LECTURES ON THE PRINCIPLES OF SURGICAL DIAGNOSIS: ESPECIALLY IN RELATION TO SHOCK AND VISCERAL LESIONS.

Delivered at the Royal College of Surgeons of England.

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LECTURE III.—LESIONS OF THE NECK AND THROAT.

Penetrating Wounds.—Cut Throat.—Shock.—Contusion of the Larynx.—Scalded Throat.—Foreign Bodies in the Larynx and Trachea.—Tracheotomy.—Foreign Bodies in the Pharynx and Œsophagus.—Wounds of the Heart.—Parallel between Injuries of the Brain and Lungs.

MR. PRESIDENT AND GENTLEMEN,—The diagnosis of traumatic lesions of the air-passages, either from accident or by design, is, generally speaking, simple and evident, in consequence of the palpable character of the injury, or of the unequivocal nature of the attendant signs and symptoms. The same may be said, with some qualification, of the pharynx and Œsophagus; and of all it may be remarked that an early fatality often attends the lesions of parts so essential to life.

The proximity to each other of the organs referred to, associates them in some respects in the performance of their functions, and renders them obnoxious to injuries affecting them simultaneously. Thus, the special provisions existing for the security of the larynx and trachea are imperilled by the ingestion of food, when the functions of either part are interfered with by wound or other injury; and the arrangements for modifying the asperity of the external air, and of filtering from it the floating particles which abound in it, are likewise suspended when that air is admitted to the lungs by an artificial and more direct channel; and a source of irritation is thus occasioned, which is often productive of serious evil.

The various and important structures which are packed in so small a compass in the neck and upper outlet of the chest, are all liable to injury from external violence; and the consequence of such violence is, therefore, not infrequently of a complex character. The wound inflicted by the would-be suicide, or the stab of the assassin, may thus involve the air-passages, the great vessels, and the nerves of the neck; and the well-known fatal plunge of the dagger behind the clavicle may not only sever nerves and vessels, but penetrate the lung itself.

The treatment of penetrating wounds of the neck, accompanied by profuse arterial hæmorrhage, is dependent on the correctness of the diagnosis as regards the wounded vessel or vessels; and this diagnosis is by no means easy, when a pointed weapon with a cutting edge has passed obliquely and deeply into the cervical region behind the angle of the jaw. By such a wound, either the external or internal carotid may be laid open, or some branches only of the former may yield the blood. A careful dissection might, no doubt, display the source of hæmorrhage; but the circumstances are not such as to admit of this investigation; and I know of no other means of acquiring with certainty the required information.

Two such cases have come under my care, and in each I pursued the same course, in placing a ligature on the common carotid trunk. The injury was inflicted in the same way, and with the same form of instrument, in both instances; a pointed table-knife was plunged downwards and inwards behind the angle of the jaw. The bleeding was in each case controlled only by direct pressure with the finger in the wound; and whilst this pressure was maintained, I tied the artery. Not an untoward symptom accompanied or followed either of these operations. In one, a salivary fistula continued open for some time, in communication with the original wound; but this was closed by a single application of heated wire. The only other point of interest which struck me, in connection with one of these cases was, the sudden and profuse gush of arterial blood, which immediately followed the removal of the pressure, after the ligature was applied; but this was only a single rush, and then it ceased. The absence of any symptoms indicating such lesion, led me to conclude that no nerves of importance were implicated in these injuries; and no cerebral symptoms were observed during the period of convalescence or subsequently.

It is somewhat remarkable how constantly the large vascular trunks of the neck escape injury in self-inflicted wounds of the throat. The prominence of the larynx in the median line and of the sterno-mastoid laterally contribute to this result; and the protection afforded by the muscles is probably favoured by their excited spasmodic action during the suicidal attempt. No doubt the popular conviction that the speediest mode of destroying life is to open the wind-pipe, aids in producing this result; yet, I have known many instances in which the wound was both long and deep, where similar immunity has existed in behalf of the large vessels and nerves. The thyroid and lingual branches of the carotid are most frequently wounded; yet, without these being implicated, the venous bleeding is often very profuse, and is succeeded by syncope and suspension of the hæmorrhage. It is at this stage that these cases are usually brought under the notice of the surgeon; and it behoves him not to be deceived by the signs of arrested bleeding. It is rarely that patients succumb to the first loss of blood, unless a large trunk is involved: but if this interval be lost, and recurrent hæmorrhage come on with reaction, the second collapse is often fatal. The track of these wounds, and the parts implicated, are rarely doubtful, except in respect of the minor vessels involved; and the thyro-hyoid space is the most common line of incision; but its position may be either above or below this point. It is very rarely, in my experience, that the trachea is laid open, although I have frequently seen the throat, or rather the cavity of the mouth, exposed by an incision above the hyoid bone; and other cases in which the determined hand of the suicide has partially divided the posterior wall of the pharynx. The hæmorrhage is generally greater when the incision is above the hyoid bone, one or both lingual arteries being severed with the base of the tongue: the epiglottis is not necessarily implicated, the line of separation usually leaving it below; but the injury of this valve does not entail the serious consequences which a consideration of its functions would suggest.

The intrusion of blood into the air-tubes is indicated by irritation and a sense of suffocation, requiring the precaution of leaving the wound freely open: and the diminished sensibility of the glottis, under these circumstances, is manifested by the occasional introduction of food into the larynx—a sign which, therefore, is not to be accepted as a proof that the pharynx is implicated, when the wound is below the entrance to the air-tube. If the wound be above the thyroid cartilage, symptoms of apnoea may be due to œdema of the glottis; but this is a rare complication so far as my observation enables me to judge.

Difficulty in deglutition is often superadded to the other consequences of these wounds, and necessitates artificial feeding for a time. Not infrequently the suicidal attempt is frustrated by cutting on the thyroid cartilage, which may be notched and jagged in the effort to divide it: and if any doubt exist as to whether the air-tube is implicated, the exit of air or the occurrence of emphysema sets the question at rest.

The later occurrence of bronchitis and pneumonia is indicated by the usual symptoms attending these affections, and is a common cause of mortality, when patients have survived the earlier risks consequent on exposure of the air-tube to the direct ingress of air. I do not mean that a fatal issue from this cause is a common occurrence, for these cases, as a rule, recover, if the patients survive the first few days; but when death does occur at a later period, it is usually the consequence of lung-mischief.

When the wound is low down, just above the outlet of the chest, the contiguity of the thoracic viscera may determine their implication in the resulting inflammation. This circumstance is exemplified in a case which occurred during last year in St. Thomas's Hospital. The cricoid cartilage was cut partially through and wounded in several places, and the connecting membranes were divided above and below it. The patient died on the fourth day from pleurisy; the areolar tissue behind the trachea was infiltrated with pus from the wound in the throat, and the pleura had become inflamed from contiguity to the burrowing abscess. In another case which occurred about two years since, and in which the incision extended deeply above the hyoid bone, death resulted in about twenty-four hours—dyspnoea, from some unexplained cause during life, coming on gradually, and increasing until life was extinct. At the autopsy, the blood in the heart was found churned up and frothy, and there were several isolated patches of recent hæmorrhage and consolidation in different parts of the lungs. Further investigation at the seat of injury suggested that a half-divided vein, which had been ligatured only on its distal or bleeding side, had slowly absorbed air, the admixture of which with the blood had proved fatal.

The amount of shock which accompanies these wounds varies very considerably; and this is due to circumstances which demand the consideration of the surgeon. The previous mental condition and habits of the patient greatly influence this result; and neglect in attending to these antecedents may seriously mislead the surgeon in his subsequent treatment. Thus, in a case in which, during a drunken frolic,

the throat of a patient of mine was severely wounded by one of his comrades who attempted to cut off his beard with a table-knife, though the bleeding was profuse, the shock was trivial; and, as no important parts were injured, he soon recovered. Yet, in other cases I have known death to result from shock where the hæmorrhage was not abundant: but, in these instances, the moral depression of the patient, complicated, as is often the case, with habits of intoxication, leaves him a prey to shock which is, no doubt, due partly to loss of blood, but chiefly to depressed vital power. A remarkable case, belonging to this class, was referred to in my former course of lectures, when I was discussing the subject of shock generally. The patient was a middle-aged man, and we had no proof of his having lost very much blood from the wound in his throat, no vessel of sufficient size to require a ligature having been opened. Yet, one hour afterwards, the temperature had sunk to 91.2 deg., and all the symptoms of collapse were well-marked. In eight hours the temperature had regained its normal standard; and, after the lapse of twenty-four hours, it had risen more than two degrees above that standard. This patient's mental condition was very depressed and desponding; but he recovered.

In the other cases which I have collected, belonging to this category, I find that although, in almost all, the general symptoms of shock were pronounced, the temperature did not descend below 96 deg., and never exceeded 101.5 deg., the maximum being attained in about twenty-four hours; with the exception of one fatal case, in which the trachea and half of the œsophagus were divided. In this instance, the temperature rose to nearly 103 deg. at the expiration of thirty-two hours; but the patient died eight hours afterwards.

The accidental concurrence of certain states of the system with these self-inflicted injuries should not, therefore, be lost sight of, as the actual state of the patient may be thereby importantly influenced, and the diagnosis rendered perplexing. Sometimes long-continued and concealed bodily suffering may determine the suicide to take the rash step of striving thus to end his suffering, of which I have seen many examples: and moral depression in most cases aggravates the consequences of the deed. In a recent instance where the wound was superficial—had implicated neither larynx nor trachea, the patient died with symptoms of pericarditis: and it was this disease which actually destroyed life, as was verified *post mortem*. But it had also been ascertained, before death, that the precordial pain was so intense as to induce the poor fellow to seek relief in suicide. The seat of suffering, in these cases, is not infrequently selected for the self-inflicted injury.

An analysis of eighteen cases of cut-throat which have been admitted into St. Thomas's Hospital during the last three years, fairly represents the results of my observation extending over a lengthened period. Fifteen of these patients were male, and three female: eleven recovered, and seven died. In five the wound was only superficial, neither trachea nor larynx being involved. One of these is that to which I have just alluded, as complicated with pericarditis, and the only one of them which proved fatal. In six cases the wound was above the hyoid bone, and in four of these the injury was fatal: and of the remaining two, one was a case in which only the muscles of the tongue were divided, but neither larynx nor mouth was laid open. Of the four fatal cases, one died from shock and delirium one day after admission; two died from hæmorrhage soon after they were received into the hospital. In one of these, a patient of my own, the left lingual artery was divided, the right just escaping; in the others, only some smaller branches required ligatures. One was the case referred to, in which air was imbibed by the open mouth of a partially divided vein. In five cases the wound was through the thyro-hyoid membrane, and all the patients recovered. I may remark that, in one of these, which was under my care, the primary hæmorrhage was very profuse, though no artery of importance was cut; and being, therefore, principally venous, there was no recurrent bleeding. The wound in this case extended obliquely upwards, and severed a portion of the epiglottis; but, the skin overlapping, the patient soon began to breathe by his mouth, and recovered his voice in about a week; though deglutition continued, for a time, painful and embarrassed, and he had a distressing cough, but no bronchitis.

In one case, the thyroid cartilage was notched in several places; and the patient, a woman, died on the second day from shock, combined with previous loss of blood. The last case was that in which the cricoid cartilage was cut, and which proved fatal from pleurisy. In no one of these cases was any fistulous opening left in communication with the air-passage. Indeed, according to my observation, such consequence is very rare.

I may observe that the general remarks which precede these very limited statistics were founded upon a much wider basis than the foregoing cases afford; but the analysis I have given supports these remarks, which were written before I obtained it.

Severe contusions or fracture of the larynx are not of frequent occurrence. The protection afforded by the symphysis of the lower jaw, and the mobility of the air-tube on the front of the neck, probably account for the rarity of such injuries as entail serious interference with the functions of the parts. A female, of middle age, was admitted into the hospital under my care about two years since, whose case exemplifies this condition. She had been struck violently on the chin with a fist—I am afraid it was that of her husband; she did not know whether she was struck on the throat. The chin was bruised, and there was great tenderness over the temporo-maxillary articulation. Manipulation of the larynx caused great pain, and so likewise did the effort of deglutition: aphonia was complete. No irregularity could be detected when the thyroid cartilage was examined; but, during deglutition, a peculiar sensation was communicated to the fingers, as if a piece of the cartilage were detached towards its upper part; and at the same time the saliva was heard to gurgle loudly in the throat. There was no blood in the sputa. In about ten days she began to recover her voice; and in three weeks was quite well. I am disposed to doubt whether there was in this instance more than severe contusion, though I believe it quite possible that severe injury may be inflicted on the larynx by the lower jaw being violently forced back against it. But the patient recovered rapidly; and functional disturbance would account for most of the symptoms, including loss of voice. As regards the sensations communicated to the touch, in moving the larynx from side to side on the cervical spine or in deglutition, the manipulator may be deceived, especially when the larynx is large and in elderly persons, by the peculiar feeling of roughness or inequality which is thus elicited. This simple circumstance should not be lost sight of in the diagnosis of these injuries.

Another form of lesion which I may notice here as of not infrequent occurrence, is that produced by the contact of hot water with the fauces and throat. This accident occurs in young children, who attempt to drink from the spout of a tea-kettle. Whether, under these circumstances, the mischief primarily affects the lower part of the pharynx, or whether, indeed, any of the scalding water is actually swallowed, I have not been able to satisfy myself, but I think not. The condition of the mucous membrane of the mouth, fauces, and tonsils, which is produced by the contact of water at a high temperature, is neither aphtha nor vesication, but a white, patchy appearance, indicating destruction of the surface of the membrane. The local suffering is not commensurate with the extent or amount of lesion; but the shock is generally considerable. The fatality of this lesion is due to obstructed respiration from inflammatory swelling in the neighbourhood of the glottis, or from subsequent pneumonia.

Of the beneficial effect of tracheotomy in these cases I am very sceptical, judging by the results of such as have come under my observation; although I do not doubt that, in threatening suffocation from cedema, it may be the only expedient by which life can be saved. Of the actual condition of the lungs, and of the cause of that condition, I am not prepared to speak positively; but I am disposed to call in question the commonly received opinion, that extension of inflammation from the injured parts is the true explanation of the pulmonary symptoms. As these points are well illustrated in the last case of the kind under my care, I will relate its history.

About half-past one in the day, a little boy, rather more than four years old, attempted to drink some water at boiling heat from the spout of a tea-kettle. After much crying he went to sleep, and in about an hour the mother noticed a rattling in his breathing; he had much dyspnoea, and was brought to the hospital. The House-Surgeon did not think the symptoms sufficiently urgent for the child's admission, but he was received on the following morning, and I saw him immediately afterwards, and twenty hours after the occurrence of the accident. His feet and hands were cold, pulse 156, temperature 99 deg. The breathing was hurried, and there was excessive action of the muscles of inspiration, but the chest was not filled, as shown by the falling in of the epigastrium and intercostal spaces. The lips and nails were slightly dusky, the nostrils dilated, and the eyes staring and dull. The little patient was not insensible but listless. There was a white, soddened appearance, in patches, of the mouth and fauces, with some swelling of the latter. I carefully examined the chest, and found much rattling and loud rhonchus in the trachea; and these sounds seemed to be transmitted to all parts of the chest; there was also large crepitation, especially on the right side; vocal sounds normal; breath-sounds puerile on both sides, and resonance nearly equal. Inspiration was suddenly checked by a croupy catch as the breath was drawn.

During the examination, and subsequently, whilst I remained in the ward, these symptoms became aggravated, the temperature rising to 102.8 deg.; and, though not entertaining a favourable opinion of tracheotomy, I felt compelled to offer this alternative to the parents, who were present, fearing the child might speedily succumb, in consequence

of the obstruction to the ingress of air. Their consent was refused; I therefore ordered beef tea and wine to be immediately administered, and these were swallowed without difficulty. I also directed that a large linseed poultice, with a twelfth part of mustard, should be placed over the chest, and hot bottles to the feet. Very speedy relief followed these remedies: in two or three hours, the child was able to speak easily, to cough with strength, and to breathe more freely.

The croupy catch in inspiration continued, except after coughing, which seemed to clear away the obstruction in the larynx. The pulse, however, was so rapid that it could scarcely be counted, and the temperature had risen to 104.3 deg. Small doses of liq. ammon. acet. and nitric ether were given with some ipecac. wine at intervals. On the following morning, both the pulse and temperature had sunk; but the face was flushed and there was small crepitation over the right lung. On the fourth day, all the symptoms were subsiding, and the child seemed cheerful and disposed to take food; but on the sixth, he had a renewal of the previous condition, suggestive of broncho-pneumonia, which soon disappeared under the application of linseed meal and mustard, as before. On the seventh day, there was only slight dulness and deficiency of breath-sounds, and movement of the ribs on the *left* side, but there was neither crepitation nor evidence of bronchitis on either side, though he had a hacking cough. From this date he rapidly recovered, and was dismissed well on the fourteenth day. The mouth required no special treatment.

I have narrated this case somewhat at length, because some important practical considerations suggest themselves, in connection with the diagnosis of this class of injuries. Was there, at any time, inflammation, properly so-called, of the lung-tissue or of the bronchial membrane? and, if so, how was it produced? If propagated by continuity of surface, the larynx would have been first affected, and the symptoms and signs would have been longer delayed and more persistent. But the crepitation was never very marked, and the dulness and indistinctness of breath-sounds shifted from one side to the other. It was evident that a severe shock had been sustained, and fell principally on the lungs. I am disposed, though I speak with diffidence on this *Medical* subject, to regard the condition of the little patient as denoting nervous shock to the lungs—by which I mean that the vaso-motor nerves, and probably the pneumogastric filaments, were so impressed, and their functions so disturbed, as to cause congestion and its consequences, with other functional derangements which induced the condition noticed, and which was relieved in so marked a manner by the simple means employed. The croupy catch in inspiration seemed to be due, in part, to spasm, and partly, at a later period, to accumulation of tenacious mucus in the larynx.

I have the record of a similar case in a younger child, which occurred about five years since, and which I treated in a similar way, with success: the breathing was rapid and noisy, and the little patient half comatose; but he rallied after remaining two or three days in a critical condition, and was soon convalescent. I think it very probable that if tracheotomy had been performed at the time I contemplated it in the former case, it would have proved fatal, as it has been under similar circumstances, from the entailed consequences of broncho-pneumonia. I cannot regard the opening of the air-tube, especially in children, as an unimportant operation, or as expedient except under urgent circumstances; but I shall return to this subject presently.

Foreign bodies are sometimes introduced into the nostrils, and may remain, entangled in their sinuosities, for an indefinite time, giving rise to irritation and symptoms resembling *ozæna*. I am acquainted with one instance of this sort, in which a button remained so lodged and impacted for years, producing irritation which was subject to aggravation from accidental causes; it was ultimately discovered and removed. In another instance, a gentleman brought to me his child, who was suffering from a suppurative discharge from the nose, which could not be accounted for. I concluded that it was due to a strumous tendency in the child, and directed that a mild astringent injection should be used. A few days afterwards, a black mass was washed out, which proved to be part of a skein of floss silk; and then the little fellow acknowledged that, having watched his grandfather take snuff, he was ambitious to imitate him, and selected the above material, which he introduced into his nose in the same way as he had watched the old gentleman take his snuff.

Both my hospital and private practice have been singularly unproductive in cases in which foreign bodies have been introduced into and retained in the air-passages. Indeed, I think I may say from my personal knowledge that, during the last forty years, not more than two or three cases, coming strictly within this category, have been under treatment within the walls of St. Thomas's Hospital.

I do not include cases in which speedy relief has been obtained without surgical interference—cases in which the inhaled extraneous body,

of whatever nature, has been speedily expelled. With such a limited personal experience, I must content myself by making a few observations which occur to me, in illustration of the diagnosis in this serious class of lesions.

It is well known that death may be the immediate consequence of the impaction of a foreign body in the air-passage, or that the fatal issue may be delayed until after the lapse of weeks, or months, or even of years. In the former case, a large body is usually lodged and immovable in the larynx; and death results from apnoea, partly, though probably not wholly, due to the direct obstruction to respiration thus occasioned; but, probably, also in a measure, the consequence of superadded spasm in the orifice of the larynx. The delayed fatality of these cases is owing to a variety of causes; of which the site and form of the foreign body, as well as its magnitude, are the most important. Thus, impaction of a body in the *lower* part of the larynx, when not of sufficient size seriously to impede respiration, nor of such form nor asperity of surface as to produce mechanical injury where it is located, may remain quiescent for a considerable time, without producing much irritation; for the lining membrane of the larynx is by no means so sensitive here as it is higher up. Again, the constantly shifting position of a smooth object prevents early local irritation from resulting, and gives rise to symptoms which vary according to the position of the intruder—sometimes threatening immediate suffocation, at others leaving the patient tranquil and almost free from inconvenience. In dealing with these cases, it should not be forgotten that inflammatory and spasmodic affections of the larynx are often, in many of their symptoms, allied to the consequences of these accidents; and that the converse is also true: but it must very rarely happen that a careful examination of all the signs, as well as symptoms, and an investigation into the history of the case, can deceive the intelligent surgeon. Yet, there are, sometimes, perplexing and complicating circumstances which may mislead even the most wary. Food may pass into the larynx during intoxication, or, as occurred in a case of my own, which I narrated in one of my Lectures last year, the same accident may complicate the consequences of injury to the head. The patient to whom I refer, was buried by a fall of earth in a drain. As soon as he was dug out he was brought to the hospital. I extract the report of this case from the Lecture to which I refer. "When admitted, he was insensible; his pupils were contracted and sluggish; his breathing was stertorous, and he was convulsed. His respiration became intermittent, and at shorter intervals; and he died comatose after six hours—his heart continuing to beat for some time after respiration ceased. There was not any injury found in the brain or spinal cord; but a part of the contents of the stomach, identified by comparison, had found its way into the trachea, and had blocked up many of the bronchial tubes." This case appeared to be one of suffocation complicated with concussion. How and when the contents of the stomach were transferred thence to the lungs, we have no evidence to show. It might have occurred at the moment of the injury, in consequence of the pressure to which the distended stomach was then subjected; or it might have occurred in the act of vomiting before he reached the hospital. But certainly the rarity of such a coincidence might excuse the erring diagnosis which failed to identify the cause with the symptoms. Happily, the oversight could not affect the issue.

Pressure, from any cause, on the exterior of the larynx or on its supplying nerves, may occasion symptoms similar to those produced by the presence of a foreign body in the air-passage. Again, the lodgment of a morsel of food in the upper part of the gullet, may so obstruct the aperture for the ingress of air, as to threaten suffocation. I remember a young child, who was brought to the hospital many years since, being almost immediately relieved by a dose of ipecacuanha wine, which I, then a student, administered under the direction of Dr. Williams; a large fragment of meat was ejected, and the lividity and struggling immediately ceased. I shall presently refer to a fatal case of the same nature.

It is a dangerous practice to permit patients to inhale chloroform in operations involving the interior of the mouth; although the risk is diminished if the sitting posture can be maintained. The intrusion of blood into the larynx, in any quantity, can scarcely fail to prove fatal under these circumstances; the admission of even a small quantity is sufficient to excite apprehension.

In forming a diagnosis in the class of lesions to which I am now referring, particular inquiry should be made into the history of the case, and the circumstances under which the alarming symptoms first made their appearance; and this should be succeeded by a careful scrutiny of the chest. The actual position of the foreign body, if present, may be thus ascertained. It is possible that one lung may retain its normal resonance, whilst the absence of breath-sounds proves that air is not passing into and out of it. In such case, the conclusion would be that one bronchus is blocked. Or these signs may be limited to a portion

only of one lung; and thus the site of the extraneous body may be still more accurately determined; at the same time that all doubt may be removed as to its actual presence, by the shifting character of these indications. It is an unquestionable fact, explained by the relative anatomy of the parts, that the right bronchus is very commonly, and the left very rarely, the seat of such obstruction, a foreign body passing more readily into the former than into the latter. But the size and form of the body have much to do with the resulting symptoms; thus, a coin, when impacted edgewise, may allow of respiration being readily performed; but with a change of position, by which its circumference becomes adapted to that of the trachea, symptoms of impending suffocation may immediately declare themselves. Other unnatural sounds are heard in breathing, which are due either to the passage of the air over the intruding object, or to the accumulation of mucus around or behind it.

The later history of these cases, where a fatal issue is delayed, is replete with variety in its details, though all pointing to those structural changes which mark the abortive effort which nature makes to repair the lesion, but which proves destructive in their issue; for it is rarely that she succeeds in so enclosing the extraneous object, whatever it may be, in a capsule of low organisation, as to secure to the rest of the lung immunity from the effects of its presence.

The following case was watched by me with much interest whilst the man was an inmate of St. Thomas's Hospital; and I am indebted for the autopsy to Mr. Solly, under whose care the patient remained until he went home.

J. S., aged 49, an excavator, of tall and robust frame, was at work with a pebble in his mouth, about the size of a marble. This was drawn into the trachea during a fit of laughter, and he imagined he had swallowed it.

When he applied first to a local medical man, his symptoms were not of a character to excite alarm; his breathing was more frequent than natural, and sonorous, and the period of each respiration was diminished; he was also troubled with a short, hacking cough. The expansion of the chest, viewed both anteriorly and posteriorly, appeared to be uniform on both sides. At a spot behind the sternum, he complained of a dull pricking sensation; and when the stethoscope was applied here, a whistling and cooing rhonchus was heard; the breath-murmur was described as heard, at that time, over most parts of the chest; but masked by the other loud sound.*

He was sent to the hospital; and, when admitted, it was observed that, whilst recumbent and at rest, he suffered no inconvenience; but, when turned on the left side, great dyspnoea and cough were induced. Respiration was loud, but otherwise natural, on the left side; there was a loud cooing sound about four inches below the right clavicle; below this, over three square inches, the breath-sounds were inaudible; but percussion elicited a clear resonance; sometimes air entered the chest at all parts.

The patient was bound to a plank, inverted, and struck on the back and chest, but without effect. Tracheotomy was subsequently performed, and the above experiment repeated; bronchitis succeeded. He afterwards left the hospital, and suffered from severe fits of dyspnoea and suffocating cough; and the expectoration was profuse during the last week of his life. There were physical signs which indicated that, subsequently to his leaving the hospital, and after a violent fit of coughing, the pebble had changed its position from the right to the left side of the chest.

At the *post mortem* examination, a large collection of pus was found in the left pleura, whereby the lung was compressed, but it was not otherwise diseased. The right pleura was healthy; but there was a circumscribed abscess in the anterior part of the middle lobe of the corresponding lung, containing three ounces of pus; the bronchial tubes on the same side were inflamed. Just at the first division of the left bronchus the pebble was found firmly impacted; in the division of the right bronchus, the spot where the foreign body had previously lodged could be identified; the mucous membrane throughout the larger bronchi on both sides was free from ulceration. The patient survived the accident two months; and died about a week after leaving the hospital.

The importance of *Tracheotomy* is very differently estimated by surgeons—I do not mean in regard to its applicability in various conditions suggestive of its employment; but I speak of the operation and the risks which it may entail. My experience has induced me to regard it as, in itself, fraught with much danger, and as involving, therefore, a serious complication in diseases of the air-passages, especially where, by continuity of surface or otherwise, the lungs are disposed to sympathise in the morbid action. I have already remarked on broncho-pneumonia

being a frequent cause of secondary fatality in attempted suicide by cutting the throat; and this arises, apparently, from the direct ingress of air by an artificial inlet. In children, probably from their greater susceptibility, the results of tracheotomy, performed for various reasons, are far from satisfactory or encouraging, so far as I can gather from the various sources of information at my command. I may speak more favourably, from my own personal experience, of tracheotomy in adults; the result has certainly been, in a great many instances, the protraction, in not a few the preservation, of life, and, in two or three, the restoration of suspended animation. Yet, these have been, for the most part, cases of acute or syphilitic laryngitis, or other conditions in which the lungs were in no way implicated. I am, therefore, quite prepared to admit, to its fullest extent, the value of this operation; but I do not the less appreciate the risks attending it, under the conditions alluded to. It is my conviction that an artificial opening into the air-tube should not be made except under circumstances of urgent necessity; and that, in all cases, the condition of the lungs should be ascertained before resorting to it. I am aware it may be objected that the physical signs are masked by the obstructed ingress of air; yet, I have not found it so, to an extent sufficient to preclude the detection of abnormal sounds, either in the bronchial tubes or air-cells; and by such physical examination, the fault may, perchance, be found to exist chiefly in the lung itself. The hasty performance of this operation, in anticipation of evil which may occur, is to be deprecated. Indeed, I think that every available expedient should be resorted to, before this ultimatum is adopted. The attendant risks of the operation are not limited to the manipulative procedure itself, nor to the direct admission of air to the lungs. The presence of the tube often excites mischief externally as well as internally; and the wound becomes unhealthy, and ulceration and suppuration extend, even to the lung itself. Cases of scalded throat, treated by tracheotomy, are very far from being uniformly successful, even though temporary relief be obtained; the actual cause of death being due to pulmonary changes, which may be referred with more show of reason to the operation than to the original lesion. Since writing the above remarks, I have had the opportunity of witnessing the autopsy of a child on whom tracheotomy had been performed for scalded throat. I saw the patient, apparently doing well, some days after the operation, whilst the tube was still worn. Subsequently the tube was removed, and the child died with symptoms of broncho-pneumonia. On examining the air-tubes and lungs, there was found ulceration at the front of the trachea, corresponding to the spot where the extremity of the tube would impinge. There was inflammation, with some deposit of lymph, extending thence throughout the bronchial tubes, with infiltration and consolidation of the lungs generally. The child died evidently of broncho-pneumonia, the consequence, I have very little doubt, of the operation and not of the original lesion. The mechanical irritation caused by the presence of the tube accounted, in part, for this result, which is suggestive of the need of some change in the form of the tube, or in the mode of keeping patent the opening for the admission of air. Indeed, two or three instances have come to my knowledge where fatal hæmorrhage, in children, was consequent on ulceration extending through the trachea into the innominate artery. In the above case, the general infiltration of the lung could scarcely be attributed to irritation propagated from the inflamed trachea; though there was no interruption to the continuity of the inflammation, as it spread thence throughout the bronchial tubes.

If, in these cases of scalded throat, it be ascertained that life is threatened by cedema of the glottis, and the risk is imminent, relief must be given; but the surgeon should first satisfy himself that the dyspnoea is not due to any other cause. Probably spasm, superadded to inflammatory swelling, is often the immediate cause of death. If introduced, the tube should be dispensed with as soon as possible; though it is an unquestionable fact, that the opening of the trachea necessitates the retention of a tube for a much longer period than would have been requisite for the recovery of the glottis without such opening. The comparative insensibility of the glottis, when the trachea is opened, seems to render it less inclined to fulfil its normal functions when the most important of them is thus artificially and vicariously performed.

The value of antimonials, without tracheotomy, in these cases of scalded throat, has been repeatedly tested, as well as in other inflammatory conditions of these parts, and with a favourable result.

I may notice a rare interference with the completion of tracheotomy, which, however, nearly proved fatal in one of my patients, whose condition did not admit of delay. He was an old man, in whom the rings of the trachea were rendered so resisting by ossification, that the knife would not divide them. A short blunt-pointed pair of scissors is, under such circumstances, the most available instrument to lay open the air-tube.

[To be concluded.]

* These notes were supplied by Mr. Passmore, of Potter's Bar.