should, in the first instance, be confined to ligature of the carotid, ligature of the third part of the subclavian being resorted to if advisable at a future stage in the progress of the case.

The case reported further illustrates the value of the antiseptic catgut ligature and other antiseptic precautions, the combined use of which has, in my opinion, removed all the most serious risks in connection with the ligature of arteries.

ON LIGATURE OF THE COMMON FEMORAL ARTERY; AND ESPECIALLY ON LIGATURE BY AN ANTISEPTIC MATERIAL.*

By OLIVER PEMBERTON, F.R.C.S.Ed.,

Surgeon to the General Hospital, and Professor of Surgery in Queen's College, Birmingham.

THREE years since, when I had the honour to deliver the Address in Surgery at our Birmingham meeting, I mentioned a case of aneurism in Scarpa's space, in which, in preference to applying a ligature to the external iliac, I tied what I presumed to be the common femoral an inch below Poupart's ligament. I did this with an ordinary hempen ligature, and left the wound completely open.

So far as the treatment of the aneurism was concerned, the case did perfectly well; but, when I came to dissect the arteries involved—death having taken place from causes wholly removed from the aneurism—I found the circumflex ilii, epigastric, and profunda femoris given off together; that is, at opposite points of a line drawn from the main trunk a little above Poupart's ligament; the point of the ligature being five-eighths of an inch below these vessels, and the tube of the artery intervening being firmly plugged.

Now, although it is obvious that I really tied here the superficial, not the common femoral, owing to the abnormal origin of the profunda, yet the case affords an overwhelming proof of the fact that an abiding coagulum can form in the immediate vicinity of almost any number of branches on the proximal side of a ligature. If this be so, the chief ground for discarding the operation of ligature of the common femoral disappears.

I wish, however, to show that it is the duty of the surgeon to choose this proceeding in preference to tying the external iliac: a duty that becomes imperative when it is based on the knowledge that he submits his patient to less risk of danger to life from the mere operation; and, what is of equal importance, that he has yet a favourable artery to tie in case of failure. I am fully aware that no mean surgical authority—Mr. Erichsen—lays down the rule of surgery, "That in all cases of aneurism above the middle of the thigh, and in which sufficient space does not intervene between the giving off of the deep femoral and the upper part of the sac for the application of a ligature to the superficial femoral, the external iliac should be tied, unless compression can be successfully employed". From this I dissent, and, as I have already said, because the very reason Mr. Erichsen assigns for his judgment—namely, that the liability to secondary hæmorrhage is almost a necessary consequence of the operation, the shortness of the trunk rendering it necessary to tie the artery in close proximity to such large collateral branches that the arterial coagulum will not readily form—does not, in my opinion, constitute a sufficiently valid reason.

And now I will ask to place on one side for a moment the case I have submitted, and inquire whether this source of danger is not diminished, or even entirely removed, by the use of a ligature composed of antiseptic materials.

CASE.—A strongly built Indian soldier, aged 33, non-syphilitic, came under my notice at the General Hospital, Birmingham, in May 1874, with a rapidly increasing aneurism of the left superficial femoral artery. Of very slow growth in its early history, its character was now changed. Reaching to within three to four inches distance from Poupart's ligament, it compassed a space of six inches in extent, was largely raised above the surrounding parts, and was accompanied by strong visible pulsation, by oedema, and severe pain.

After a few days of carefully applied pressure at the arch had proved of no avail, on May 26th I tied the main artery and what should be the common femoral, an inch below Poupart's ligament. I used an ordinary antiseptically prepared catgut ligature, tying the vessel by a single loop, and finishing by a double one. The ends were cut off short, and the wound closed. The contents of the aneurismal sac remained fluid for a long time; and it was not until nearly three months had elapsed that everything was absorbed and the limb restored.

* Read before the Surgical Section at the Annual Meeting of the British Medical Association in Edinburgh, August 1875.

Now, neither at the operation nor subsequently did I follow out the antiseptic method of treating the wound; that healed in the ordinary way by supuration and gradual repair. I simply desired to permanently close the artery at a given point without cutting it through; and this, I submit, was effectually and safely accomplished, even in the midst of supuration.

I am not aware of any previous instance in which an animal ligature has been applied to the common femoral, with the exception of Professor Lister's case referred to by him in his Address to the British Medical Association at Plymouth (August 1871), where, in the face of a diffused popliteal aneurism, he tied what he expected to be the common femoral with a catgut ligature. The vessel, at any rate, as he informs me, was ligatured about the most frequent situation of the origin of the profunda—making the case all the more striking, as the only result he would expect from the application of a silk ligature in such a situation would be secondary hæmorrhage.

The principle involved in tying arteries in their continuity by means of animal ligatures may be still on its trial; but I will be bold enough to assert "that the fate or behaviour of a given antiseptic catgut ligature, applied to the continuity of an artery", will yet be foretold with confidence as to the favourable result. And in this I appear to be more sanguine than Mr. Maunder states himself to be in his recent Lettsomian Lectures on the *Surgery of the Arteries*.

It is, I think, to be regretted, that I was unable to place my recent experience in Mr. Holmes's hands before he summed up his views on ligature of the common femoral in his lectures at the Royal College of Surgeons last year, as I intended doing, thereby strengthening the conclusion at which he arrived: that there was no just cause to banish this operation from surgical practice. The cases of Ramsden, of Mott, of Porter, Macnamara, Colles, and myself, led him to this view with the use of the hempen ligature. Surely the consideration of Professor Lister's case, and the one I now for the first time lay before the profession, should remove from his mind his remaining objection, based on the uncertainty of the place of origin of the profunda: a circumstance, I venture to think, of no real importance, when the canal of the artery is not cut through.

TWO CASES OF ANEURISM, ONE OF THE CAROTID AND ONE OF THE FEMORAL ARTERY, SUCCESSFULLY TREATED BY THE WIRE COMPRESS.*

By JOHN DIX, M.R.C.S., Hull.

THE wire compress, a substitute for the ligature, was first used by me in September 1860, just fifteen years ago, and was brought before the profession by a paper read at the Royal Medical and Chirurgical Society, January 13th, 1863. An abstract of this paper, with the discussion thereon, appeared in the weekly medical journals: it was published *in extenso* in the *Edinburgh Medical Journal* of September 1864, and reproduced in Braithwaite's *Retrospect*. The procedure was then looked upon as a novelty, and there was the usual dispute about priority of invention. The late Sir James Simpson afterwards settled this question for us by showing that the idea and the practice were more than three hundred years old—older, in fact, than the ligature—and that the only change from the method of the surgeons of the fifteenth century, was the substitution of wire for the thread of hemp or silk used by them. So true is the saying of Liston, that "young surgeons meet with many anomalous cases; they also rediscover many things".

It seems that this practice was superseded by the ligature, which was invented by Ambrose Paré about the year 1564; yet it was not altogether forgotten or laid aside, as mention of it crops up here and there in the surgical writings of various old authors, both English and foreign. Its revival in modern surgery is clearly due to the impetus given to surgical ingenuity by the introduction of acupressure by Sir James Simpson and his writings thereon, which so rudely shocked the faith of surgeons as to the perfection of the time honoured ligature.

But the long needles as at first used were by no means pretty, and many who thus made trial of acupressure, while recognising the soundness of its principle, could not shut their eyes to its defects, and so cast about for other methods of applying it. Hence we soon had before us various kinds of needles and varying modes of using them. Hence, also, arose this process, which I have called the "wire com-

* Read before the Surgical Section at the Annual Meeting of the British Medical Association in Edinburgh, August 1875.

press", which seems to have occurred to many minds, independently and almost simultaneously. I may mention Langenbeck of Berlin, Neudörfer of Prague, Mr. Hilliard of Glasgow, Dr. Pollock* of Pittsburg, as well as myself. So far as I know, I was the first in this kingdom to use it in actual surgery, and the first to write thereon in the paper to which I have already referred. This paper attracted considerable attention; many surgeons expressed themselves pleased with the device, and proffered to try it, though I know of no one who really gave it a serious trial except Mr. Teale of Leeds. It found a place in the next published edition of Druitt's *Vade Mecum*; and a long chapter on the whole subject, under the title of "Filopressure", may be read in Simpson's book on *Acupressure*.

Meanwhile, out of this crusade, or revolt as it were, against the ligature, sprang the revival of another ancient and long defunct process, viz., torsion, by Professor Syme; and, also, the *carbolicised catgut* ligature of Professor Lister, which differs so much in its effect and action from the silk ligature that, but for bearing the same name, it would never be classed in the same order of appliances. These two processes have been so strenuously advocated, and been found so practically successful, that they are now the popular, and in some schools the almost exclusive, methods of arresting bleeding; and the "wire compress" has died out, and, except by myself, has been well nigh forgotten.

Yet it has never failed or disappointed me. Since I first wrote on the subject, I have scarcely ever used any other hæmostatic. I had then had but five cases. I have since employed it in many and various operations; amputation of limbs, breasts, testicles, and for various arteries accidentally wounded, and with most satisfactory results. Thus I have had, of secondary hæmorrhage, never an instance; of suppuration, a minimum; and not unfrequently complete primary union even in large wounds, and that without any antiseptic precautions. I will mention but two illustrations.

For the removal of a breast, the incision was nine inches long; three arteries were secured by the wire. On the fourth day, the only trace of the operation was a firm linear cicatrix and the suture marks. There was not a drop of pus nor exudation of any kind whatever.

About eight weeks ago, I amputated the leg of a feeble old man for acute destruction of the tarsal and ankle bones. Here again there was perfect primary union. On the sixth day, the stump was firmly healed, needing only the support of a strip of plaster. With such results, is it to be wondered at that I still have faith in this procedure and continue to employ it?

I pass now to the more immediate object of this paper, viz., to relate to you two cases of aneurism treated by this same "wire compress". In the essay to which I have already referred, I spoke of the *applicability* of this method to arteries in their continuity, and demonstrated the process by this rude model which I here again exhibit, and which, by a stretch of imagination, may be taken to represent a femoral artery, secured by the wire for an imaginary popliteal aneurism. It was two years afterwards that I first had the opportunity of bringing the idea to the test of actual practice, when the following case fell into my hands at the Sculcoates Union Workhouse, to which institution I have the distinguished honour of being surgeon.

William Gardner, aged 50, formerly a man-of-war's man, lately a lighterman, had met with much rough usage in his vocation, and also in the battles of Venus. He had aneurism of the left carotid, first observed "about the size of a hazel-nut", six weeks ago. It was now somewhat larger than a duck's-egg, occupying the anterior triangle of the neck, pushing the larynx from the medium line.

November 29th, 1865. The artery, which was very large, was exposed below the omohyoid, and an aneurism-needle passed under it in the usual way. A piece of surgical iron wire was threaded through the eye of the aneurism-needle and conveyed beneath the artery by the withdrawal of the needle, which was then detached from the wire. To each end of the wire a straight needle was next attached, and the two needles were passed through the tissues, on the outer side of the incision, being about half an inch apart at the surface of the skin, and the same distance from the edge of the wound; the wire being drawn through and thus looped over the artery, the needles were detached. The half of a vial-cork was placed, the flat side downwards, between the ends of the wire, and firmly pressed down along the course of the artery; the wire was tightly twisted over the cork, stopping at once the current through the artery and the pulsation of the aneurism. The superfluous ends of the wire were cut off, and the wound was united

by wire sutures. The man was then in a state of extreme collapse from chloroform; in fact, he was to all appearance dead, and was only resuscitated by the strenuous and persevering exertions of my assisting friends. With the recovery of the circulation, there was also a recurrence of feeble pulsation in the tumour. This was allowed to go on till the third day, when the compress was thus tightened. The cork being firmly pressed down upon the artery, and the wire drawn outwards by gentle traction on the twisted end, two small wooden wedges—portions of lucifer matches in fact they were—were pushed in between the cork and the wire; and now, for the first time, the circulation was entirely arrested, and all pulsation and *bruit* ceased. Two hours afterwards, there was again a feeble thrill; so next day, the fourth after the operation, another little wedge was inserted. After that, there was no more pulsation.—Fifth day. No pulsation; the tumour was evidently consolidating, and perceptibly diminished in size. One wedge was removed to lessen the tension.—Sixth day. The other two wedges were withdrawn in the morning, and, in the afternoon, the cork was also removed. The tumour was considerably smaller, and, on the seventh day, the wire was withdrawn without difficulty and without blood. Some pus exuded from the track of the wire, and there was moderate suppuration in the wound.—Tenth day. It is noted that "the tumour is nearly gone". There was pulsation in the artery up to the aneurism beyond the site of the application of the wire, showing that no damage was done to the coats of the vessels. This only continued for a few days, for, as it led to nowhere, the artery was soon obliterated, and, when the man died seven years afterwards, a fibrous cord was all that remained either of the artery or of the disease. In a fortnight, the wound had healed, and the patient was cured.

I related this case and exhibited the patient at a meeting of the East York and North Lincoln Branch of our Association, May 23rd, 1863; but it was not published, nor alluded to in print, except by a brief note in the *JOURNAL*, and in the *Medical Times and Gazette* of December 16th, 1865, in reply to Mr. Syme's strictures "On Acupressure and other Nonsensical Contrivances for the Suppression of Hæmorrhage". It is also alluded to in a paper by Mr. Teale in the *Lancet* of January 5th, 1867, on a case which he treated by this method.

On January 24th of the present year, my partner Mr. Rudd was called in to one John Hull, and, on his return, reported the case to me as one of femoral aneurism. I saw the man with him the next day. He also was a waterman, twenty-five years old, short, florid, and very fat. There was a pulsating tumour of large size at the lower part of the right thigh on its inner aspect, which was first observed about nine weeks before. It now measured quite four inches and a half in length and four inches across, and was clearly an aneurism of the femoral artery protruding from the edge of Hunter's canal. The whole limb was much swollen. Not to weary you with minute details, I would briefly state that pressure was tried for four days without benefit; and it was, therefore, determined to secure the artery by the wire compress, which was done on February 2nd, at noon. The superficial femoral was exposed in Scarpa's triangle, by an incision five inches long and at least an inch and a half deep. A wire was carried under it by an aneurism-needle, as in the previous case, brought out to the surface of the skin about half an inch on the outer side of the incision, and there twisted over the cork—which was firmly pressed down over the track of the vessel—till the pulsation was arrested. The wound was closed by wire sutures, supported by a large pad of lint on each side, and long strips of plaster over them. The limb was already bandaged with flannel during the application of pressure, and so it was left. At 3 P.M., there was pulsation in the aneurism. At 9 P.M., there was none. The pain, which had been great, had entirely left him. Next day, at 11 A.M., there was again pulsation. Two wedges were inserted between the cork and the wire; and at 9 P.M. there was no pulsation.—Third day; at 11 A.M.: the limb was readjusted on the pillows, and his position made less irksome. There was then no pulsation. At 9 P.M., there was a feeble thrill.—Fourth day. Slight pulsation; two more wedges were inserted, and the pulsation ceased, to return no more.—Fifth day. The limb was diminishing, causing the tumour to seem more prominent. The limb retained its warmth, and there was no constitutional disturbance whatever. He complained only of being worried by fleas.—Sixth day. Tumour less, quite solid. Wedges removed.—Seventh day. The cork was taken away, and the wire loosened. It moved in consonance with the pulse.—Eighth day. Wire removed without difficulty, followed by one single drop of pus and one of blood.—Ninth day. Plasters and sutures removed. The wound was entirely and completely healed. From the time it was closed, there was never the least exudation. The tumour was solid, and much diminished; in fact, the patient was cured. It was some weeks before the tumour was entirely absorbed and the limb regained its strength; but it is now some time since he returned to his laborious occupation, and the only

* Dr. Pollock, in a pamphlet which he has kindly sent me, relates twenty-six cases of amputation and one of aneurism (popliteal) treated by this method—which he calls "the wire-loop"—with excellent results. When it comes back to England as an "American" invention, it will probably attract more attention than it has done as an indigenous product.

difference between this leg and the other is the large cicatrix and a greatly increased growth of long thick hair.

I think it will not be denied that these cases prove that this is a safe and efficient mode of treating an aneurism. We may, therefore, now proceed to estimate its relative merits, as compared with other methods.

Into this competition certain of the hæmostatic agents do not enter.

Torsion, for instance, is not applicable to aneurism; at least, I have not yet heard of any proposal to sever the artery and twist both ends in the wound, though my friend Mr. Maunder has lately suggested the division of the vessel, and the application of a catgut ligature to each end. I trust he will not practise it.

Acupressure, too, has been tried by Dr. Heron Watson and others; a needle being passed under the artery, and a wire twisted over it. I believe the result was not satisfactory, and I have lately heard nothing of the method.

Quite recently, Dr. McGill of Leeds has published a case in which he applied temporary compression to an artery by means of a pair of forceps sticking out of the wound: a method suggested to me many years ago by my friend Dr. John Lowe of Lynn. Surely this is an ugly-looking appliance, and, so far as I see, offers no advantages over the wire, whilst, as I shall presently show, it lacks one of the chief merits of my compress.

There remain, then, to be considered but the old-fashioned silk ligature and the carbolic catgut. As I have already remarked, these differ so materially in their action and effect, that it is a pity they are confounded together by bearing the same name, which only leads to a confusion of ideas.

I was once taken to task by a very great surgeon for abusing the ligature, "one of the grandest things in surgery". I do not forget that the abuse of the ligature adds nothing to the merits of my substitute; but neither will praise of the old friend detract anything from the new one; and, spite of previous warning, I cannot hesitate to protest that the ligature is but a clumsy unscientific appliance in the treatment of aneurism. Let us fairly, and without prejudice, trace its course and action.

For the cure of aneurism either by the coagulation of blood, or by the deposition of lymph in layers, or by these two processes combined—as I suppose mostly happens—the one thing needful is to obstruct the flow of blood into the sac, either partially or totally. Opinions differ as to which is preferable. Of course, the ligature acts only by sudden and abrupt exclusion; whereupon arises one of the special and greatest dangers of the operation—gangrene, to wit. Nevertheless, this risk must be run; so you cut down on the artery, and tie tightly round it a piece of silk or hempen cord, which is left dangling from the wound. And what have you done by this? You have made a contused and lacerated wound of the coats of the artery. This is said to be a good thing, essential to the process of repair, and to the ultimate detachment and withdrawal of the ligature; yet surely it is a violation of the first principles of surgery, which teach us that contusion and laceration are not favourable to healing. Well, but, at any rate, you have effected your primary object, and have cut off the current of blood from the aneurism. In two or three days, consolidation has taken place; and, if you could now get rid of your ligature, all would be well. But this you cannot do. Though the ligature has answered its purpose, and is now naught but a nuisance in the wound, yet the surgeon is, so to speak, at the mercy of his own weapons; he must bide his time, awaiting the slow bungling processes of nature to cast off the foreign body. Meanwhile, what is your ligature doing? First, it is setting up supuration in the wound: surely a thing to be avoided, if possible. Next, it is producing ulceration through the artery itself. Who will maintain that *this* is not an evil? And when, after many tedious days or weeks, it is at length detached, what guarantee have you that the needful closure of both ends of the divided artery has taken place, and that bleeding will not ensue? On the contrary, do we not know by fatal experience that often and often hæmorrhage does occur; and, even when it does not happen, no one can deny that there has been the *risk* of it, and that the patient escapes more by good luck than by the skill and science of the operator.

Now let us follow out in the same way the *modus operandi* and effects of the wire compress. What a contrast to the foregoing picture does it present! First, then, whilst it obstructs the circulation just as completely and effectually as the ligature, it affords the operator a choice of methods—the gradual or the sudden occlusion—according to his judgment. Surely this is an important and material point, one on which it behoves the surgeon to have a definite view. My own opinion—whatever that may be worth—is, that gradual obstruction *at first* is of immense advantage; that it is more favourable to the cure of the aneurism, by leading to the deposition of lymph; and also greatly diminishes the risk of gangrene by allowing time for the establishment of the collateral

circulation, which keeps the limb, or may be the brain, alive. If the limb were cold, and gangrene threatening, the compression could be relaxed or altogether removed, and so the impending mortification might be prevented; and although, in such a case, amputation might be the only resource, yet this operation would be done at less disadvantage than in a gangrenous limb.

If, on the other hand, all go on well, and in five or six days the pulsation have ceased, the surgeon has his appliance under his entire control. He first relaxes the pressure by withdrawing the cork, or untwisting the wire; feeling his way, as it were, and still keeping command of the artery in case of need, till, being assured that the desired consolidation has really taken place, he with confidence, aye, with certainty of success, withdraws the wire. Meanwhile, the wound has healed, or, at all events, has had the best chance of doing so, there being no foreign body to excite supuration. The artery also is still intact, so that hæmorrhage is impossible, and the patient is cured; may we not triumphantly say, *tuto, cito, et jucunde!*

Here let me remind you that, in both my cases, a moderate feeble circulation through the artery was allowed for three days, and in twenty-four hours after its *entire* obstruction consolidation was complete. Moreover, the secondary processes of absorption of the tumour, and restoration of power to the limb, were accomplished with unusual rapidity, dependent possibly on the more healthy condition and action of the parts which had not been excited and disturbed by adjacent inflammation and supuration, or by the laceration and ulceration of the artery; the circulation through which is probably restored beyond the point of compression, even up to the seat of the now consolidated aneurism; it certainly was so in my carotid case. Again, out of this perfect immunity from bleeding, the surgeon gains another advantage in a wider choice as to the point of election in operation. Thus, for hæmorrhagic reasons, it is thought specially dangerous to tie the common femoral; so much so, that some think it ought never to be done, though otherwise it would often be a desirable situation for a ligature. The use of the wire entirely obviates this objection. So with the external carotid, which is rarely or never tied because of its numerous branches, and, consequent proclivity to bleed; for this reason, the common carotid is selected, though the lesser operation might suffice, *quoad* the cure of the disease. Why, for instance, should you cut off half the circulation from a man's brain to cure a vascular tumour outside his skull?

So much for comparison with the silk ligature.

I have still to deal with the antiseptic catgut.

This appears to have been uniformly successful in the five cases in which it has been used by its inventor, Mr. Lister, but, as often happens, it has been far otherwise in the hands of others. Thus, Mr. E. Watson relates a disastrous case of popliteal aneurism, in which this appliance on the femoral artery failed to arrest pulsation, apparently by reason of the early yielding of the catgut. The same thing again happened when the iliac was subsequently tied, to remedy the failure of the previous operation; and so, after amputation, the patient died.

In Mr. Spence's case of ligature of the carotid, the patient, on the second day, became comatose and paralysed from embolism of the middle cerebral artery, caused "By a fragment of clot, which had become detached from the site of operation, in consequence of the too speedy softening and relaxation of the catgut, and so carried into the circulation by the current of blood". He also says that he has known hæmorrhage to occur after amputation, from the ligature softening and losing its constricting power. From this cause also, Mr. Holden affirms that fatal bleeding occurred in a case in which the femoral artery had been tied.

My friend Mr. Maunder (from whose lecture, in the *Lancet* of April 17th, I have gleaned these cases) expresses his opinion, founded thereon, that "The catgut may melt away before repair has taken place", but he says, "for the surgeon distrustful of the catgut there is yet one resource, viz., the antiseptic *silk* ligature cut short". I hereby offer him another and a better resource, viz., the wire compress. Farther on, he quaintly remarks that, "After mature consideration, he has arrived at the conclusion that the fate or behaviour of a given antiseptic catgut ligature, applied to the continuity of an artery cannot be foretold." I can confidently foretell both the fate and behaviour of the wire. Its behaviour is simply to control the circulation through the artery so long as is needful for the cure of an aneurism; and its fate is to be then withdrawn, and perhaps exhibited at a meeting of surgeons. Here is the piece of wire which so "behaved" in the case of my patient John Hull.

It seems, then, that the catgut may fail from softening and yielding too soon; a special and peculiar danger superadded, as it were, to the ordinary risks of the silk ligature; that it cuts the artery, and so gives rise to the risk of bleeding, and, of course, it can act only by

peremptory stoppage of the circulation. The wire compress is free from each and all of these objections.

This, then, is a fair summing up of the case as it appears to me :

The wire compress does not damage the coats of the artery as the ligature does.

It is not a foreign body in the wound, as the ligature is.

Therefore it does not excite suppuration and impede healing, as the ligature does.

It is not a fixture upon the artery, as the ligature is ; but it can be removed, or relaxed at any time, which the ligature cannot.

It does not ulcerate through the artery, and open the blood channel, as the ligature does ; therefore, bleeding is impossible : with the ligature there is always the risk, and not seldom the occurrence, of bleeding.

It causes a retarded circulation and gradual occlusion of the artery, so diminishing the risk of gangrene ; the ligature causes sudden obstruction, hence gangrene often follows.

Ultimately, or even at once, if desired, it entirely obstructs the current of blood, so curing the aneurism, as effectually and as completely as the ligature does.

It affords a wider choice of locality for operation than the ligature does, and is applicable to all arteries alike, which the ligature is not.

As compared with the catgut :

It is not liable to become relaxed or detached too soon, as the catgut is ; it does not cut the coats of the artery, as the catgut does.

Thus it confers absolute immunity from hæmorrhage, which the catgut does not ; it causes gradual occlusion, which the catgut cannot do.

I ask you, as surgeons, are these mere fanciful imaginary advantages, or have I, as I steadfastly believe, introduced to you a real improvement in surgery ?

POST PARTUM HÆMORRHAGE TREATED BY SOLUTION OF PERCHLORIDE OF IRON.*

By J. C. CLARK, M.R.C.S. and L.S.A., Medical Officer of the Gildersome District.

THE patient whose case I have the honour of bringing before you was, in several respects, unfavourably placed—mentally, physically, and sanitarily : *mentally*, for she was impressed with the idea that she was doomed to die in her confinement—a by no means uncommon idea in pregnant women ; yet, in her case, it was deepened by the fact that her mother had died from some pelvic mischief, which had parturition as its starting point ; and her aunt, her mother's sister, had died from flooding : *physically*, for she had a contracted pelvis, instrumental aid being required for her delivery ; and *sanitarily*, because the room in which she was confined was very small, damp, and cold, there being no fireplace and no ventilation ; and, just before delivering her, I was compelled to visit a patient suffering from pneumonia, with severe erysipelas of the face and head.

Mrs. C., a primipara, aged 19 years, had been in labour several hours when I was summoned, at 3 o'clock in the morning of February 3rd, to attend her in her confinement. The patient was a small, fair-complexioned woman ; she looked somewhat exhausted, although her pulse was fair ; the pains, which were of a bearing-down character, were regular, with an interval of about five minutes. On making a vaginal examination, I was struck by the facility with which my finger touched the promontory of the sacrum, thus showing probable contraction of the brim. The os was expanded to about the extent of two inches, and was easily dilatable. The membranes were projecting through it, and the head lay in the first position at the brim. I remained with her about two hours and a half, during which time the pains were regular ; but, as I expected, no progress was made ; and, feeling convinced that instrumental aid would be required, I left her, telling her friends to let me know if any change took place. Hearing nothing from them, I returned at 9.30, accompanied by my brother, who is a qualified man. On my way down, I was entreated to visit a patient who was suffering from severe erysipelas of the face and head, complicated with pneumonia, and whom I had been attending for some days past, as his friends believed he was dying. After examining this patient, I washed my hands, brushing my nails with a tooth-brush. On arriving at the midwifery case, I again washed my hands in a solution of permanganate of potash ; and, on examining the woman, found that the liquor amnii had escaped, but not the slightest advance had been made. My brother agreed with me that, as

we had already given Nature a fair trial, and as the pulse was becoming accelerated, we had better at once put on Barnes's long forceps. Without giving chloroform, I, with comparative ease, applied them, my brother carefully steadying the uterus, whilst I made traction during the pains. With considerable effort, I brought the head on to the perinæum, and then removed the forceps, so as to allow Nature to complete the delivery. During the passage of the head through the cavity of the pelvis, a considerable amount of blood escaped by the side of the head. When, after due time, the head was born, I did not hasten the birth of the remainder of the body, but rather retarded it, so as to allow the uterus gradually to contract on its contents, my brother keeping up steady pressure, both during and after the birth of the child, the right side of whose forehead was forced in ; and it had facial paralysis.

As soon as the child was born, flooding commenced. We at once gave a full dose of ergot ; and, the placenta being extruded from the uterus by pressure from without, I removed it from the vagina ; it was followed by an unusually large amount of membranes, which I was especially careful in removing. Notwithstanding the removal of the placenta and membranes, the hæmorrhage was very profuse, although the pulse was fairly good. We at once applied cold to the vulva and lower part of the abdomen, keeping a steady grasp on the uterus. The bleeding almost stopped, only a little oozing taking place from the vulva. In a minute or two afterwards, the uterus seemed to melt away from the grasp, and profuse hæmorrhage came on. I now passed my hand into the uterus, and cleared out the blood and clots, firm pressure being maintained on the abdomen. This did not arrest the hæmorrhage ; whereupon we injected cold water into the uterus, through a Higginson's syringe. This had no effect. By this time, the patient had become blanched, respiration sighing, and pulse rapid. I passed my hand into the uterus again and again, but it would not contract on it. The woman's condition was becoming so alarming, that we thought it advisable to sponge out the cavity of the uterus with a solution of perchloride of iron (1 to 4), but it failed to arrest the bleeding. The woman's condition now appeared to be truly desperate ; the pulse was not perceptible at the wrist, she became blind, and the respiration was gasping, but blood was still running from the vulva. I now passed my left hand into the uterus (my fingers resting against the fundus), and carried the vaginal tube of the syringe along its palmar surface. I then slowly injected about six ounces of the perchloride solution. The hæmorrhage at once completely ceased, and the patient gradually rallied.

On Feb. 4th, pulse 124.....	respirations 24.....	temp. 99.8.
" 5th, " 120.....	" 24.....	" had no pain.
" 6th, " 130.....	" 30.....	" temp. 102.2.
" 7th, " 134.....	" 	" 101.8.
" 9th, " 100 (good quality) ..	" 24.....	" 98.8.

From the time of her delivery on February 3rd, till the 11th of the month, when I ceased to take note, she slept well, took support freely, had no pain ; there was a very scanty flow of the lochia ; and the bowels were not moved till the seventh day.

OBSTETRIC MEMORANDA.

ON INJECTION OF THE PERCHLORIDE OF IRON IN POST PARTUM HÆMORRHAGE.

THE fatal case furnished by Mr. Boddy, in the JOURNAL of the 16th instant, and Dr. Swayne's comments upon it in the last number, are, I venture to think, of great importance, believing as I do that Dr. Swayne's explanation of the cause of death (*viz.*, the passage of some of the iron solution through the Fallopian tubes, or one of them, into the peritoneum) is very likely to be the true one. Indeed, I may say that the fear of such an occurrence has to some extent prejudiced me in the use of intrauterine injections of irritant fluids, especially since the following case happened a few years ago. Hastily summoned to a woman, I found her on the bed suffering apparently with the most severe colic that I had ever met with. On inquiry, it transpired that she had been prescribed for at the public dispensary, and for some weeks had been using, for leucorrhœa, a strong solution of sulphate of zinc and alum, which she had injected by an eight-ounce elastic bottle having an elastic nozzle of about six inches in length. She was in the act of using this injection at the time of being suddenly seized with the fearful pain in her belly ; and, as she admitted that she had introduced the nozzle higher up the vagina than usual, I considered that she had chanced to inject the womb itself, and then a Fallopian tube and the peritoneum. The case proved to be a sharp but short-lived peritonitis ; for, under opium internally, and poultices of mixed

* Read before the Leeds and West Riding Medico-Chirurgical Society.