tempt to cure by distal ligature of the carotid and subclavian arteries; but I am not able to speak with any great enthusiasm on the subject.

I should resort to it, in performing such an operation, more from a sense of duty to my patient than with any great hope of success; and I should congratulate myself with profound thankfulness if, in any case, I succeeded in achieving permanent success.

Anæsthetics in Thoracic Operations.—One word on the propriety of the use of anæsthetics when performing any serious operation on the chest.

In many instances, especially where the performance of the operation is likely to be prolonged, or great pain is likely to be given, I would plead for the use of ether.

I have never seen any harm arise from its administration for such an operation, even though the sense of impending suffocation, due to the disease, has seemed to contraindicate it; but it is not, by any means, necessary in all cases; and the help that the conscious patient is able to afford us, by change of position, by greater or less efforts at expansion or contraction of the chest-walls, and in many little ways, is too great to be sacrificed for anything short of absolute necessity.

The Use of Antiseptics.—Of the use of antiseptics, I would say exactly the reverse; and I should regard myself as very culpable if I undertook any, even the simplest of such operations, without the use of every possible available antiseptic safeguard.

In even the most pressing cases, and under the most urgent circumstances, much may be done in this way.

A little turpentine wherewith to cleanse the skin; a little cotton-wool wherewith to filter any air that may or must enter the chest, are to be found in every house; and absolute purification of every instrument used, with ceaseless care in dressing, are essential in every case.

This I consider, gentlemen, to be a correct exposition of the present state of thoracic surgery; and I thank you for the patience with which you have listened to my attempt to lay it before you.

GANGRENOUS ABSCESS OF THE LUNG, PROBABLY CAUSED BY THE STUMP OF A TOOTH PASSING INTO THE RIGHT BRONCHUS, TREATED BY PUNCTURE AND DRAINAGE; RECOVERY.

By WILLIAM STRANGE, M.D.,
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It is the great and justifiable boast of modern surgery that it has carried its operations into the great cavities with a certainty and success almost equal to that which it has long claimed when dealing with the external organs of the human body. But I think that the physician of to-day may equally pride himself upon the increased exactitude of his diagnosis of diseases of the internal organs, and assert that, without the assistance of this more exact discrimination of the seat and nature of these diseases, the success which the surgeon claims for his bold operations would be very much reduced. Take the splendid achievements of modern surgery in regard to the abdominal cavity and its contents. Section, incision, ablation, or mere exploration of the abdomen is now undertaken with almost as light a heart as the reduction of a strangulated hernia or the removal of a necrosed bone. Yet it was the physicians who showed the way to this greater certainty and boldness of operating by bringing to bear upon the diagnosis of such cases greater acumen and greater discrimination than had ever before been used. And the same endeavour after greater certainty of diagnosis has been made in the case of the other great cavities, those of the chest and the cranium. We must admit, however, that a similar advance has not yet been made in these regions. We may ask if this difference arises from greater dread of the results of opening the cavities of the chest and the cranium, or from consciousness of defective diagnosis? Scarcely the former, because until a quite recent period no cavity of the body was held so sacred, so unapproachable, as that of the abdomen. Now, we do not scruple to open it for all sorts of reasons, nor hesitate to explore its contents, even when our notions as to what we shall find there are of the very haziest kind.

It is, then, probably the other matter which acts as a deterrent, namely, defective diagnosis. And I rather believe this to be so because, whenever a fairly easy diagnosis can be made, men have not been deterred from thrusting, for instance, a trocar into the cavity of the pericardium, or into the ventricles of the brain, or, as in the case

I am about to relate, into the lung itself. And yet, in the case of the pectoral and the cranial cavities, it is not quite the difficulty of making an exact diagnosis only which makes us pause, but to some extent the difficulty, when we get there, of finding what we are in search of, caused by the natural repugnance of the brain and the lungs to be meddled with; and the difficulty, or rather the impossibility, of turning them inside out, as we do the contents of the abdomen. When, however, the diagnosis is simple and the necessity urgent, we need not hesitate to open the pectoral cavity and its enclosure, the pericardium. In some cases it is not difficult to conclude that the latter is full of serum, and that the action of the heart is becoming fatally impeded thereby. My friend Mr Wheelhouse, of Leeds, some time ago rescued from impending heart suffocation a case of this kind, and others are on record. Again, large cavities within a phthisical lung are easy of discovery. The puncture and evacuation of their contents has been practised on several occasions, but hitherto with small results as to any benefit conferred by it. Puncture of the skull also, when the diagnosis is easy, as in some cases of chronic hydrocranium, is a simple, and sometimes a successful operation.

Successful puncture or opening of the skull to remove tumours in cases where the diagnosis has been worked out by the most splendid efforts of inductive reasoning, which has been done lately by Dr. Ferrier and others, is one of the medical marvels of the last few years.

R. M., a robust young woman, aged 23, with well-developed chest and fine physique, and in good health, although in infancy she had been the subject of scrofulous abscesses of the hands and feet, took chloroform for the extraction of several stumps of teeth, on February 17th, 1887. A few days afterwards a troublesome irritative cough came on, with slight muco-purulent expectoration. This condition continued until the month of June—four months. During this time she was never entirely laid up, although frequently confined to her bed for two or three days; nor did she lose very much flesh or appetite. The cough continued to annoy her greatly; the expectoration increased, and the strength began to fail. She was first seen by me as an out-patient at the Infirmary on June 8th, and on the 15th her case appeared to be so serious that she was placed under treatment in a private house.

Symptoms.—There was almost incessant cough, preventing any sleep, except by the use of narcotics; large muco-purulent expectoration, which was very offensive; coarse rales were heard over a large area of the centre of the right lung, extending from the upper third of the scapula down to the ninth rib vertically, and from close to the spine to just above the nipple transversely. In front, there was great tenderness over the third, fourth, and fifth ribs, but no pointing or bulging of the intercostal spaces. Over the other parts of the lung respiration was free and normal, with the exception of some dulness at the base. The left lung was rather hyper-resonant. The paroxysms of coughing continued unceasingly for several hours at a time, almost abolishing sleep. There was not very much loss of flesh; the appetite good; pulse 110; temperature 102° F.

At a loss to conjecture a sufficient cause for this condition of the lung, all signs of pneumonia or of tuberculosis being absent, I fell back upon the history of the tooth-drawing business. From the account given to me by a young friend who accompanied the patient to the dentist, it appeared very probable that a stump had escaped the operator, and had passed down the trachea into the right bronchus. This idea was confirmed by the friend stating that there was great searching of the mouth for a stump, and some alarm expressed. Further, she stated that before the patient applied to me at the Infirmary, rings of cartilage, showing necrosis, were found in the sputum, which was horribly offensive. From June 15th to July 18th the case continued to increase in severity and urgency. The cough was almost incessant; bad bedsores formed from the continuous sitting posture; the temperature, however, only varied between 101.4° and 99°, and was often normal.

The pulse on June 16th was 146, on the 19th 160, then it fell gradually to 120 on the 26th, again rose to 140 or more, and finally dropped, under large doses of brandy, to 120, where it remained until July 18th, the thirty third day of treatment, and five months from the date of the tooth drawing. During the whole of this time hectic fever continued to consume the patient's strength. The expectoration was putrid to the last degree, the room, and also the house itself, being only rendered bearable by chlorine gas freely used, with deodorants to the sputum. For some time past the sputum had contained a large quantity of broken down pulmonary tissue which settled in quantities to the bottom of the vessel. From two to three pints of this stinking stuff were expectorated daily. Occasionally it ran in a

stream from the patient's mouth, and this caused a very tiresome apthous condition. Large amphoric breathing with metallic tinkling was now heard in the centre of the lung over a space of over four inches square.

The hope that the abscess would finally empty itself, and give the patient a chance of recovery at length died away. The quantity of pus expectorated was increasing instead of diminishing, and the strength was reduced to the lowest ebb by the violent hectic and loss of sleep.

Having now, on July 18th, five months from the access of cough, to deal with the above named state of things, namely, a gangrenous abscess of very large dimensions, with continuous destruction of lung tissue, and which abscess had certainly existed for thirty-four days, if not longer, I came to the conclusion that nothing but puncture of the lung, reaching the abscess, and draining it, would give the patient any chance of surviving, even for a few days. Sir W. Foster had seen the patient with me a few days before this time, and, although disposed to recommend a little more delay, he agreed with me that puncture would probably have to be performed to give the girl the only, though a remote, chance of recovery.

July 18th. Convinced myself that even another day's delay might prove fatal, I resolved to operate. Assisted by my colleague, Dr. Crowe, the needle of an aspirator was pushed quite home into the chest, just below the ninth rib, and at one inch behind the axillary line. A drop of pus appeared almost at once. Withdrawing the needle, a large curved trocar, nine inches in length, was thrust in its track to a depth of about eight inches in an upward and forward direction towards the fifth interspace in front. Pus of the same stinking character as that expectorated followed in large quantity. A drainage-tube was now pushed home through the cannula of the trocar by means of a probe, and the trocar was then withdrawn. The wound was dressed antiseptically with plenty of carbolic tow. There was no bleeding, nor any escape of pus or air into the pleural sac.

The subsequent history of the case may be given very briefly. Immediately after the puncture the expectoration lessened to a great extent, and in a few days quite lost its gangrenous odour, nor did any lung tissue now appear in it. The cavity was syringed out with fluid sanitas once, sometimes twice, a day; but in two or three days the discharge was reduced to small dimensions, and quite lost its offensive smell. The rapid diminution in the quantity of pus discharged after drainage was set up proves, I think, that the secretion of such immense quantities had been kept up by the presence of the pus itself in the lung.

The condition of the patient improved so rapidly that in a few days hopes of recovery could be entertained. The pulse, indeed, remained small and very feeble, about 120; but the respiration became much easier, and fell from 48 or 50 to 36, or thereabouts. She was now able to lie down, which for weeks she had not been able to do. The night sweats diminished, and sleep was obtained.

Ten days after puncture the patient had so far improved that I ventured to leave her to attend the meeting of the British Medical Association in Dublin. On the twelfth day after puncture the tube was taken out and shortened about two inches, as its extremity was causing pain in the lung, apparently from the granulating process going on in it and the tube impinging against it. It was exchanged for one of larger calibre, in the hope that the tooth stump might be expelled through it, but it never appeared. On August 17th, the sixty-fourth day of treatment, and the thirty-second day after puncture, the tube was finally withdrawn, the discharge having practically ceased. The wound soon healed. The condition of the lung at this date was as follows: There were a few small *râles* over the central portion of the abscess space, normal respiration having returned to the greater part of the lung. There was some distant amphoric breathing in the centre, and some dullness below the point of puncture, but there was no evidence of any pus being contained in the pleural cavity. What dullness there was appeared to be owing to the compression which the lung had undergone by the abscess. Expectoration slight; mucoid; no smell; still a little irritative cough; the hectic gone; the bedsores, which were very severe and tending towards gangrene, showing signs of improvement; appetite returning; temperature generally below normal; pulse 114; very weak.

The treatment throughout was, of course, of the most sustaining character, with wine and brandy in very large quantities. Turpentine inhalations were used when it was possible for the patient to breathe them, and terebinte was given internally, but without much apparent benefit. Large doses of quinine, arsenic, and iron were given so long as they were required.

On September 12th, seven months after the accident, and fifty-five days after puncture, she was discharged cured. She went out for a drive for the first time on that day.

Condition of the lung at this date: The respiration was everywhere normal, except a slight dullness at the base, where it had always been dull, and a very little amphoric breathing just in the centre. There was cough at times, especially on exertion, or on taking a long breath, and some mucous expectoration. There was considerable flattening over the site of the abscess, otherwise the chest was rapidly resuming its former fine development. Her appetite was good, and she was rapidly laying on flesh. The bedsores were still unhealed, they having caused an enormous loss of muscular structure.

Condition on October 27th. Eight months after accession of mischief, and six weeks after last report, she had gained flesh to the amount of two stones; her appetite was good; she could walk alone a short distance. There was some irritative cough on exertion, owing, probably, to the cicatricial contraction of the lung tissue. The breath sounds throughout the affected lung were entirely normal, except a little remaining dullness at the base. There was no pectoriloquy, metallic tinkling, or amphoric resonance. In fact, all signs of this immense abscess and its cavity had disappeared.

REMARKS.—Cases of gangrenous abscess of the lung are not very uncommon, particularly where old bronchiectasis exists. A few such cases have been treated by incision. Two, to which Dr. Saundby has kindly referred me, were reported March, 1886, to the Royal Medical and Chirurgical Society by Dr. C. T. Williams and Mr. Godlee. They were both cases of bronchiectasis, treated by incision and drainage. These gentlemen held that the indications for operation were (1) the disease confined to one lung, (2) situate in the lower lobe, (3) with adherent pleura. Of course it will be seen that in my case bronchiectasis was entirely excluded. There had been no evidence of any abnormal condition of the lung previous to the tooth-drawing. In fact, the patient was up to that time in perfect health. It may be thought that there were some favourable circumstances in this case which tended towards the hope that a happy issue would crown the operation. It may be supposed that the abscess had crept up close to the pulmonary pleura, so that a small depth of lung only had to be punctured. Adhesion to the costal pleura may also be supposed, preventing the shedding of pus or air into the pleural cavity, and the setting up of either an empyema or a pneumothorax, or both. I do not believe that any of these favourable conditions were present in this case. First, because the pus was not reached until about seven inches had been traversed by the trocar; and, secondly, because there had been no pleurisy capable of gluing the two surfaces of the pleura together. Both auscultation and percussion pointed to the presence of a considerable layer of sound lung between the pleura and the abscess wall, which layer was at least several inches thick. If I am called upon to explain the absence of bleeding at the operation, and of effusion of air or pus into the pleural cavity, I can only say that I attribute it all to the resiliency of the healthy portion of the lung, and the pressure exerted by the close-fitting piece of elastic tubing which was inserted immediately after the pus had been evacuated.

A NEW DEPARTURE IN THE DIAGNOSIS OF HEART MURMURS.

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It is needless to occupy space by enumerating evidences of the uncertainties and difficulties surrounding the diagnosis of cardiac murmurs. If proofs were demanded, one has only to refer to the recent revival of the battle of Presystolic *v.* Systolic Murmurs, waged with rare ability in the Medical Society of London, and by Professor Gairdner and Dr. Dickinson elsewhere. The object of the present contribution is to point out the cause of the difficulties, and to suggest a method by which they can be, to some extent, overcome.

The site of maximum intensity, direction of conduction, and quality of the *bruit* (each of importance and value) may be omitted from our present consideration, the question of rhythm only falling under the scope of this paper. Given an ordinary case of valvular lesion, where, say, one murmur is heard about the region of the apex; the physician or student attempts to determine the relation of this murmur to the systole or first sound of the heart. If a normal first sound be present, there may be little difficulty; but very often the systolic sound cannot be discriminated from the second; it may be absent and its place taken by the murmur, or both sounds may be so altered that the ear fails to distinguish which of the three sounds is the murmur