

more than fourteen times during the first night, after compression had been resorted to. To the care and close attention paid to the case by Mr. Andrews, the assistant-surgeon of the regiment, he was indebted for so quickly bringing it to a successful issue.

Dr. MACLACHLAN believed that if the records of the Medical Board were examined, a large number of cases would be found among the soldiers invalidated, who had previously been cured of popliteal aneurism by compression. Considered that the paper read to the Society by Mr. Blenkins was a purely practical one, which, in a Society of this kind, was so much to be desired. The interests of a patient affected with popliteal aneurism would be much neglected if the surgeon neglected to resort to compression. He alluded to the case of an old pensioner at Chelsea Hospital, who would not at first submit to the treatment by compression; in this case, it was diagnosed that the whole arterial system was diseased, and fourteen days after the application of pressure, the aneurism burst into the muscles of the leg; the artery was tied, gangrene followed, and the limb was amputated; hemorrhage subsequently took place from the site of ligature; but the opening through which the blood flowed was small, and by pressure of the finger over the orifice the bleeding was arrested, but the man sank. At the *post mortem* examination two aneurismal sacs were found, but there was no obliteration of the vein; the sheath of the vessels, however, had united itself so closely to the coats of the artery that it was very difficult to pass a needle around it; this was to be ascribed to the effects of the pressure, and was a most desirable end; indeed, when compression had been employed, an obstacle of this kind may be anticipated as likely to happen.—*Med. Times and Gaz.*, Jan. 3, 1857.

38. *Seventy-eight Cases of Surgical Aneurism.*—JONATHAN HUTCHINSON, Esq., has published (*Med. Times and Gaz.*, Nov. 22 and 29, 1856) a tabular statement of seventy-eight cases of surgical aneurism. We have only space for the following analysis of the series, with comments:—

The table embraces 78 cases of aneurism or pulsating tumours involving large vessels treated under various plans, with the result of 57 perfect recoveries, 2, the disease remaining unrelieved, and 19 deaths. These relative numbers, when we consider the importance of the vessel involved in a considerable proportion of the cases, must be considered highly satisfactory. Of the fatal cases, 1 was after ligature of the abdominal aorta, 3 after that of the common carotid, 2 of the subclavian, 2 of the external iliac, and 10 of the superficial femoral. In 1 case death followed amputation of the thigh, consequent on the aneurism having become diffused, no ligature having been applied. All the cases, 5 in number, in which either the aorta (1), the common carotid (2), or the subclavian (2), were tied, ended in death. Of those in which the external iliac was tied, 3 recovered, and 2 died. Of those of ligature of superficial femoral 23 recovered, and 10 died. All those in which either the brachial or the ulnar were tied recovered. These proportions are expressed in the following table:—

Ligature cases.	Number.	Recovered.	Died.
Of abdominal aorta	1	—	1
Of common carotid	2	—	2
Of subclavian	2	—	2
Of external iliac	5	3	2
Of femoral—			
No previous trial of compression	9	6	3
After failure of compression	22	16	6
In Hunter's canal for pulsating tumour in tibia	1	—	1
Tumour laid open and the bleeding vessels secured	1	1	—
Total	43	26	17

Of the causes of death, we have in the case of ligature of the aorta, the *collapse consequent on the operation*; in 1 of the 2 cases of ligature of the subclavian, *constitutional irritation*, etc., and in the other *secondary hemorrhage*; in 1

of those of the common carotid, *paralysis and nervous shock*, and in the other 2 *secondary hemorrhages*; in 1 of those of the external iliac, *diarrhoea and exhaustion*, and in the other *pleurisy, &c.* Of the 10 cases ending fatally after ligature of the superficial femoral, in 5 the death was from *gangrene*, in 1 of them *secondary hemorrhage* having also occurred; in 2 it was from *pyæmia*; in 1 from *constitutional disturbance following implication of the knee-joint*; in 1 from *amputation for gangrene*; and in 1 it was sudden and unexpected from *disease of the heart*.

This enumeration need not detain us longer than just to remark upon the rarity of secondary hemorrhage as a cause of death after ligature of the superficial femoral or external iliac, and its comparative frequency after that of the subclavian and carotid. As the whole 5 subclavian and carotid cases were fairly favourable ones for operation, and yet all ended fatally, their result must be held to point most definitely to the necessity for endeavouring to discover some other method of treatment, which, even if tedious, troublesome, and uncertain, should be exempt from so great a risk to life. Whether we regard Mr. Fergusson's case, in which a subclavian aneurism was cured without operation (Case No. 35), as one exemplifying the benefits of compression or of manipulation, or as one of accidental and spontaneous cure, its result is alike important and instructive.

Passing now to the special consideration of compression treatment, and its advantages, we must first separate from the series those cases in which, for various reasons, it was not tried.

Compression treatment was not tried in 24 cases.—Of these, 1 was an abdominal aneurism (71), 3 were of the carotid or its branches (38, 45, and 73), 2 were of the subclavian, and 4 of the femoral so high up as to necessitate ligature of the external iliac. To those which belong to the class usually deemed, from anatomical position, not susceptible of compression treatment, we might add 3 more, in 2 of which (Cases 7 and 78) the aneurism was of the femoral so high up, that although in each a very brief trial of it was made, yet it was desisted from of necessity, in consequence of there not being room for the pad, and in the third (Case 74), there not being room for the compressing pad, the tumour was laid open and the bleeding vessels tied in the wound. Here, then, we have 13 cases unsuitable from position. Of the remaining 13 cases, one (Case 59) was of the ulnar, traumatic, and already diffused, one (Case 33) of the radial under similar circumstances, and a third (Case 68) of the brachial of like nature. In these 3 the operators preferred to tie the injured vessel above and below the wound, to open the cyst, and to turn out the coagula, treating the cases, indeed, as those of wounded arteries. In a fourth case (70) the disease was a pulsating tumour of doubtful nature in the head of the tibia, and the sudden cutting off of the supply of blood by ligature of the femoral in Hunter's canal was preferred by the Surgeon (Mr. Lawrence) to any attempt at cure by compression. In the 9 cases which we have now left, the aneurism was either popliteal or of the femoral so low down as to have easily admitted of compression being resorted to. In 3 of these (4, 39, 51) the tumour was diffused at the time of the patient's admission, and there was no time for delay in treatment. In 2 (61 and 44), although not diffused, it was thought to be too large to be suitable for compression treatment, and was increasing too fast to admit of delay. In one the man was in poor health and the subject of constitutional syphilis, circumstances which induced the surgeon to prefer ligature to compression. In 3 cases (65, 53, and 57) there was no motive for not trying compression as far as the facts in our possession show. Of these 3 suitable for compression, but in which it was not tried, 1 ended fatally after ligature, and 2 recovered.

We now pass to the consideration of the cases in which

Compression treatment was tried.—Of these, 54 in number, the subjoined tabular statement exhibits the gross results. And it must here be borne in mind that these results, which cannot, we think, but be considered as triumphantly in favour of the new plan, have been obtained by surgeons, many of whom had little or no previous experience of its details. In this respect lithotripsy and the compression plan stand in like condition. They are both of them more

difficult in the successful carrying out than the operations they are intended to supersede, and require more of special experience and of attention to detail on the part of the surgeon. The vast difference in result between lithotripsy in private and lithotripsy in hospitals is generally acknowledged, and it is probably to be explained in considerable degree by the circumstance that in hospitals the patients come almost by chance under the care of different surgeons, while in private it is a sort of specialty, and they come usually into the hands of those who have had large experience. We mean, of course, in saying this, not the slightest disrespect to the attainments and qualifications of hospital surgeons in general, but simply to assert that the old rule that "practice makes perfect" applies with equal force to the management of rare and difficult surgical cases as it does to the other affairs of life. Thus, then, we may fairly argue that, had the whole of these cases been under the care of one or two surgeons, very different results would have been obtained. And, further, we may fairly expect that in future, when compression treatment shall come to be more generally understood in all the details of its management than it is at present, a much larger proportion of successful cases will be produced.

Compression cases.	Number.	Succeeded.	Failed.
Subclavian aneurism (manipulation treatment)	1	1	—
Femoral	5	—	5
Popliteal	46	24	22
Anterior tibial	1	1	—
Radial	1	—	1
Posterior tibial	1	—	1
Total	55	26	29

If we except, as we may fairly do, those cases from this number in which the compression treatment was only tried for very short periods indeed, we have a total of 51 cases and 26 successes, or rather more than half. Of the successful cases, all, excepting two, were popliteal aneurisms. Now, as we shall presently have to show that the cases in which compression did not effect a cure derived advantage rather than injury from its trial, we may thus state that the 26 successful cases were cured by means involving no risk whatever. In other words, the statistics of death from aneurism are the same as they would have been had these 26 patients never suffered from the disease at all; and the cases are to be counted as clear gain on the credit side of the surgical account. A few words may be said on the following points:—

The average period of treatment.—In the 26 successful cases the time occupied in treatment varied from sixty hours to eight months, its average being two weeks and five days. It must be borne in mind that in but few cases comparatively was the attempt made to secure complete arrest of the circulation through the tumour. In most it was only retarded, and in many the patient was allowed to lay aside the instrument at night. In some of the longest cases the constitutional suffering on the part of the patient was little or nothing. Amongst the means by which we have little doubt but that this average might be greatly shortened, and to which as yet but little attention has been given, are, 1. Local support to the tumour, and 2d. The diet of the patient. It is evident that by bringing the walls of the sac together, or nearly so, by local compression, its fibrinous obliteration would be likely to be assisted, and it is surprising so little has hitherto been attempted in this way. An air-pad, bandaged upon the tumour empty, and afterwards inflated, would offer the most convenient means. In several cases of failure, in which the tumour enlarged, the increase in size seemed to be merely from want of contractile power in the aneurismal walls. Apart from its benefit in relieving this condition, local support would also be very likely to disturb somewhat the coagula already formed, and thus afford projections for new fibrin to be deposited upon.

Instrument to be used.—We have, of course, in the different hospitals witnessed the employment of a great variety of compressing instruments. On the whole the result of experience has seemed to us to be in favour of those of simple

construction; those, namely, which consist of a modification of the clamp tourniquet. In some cases, Carte's apparatus, with elastic springs, has been found to answer; but in others it has been discarded after fair trial. A great point is to have an instrument by which the artery may be compressed as it crosses the brim of the pelvis, for here it is more free from the vein than at any other part of its course, and this is, perhaps, best attained by the cylinder weight described and figured in a former report.

Cases in which compression failed.—Of these we have 29 cases, 3 of which, as already observed, ought, however, to be excepted on account of the trial having not been persevered with. In two or three others also the trial was very short. In one case the patient being the subject of these aneurisms was discharged as beyond hope from treatment. In one gangrene of the leg threatened, and amputation was resorted to. In 3, the tumour threatening to burst, amputation was performed. In one ligature of the external iliac, and in one that of the brachial was performed. In 22 ligature of the superficial femoral was performed. Of the whole 29, 7 ended in death, 3 recovered after amputation, 2 were discharged in *statu quo*, and 17 recovered after ligature of the vessel involved.

The statement made above, that, even where it failed to cure, the compression treatment did no injury, is not to be understood as applicable to individual cases, but only to the average result. It is based on the fact that, whilst of 27 of that class (all of the lower extremity) submitted to ulterior treatment, 20 recovered, or nearly 3 in 4; out of 10 cases of ligature of the femoral, no previous treatment having been adopted, only 6 recovered, or rather more than 2 in 4. If it be objected that the mortality of the latter was above the average, we may refer to the collection of cases made by Norris, who, in a series of 188 primary ligatures of the femoral, found that 1 in every 4 died. Now, when we consider that, in not a few of those cases in which ligature was performed after failure of compression, the latter was desisted from, either because the tumour had very greatly increased, or there had been great cedema of the limb, or the patient was worn out by want of rest, it is manifest that there must have been compensating circumstances which prevented the mortality from being higher than it was. These cases were in a much less promising state ostensibly at the time of the operation than those in which primary ligature was practised; and yet we find that their mortality was less. The explanation of this is doubtless to be found in the circumstance that the trial of compression, although it might have been hurtful in other respects, had conferred a great benefit in opening up the collateral circulation, and thus preventing the risk of gangrene after ligature. Out of 10 cases of primary ligature of the femoral, three died of gangrene, whilst out of 22 in which ligature followed a trial of compression, only two ended fatally from that cause. It is evident, therefore, that compression has its uses when considered not as a means of cure in itself, but simply as a preparatory measure for the application of a ligature. The fatal nature of gangrene when it does occur, is sufficiently shown by a glance at the following table of amputation cases, in which it will be seen that all the cases severe enough to require amputation ended in death.

Amputation cases.	Number.	Recovered.	Died.
For gangrene after ligature (no compression)	1	—	1
For gangrene after ligature after compression	2	—	2
For gangrene after compression (no ligature)	1	—	1
Tumour threatening to give way after compression; no gangrene; no ligature	3	3	—
Total	7	3	4

Indications for guidance in future cases.—1. To have two compressors from the first in constant readiness, and use them alternately.

2. To employ the pressure by preference over the brim of the pelvis where the vein and artery lie side by side, and the latter may be compressed without the former.

3. To be very particular in removing all hair from the skin of the part, to dust it well with flour, and use every precaution for preventing excoriation. With this view it may be well, as suggested by Mr. Paget, to harden the skin by the use of a bichloride lotion for a few days before beginning the treatment.

4. To load the patient's blood with fibrin by limiting his diet to solid food as much as possible. This should be attended to before beginning the treatment. He should be purged, allowed to eat freely of meat, but to drink only the least possible quantities. The drink allowed should be diuretic.

5. The aneurismal sac itself should be supported by the pressure of a soft pad or an air-cushion. If solidification be unduly slow, it may even be justifiable to disturb and break up the coagula by forcible manipulation, in the hope of thus affording irregular projections in which the deposit of fibrin would take place.

39. *Deligation of the Abdominal Aorta for Aneurism of the External and Common Iliac Arteries.* By Mr. SOUTH, Senior Surgeon to St. Thomas's Hospital.—Unquestionably the operation of tying this great vessel is one of appalling magnitude, and so rarely is it adopted, that we may hail it as an event in the annals of surgery whenever it is done. This was the celebrated operation of Sir Astley Cooper, which in his day created an interest of the most intense kind in the mind of every surgeon. It has not hitherto been selected in the cases that have been recorded, unless as a last resource, and justified by the most trying and urgent circumstances. Sir Astley Cooper was the first surgeon who applied a ligature to the aorta in the living subject—upon a porter, aged 38, at Guy's Hospital, in 1817. This case will ever stand as one of the most remarkable in the annals of surgical science. His patient survived forty hours. He made an incision three inches long in the linea alba, giving it a slight curve to the left, to avoid the umbilicus; one inch and a half was above, and the remainder below the navel. The peritoneum was then cut through, and, by scratching with his nail at the root of the mesentery, he was enabled to insulate the artery and carry a thread round it.

A precisely similar operation was performed by Mr. James, of Exeter, whose patient survived three hours and a half. In a third example of ligature of this great vessel, at the Cape of Good Hope, Dr. Murray tied it, without opening the peritoneum, making his incision from the jutting extremity of the tenth rib, continuing it downwards about six inches, and curving backwards to an inch from the upper front of the hip-bone. The aorta was easily reached, the peritoneum being separated with the flat of his hand from the internal iliac and psoas muscles. His patient survived twenty-three hours after the operation. A fourth case is recorded [see this Journal for Oct., 1853, p. 508], the operation being performed at Rio Janeiro, by Dr. C. B. Monteiro, the patient surviving till the tenth day, when he died from secondary hemorrhage from a small opening on the left side of the vessel immediately above the ligature. Mr. South's makes the fifth case, with a survival of forty-three hours. Monteiro's case, therefore, was the most successful. Three out of the five have been done in England—the first and the last at the Borough hospitals, where the preparations are to be seen in their respective museums.

The following were the forms of aneurism in the five cases for which this formidable operation was attempted: 1. Aneurism extending four inches above and as many below Poupart's ligament; affecting the left iliac artery. 2. Aneurism of the external iliac artery. 3. Very extensive iliac aneurism. 4. Spurious aneurism of the femoral artery, formed by the bursting of that vessel; a large swelling occupying a great portion of the right under part of the belly. 5. Aneurism of the external and common iliac arteries, occupying a very considerable portion of the right half of the abdomen.

The late Mr. Guthrie held that it is quite unnecessary to tie the aorta in any case, because, in an aneurism of the external or internal iliac arteries, the common iliac on the diseased side can always be got at—and if not there, yet on the healthy side—for the purpose of carrying a ligature around it. In these views the late Samuel Cooper coincided with Mr. Guthrie. If these cases are analyzed, it will be found that this operation was justifiable in this instance,