CRITICAL REVIEW

PERORAL ENDOSCOPY.

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Tracheal or Lower Bronchoscopy.—One phase of this subject seems to be disregarded. It should always be borne in mind that a tube too large to go through the larynx will not enter either main bronchus. It is obviously a physical impossibility to reach with a large tube a foreign body in a small branch bronchus deep in the lung. In such cases the tracheotomic route has no advantage whatever. Large foreign bodies in the trachea may be removed without any endoscopic tube if a very low tracheotomy is performed. It seems a platitude to say that foreign bodies in the main bronchi require a tube that will enter the main bronchi. Such a tube will readily pass through the normal larynx, and with it 100 per cent. of the foreign bodies lodged in the trachea and main bronchi can be removed by version, rotation, disimpaction, disentanglement, suction, or whatever solution of the mechanical problem is required for the particular case.

The difficult cases of bronchoscopy, as developed to-day, are those in which a small foreign body is in a small branch bronchus well out toward the periphery of the lung. Here a large tube is obviously useless because it cannot be got anywhere near the foreign body; and it is sad to see the quite unnecessary tracheotomy done in such cases because of the persistence of a fallacy in medical literature. Would it not be well to state that the tracheotomic route does not permit the use of a larger tube in the case of a foreign body located in a small branch bronchus.

Recently there has been offered for guidance in the choice between the oral and the tracheotomic routes the statement: "The upper never for vanity, the lower never for indolence." It is very unfortunate that so good an idea should be expressed in such ill-considered words. It is a sad commentary on the practitioner that he should be deemed in need of an aphorism to prevent him sacrificing the welfare or the life of his patient because of either vanity or indolence. Since it requires less effort and less time (about half a minute) to insert a bronchoscope than to do a tracheotomy, it is presumed that "indolence" refers to the practitioner who is too lazy to acquire the technique of peroral bronchoscopy. As to vanity, the sweeping accusation against the practitioner is very unjust to the now numerous bronchoscopists, who, by experience, have found it easier to work through the mouth than through the neck with the head

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in the way. No one for a moment questions the advisability of tracheotomy for severe laryngeal dyspnœa. There are no contra-indications whatever to tracheotomy in such a case. If, after having done a tracheotomy for dyspnœa one practitioner prefers to work through the mouth, because for him it is easier to work in the usual way, and another practitioner prefers to work through the neck, because his instruments or his previous habit lead him to believe the tracheotomic route will increase his chances of success and lower his chances of mortality, each should be permitted to follow his conscience in doing what he believes best for his patient, without accusations of risking his patient's life or health from either indolence or vanity. Would it not be better to say: "Oral or tracheotomic route according to the equation of the case, the operator, and the available armamentarium"? The decision would then rest upon a scientific basis not on a question of the integrity of the operator.

New Bronchoscopic Instruments.—A number of efforts have been made by ingenious men to combine some form of grasping or hooking instrument with the bronchoscope. One who has cultivated bimanual manipulations with forceps and tube until they are co-ordinated like knife and fork in eating, would, at first, think of the awkwardness and limitations of the combined knife, fork, and spoon of the Northwoods trapper. But no one should condemn any effort on purely theoretical grounds; that has been the mistake in all spheres of human endeavour; even bronchoscopy itself was at first thus condemned. One thing, however, must be insisted upon, namely, that all new instruments be thoroughly tested, first upon the rubber tube, then upon the cadaver, next upon the living dog, and finally upon the adult patient—all these before attempting to use them upon a child.

Most foreign-body cases occur in children, and it makes one shudder to think of anyone experimenting upon a baby with an untested instrument, especially with a complicated combination of tube and grasping device. Bronchoscopy will not be advanced in the estimation of the profession by such short cuts in experimental development. What is most necessary for proper recognition of the merits of bronchoscopy and œsophagoscopy is the demonstration of the facility and harmlessness of their use (in trained hands), in order that the practitioner may feel justified in submitting his patient to them, rather than to the so frequently fatal external operations.

The Training of the Bronchoscopist.—Surgery like most other human activities will vary in skill with the individual ability of the operator. So it will be to the end of time, and it is needless to contest, or protest against, the inevitable. But when a practitioner who has never before looked through a bronchoscope or an œsophagoscope purchases one of these instruments and starts down the tender passages of a baby we

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have a lack of skill that would be unpardonable, almost criminal, if the lack were realised. The practitioner is not aware that he is almost certain not only to fail but to kill the child; whereas, with proper training, he could avoid all risk and almost certainly succeed in removal. This line of thought has been suggested by a letter received by the reviewer upbraiding him for not having urged that œsophagoscopy should be done only by those trained in the work. The letter was written by a physician whose child had died on the operating table during an attempt œsophagoscopically to remove a safety-pin by a surgeon who, though exceedingly skilful in all other branches, had no endoscopic training.

Anyone who has had endoscopic training and experience can see, all through the medical journals of to-day, reports of cases in which it is clear that the operator not only has had no training but he does not realise the necessity of any. A surgeon who has never done a cataract operation would not think of attempting the removal of a cataract without preliminary practice on dead animals' eyes. This is because the necessity for such practice has been established as an essential part of post-graduate medical education. In a cataract operation the operator has the unhampered use of both hands guided by binocular vision; and the worst that can follow his failure is the blinding of one of his patient's eyes. How much more necessary then is practice before attempting bronchoscopy and œsophagoscopy in a child with the limitations imposed by: (*a*) the smallness of the natural passages; (*b*) the knowledge that prolonged bronchoscopies in children are dangerous; (*c*) the necessity of gauging depth with one eye only while the image of the other is ignored; (*d*) the mechanical manipulations of unfamiliar instruments; (*e*) the problems of disimpaction, disentanglement, version, safety-pin closure or what not, that may be required for safe removal.

There is no intention to advocate here the creation of a new specialty. Any practitioner who wishes may do bronchoscopy; but it should not be attempted on a patient without preliminary education of the eye and the fingers in the peculiar requirements of the work. A theoretical or even a practical knowledge of the introduction of the endoscopic tube is not enough. All the special Societies have committees composed of their foremost men working upon the problems of post-graduate education of the specialist. The time is ripe for urging the necessity of preliminary training of those who may be called upon to do bronchoscopy and œsophagoscopy.

Foreign Bodies in the Larynx Simulating Diphtheria.—The tolerance of the larynx to the presence of foreign bodies for protracted periods is truly remarkable. Many instances are recorded of the presence of thin or flat non-obstructive objects for months before

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serious swelling of the laryngeal tissues result in urgent dyspnœa. In a number of instances laryngeal diphtheria was diagnosed, and antitoxin was wisely given by the attendant practitioner, who had no one available capable of examining the larynx of a child. That practitioners frequently consider no other possibility, and ignore the history of choking on a "swallowed" object is shown by a number of case reports.

A typical instance of prolonged laryngeal sojourn of a foreign body in a child aged six years is cited by Orton,[1] who removed with the direct laryngoscope an open safety-pin which had been in the larynx for six months. Stridorous respiration finally demanded the services of a laryngologist after a diagnosis of diphtheria and antitoxin treatment, it being then considered that the tonsils were at fault. An important point in the history was the report of a radiographic examination on the day of the accident stating there was "nothing in the throat." The ease with which the larynx of a child can be directly examined without anæsthesia of any kind is not sufficiently appreciated by the general practitioner and pediatrician, and it is our duty to make known to them the necessity for the laryngeal examination of any child suffering from hoarseness or dyspnœa. On the laryngologist rests the obligation of being prepared, at all times, to go to the patient's home at the call of the family physician to make a diagnostic direct laryngoscopy, without anæsthesia, in a child too young to be examined with a mirror. Obviously general anæsthesia is doubly contra-indicated in the presence of dyspnœa and possible diphtheria; cocaine is not to be thought of in children.

Foreign Bodies in the Intestines.—The necessity of watching the progress of a foreign body through the intestines, until recovered from the stools, has been advocated. A confirmation of the wisdom of such watchfulness is illustrated in a case reported by Hagler and Stewart.[2] A man, aged 39 years, was admitted complaining of about two days' illness, the chief symptoms being generalised cramp-like abdominal pain, nausea without vomiting, and chilliness. Examination revealed tenderness in the right lower abdomen with right-sided rigidity, and general distension. The abdomen was immediately opened. The appendix was found adherent to a large omental mass which contained a loop of intestine, pus, and intestinal contents. Six inches of the damaged bowel, including Meckel's diverticulum, were removed. The diverticulum was found to be perforated by the sharp end of a fish-bone, the other end of which was blunt and was impacted in the opposite wall of the diverticulum. In spite of this prompt and skilful surgical intervention and after-care, the peritonitis extended and the patient succumbed.

We have in this case and similar cases in the literature, confirma-

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tion of the soundness of the opinion that while, as a rule, foreign bodies even though sharply pointed, usually pass safely through the intestinal tract, it is not safe to dismiss the patient from observation until the intruder has passed. Of course, in the case of the fish-bone no observation would have been possible, even if the patient knew he had swallowed it; but had the intruder been a needle or pin, its lodgment for a number of days in one location would have furnished the indication for abdominal operation by which the foreign body could have been removed before perforation.

Fish-hooks.—These are infrequently encountered foreign bodies and offer difficult problems of removal as anyone who has worked upon these problems in the laboratory will testify. A. Logan Turner[3] reports the ingenious indirect removal from the laryngopharynx of a trout fly with fishing gut attached. "While the patient was moistening the gut in his mouth, the fly disappeared in his throat, but the end of the gut protruded from the mouth. He attempted by gentle traction to pull up the fly, but failed. The gut then disappeared. When examined with the mirror forty-eight hours later, the fly feather was detected just behind the left arytenoid and the free portion of the gut was seen passing downward behind the larynx. After cocainising by the drop method, the gut was grasped in laryngeal forceps and pulled upwards, a fresh hold being taken upon it at intervals until the free end could be seized and brought out of the mouth; this was anchored with artery forceps. The laryngeal forceps were again introduced, the fly grasped and pulled downwards so as to release the point. Extraction was then easy. The fly is a March Brown, and the gut is 8½ inches in length." Even the most enthusiastic advocate of the direct method must agree that in this case the indirect method was the one of choice. The ingenious tethering of the foreign body by attaching a hemostat to the gut is certainly a precaution to be remembered. The increasing difficulties that would inevitably result from allowing the hook to follow its inherent tendency to work downward into the œsophagus, were at once prevented. The treatment of this case calls to mind the regrettable modern tendency to neglect cultivation of the art of indirect manipulation, which is, and always will be essential to the well-trained laryngologist. The only drawback to the mirror method of dealing with a foreign body at high levels is the risk of it dropping into the lower air passages, if it should slip from the grasp of the forceps or be dislodged before it can be grasped. This applies only to mirror laryngoscopy in the usual sitting position. It does not apply to Logan Turner's case because of the gut and the ingenious use made of it. The only other case of fish-hook recalled is that of D. R. Paterson,[4] in which he very skilfully removed the hook by œsophagoscopy with the aid of an aspirating tube passed over the gut and used

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as a protector of the tissues from trauma by the point of the hook. The reviewer is collecting data on the fish-hook problem and would be glad to receive published or unpublished reports of such cases.

Physical Signs of Foreign Bodies in the Air Passages.—It is a misfortune that there is a tendency to neglect careful physical examination in those cases in which the foreign body is of such density as to show clearly in the roentgenogram. In all such cases invaluable data could be obtained by the systematic record of physical signs made by an expert physical diagnostician unbiassed by any knowledge of the ray-findings.

In an interesting article Thomas M'Crae[5] ably presents the subject of diagnosis from the view-point of the internist. The study of his cases suggested to him "a number of clinical problems: (1) How frequent is the occurrence of foreign bodies in the bronchi? (2) What symptoms and signs are there which are diagnostic or suggestive of their presence? (3) Is there any clinical picture or are there physical signs suggestive of the presence of a foreign body in the absence of röntgen-ray findings? (4) Are there definite physical signs suggestive of a particular kind of foreign body? (5) To what extent can we reduce the chance of error in failing to recognise the presence of a foreign body in a bronchus?" He states further: "It is evident that we have to discuss very different sets of conditions, and that no one description can cover all the cases. Thus, we have certain signs due to the foreign body and the local reaction set up by it, and others due to changes in the lung supplied by that bronchus. The character of the foreign body is important; a safety-pin may do little damage while a pea-nut causes marked changes very rapidly. One foreign body plugs a bronchus completely, another acts as a ball valve. Pus forms below the foreign body and may be retained or escape. The secretions may be forced into bronchi other than the one involved, or from the affected lung into the bronchi of the opposite one, so that signs are found on both sides. The signs may change greatly from hour to hour in acute cases, so that any set description fitting all cases is out of the question."

We read: "It is interesting to note how frequently the diagnosis of pneumonia is made in these cases. This comes out very frequently in the histories, but a careful study of the physical signs should prevent the error. Fever is very common after the aspiration of a foreign body, and if there is no dyspnœa, with cough and bloody or blood-streaked sputum, the diagnosis of pneumonia is suggested before the examination of the thorax is made. Decreased expansion on one side and dullness may suggest the diagnosis, but a careful study of vocal fremitus and the auscultatory signs should show that if the condition is pneumonia there is plugging of the bronchus—a rare condition.

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The writer has not seen pneumonia associated with any case of foreign body in a bronchus. The local signs are usually those due to the supplying bronchus being obstructed. Variations depend on the quantity of air in the portion of lung, the amount of secretion, and the persistence and completeness of the plugging of the bronchus. In many cases there are no breath sounds or râles heard over the affected parts, in others there may be râles but no breath sounds. In the majority, the affected portion of lung seems to be airless, and in the röntgen-ray plates at early stages it shows as a homogeneous shadow. Later, fibrosis, abscess formation, and bronchiectasis may be found. These show no special peculiarity in the physical signs, but are important in that they may be wrongly diagnosed as tuberculosis."

M'Crae's summary is as follows:—

"1. Cases of foreign body in a bronchus are not mere curiosities but are more common than we have supposed.

"2. There may be no disturbance at the time of entrance of a foreign body and no suggestion in the history of such a happening.

"3. Certain signs are of value, especially decreased expansion on the affected side, the presence of very fine râles, and the 'asthmatoid wheeze.'

"4. Some foreign bodies, such as a pea-nut, set up a very acute general process which is fairly distinctive. Other structures, such as metallic objects, cause permanent changes, usually in a lower lobe.

"5. The chief errors in diagnosis are to mistake the signs for those of pneumonia in the early stages and in the acute cases, and for tuberculosis after the body has been present for some time."

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