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CASE OF AMPUTATION OF THE LEG, WITH SOME OBSERVATIONS ON A NEW MODE OF AMPUTATING.

By THOMAS GREEN,
Surgeon to St. Peter's Hospital, and Lecturer on Surgery at
the School of Medicine, Bristol.

James Allpass, aged thirty-four, a butcher, was admitted into St. Peter's Hospital, on Feb. 22, 1842, under the care of Mr. Green.

About four years ago the patient met with an accident, which caused a severe compound fracture of the right leg. After some time the bone united, not in a straight line, but obliquely, and there is now a considerable projection of bone at the seat of the fracture, around which the skin has been extensively ulcerated for some time. He has been repeatedly in the hospital; on each occasion the state of the ulceration was improved; but immediately on attempting to walk, it again degenerated into a state of foul extensive ulceration. On admission, the ulcer was found in a sloughing condition, with copious sanious discharge; the surrounding skin was of a fiery red color, and the whole extremely painful; the limb is shortened, and he cannot bring the heel to the ground; tongue coated; pulse quick; complains of cough and loss of rest.

Finding that the leg was entirely useless, and that he had suffered in general health from the last extension of ulceration, he consented to the removal of the limb; but the operation was deferred until he was in a fit state to undergo it.

March 6. The cough has now ceased; tongue clean; pulse natural; he sleeps well; the ulceration is in an improved condition, and the skin healthy below the knee.

Mr. Green decided on performing the flap amputation, but in a different manner from that in which it is usually done. A transverse incision having been made across the front of the leg, through the skin, another was made through the integument at the back of the limb, including a large portion of the calf, and leaving skin enough to cover the flap of muscle, which was next formed by passing the catlin through the leg a short distance behind the bones, and cutting out in the usual way; the remaining muscles were divided by a transverse incision passing between the bones, which were next sawn through, and the arteries tied. Hæmorrhage still continued from a large vein, which it became necessary to secure by ligature. Three sutures and pieces of strapping were applied to keep the posterior flap in apposition. Cold cloths to be constantly applied to the stump, and to take immediately half a grain of acetate of morphia in a draught.

9. The patient has had no unfavourable symptoms
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whatever until this morning, when hæmorrhage came on from the stump, from which he lost a considerable quantity of blood; the tourniquet was immediately placed round the thigh, and secured, by which the bleeding was arrested. He states that the limb has started occasionally during the night. His system shows the effects of loss of blood; his face and lips are pallid; feels faint and cold; pulse quick and small; tongue pale and tremulous. Cold water dressings to be constantly applied to the stump; to take at once half a grain of acetate of morphia; the tourniquet to be kept loosely over the femoral artery, and tightened immediately on the appearance of fresh hæmorrhage.

12. There has been no further bleeding until this morning, when the stump bled again to some extent in a few minutes; the tourniquet was immediately tightened, and the hæmorrhage was stopped. Mr. Green having been sent for, directed the same means to be used; the man to be kept perfectly quiet and closely watched. He stated that, on the return of any fresh hæmorrhage, he would apply a ligature round the femoral artery, considering it useless in the present stage of the wound to attempt to secure the bleeding vessel by opening the stump.

17. There has been no loss of blood since last report; a considerable portion of the wound on the fibular side has united.

April 6. The wound is entirely healed, except where one ligature hangs out; the others have come away. His general appearance is much improved.

20. The ligature only came away to-day, repeated gentle attempts having failed to bring it away previously; stump healed and in good condition.

On the method of operating resorted to in this case, Mr. Green made the following remarks at the next surgical lecture at the Medical School:—

I take the opportunity afforded me by this operation, of showing you the limb which has been removed, that you may see exactly how it has been done; and I shall briefly explain the reason why I operate in this way below the knee. I shall not now detain you by considering the comparative merits generally of the two modes of amputation, commonly known as the circular and flap operations, but beg to direct your attention specially to amputation as performed below the knee.

Some surgeons, I believe the majority, prefer the circular operation; others condemn it, and give a decided preference to the flap amputation at this situation. In one of the most recent works published in this country on operative surgery, I mean Mr. Liston's "Practical Surgery," he decidedly condemns the circular, and as strongly advocates the flap amputation in the upper part of the leg. For myself, I give a preference to the flap operation below the knee, and have always performed it, where the skin and muscle of the calf were sufficiently healthy to afford the large

flap necessary to cover the stump. The way in which this operation is usually performed is, I believe, the same as that described by Mr. Liston in the work alluded to. An incision is made across the fore part of the leg, by which the integuments are divided; the long knife being pushed through the limb immediately behind the bones, is carried downward and backwards, and a flap of sufficient size formed to give a covering to the face of the stump; the muscles lying in front and between the bones are divided transversely, and the operation completed in the usual way. The operation as just described is the one I have hitherto performed myself until recently; and the gentlemen present, who may have seen the termination of these cases at the hospital, can bear witness to their success, as far as the formation of a good stump is concerned. I have, however, found that there are evils practically resulting from this mode of amputation below the knee, and occurring during the operation itself, which, though I believe they do not interfere with its ultimate success, are still objections sufficient to induce many surgeons to give a preference to the circular operation. Amongst others, the high authority of Sir C. Bell is in favour of the circular operation, on account of the evils found to occur during the operation itself. He states as an objection to the flap amputation, that the muscle is larger than the integuments, and that the gastrocnemius projects beyond the skin, when the flap is brought over the face of the stump; he also says that the vessels and nerves are divided obliquely. These disadvantages are precisely what I have found to occur in practice from the usual flap operation; the projection of the muscle beyond the skin in muscular persons, when the flap is turned up, I have found a great inconvenience, and one which makes it necessary to strain the integuments more than is desirable to bring them over the mass of muscle. One of the evils, and not the least, is the manner in which the nerves are sometimes divided; it will occasionally be found that the long knife, in passing downwards to form the posterior flap, carries along its edge for some distance the large nerve of the leg before it is divided by the movement of the instrument backwards; this I have found to occur in two cases in which I have operated at the hospital, when fully an inch of the posterior tibial nerve was in each case hanging out from the flap, rendering it necessary to cut the nerve off close to the surface. Some of you have seen the pain which this has caused, though done as quickly as possible; the vessels are also divided obliquely, and here I have found greater difficulty in securing them than when cut transversely. The practical inconveniences attendant on this mode of operating I consider to be three: first, the projection of the muscle beyond the integuments; second, the oblique division of nerves; and lastly, the oblique division of the vessels. These, I admit, are all serious objections to the usual flap operation at this place, and have been sufficient to induce Sir C. Bell to recommend its being given up altogether. The same difficulty has occurred to other surgeons during the past and present century, and various contrivances have at different times been thought of, and employed, to obviate these disadvantages, by those who, for other reasons, give a preference to the flap. It has been proposed to cut off a portion of the muscle from the flap; in fact, to slice

off that which is suberabundant. I need hardly say that this appears to be altogether objectionable. The German surgeons have tried different ways of diminishing the quantity of muscle while preserving sufficient integument to cover the flap—such as drawing up the skin, and bending the ankle-joint at the time the incision is being made. This proceeding would be likely, to some extent, to obviate the difficulty, but not, I should think, sufficiently so to remove it entirely; at least, not in muscular persons. A knife curved laterally was employed, I believe, by Graafe, with the intention of diminishing the quantity of muscle by scooping a portion of it from the flap as it was carried along. Of these contrivances I can say nothing from my own experience, but should consider them not sufficient to prevent entirely the evils I have spoken of.

The mode of operating employed in this case I first tried a few months ago at St. Peter's Hospital, on a man named Morris, and found that by it all the inconveniences alluded to were avoided, for the man left the house with an exceedingly good stump, and now makes good use of in his vocation as a sweeper of one of the crossings at Clifton. I shall now describe the operation as I performed it yesterday, and if you examine the limb removed, which lies on the table, you will easily understand its stages. An incision was made anteriorly across the fore part of the leg, in the usual situation, about two inches below the tuberosity of the tibia; it extended from the inner angle of that bone to a point behind the fibula; from the termination of this incision, on the inner side of the leg, the knife was carried downwards to some extent, next across the limb posteriorly in a curved line, and brought up at the outer side, so as to unite with the front incision behind the fibula. In this manner a portion of integument was divided, which might be correctly described as representing two-thirds of an oval figure. This incision should go through the skin and subjacent tissue, down to the fascia covering the muscles; the contraction of the integument itself, with a trifling assistance, by drawing the skin upwards, leaving a separation of about half an inch between the edges of the incision. A long catlin was now pushed through the leg, about one-third of an inch behind the bones, and carried downwards, and next backwards, so as to make a flap of muscle, its edges corresponding with those of the retracted integument. The remaining muscles were next divided transversely; in this division are contained the large vessels and nerves, which are those cut transversely. The bones were separated, the sharp angle of the tibia was sawn off, and the arteries secured in the usual way. The flap, when brought up over the face of the stump, was entirely and abundantly covered by skin; three sutures were used, assisted by two broad pieces of strapping; a cloth wetted in cold water was applied over the stump, and the man removed. I prefer sutures in this operation, on account of the weight of the flap having a tendency to draw it down, and thus separate it from the anterior surface. These I always remove on the third day, and have not found any inconvenience from their use.

Should this case escape the usual casualties succeeding to amputations, I have no doubt the patient will leave the hospital with an excellent stump. In

the remarks now offered, I have not alluded to other questions involved in the comparative merits of flap and circular amputations, such as the mortality after each, the chance of secondary hæmorrhage, of union by the first intention, &c. These I shall consider at another time.

In conclusion, Gentlemen, should you decidé on giving a preference to the flap operation, when in after years you may be called on in practice to make the decision, I can safely recommend to you its performance in the way I have described.

PULMONARY EMPHYSEMA AS A CAUSE OF DEATH.

TO THE EDITORS OF THE PROVINCIAL MEDICAL JOURNAL.

GENTLEMEN,—The following cases of pulmonary emphysema will probably be deemed interesting, as bearing upon the question considered in the memoir of M. Prus, noticed in your Number for June 4, p. 176.

I am, Gentlemen,
Your obedient servant,
R. T. HUNT.

Manchester, June 20, 1842.

CASE I.—Rachael Rigby, aged one year and ten months, a strong, healthy child, has suffered from pertussis, with occasional dyspnœa, for three weeks. She has had no vomiting; her appetite has continued good, and she has run about as usual.

January 16, 1833, Five, p.m. Whilst out of doors, she was suddenly attacked with severe dyspnœa, the character of which was quite different from any that I had previously observed in chest affections. Inspiration and expiration were equally difficult, and both accompanied by violent and continuous struggles, which affected all the limbs; inspiration had a hoarse, croupy sound; every paroxysm of coughing produced a deep scarlet suffusion of the face, succeeded by lividity, with the lips of a deep purple color; the pulse was too rapid to be counted; she was perfectly sensible, and appeared to suffer most acutely. Six leeches were ordered to be applied to the chest, and eight grains of ipecacuanha to be taken immediately, and frequently repeated. The ipecacuanha had no emetic effect, and there was nearly three hours delay before the leeches were applied, in which time the symptoms, if possible, had become more aggravated. The bleeding, although very free, produced neither coolness of extremities nor the slightest faintness; and at half-past eleven, p.m., the child died, the symptoms having continued the same nearly to the last.

Autopsy, 17th.

Upon opening the thorax, the lungs, instead of presenting their usual collapsed appearance, not only completely filled the pleural sacs, but even rose above the level of the divided cartilages. The lungs were of a light reddish colour, and their pleural surfaces bright and shining, and showing no trace of adhesions. At first they appeared quite healthy, but upon closer examination there were distinctly seen beneath the

pleura, occupying every visible part of the lungs, minute pearl-like globules, smaller than the head of a pin, all of the same size, and apparently constituting what Laennec has called vesicular pulmonary emphysema, or dilatation of the minute air vesicles. None of these vesicles were prominent upon the surface of the lungs. Rupture of a few vesicles was found where the pleura pulmonalis is connected with the pericardium, and the irregular form of these small collections of air, thus extravasated, at once distinguished them from those which I have called the dilated vesicles. The trachea and bronchi were not inflamed, but the interior of the larynx was slightly so, and near the rima glottidis a minute speck of lymph-like mucus was attached to the mucous membrane. The heart and abdominal and pelvic viscera were healthy, but all the abdominal veins were much gorged with blood. The brain was not examined.

CASE II.—Mrs. J., aged about thirty-four, mother of several children, had enjoyed good health for several years, but had a tendency to plethora, and was of a florid complexion. She had been suffering from a troublesome cough since January 2, 1835, for which a blister, a common linctus, and a mucilaginous mixture, with small doses of potassio-tartrate of antimony, had been prescribed. On the 6th, the cough having increased, and being accompanied by dyspnœa, a sensation of weight in the chest, quick pulse, and checked urinary secretion, she was bled from the arm to syncope, and the dose of potassio-tartrate increased. She was much relieved, and continued improving until the evening of the 8th, when the cough suddenly became extremely harassing, and the dyspnœa very urgent.

When I saw her the symptoms had assumed a similar character to those described in the previous case, with two exceptions: the colour of the countenance, which to the last remained of a deep scarlet, never assumed the livid appearance; and free perspiration of the whole cutaneous surface, but more particularly of the head and face, existed. A mustard poultice was applied to the sternal region, and she took during the night sixteen grains of the potassio-tartrate of antimony, which produced only slight vomiting, and she died about six, a.m., on the 9th, having continued perfectly sensible to the last.

Autopsy.

The thoracic viscera presented characters so nearly similar to the former case, that a repetition is unnecessary.

CASE III.—About three years since, through the kindness of my friend and colleague, Mr. Lynch, I witnessed the examination of the following case of emphysema:—A home patient of the Lying-in Hospital, a strong, plethoric female, about thirty years old, at the full period of pregnancy, felt so ill that she sent for her midwife, who, when she came, told her there were no signs of labour, and that she must send for the surgeon. When Mr. Lynch arrived the female was dead. All that could be learned from the friends was, that she had lately suffered from cough, which had suddenly become very harassing and painful, and that up to the time of her death she had been perfectly sensible.

There were no appearances in the uterus or appendages indicative of the commencement of parturition or of disease. All the abdominal veins were much