BRONCHOSCOPY FOR DISEASE.*

BY

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In suppurative conditions due to foreign body abundant experience has demonstrated that no procedure other than bronchoscopy is worthy of a moment's consideration. In suppurative conditions due to causes other than foreign body the status of bronchoscopy is altogether different; it is merely an adjunct to the medical and surgical care of the case. Both the physician and the surgeon have found a bronchoscopic assistant of great usefulness in diagnosis and in treatment of certain classes of cases.

Pulmonary Malignancy.

Malignant disease of the lung is a mild, and for a long time purely local, process. The bronchoscope is the only means by which an early diagnosis can be made with the certainty required by the surgeon. When the bronchoscope is resorted to early, a positive diagnosis of primary pulmonary malignancy enables the surgeon to cure by lobectomy. One of the most striking things in bronchoscopy for disease is the frequency with which the bronchoscopist finds unsuspected cancer in a patient treated for months, even years, for a supposed benign or tuberculous suppuration. We think every case of haemoptysis in which no tubercle bacilli can be found should be bronchoscopically examined for diagnosis.

Suppurative Pulmonary Disease not due to Foreign Body.

Hippocrates and his predecessors preached drainage of suppurative areas. Throughout the centuries since the days of Hippocrates this has remained the unshaken foundation of all surgery of suppurative disease. The only modern thing is the discovery of the feasibility of drainage through the mouth. The question therefore is, How efficiently can we drain suppurative areas in the lung with the bronchoscope? So far as experience up to the present is an indication we may answer: In a few cases it is hopelessly inefficient; in other cases curatively efficient; in most cases stagnation is prevented, the odour disappears, and the general and local conditions improve. Until 10,000 cases shall furnish data for analysis it will be impossible to classify cases beforehand as to indications for bronchoscopy. Of bronchoscopy for suppurative disease of other than foreign body origin we can only say positively that we can safely and successfully combat stagnation in the bronchi. It becomes a question, then, of how great a factor endobronchial stagnation is in the perpetuation of pulmonary suppuration.

Let us consider for a moment the normal physiological mechanism for the prevention of stagnation of any excess of secretion in the bronchi, large and small. There are three mechanical factors—namely, (1) the "squeeze" of thoracic compression of the lung in cough; (2) the cough blast; (3) ciliary action. Upon the efficient and co-operative activity of these three factors drainage of the human lung depends. A chain is no stronger than its weakest link, and the weakest of the three links in this chain is the ciliary link. It is not at all certain that the ciliary link is the weakest under normal or mildly pathological conditions—in fact, my personal opinion is that it is the most efficient of the three—but I am equally convinced that the ciliary link is the first to weaken and break down in the presence of gross inflammatory changes in the mucosa of bronchi, large and small.

To be convinced of these two statements one has only to see the stream of pus distributed along the posterior wall of the bronchi in recent suppurative conditions of mild degree, evidently an upward flowing stream, and to compare it with the stagnant pool or adherent patch of stale or foul pus in chronic conditions. Considering the structural delicacy of the cilia it is logical to suppose—and the supposition is supported by histological studies—that violent or long-continued inflammatory processes destroy the cilia or impair their activity in the area affected. Then enters

another factor to impair ciliary activity—namely, obstruction due to inflammatory swelling of the mucosa, which, as all bronchoscopists have seen, objectively obliterates the smaller bronchi. Still another factor to impair ciliary efficiency appears if the inflammatory process continues and the already impaired ciliary action is not aided—namely, the development of granulations. The subjacent impaired, or even unimpaired, cilia, if such exist, cannot do much in the way of forcing pus through a bronchus whose lumen is completely occluded with granulations dovetailing together in their mutual approach from opposite positions in the bronchial wall. And, moreover, it must be noted that granulations have no cilia. Hence, a granulating area creates a gap in the continuity of ciliary effort. A cilium, like an individual in the line of a bucket brigade, can pass on only what is received from the adjoining co-worker. The unreplaced dropping out of a number of individuals in the line stops the transmission. This in the bronchi means stagnation, and we may say that stagnation is one of the chief factors in the development of pulmonary abscess and of bronchiectasis.

Bronchoscopic Aspiration.

The pathological considerations referred to in the foregoing paragraphs give us an explanation of the remarkable results obtained, clinically, from bronchoscopic aspiration in certain cases. These results have amply justified the statement that the bronchoscope is the most efficient means yet discovered of combating stagnation of pus in the bronchi. The larger bronchi are quickly emptied with the aspirator. The "squeeze" of the thoracic compression of the lung during cough forces up the pus from the bronchioles and obstructed smaller bronchi, and the multiple minute pockets, into the larger bronchi, whence the aspirator can readily remove the pus.

Multiple foci of suppuration deserve separate consideration. Usually the separate foci can be reached in turn by the aspirator. If not, however, they may be fairly well drained by the squeezing due to the compression of the whole lung by the cough. This mechanism is endoscopically obvious during bronchoscopy in suppurative cases. The visible pus in the larger bronchi is removed by aspiration, and the bronchi are for a moment visibly clear of pus. The next cough forces up a quantity of pus from certain bronchi or fistulae. This in turn is aspirated. The next cough forces up more pus, but the quantity is less. This is aspirated, and is replaced by a still less quantity. This cycle is repeated until all the communicating cavities and fistulae are clear.

Summarizing, it may be stated that in any case of suppurative focus communicating with a bronchus, and in which the surgeon and the internist deem external operation not strongly indicated, bronchoscopic aspiration should be used to supplement medical care. A very satisfactory percentage of such cases will be cured. The chief contraindications to bronchoscopy are (1) a moribund condition of the patient, (2) imminent rupture of the focus into the pleura.

Suppurative Foci not Communicating with a Bronchus.—These can be penetrated with the bronchoscope if deemed advisable, but the wisdom of doing so has not yet been demonstrated. If for any reason the surgeon deems external operation inadvisable, bronchoscopic penetration may be considered. In such cases spontaneous rupture into the bronchus or the pleura usually occurs sooner or later, and delay in external operation is very rarely advisable.

EVOLUTIONARY FACTORS IN THE PRODUCTION OF PHARYNGEAL DIVERTICULA.

BY

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(Abstract.)

MR. NEGUS commenced by describing the site of exit of the pouches under consideration as between the lowest circular and adjacent oblique fibres of the inferior constrictor muscle of the pharynx. He referred to the importance of longitudinal muscle fibres in pulling the pharynx and oesophagus

* Abstract of "chalk talk" and cinema demonstration.

over a bolus of food, in much the same way as that in which a snake appears to creep forward over a rabbit when swallowing it.

The obstructing action of the powerful and tonically contracted crico-pharyngeus muscle was pointed out, and the function of the muscle was described as one related to the necessity for prevention of air entrance into the oesophagus during inspiration, in order to ensure its passage into the lungs. This function was said to be most important in those animals with a narrow laryngeal aperture and in those which close the glottis when the thorax needs to be fixed during independent use of the fore limbs.

The function of the cartilages of Santorini was given as that of suspension of the oesophagus, in such a way that when the larynx is closed for deglutition the oesophagus is opened in a funnel-like manner.

The absence in man of longitudinal muscle fibres in the posterior part of the pharynx at its lower end was compared with the condition in various animals.

The role of the posterior palatine folds was spoken of in relation to olfaction and deglutition, especially with regard to direction of food into the mouth of the oesophagus; and it was pointed out that keen-scented animals have strong folds in close relation to the larynx, and that most herbivorous species have a complete girdle called the arcus palato-pharyngeus, made up of these palatine folds united posteriorly.

It was shown how descent of the larynx in the neck of man for various reasons has led to fanning out of the inferior constrictor muscle.

The reasons why pharyngeal diverticula do not occur in various types of animals was compared with the condition of man, in whom the predisposing factors were given as these. First, descent of the larynx and fanning out of the inferior constrictor muscle, associated with absence of longitudinal fibres in the lower pharynx posteriorly, so that during swallowing upward pull of various muscles and downward pull of the oesophagus cause stretching in the position where a diverticulum arises. Secondly, lack of relaxation of the crico-pharyngeus muscle because of delayed passage of an excessively large bolus. Thirdly, absence of directing posterior palatine folds because of the degeneration of the olfactory sense and the lack of necessity for combined respiration and deglutition. And lastly, attachment of the oesophagus in part to the cricoid cartilage, and not entirely to the cartilages of Santorini, with the result that funnel-like opening is not efficient.

[The paper will be reported in full in the *Journal of Laryngology and Otology*.]

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ACUTE APPENDICITIS IN AN OCTOGENARIAN.

Cases of appendicitis in patients over 80 years of age must be rare.

Mrs. P., aged 86, suffered from acute abdominal pain late one afternoon. Dr. Owen Foulkes Evans was called in and suspected acute appendicitis; the temperature was slightly elevated. Next day she was worse, and I saw her in consultation and found great abdominal tenderness in the right iliac fossa, and rigidity; the temperature was 100° F. It was now definitely a case of rapid acute appendicitis. She was operated upon twenty-two hours from the commencement of the symptoms, and we found, immediately under the parietal peritoneum, a large, green, distended appendix showing a pale area at one spot; the appendix was evidently on the point of bursting. On removal it was found to be full of stinking material, and the whole was gangrenous. There was some turbid material in the pelvis. She made an uninterrupted recovery. The wound was not drained.

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RECTAL INJECTION OF TARTAR EMETIC FOR BILHARZIASIS.

SINCE reading, at the time, the article by H. F. Wilson of Livingstonia, Nyasaland, published in the *BRITISH MEDICAL JOURNAL* of January 28th, 1922 (p. 137), giving the results of his treatment of bilharziasis by rectal injections of tartar emetic, I have, since that date, and in consequence of reading that article, used exclusively that treatment.

I commenced, as he did, with graduated doses, but ultimately came to the conclusion that a single dose, large enough to destroy the parasite, was the only rational treatment for this disease.

I have given as much as 19 grains in one dose, without unpleasant effect. But this was not given as a first dose; neither was it given to a case of bilharziasis. I have not given a larger dose than this, because 19 grains is so much in excess of the minimum dose universally lethal to the parasite that to experiment with larger doses seemed useless. The last case I treated, a native boy of about 17, had but one injection, of under 6 grains. After this injection the ova disappeared.

I dissolved the weighed dose of tartar emetic in four ounces of warm water, and injected with a four-ounce all-metal ear syringe, over whose metal nozzle had been drawn the soft rubber conical end-piece shown in Down Brothers' catalogue, as No. 1683, on p. 389. With vaseline applied to the anal canal, the insertion of this soft rubber end-piece is easy. I think half an hour in the recumbent position, after the injection, is sufficient, and have been indifferent as to whether the bowel was emptied previously or not.

The simplicity, safety, convenience, and efficiency of the rectal administration of tartar emetic appear to make its intravenous injection in bilharziasis no longer a justifiable treatment; and they further appear to open up new possibilities in the direction of eliminating human schistosomiasis from any district. Whether the routine injections towards that end should be given every seventy days, or at some other interval, will have to be decided by further experiment.

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TORSION OF A LARGE DERMOID OVARIAN TUMOUR.

THERE were some circumstances in the following unusual case of a dermoid ovarian tumour which are of interest.

A single woman, aged 39, a cook, was exceptionally uncommunicative towards her mother and sisters, and never discussed her health with them. She resolutely avoided medical advice.

When first seen, at 9 p.m. on June 19th, the abdomen was enormously distended, and she was acutely ill. She said that for the last ten years she had noted a fullness and swelling of the abdomen which had gradually increased, but although she had lost weight recently she had carried on her work and even cycled up to seven days before.

On June 10th, preparatory to a day's excursion in a car, she said she had laced her corsets extra tightly, and that she had been jolted about because she had been seated on the floor of the car on the return journey. She felt very ill that evening and suffered thereafter from severe vomiting and diarrhoea, coupled with rapidly increasing abdominal distension. It seemed almost incredible that the abdominal wall could stand the tension existing; the temperature was 102° F., and the pulse rapid. She was immediately transferred to Cirencester Hospital, where she was operated on at 11 p.m.

The tumour was exposed through a left paramedian incision and was found to be markedly adherent to the parietal peritoneum. The wall of the tumour was a quarter of an inch thick, and densely adherent to it were most of the coils of the small intestine and great omentum. An incision released approximately 4 quarts of yellow pultaceous fluid. The tumour arose from the left ovary and had undergone torsion; it was removed. The patient stood the operation well but died four days later.

The tumour was exceptionally big, weighing, after the loss of the 4 quarts of fluid, 18 lb., which makes the total weight approximately 25 lb. It was multilocular and contained masses of yellow pultaceous material mixed with hairs, together with portions of bone, cartilage, and fibrous tissue.

The remarkable feature of the case was the small interference this huge tumour had produced and the way in which the patient had even cycled until seven days before the operation.