience he had already had of the formidable nature of the malady, M. M. looked on his present trouble merely as a "varicose vein," and in this belief presented himself for treatment in the practice of my friend, Dr. Albert O. Speedy, to whose kindness I am indebted for the opportunity of observing this case of unusual interest and importance. On examining M. M., a swelling of large size and flattened outline was seen occupying the right ham and inside of lower part of the thigh. It pulsated visibly and strongly throughout, giving to the hand the impression that but the most attenuated and thinnest of membranes intervened between it and the heaving fluid within; it seemed as if very slight provocation—indeed, a false step, an accidental stroke, or even ordinary manipulation—would determine immediate rupture. Careful examination showed that the cardiac action was feeble, but gave no indication either of disease in that region or of further arterial

mischief. The pulse beat 90 at the wrist; the impulse was feeble.

Treatment by pressure was begun without delay, "Skey's" tourniquet being applied as near to the groin as possible, and a common screw clamp lower down. The use of these instruments was directed to be conducted with attention to similar details of management as observed in the foregoing case, which it will be seen from the dates was simultaneously under treatment. In this case, likewise, a strictly recumbent posture was enjoined, and fairly observed by the patient, who, however, only for a day or two submitted to the desired dietary arrangements. Half a pint of porter had to be allowed at dinner, and two ounces of whiskey in punch at night. A pill, composed of $\frac{1}{2}$ grain acetate of lead, with 3 grains of gallic acid, and made up with extract of hyoscyamus, was prescribed to be taken three times a day. Five grains of citrate of iron and quinine were also directed to be taken an hour before each meal, the patient being anæmic and complaining of loss of appetite.

3rd.—A good night's sleep was obtained after a single grain of opium given at 9 o'clock, when the pressure was suspended for the night. Each succeeding day the instruments were kept on from 7 a.m. till 9 p.m. M. M. managed them then in the most perfect manner, and, alternating the instruments, controlled the circulation effectually. The report of the 7th shows that, notwithstanding the same care adopted (by laving the parts occasionally with camphorated spirits of wine, and using perfectly fresh pads of the softest chamois between the instrument and the skin), in this case, as in that of X. X., the integument under the lower instrument (the clamp) had blistered. This apparatus was therefore removed, and a Milliken spring compressor having been procured, was fitted to the groin instead; thus, it and the "Skey's" tourniquet were nearly in contact. Two days later (9th), in consequence of evidences of cardiac irritability, $\frac{1}{6}$ of a grain of extract of belladonna was directed to be added to each pill. As already stated, the case was regarded as one of the utmost gravity, and in which prompt surgical interference might at any moment be called for; the patient was therefore habitually seen by me at very short intervals. When visited, between 5 and 6 p.m. on the day in question, there was no apparent change whatever in the tumour; no appreciable deposit of fibrine or coagulation within it—if possible even less intervening structure seemed to separate the blood-torrent from the examining hand.

On the occasion of my next visit, at 11 p.m., two hours after the pressure for the day had been ceased, the tumour was found to have become quite solid; not a vestige of pulsation could be felt. The integument on the surface of the swelling, which hitherto had in no respect differed in appearance from that on the rest of the limb, was now quite red, and very tender to the touch throughout. The foot, for the first time, was now slightly œdematous, and, in describing his own sensations, M. M. said he had no absolute pain, but felt as if the blood were trying to force its way through the aneurism. A good night's sleep followed the administration of a couple of grains of powdered opium in pill. On the next morning the aneurism felt quite solid and hard—so tense, in fact, that it resembled to the touch an India-rubber football; the foot was rather more œdematous too. Expression of face very anxious. Pulse remarkably hard, but retaining its almost constant value of 90. An opium pill was directed to be given every fourth hour—pressure to be discontinued.

12th.—Limb uniformly bandaged, a soft pad being superposed over the artery. This dressing was not disturbed for four days. At the expiration of this time the only change observable was that the tumour was somewhat softer, though still solid. The countenance had, in great degree, lost the anxious expression noted on it for some time past. The bandage was directed to be kept constantly applied, unless whilst the integument covering the aneurism was being painted with a saturated solution of iodide of potash, which for a time was applied twice a day. Limb kept securely at rest on a well-padded gutter splint accurately adapted to it. Early in October the patient was allowed to get up and move about. The contents of the occluded aneurism were steadily absorbed, and on the 19th of the same month M. M. was allowed home, now quite well, and with but little remnant of his late trouble.

The gross aggregate of the pressure in this case was 106 hours. The consolidation of the aneurism was quite sudden, occurring in a space of time certainly less than five hours. Like as in the preceding case, the instruments were in the main managed by the patient—subject, however, to the almost constant surveillance of either the resident gentlemen at the hospital or myself.

CASE III.—*Popliteal Aneurism on the Right Side, occurring Seventeen Years subsequent to Gunshot Injury of the Thigh in an individual who, a year previously, had also been cured by Pressure of Popliteal Aneurism on the Left Side; Ligature of the Right Femoral Artery, followed by Recovery.*

J. M. (No. 1,116), a tall and fairly-strong muscular man, about forty years of age, was admitted February 6, 1872. He had been a marine artilleryman, and had been wounded seventeen years previously by a "wrought" bullet in the right thigh, the locality of the wound being now indicated by two depressed cicatrices, situated below the centre of the thigh, respectively placed on its antero-internal and posterior aspects. The anterior scar was, the patient said, on the site of the orifice of entrance of the missile. A line connecting the two scars would seem to implicate the course of the great vessels, but at the time of the accident, J. M. states, the surgeon in charge of him did not regard the vascular packet as having been damaged. There is a previous history of syphilis, of which no distinctive traces now remain. In the commencement of 1871, J. M. was an inmate of a London hospital; he then suffered from trouble in both hams. On the left side was what appears from the history to have been a well-defined popliteal aneurism; this was cured by pressure in five weeks. On the right side some complications existed, and, according to the patient's account, there was coincident mischief in the knee likewise. The pressure treatment on this side utterly failed. Some weal-like indurations now remain along the track of application of the instrument (from description apparently a "Carte"). Since leaving hospital on that occasion his right limb has been a constant source of suffering. On moderate exercise it would swell and become oedematous up to the knee. An extensive interlacement of enlarged and varicose veins, which covered the surface of the leg from that joint downwards, was also wont to become very painful. Some few days prior to his admission to Mercer's, J. M. had slipped on a staircase, and hurt his right knee, which had become swollen and painful. In the ham was an elongated swelling, pulsating violently; this gave the feel of being deeply placed and covered with much dense, firm tissue. In addition to the conditions already mentioned, it was at once obvious that the right knee-joint was considerably larger than its fellow; on measurement it was found to be an inch in excess, and, in consequence of pain on attempting to do so, the

articulation could not be flexed. The increased size of the parts was entirely consequent on the effusion into the joint, as in the aneurism there was but little lateral dilatation. The result of frequent thermometric observations showed that the left leg was usually 2.8° F. lower in temperature from the knee down than the corresponding points on the right side. The instrument registered 91° and 93.8° between the toes at times when the patient was warm in bed; it gave the same readings in the hams, and under the tongue indicated 98.3° . On the left side neither anterior nor posterior tibial arteries could be felt, nor pulsation or any remains of the aneurism found in the popliteal space. Two arteries of considerable size could be detected pulsating beneath the patella—one on either side of it. Except for the indurations above mentioned, as situated on the course of the main trunk, both thighs presented to the eye the same appearance; but whilst on the left side the femoral artery could be traced for some distance normally down the thigh, on the right the vessel immediately after crossing the bony pubis, where alone its pulsations were perceptible, seemed to dip deep into the structures of the thigh, its whereabouts being no longer recognisable by the finger, though firm pressure in the direction of the normal course of the vessel arrested the pulsation in the hams. In the inguinal and iliac regions on this side there was a general diffused puffiness (the remains doubtless of the severe inflammatory action that, subsequent to the wound, had extended upwards, but no definite morbid condition could be made out. The heart's action, though weak, was otherwise healthy. The pulse ranged usually at 86, and, except for a generally anæmic appearance, the patient seemed to be a fairly healthy man; he was, he said, occasionally intemperate.

J. M. remained in Mercer's Hospital till June 6th, when he went back to England. Unfortunately the notes daily taken of his case during his first sojourn at the hospital were lost, and details of treatment cannot be quoted with absolute certainty. As in the preceding cases, the endeavour to associate absolute repose with a strictly-regulated diet was "kicked against." During the early part of his stay iron and digitalis were given with benefit; subsequently liquid extract of bark was prescribed. Pressure on the femoral artery was tried, both digitally and with various forms of instrumental appliances, but it was found impossible to keep the blood-current stopped any length of time continuously. On the whole, Mr. Skey's tourniquet was found to give the best results; it

was managed with much skill by the patient, but, as stated, the artery habitually baulked every attempt at continued compression. Towards the middle of May some improvement had taken place, and, yielding to the exigencies of the case, the patient was allowed to walk about on crutches, the foot being supported in a sling.

July 29th.—J. M. again sought admission to Mercer's Hospital. He stated that he had been as far as Liverpool, had used his leg very freely, and tried to "walk-off" his affection. This line of conduct had the effect of greatly aggravating his sufferings, and, not getting any relief in Liverpool, he came back to Dublin. There was now present a state of more or less constant pain in the limb, and his temper, too, had become very irritable; he would neither submit to pressure nor rest quiet in bed. Under these circumstances it was determined to cut down along the line, where pressure was known to arrest the beating in the aneurism, in view of finding and securing the vessel that fed it.

August 10th.—With some difficulty chloroform anæsthesia was obtained; then the limb being partially everted (it could at that time be scarcely at all flexed), an incision about four inches long, beginning about two and a-half inches below Poupart's ligament, was made in a line corresponding as nearly as possible to that of the normal course of the femoral; whilst dividing the subcutaneous fat, which was thick, three small vessels were "started;" one of these was secured by torsion, and the others tied. At the inferior extremity of the incision the fibres of the sartorius were in view; a layer of strong fibrous tissue was now cut through on a director, and then some muscular and tendinous bands, which done—at the bottom of the wound, now a full finger-length in depth, and in shape closely resembling a funnel-like pit—there lay exposed a thick cord; no pulsation in this could be felt, and it was intimately adherent to the surrounding tissues; two nerves, one a mere thread, the other of considerable size, crossed the surface. To gain the necessary room for manipulation, the cut was prolonged upwards another inch; a small portion of the thick and dense fibrous capsule and well to its outer side was then picked up on a toothed forceps and nicked by the knife; the tissue was then divided on a director, when the artery could be seen and felt pulsating freely; it was about the size of an ordinary black-lead pencil. An aneurism needle carrying a double fine silk ligature was without difficulty passed round the artery, from within outwards; as the artery was pressed on the instrument all pulsation stopped in the ham; the

bight of the silk having been secured, the needle was withdrawn, and the loop cut; then, by one of the fine silk threads (the other being a reserve to be used in the event of accident), a previously prepared, doubled and twisted, carbolised cat-gut ligature was drawn through, and the artery tied by a properly secured knot; both ends were cut off short, and the now unnecessary second silken thread withdrawn from under the artery. Though the ligature was very firmly tied, the artery presenting quite a puckered appearance, there was no sensation given as is usually felt on the parting of the inner arterial tissues. The vein was not seen at all. Two gut sutures and suitably applied adhesive straps sufficiently supported the parts. Ere the patient was removed from the table the foot and leg became very cold, as contrasted with the fellow limb. The extremity was wrapped in two or three plies of flannel roller as far as the knee, the thigh having a folded towel compress along each side of the wound, being surrounded with cotton wadding, and uniformly supported by tails. When placed in the ready-prepared heated bed both legs were somewhat elevated on pillows, with a hot jar at the feet. Forty drops tr. opii were given in a little brandy. Two and a-half hours after operation the foot had become warm; there was considerable local pain, for which another opiate was given. In the afternoon severe pain in the foot and leg, described as being of a bursting or rending character, occurred; this was very intense at 4 o'clock (five and a-half hours after ligature). The temperature of the limb, the hot jar having been removed an hour previously, was—foot 96°, knee 97°. These figures continued unchanged at night; occasional sickness of stomach occurred during the day. A grain of opium was given in pill at "bed-time," and followed by a good night's rest.

On the 12th the case was progressing most favourably, no complaint unless of soreness and pain in the region of the wound and over the pelvis of the same side, where some swelling and tenderness existed. The temperatures noted were between first and second toes, right side 96°, ditto left 93°; at knee, right, 97°, left 94.5°. A large poppy stupe was applied locally outside the dressing, and an iron and quinine mixture ordered. In consequence of the continuance of the local pain, which, however, did not prevent the patient eating a meat dinner, two opium pills were given during the day, without affording relief. In the evening, therefore, the tails were separated and the wound exposed; nothing could look better, but the upper end of the inner towel-pad had been rendered

quite hard by the drying of a little effused blood. The substitution of a soft fresh pad in its place, a strip of lint spread with creasote ointment being placed over the cut parts, afforded prompt relief. Next day there was a faint erysipelatous hue over the lower regions of the pelvis and front of the thigh, and the wound seemed puffy. One of the retaining straps of plaster was divided to give vent to any fluid that might be pent up therein, but only a few drops of red glairy discharge escaped. The ungt. hydrarg was freely smeared over the parts, which were then wrapped in a large poultice. The patient continued to feel well, with a pulse of 84, clean tongue, eating with his ordinary appetite, and but little febrile disturbance being present.

On the 14th suppuration began in the wound; the abdomen was now tympanitic, and some annoyance was caused by "windy retching." A rhubarb draught was prescribed, and, failing to act, was later on followed by a turpentine enema. This also did its work very imperfectly. However, on the next day (15th), after three doses of the "red mixture," the bowels responded freely. Matters now progressed favourably. There was occasional irritability of the stomach, but the wound healed kindly; the most approved dressing being lint wrung out of hot water and saturated along the line of the cut with tincture of opium.

On the 24th, a fortnight subsequent to the operation, the flannel bandage was opened for the first time, and the state of the popliteal space examined. In it was a firm mass the size of a walnut, in which there was no pulsatory movement whatsoever. The development of the collateral vessels could not be determined. Against the end of the month the wound had entirely healed, and on the 2nd of September the patient was allowed up. He now rose regularly every day, and, in a short time, began to go out, gradually increasing his distances of exercise, and, on the 5th of October, was discharged as well—the aneurism being in slow progress of absorption.

As part of the scheme of treatment in these cases, it was endeavoured to carry out the plan of a restricted and specified dietary scale, in association with undisturbed recumbency, that in this country finds much favour, as being conducive to the deposition of laminated fibrine. For each individual the items and times for his nourishment were carefully laid down, but as no one of the men could be induced to continue an approximation even to a fair

trial of this system, it would have been a useless consumption of both time and space to have entered into details on this matter.* X. X.'s condition in particular was such as to absolutely necessitate a liberal dietary, with, at times, even the free exhibition of alcoholic stimulants.

There were, more or less, strong grounds in all the cases for believing that each of the men had at some former period of their lives suffered from constitutional syphilis. During the prolonged treatment of these cases, not only had the patients the advantage of the experience and advice of my hospital colleagues, but others of the senior surgeons in the city were kind enough to see them likewise on various occasions.

It is but comparatively seldom that the surgeon has the opportunity of keeping in view the progress and *result* of his successful cases. When they have once passed from his immediate care he too often fails in his efforts at tracing the sequel of his patient's history.

With reference to the three cases here narrated, the writer deems himself specially fortunate in that circumstances enabled him occasionally to "keep an eye" on them. The sequel of the first case since leaving Mercer's can be briefly summarised. The patient, a man of restless and erratic disposition, spent much of his time perambulating the country; and on his pin leg, without other aid than his staff afforded him, he made long and frequent journeys on foot. Since the amputation he repeatedly travelled thus from Limerick to Dublin, and *vice versâ*. Sometimes he worked in this city, during portions of the summer, as a bottler in a mineral-water manufactory. The winter he usually passed in the southern and western counties, where he was well known by many members of our craft. On one occasion he was under my treatment for some weeks in Mercer's for a bad attack of bronchitis, which nearly ended fatally, contracted whilst walking from Cork to Dublin during bad weather. On the morning of Sunday, July 18th, this year (1875), I met him accidentally in the street; he

* German to the question of the effect on the blood of very restricted consumption of fluids by the patient, allusion may here be briefly made to the case of a woman some sixty years of age, who was in the hospital a couple of years ago with a *non-traumatic palmar aneurism* on the right side. It resisted prolonged and varied treatment. The patient was attacked by an obstinate and profuse diarrhoea that lasted several days and enfeebled her greatly. Whilst thus bad the aneurism consolidated, and got perfectly well—at a time, too, when it was not the subject of any immediate treatment.

looked in prime health, and told me that he had never felt better in his life. He was then, he said, on the start for a day in the country. How or where he passed the day I could not learn, but at a late hour the same night he was brought into the hospital in a state of profound collapse, and expired, it was said, immediately. Unfortunately I had to leave town next morning, and did not return for some days. The efforts made to obtain a *post mortem* failed through the determined opposition of a relative. The amputation of the thigh had been survived nearly four years. It was at the time, and has continued to be, a matter of regret to me that X. X. prevented the femoral artery being tied on the day appointed for that operation. Had he allowed this to be proceeded with, in all probability he would have been saved from the loss of his limb.

Both the other men are still alive, in good health and younger looking than at the period when they were under treatment. Nothing could continue more satisfactorily than the progress of the second case since he left the hospital. It happened that on the occasion of my last seeing him, on the 3rd of the present month (September, 1875), Dr. J. Eaton, formerly a resident pupil at Mercer's Hospital, was with me, and joined in the very partial examination circumstances enabled to be made. M. M. stated that he felt himself to be in perfect health, and his appearance confirmed his statement; the limb was normal in appearance and feel; no trace of the old aneurism could be detected, and he said that he was quite free from any sort of annoyance or inconvenience in it. *More than four years had lapsed since the cure of the aneurism on the right side; more than five since the amputation for the same disease of the left thigh.*

Through the agency of a young lad, himself a patient at the hospital, the whereabouts of the third case, the subject of which was now residing at some little distance from the city, was also made out. Upwards of three years have passed since the ligature of the femoral. J. M. stated that he felt himself in good health. The varicose veins in the right leg have much improved (elastic stocking worn regularly), and are not at all as numerous or large as formerly. The knee-joint, too, has recovered, and considerable extent of flexion can be used without pain. No trace of aneurismal disease can now be detected in either extremity. On each limb anastomosing arteries can be felt beneath the patellæ, but neither of the anterior or posterior tibials can be felt pulsating. The heart's action is weak and feeble, though not so markedly as formerly, but no distinct disease can be localised. Perhaps, though it

is doubtful, some tendency to stiffness and rigidity can be detected, in the temporal arteries specially. A day or two before his coming to see me a slight accident had produced a minute abrasion, not so large as the nail of the little finger, on the front of the right shin. In consequence of the remaining varicose condition of the superficial veins, he was advised to come into the hospital. This he did, and the little ulcer healed soundly, though slowly.

The fact that the subsequent histories of the individuals whose cases have furnished the subject matter of this communication have been able to be kept in view, adds, in no small degree, to the clinical importance of same, specially as to the circumstances attendant on each. Two of the patients having been the victims of previous aneurismal affection, made the prognosis, whether immediate or remote, not by any means a hopeful one. The eminently satisfactory results obtained in all the cases have been, indeed, such as may fairly encourage the surgeon to hopeful perseverance in the treatment, by the various resources open to his art, of even the seemingly most unpromising cases of surgical aneurism.

ART. X.—*Treatment of Diseases of the Knee-joint.* By R. FITZMAURICE, L.K. & Q.C.P.I., L.R.C.S.I., &c.; Physician to County Kerry Fever Hospital.

THE following treatment of knee-joint affections I can, from a fair experience, recommend, and I believe that in many cases it will take the place of the time-honoured treatment of depletion and counter-irritation. The patient is put into the recumbent position, and a poultice of the symphytum (common comfrey) applied and left on, according to the severity of the case or the feelings of the patient, for twelve, twenty-four, or thirty-six hours, and if a cure is not effected in a week or ten days, a steel apparatus is fitted to the limb that takes the weight of the body off the knee, and allows the patient to move about on crutches, or take carriage exercise, as he will. This treatment to be supplemented by appropriate internal remedies, as the case may be—if scrofulous, cod-liver oil; if gouty, colchicum and alkalis. In all cases of joint diseases there is more or less of inflammation, and this is combated at present by the every-day practice of leeching, hot stuping, or cold applications, and different forms of counter-irritation, the result of which, in some cases, is to effect a cure, but often at the expense of the constitution, which suffers from prolonged confinement. In other