the walls of the alveoli: around the grey granulations, and for a space of three or four times its area, there is a circumference of thickening affecting both the walls of the alveoli and of the smaller bronchi. This appearance is more distinct in the guinea-pig than in many specimens of tubercle in the human lung; but it can be distinctly seen sometimes in the latter, and is a fact of great pathological importance, explaining the increased density and loss of elasticity of the lung occurring in the early stages of tuberculosis, which cannot be satisfactorily accounted for by the mere presence of the grey granulations.

The bronchial glands are affected exactly like the axillary; and, a description of the one applies precisely to the other, except that the cheesy changes are rather less marked and spots of softening are less common in the bronchial.

[*To be continued.*]

CLINICAL MEMORANDA.

[Under this head, we shall publish from time to time, as materials accumulate, short records of remarkable cases in practice which are sufficiently rare, interesting, or instructive, to deserve record, but do not call for lengthened statement or comment. Brevity and point should be the valuable characteristics of cases forwarded for this column.]

SPONTANEOUS GANGRENE OF THE SCROTUM: DEATH IN THIRTY HOURS.

By R. JONES, Esq., Strefford, Shropshire.

ON February 16th, 1868, Mr. D., aged 52, a substantial farmer, of large frame, not very corpulent, had, about noon, a severe rigor which lasted some time. A warm bed and brandy and water ultimately brought about rather excessive reaction. He took during the afternoon two doses of Epsom salts, which produced a pale fluid evacuation. He vomited, but passed no urine. I saw him about ten o'clock the same evening. His face was much congested; his breathing accelerated. He was extremely restless and anxious, mouth dry, and had intense thirst. Pulse very quick; skin hot and dry. He was in no pain; but complained of great smarting and soreness of the anus and genitals. The scrotum was very red, and much swollen. There was a circumscribed patch of erysipelatous inflammation covering the anus and nates. He took six grains of calomel and one grain of opium, with a saline draught, immediately; and smaller doses of the two former and an effervescing draught every two or three hours. Twelve leeches were applied round the anus, and warm fomentations unremittently through the night.

On the 17th, at 10 A.M., he had passed a very bad night. All the symptoms were more or less aggravated. The scrotum was in a state of gangrene. The erysipelas had not extended. The abdomen was much distended. He complained of flatus and a choking sensation when he attempted to swallow anything. His pulse and breathing much increased in frequency. There was much oppression at the chest. He made an irrelevant remark, denoting delirium. He had passed about ten ounces of high coloured urine, but nothing from the bowels. A free incision was made through the gangrenous parts, and a poultice applied. A dose of colocynth and calomel was ordered to be taken, to be followed by castor oil, and wine or brandy to be given frequently. At three o'clock P.M., he had passed a feculent evacuation tinged with bile, and a small quantity of urine. The pulse and breathing were very rapid, with frequent deep inspirations. He wandered when left alone, and refused the stimulants. He died quietly soon after six o'clock, about thirty hours after the rigor.

REMARKS.—Mr. D. had been a free liver, but by no means an habitual tippler. He had never had any serious illness, and only occasionally suffered from slight attacks of bronchial and hepatic congestions. For some years he had been rather crippled by chronic rheumatism, but there existed no affection of the heart. Latterly, he had complained very frequently of feeling unwell; but he contented himself by taking an occasional dose of Epsom salts, and did not make any alteration in his mode of living. At the time of the rigor, he was engaged in dressing a contused and penetrating wound in the brisket of a horse, and had been so occupied for a week or nine days previously. The animal had been very feverish; and extensive swelling and inflammation existed for some distance round the wound, the discharge from which was very watery and offensive, and no doubt sufficiently septic to poison the blood of a person already out of health, whose system was ripe for the reception of any noxious agency. Thus we may account for the intensity of the invasion, and the rapidity with which it annihilated the vital functions.

CLINICAL LECTURE

ON

TORSION OF ARTERIES.

Delivered in Addenbrooke's Hospital, Cambridge.

By G. M. HUMPHRY, M.D., F.R.S.,

Professor of Human Anatomy and Physiology; Surgeon to Addenbrooke's Hospital; etc.

AFTER some general remarks on the importance of arresting hæmorrhage quickly and securely in the treatment of wounds, and on the various modes which have been resorted to for doing this, Professor Humphry said the principle of the ligature and of torsion is the same. In both it is related to the fact that the inner and greater part of the thickness of the coat of an artery is composed of a brittle, though strong, elastic, and more or less muscular, structure; whereas the outer and thinner structure is of very different character, being extremely tough, and consisting chiefly of white fibrous tissue. The result is that, in the use either of the ligature or torsion, the inner structure is quickly divided, either cleanly, as in the case of the ligature, or in a more irregular lacerated manner in the case of torsion, and the divided edges are held together, so as to close the artery, by the more resisting external coat which is either compressed or twisted upon it—compressed by the ligature, twisted by the torsion. When the ligature is properly applied, the cleanly divided edges of the inner coat of the artery are held so closely and firmly together by the outer coat compressed within the knot of the thread, that there is no possibility of the escape of blood, the approximated edges unite together, and the vessel is permanently sealed. The result, therefore, so far as the hæmorrhage and the vessel are concerned, is perfect, or nearly so; and provided the ligature is properly applied—that is to say, tied tight enough to divide the inner coat, and not so tight as to mutilate or divide the outer coat, hæmorrhage will very rarely, or never, occur. I am, therefore, in the habit of concluding, when hæmorrhage follows the closure of a wound, at a longer or shorter period after an operation, that there has been some fault in the tying the vessels; an insufficient number have been tied, or the thread has been tied too lightly so as to damage the outer coat, or not tightly enough to divide the inner coat and maintain the apposition of its cut edges. You will hear secondary bleeding attributed to this thing and that, to something peculiar in the blood-vessels, or to some hæmorrhagic tendencies in the patients, etc.; but I suspect it is far more commonly due to carelessness in securing the blood-vessels. The fault is not usually in the vessels, or the patient, or the ligature, but in the surgeon.

Entertaining so high an opinion of the ligature, I was long unwilling to resort to any other plan. Still, I could not be insensible to the importance of improving our treatment of wounds, and to the effect which the ligature, threads and the strangulated portion of tissue included in each knot must have in preventing immediate union of the divided surfaces. Accordingly, as I stated in a lecture a year ago,* I was induced to try the plan of acupressure proposed by Sir James Simpson, and was able to report favourably of it, inasmuch no hæmorrhage occurred in any of the cases in which I used it, and the wounds did well. Still, as I then said, I hoped some better plan would be found out, for the presence of the needles in a wound, even for a short time, is objectionable; and their removal, just when a patient is beginning to recover from the effects of an operation, and is peculiarly sensitive to any impressions and apprehensive and distrustful of our intentions, I found to be a source of annoyance; and I was anxious to find some effectual means of arresting hæmorrhage without the necessity of leaving any foreign body in the wound. After thinking, therefore, a good deal on the subject, and reflecting over various modes in which the end of the vessel could be temporarily sealed, I tried the plan of torsion, which has of late been used in Edinburgh and elsewhere, and have employed it now in a great many cases, including amputation in the thigh,† in the leg, and many others. Indeed, for several months I have used no other means but torsion for arresting hæmorrhage; and it has answered perfectly in all the cases. There has, I think, been less pain after the operations than was experienced when we used the ligature; and the wounds have, on the whole, done better and healed more quickly. In such an operation as

* Reported in the BRITISH MEDICAL JOURNAL, August 3rd, 1867.

† Professor Humphry has used torsion to the femoral artery after amputation in the thigh in two cases. The patients were young.

excision of the knee, it is especially important to prevent bleeding from the various small arteries that are divided; for, unless this be carefully done, blood will collect in the wound, between and behind the bones, after the patient is in bed, will lead to suppuration, and be a source of much trouble. To prevent this evil, I sometimes found it necessary to tie several vessels; and the presence of these ligatures with the portions of tissue strangulated by them was certainly a disadvantage. In the last two cases in which I have performed this operation, I have gladly availed myself of torsion of the arteries, and have been well satisfied with the result. Still, a greater number of cases of this and other operations are necessary, to test properly the value of this mode of closing the arteries. The plan which I adopt is, as you are aware, for the smaller arteries, to use a pair of clasp-forceps, which, at the end, are rather broad, and provided with fine interlocking blunted teeth, by means of which the artery is held securely during the twisting. This I continue till the coats are quite torn through, and the forceps are thereby set free. In the case of the larger arteries, I found, by experiment on the dead body, that these forceps divided the coats of the vessel, and tore their way out too quickly; so that, when I injected water into the artery by a syringe it soon, under very slight force, separated and obliterated the folds of the inner coat, which had been caused by the torsion, made its way under the outer coat, and burst through that coat. I tried other forceps of different shapes, and found that the pair of strong narrow-bladed hinge-forceps, which I show you, and which I have been in the habit of using to extract bone in operations for necrosis, answered the purpose better than any others that I have yet used. They resemble somewhat strong dressing-forceps; but the handles are large, giving good purchase, the blades meet closely, and the transverse ridges and furrows near the ends are well adapted, so that they hold the end of the artery tightly without tearing it. You see when I seize with these forceps the end of this femoral artery which I took from a subject yesterday, hold it tightly and twist it, that, although the forceps are not sufficiently broad to cover and embrace the whole diameter of the artery, yet they hold it firmly and retain their hold till the entire end of the vessel has been twisted off. The remaining part presents a conical twisted end, which unfurls itself to some extent, but not entirely, and remains completely closed. I now throw water into it; and not till I have used considerable force do the compressed folds of the inner coat yield, separate, and permit the water to pass beneath the outer coat, which again is so sealed by the twisting, and so strong, though thin, that it offers considerable resistance before it gives way—a resistance much greater than would be required to withstand the pressure of the blood in the living artery. I twist other portions of artery in the same manner. They are all firmly closed. Cutting them open, we find the inner coat more or less lacerated and contused, its surfaces squeezed together and thrown into folds, and held in close contact by the twisted outer coat, which forms coils, terminating in a cone or point at some distance beyond the termination of the inner coat. In some instances, I have found the inner coat detached from the outer by the squeezing that occurs during torsion, and more or less reflected into the artery so as to present its divided edge to the blood-current.

You will, from this explanation and these experiments upon portions of artery (and I have made several observations upon the dead body corresponding with these), understand what takes place when an artery is twisted. The inner thick, elastic coat is thrown into folds, which are crushed or squeezed together so as to block up the channel of the artery; it then gives way, and is torn through, and is held in its position by the outer coat, which resists longer, and undergoes still further twisting and squeezing together of its structures, so that when it is finally torn through, it retains its twisted condition, and continues to exert pressure upon and give support to the inner coat.

I have just had an opportunity of examining a popliteal artery which was twisted in a young man after amputation six weeks ago. It was perfectly closed, was contracted, and surrounded by toughish structure for some little distance. Its internal coat was wrinkled near the end, and showed some traces of ecchymosis.

You have probably observed that the attention to the blood-vessels after operations has occupied rather more time than it did when we used the ligature; and torsion has certainly, in my hands, proved somewhat more difficult than the ligature, requiring more care, more patience, and more perseverance. It is necessary to include the vessel itself in the forceps; for it is useless to twist the surrounding tissues; and it is not always easy, when blood is flowing, to make sure of the exact point from which it flows. Often, therefore, when I have been twisting, I found that my efforts were of no avail, because I had not seized the exact orifice of the vessel. Even when the vessel is seized, the inner coat is liable to slip from between the blades of the forceps, the outer coat only being retained and subjected to the torsion; and this is not to

be relied on. When, however, I have been sure of having seized an artery and properly twisted it, I have not known any further bleeding to take place from it; and if it be carefully done, torsion is, I think, a valuable means of securing small and medium-sized arteries, such as the tibials, facials, etc., and by reducing the number of ligature-threads, it will be found to promote early healing of wounds. Whether it will prove to deserve our confidence in the case of the larger arteries, I am not so sure; but I should say that the doubt is founded rather upon what I have found in experimenting upon the dead subject than on what I have observed in the living; and it may be that better appliances and more experience may justify a greater reliance upon its efficiency. The experiments which I have shown you to-day upon pieces of artery, and those which some of you have seen me make upon the dead body, have proved to you that much care is needed in the selection of proper forceps, and in so seizing and holding the end of the vessel that its inner coat does not slip from between the blades during the twisting; and it will have occurred to you that in the living subject it is not easy to make sure of doing this as it should be done, or to feel certain in any instance that the artery has been properly twisted. The only rule I can lay down is to use all care in the process, especially in grasping the orifice of the artery, and to examine well the remaining torn end after the forceps have been set free by the torsion, so as to ascertain, if possible, whether the vessel is completely closed.

I do not wish you to go away with the impression that the trials of different modes of preventing hæmorrhage from arteries have been made without due consideration, or that the conducting them has been unattended with anxiety. In the early years of my professional career, I was severely tried by some cases in which bleeding occurred and recurred after operations. These cases produced a deep impression upon me, and made me extremely cautious and careful in securing blood-vessels, particularly in the mode of applying the ligatures, and watchful in sponging the surface and examining the tied vessels before closing the wound; and I would not have been induced to try acupressure or torsion had I not been also strongly impressed with the great importance of using all means to obtain early union of the wounds after operations, or rather, I would say, immediate union of the whole or large part of a wound after an operation. There is no doubt that the success of operations will be increased in proportion as we can attain that result; and the prospect of attaining it must depend a good deal upon the mode in which the vessels are secured; the first desideratum being to prevent bleeding; the second, to do it in such a manner as shall least interfere with the healing process. The ligature effects the first object completely; but is so far open to objection with regard to the second, as to justify the cautious trial whether other modes which promise better as regards the healing process may not be equally effective in stemming the blood-currents from the arteries.

POSTSCRIPT TO "FURTHER OBSERVATIONS ON THE CÆSAREAN SECTION".

By THOMAS RADFORD, M.D., F.R.C.P. Ed.,
Honorary Consulting-Physician to St. Mary's Hospital, Manchester, etc.

As a postscript to my former observations on the Cæsaean section (*BRITISH MEDICAL JOURNAL*, March 28th, 1868, page 295), I now tabulate two cases which were then omitted, and append a few remarks. These two cases are English. One (97) stands, in the history of this operation, quite unique. There are numerous important points belonging to it; and, although I have analytically brought some of them before my readers, yet the entire case ought to be carefully read and studied, as cited in the *Medical Times and Gazette*, vol. ii, 1865, p. 359.

Mr. T. Spencer Wells commenced his operation solely with the object of removing a large ovarian tumour. Before he had completed it and cut through the pedicle, he found another tumour, which he considered to be the right ovary cystically enlarged. He now passed a trocar into it; and, after withdrawing it, three pints of a bloody fluid escaped through the cannula. The tension being thereby so much lessened, he was now able to see the Fallopian tube passing from the upper part, which at once convinced him that he had punctured the gravid uterus. On the cannula being withdrawn, a soft, spongy, bleeding mass protruded. He now introduced his finger, in order to push this back into the uterus, and also to examine the cavity of this organ, during which its tissue, which was soft and friable, as if it had undergone fatty degeneration, gave way along the middle from the puncture (which was near the