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# Editorial Forward

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The BULLETIN presents this month a number devoted exclusively to Non-tuberculous Pulmonary Disease. We are happy to have at our disposal all five of the papers forming the symposium on this subject which was given at the first session of the 1947 Refresher Course. By some fortunate bit of planning on somebody's part we also have a record of the discussion.

The editors wish to bespeak special attention to these papers for two reasons—first, because the subject of non-tuberculous disease of the lungs is one of considerable and increasing importance; and second, because these five related papers which in their entirety constitute a most comprehensive survey of this subject, were prepared and presented by five men, in practice in Nova Scotia, with expert knowledge who knew whereof they spoke. We wish to emphasize this point in support of our contention that good material can be forthcoming from local sources. Let us have more symposia on other subjects.

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## SYMPOSIUM ON NON-TUBERCULOUS DISEASES OF THE CHEST—DALHOUSIE REFRESHER COURSE

### Introduction: Diagnostic Approach to Diseases of the Lungs

C. J. W. BECKWITH M.D., D.P.H., F.C.C.P.

FROM time to time, there is benefit in pausing to review a situation in relation to a background of development, present evaluation of procedures and a projection into the future of what may be expected. The field of medical art is fast becoming more scientific insofar as more exact information can be obtained from many forms of examination. The art of medicine remains in the proper interpretation of more accurate findings leading to correct diagnosis and the application of measures, either preventive or therapeutic, to forestall development of the destructive pathological process or check them before tissue has degenerated to an irreversible lower grade.

In all the fields of specialized endeavour, there is none to which this philosophy will apply more aptly than in diseases of the chest. Many of us have witnessed the acute controversy of stethoscope versus X-ray; of X-ray being accepted to the point where it was embarrassed insofar as a negative X-ray report was interpreted as meaning no pathology even though a patient might have the cardinal symptoms of pulmonary haemorrhage or persistent cough and sputum. We all know the disrepute the tuberculin test had suffered because many thought in the terms of 1910 to 1920 at which time the majority of the population had positive tuberculin reactions forgetting that in the interval an aggressive programme for the control of the disease had lowered incidence of infection to the point where a positive tuberculin reaction, especially in the younger age groups, has real significance.

Now, it is the purpose of this symposium to review for you the salient features of non-tuberculous diseases of the chest. In the first place, it would be well to review the methods of diagnosis. These have not changed; what

has changed is the emphasis to be placed on each in relation to disease or potential disease—the evaluation of each procedure.

In the first instance, it has to be recognized that diseases of the chest can now be divided into two groups, the symptomatic group and the asymptomatic group. The symptomatic requires no further explanation. The patient complains of symptoms referable to the chest and a diagnosis is to be established. The asymptomatic group has become recognized through the extensive use of the X-ray, first as a procedure in the presence of clinical symptoms or on the basis of suspicion of pathology and later through the use of mass radiography i.e. miniature films of the apparently normal population at the rate of 100 or more per hour. While this procedure was evolved primarily for the diagnosis of early tuberculosis, it has been proven of definite value in indicating other pathological conditions within the thoracic cavity. While some shadows in such cases may be sufficiently characteristic to warrant a tentative diagnosis, rarely, if ever, will a final diagnosis be established without a complete clinical investigation, using the abnormal X-ray shadows as a starting point rather than the symptomatology as in the case in the symptomatic group.

In either instance, a diagnostic approach must be employed. This approach must include, history, physical examination, X-ray with or without fluoroscopic examination and bacteriological investigation. As a result of these investigations, special procedures may be called on before a diagnosis can be finalized. Such procedures might be bronchoscopic examination, bronchogram or diagnostic pneumothorax, thoracotomy or diagnostic biopsy of lung tissue. Of these procedures, bronchoscopic examination, in particular, is becoming so valuable in the information provided that it is approaching the place where, although not a routine procedure, it is a very common form of investigation.

It is my purpose to evaluate the common, everyday procedures and the remainder of the symposium will deal with illustrations and demonstrations of results and some methods of treatment.

*The history*—The cardinal symptoms of pulmonary disease have not changed. A process which has evolved to the point of causing clinical symptoms will produce any or all. These symptoms are: cough, sputum, pain in the chest, streaking, haemoptysis or breathlessness. Any or all of these require investigation and adequate explanation. The age of the patient is important. Persistent cough in a child has implications far different from that in a man age 40 or more. The former is almost always the result of an inflammatory condition whereas in the latter, the suspicion of malignancy is present in the face of other negative findings. It must always be remembered that the pulmonary condition may be a reflection of some pathological process elsewhere than the lung itself. A careful history covering the sequence of events up to the present complaints is well worth the endeavour and will frequently lead to providing an impression of the probable causes. Family history with reference to tuberculosis and allergy is very important. The personal history should include occupational hazards as well as a background of other general illnesses.

Of all methods of investigation, none has been more maligned than physical examination of the chest. In a sense this was somewhat justified for to conclude finally that a chest is without pathology because physical signs are normal without checking by X-ray is almost as serious a blunder as to

conclude that there is no pathology in a chest because the X-ray is negative without doing a physical examination. Limitations of physical examination are very real, the most important being that early changes from normal are extremely difficult to elicit and evaluate. Conversely, the value, when physical signs are present is just as great. In general, it may be stated that physical examination is of no value in detecting (a) early pulmonary tuberculosis of either the primary or re-infection type, (b) an early pulmonary malignancy and (c) early pneumokoniosis or mycosis. In other words signs of early disease of the parenchyma i.e. the lung substance, are difficult to elicit by physical examination. On the other hand, the value of the procedure in connection with diseases of the bronchi is great—thus bronchitis, bronchiectasis and asthma yield findings where other methods of examination are greatly limited in relative value.

When we come to X-ray examination, the opposite holds. It is invaluable in the detection of early parenchymal disease of any type but of very limited value as a routine procedure in detecting diseases of the bronchi, especially the very important condition of early, primary, bronchogenic carcinoma. Valuable as the X-ray is, an incorrect interpretation of the shadows seen may well lead to a costly error in diagnosis for the patient. While it is true that those doing chest work may not qualify as radiologists, the use of the X-ray plate has become such an integral part of the investigation of lung disease that familiarity has led to the conclusion that before a final opinion is given on an X-ray film, more complete investigation by clinical methods is required. A further definite and extremely hazardous limitation of X-ray must be mentioned. That is the retro-cardiac area, that area of the lung substance which is hidden in the routine postero-anterior film by the cardiac shadow. This area might well be termed the blind spot of chest radiology and contains pathology frequently enough that if a patient has symptoms, he should always be investigated with special techniques before the chest examination can be regarded as completed. While it is not intended to dwell in detail on techniques one of the more recent advances in radiological technique is of great practical value, namely planography. Planography really means sectional radiography i.e. pictures of the lung taken at desired planes either from front to back or laterally. The procedure is routinely done at centimeter levels and, while interpretation is at times not a simple problem, in particular cases it is very valuable and can make a real contribution to the general knowledge.

At the expense of repetition, it cannot be overemphasized that preliminary examination of the chest is not to be regarded as complete without a physical examination and X-ray plate. So frequently does the one method of examination complement the other that a cardinal rule must be their correlation. When, in addition, to the routine X-ray, special positions are studied and correlated with physical findings, information is forthcoming which if it does not clear up, the diagnosis at least points a firm finger to the direction of the next step in the investigation.

One of the most fascinating problems to work out in chest disease is the causative factors for mechanical results of intra-thoracic disease. Pulmonary fibrosis, displacement of the mediastinum, retraction of the mediastinum may be the presenting evidence. None of these conditions is a disease in itself but a result of disease. Of all these conditions, none is more important than atelectasis, sometimes spoken of erroneously as massive collapse of the

lung. Atelectasis means airless lung tissue. Its cause is always an occluded air entry to the portion of the lung involved. This portion of the lung may be a lobule, a broncho-pulmonary segment, a lobe or sometimes the whole lung. The acclusion of the bronchus or its primary, secondary or tertiary division may be from extraneous pressure or intrinsic pathology. Extrinsic pressure on the bronchus may be from enlarged glands or neoplasm. Intrinsic pathology may be due to an adenoma, a foreign body, one of the inflammatory processes or carcinoma. The diagnosis of atelectasis, no matter what volume of lung may be involved, should not rest at that point. There is a cause and the cause is the diagnosis of the condition, the atelectasis is the result. If atelectasis is permitted to remain, it becomes the initiation of a chain of pathological changes which invariably lead to permanent damage of that portion of the lung.

The bacteriological investigation of the chest problem is extremely important. Sputum is abnormal, it is a secretion of the lungs in such amount that it becomes a symptom of significance. As such, it is deserving of detailed examination and this examination, if intelligently employed and the results intelligently interpreted, will frequently add valuable information to the general picture. Differential diagnosis of an acute pulmonary condition is not sufficient insofar as, for example, a pneumonia may be due to any of a number of infecting agents, for instance, pneumococci, bacillus influenza, or tubercle bacilli. With the more specific treatment available for these acute conditions, a provisional diagnosis with introduction of treatment should be supported by bacteriological confirmation. In general sulpham and penicillin will have a quick effect on gram positive organisms but none on the gram negative, whereas with streptomycin the opposite is true. Again, remarkable and even dramatic results are obtained by the use of aerosol penicillin in tracheitis, bronchitis, bronchial asthma and even early bronchiectasis. While it is true the gun shot principle may be employed with the inference that a beneficial result indicates the presence of penicillin sensitive organisms, the laboratory procedure required to determine sensitivity to penicillin of the infecting agent is simple and it becomes possible to establish a prognosis with reasonable certainty.

A final diagnosis cannot be established without bacteriological investigation of the mycoses. A diagnosis of bronchiectasis or infective bronchitis is not finalized without having knowledge of the infecting organism, since medical treatment and in the case of bronchiectasis surgical treatment will be greatly influenced by the infecting agents. Thus, with a bronchiectasis showing penicillin sensitive organisms, a course of aerosol penicillin will greatly decrease the operative risks and improve the symptomatology of the patient. While this does not influence the underlying pathology in bronchiectasis, it does clear up the infecting agent and gives the surgeon better opportunity to produce what is most frequently a dramatic result.

Diagnostic approach to non-tuberculous diseases of the chest cannot be concluded without emphasizing that the primary objective is to rule out or exclude tuberculosis as the first point in differential diagnosis. This, in itself, is a problem of great magnitude and of extreme importance to the patient. That caution and skill are required is the more definite because of the extensive use of the X-ray plate either large or small for the discovery of early tuberculosis.

In general, the following points should be employed in arriving at a decision:

- (1) in the presence of any inflammatory parenchymal condition, exclude tuberculosis by
  - (a) repeated examination of sputum preferably by the concentrate method. A negative result will favour a non-tuberculous condition.
  - (b) re-examination and X-ray after the acute phase has subsided to ascertain that there is complete resolution of the inflammatory process.
  - (c) the use of the tuberculin test. A patch test, if used properly, is very dependable. A negative result is very strong evidence against tuberculosis.
  - (d) in cases of doubt and such exist very frequently, have the patient placed under a regime of observation which includes examination and X-ray at short intervals together with investigation of temperature, general condition, complete blood counts and sedimentation rate.
- (2) The chronic bronchitics, especially over the age of 40, after which the greater the age the truer the statement is, must have an X-ray plate and sputum examinations as a routine to exclude tuberculois.
- (3) The presenting symptom of pleural effusion or pleurisy should always be regarded as a tuberculous manifestation until proved to the contrary. Diagnostic aspiration in the case of pleural effusion will assist materially together with the clinical history in determining the probable etiology of the effusion at the time of its occurrence.
- (4) Tuberculosis may be regarded as one of the great imitators. It is because of this that the differential diagnosis is of such great importance. It is not an uncommon experience to find a patient with a typical history of so-called influenza and an acute phase of a pulmonary condition to have the disease in conjunction with pulmonary tuberculosis. Apical bronchogenic carcinomae are often missed through satisfaction with a diagnosis of tuberculosis, arrived at with inconclusive evidence. Certainly, in the perspective of the diagnostic approach to diseases of the chest, tuberculosis must always be taken in the investigation as the first disease to be excluded before the non-tuberculous group is approached.

It is our objective to keep this symposium on a practical plane. While it is fully justifiable to include in the non-tuberculous diseases of the chest all non-tuberculous conditions, this group has decided to present to you more common non-tuberculous diseases of the lung with their diagnosis and possibilities of treatment. It becomes necessary to exclude from discussion such diseases as the pneumonokonioses, the mycoses and the more acute forms of non-tuberculous disease.

# The Role of Bronchoscopy in Chronic Diseases of the Chest

D. M. MACRAE

AS a result of our increased knowledge of pulmonary disease, and the great advances made in thoracic surgery during recent years, a bronchoscopic examination should now be a common diagnostic procedure in cases of chronic diseases of the chest.

The internist requests aid in determining the cause of a chronic cough, a haemoptysis or the source of sputum, while the surgeon wants to know the exact location, nature and extent of a lesion and whether or not there is mediastinal metastasis or other evidence contra-indicating an operation.

The examination is made under local anaesthesia. The pre-operative sedation consists of sodium phenobarb gr.  $1\frac{1}{2}$  two hours before and morphine gr.  $\frac{1}{4}$  with atropine gr.  $\frac{1}{150}$  an hour before. The local anaesthetic consists of two applications of 2% pontocaine to each pyriform sinus for anaesthesia of the larynx, with 2 c.c. injected directly into the trachea. The resulting cough spreads the solution throughout the trachea and main bronchi. If a lipiodol injection is indicated, a rubber catheter is passed into the trachea, after the bronchoscopic examination, to facilitate the injection of lipiodol which is done under fluoroscopic guidance.

We usually keep the patient in the hospital for 24 hours. About the only contra-indications to bronchoscopy are aneurysm, advanced cardiovascular disease, tuberculous laryngitis and acute upper respiratory infection. Very sick patients may be bronchoscoped in their bed without upsetting them unduly.

We will now consider some of the indications for bronchoscopy, most important of which is the presence of an atelectasis, since this is due to a complete obstruction of a bronchus.

X-ray plate No. 1 shows an atelectasis in the right upper lobe of a 37 year old man. Clinically, the patient had a persistent cough, recent haemoptysis, and severe shortness of breath with marked dilatation of the superficial veins of the head, neck and chest.

The bronchoscopic examination showed slight retraction of the trachea to the right with marked congestion of the mucous membrane. The lower end of the trachea showed a marked reduction in the airway to less than one-quarter of the normal, due to pressure from without, anteriorly. The carina or bifurcation was somewhat thickened and immobilized showing involvement of the superior mediastinum. A biopsy taken from the right upper lobe bronchus was reported as being characteristic of an oat cell type bronchogenic carcinoma.

The second X-ray plate shows a segmental atelectasis in the right lower lobe of a 36 year old woman who gave a history of an attack of influenza about two months after a radical sinus operation. As her chest symptoms did not clear up satisfactorily her physician had her X-rayed with the above noted result.

Bronchoscopic examination showed the right lower lobe bronchus to be partly occluded by a mass of greyish tissue. This was easily removed with a foreign body forceps. Our impression at the time was that it was not a malignant growth since it did not appear to be attached anywhere and it did not bleed on instrumentation. However, the pathological examination revealed the presence of a bronchogenic squamous epithelioma. Apparently the growth

had originated in a subdivision and extended into the main bronchus so that the actual lesion was not visualized.

Dr. Mader removed the right lung about a year ago and there is no evidence of any recurrence. We all feel the comparatively early diagnosis in this case resulted from the alertness of her physician in having her X-rayed when the physical signs in her chest did not clear up after her temperature returned to normal.

In such cases bronchoscopy offers the earliest and the only positive diagnosis. Pulmonary cancers may be divided into (1) endobronchial and (2) peribronchial growths. About 80% of cases are endobronchial, and about 75% of these originate in a main or segmental bronchus and may be diagnosed by bronchoscopy before there is any X-ray evidence. As a matter of fact X-ray diagnosis is necessarily late because it depends on parenchymal pathology caused by interference with the ventilation and drainage of the bronchi.

In the peribronchial group positive diagnosis is late, for histological examination must wait until the growth erodes the bronchial wall. However, a tentative diagnosis may be made earlier by the finding of fixity, rigidity and deformity of the bronchial walls.

Another indication is a chronic unexplained cough, as illustrated by a woman of 30 years with the following history. One evening in August, 1943, she was eating a hamburger when she felt something "go down the wrong way." This was followed by a severe attack of coughing which eased up after a few minutes but continued to be quite troublesome for the next three days. Associated with the cough was a wheezing sound which lasted for about a week. On the fourth day she consulted a physician who told her she had asthma and bronchitis. After six weeks treatment, as she was still troubled with recurring attacks of coughing she consulted another physician who told her she had an irritable throat and gave her a Rx. for some cough medicine. She took several bottles of this but the cough continued. After Christmas she consulted a third doctor who told her she had chronic tracheitis and she was given medicine to use as an inhalation. This treatment was continued for several weeks without any definite relief. In March she was under the care of a fourth doctor who had her chest X-rayed. The plate showed no evidence of disease and she was told there was nothing to worry about but he gave her some capsules to take. The fifth doctor consulted while on vacation, referred her to the sixth doctor who sent her to the hospital for a bronchoscopic examination. This revealed a piece of bone,  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x  $\frac{1}{4}$ " in size fixed crossways in the right main bronchus, just below the level of the upper lobe orifice. It was surrounded by granulation tissue which caused some stenosis. A re-examination two months later showed a normal bronchus. The patient made the very pertinent observation, that it was too bad she had to see six doctors to find one who would believe her when she said she was sure there was a piece of hamburger in her lung.

Another interesting case was that of a 61 year old female who complained of a severe cough associated with expectoration of several ounces of sputum daily for the past six years. She was bronchoscoped under local anaesthesia with difficulty as she had a reaction to the anaesthetic. After the spasms subsided a hurried examination showed the presence of pus and granulation tissue in the right main bronchus, but no foreign body was seen. Later she consulted Dr. Schaffner who suggested another bronchoscopic examination,

which was done under general anaesthesia, when a thin fish bone about  $\frac{1}{2}$  inch long was removed. Following this her cough and expectoration entirely cleared up despite the period of time the bronchus had been subjected to irritation.

Not too long ago, haemoptyses were considered as contra indicating a bronchoscopic examination. But now it is felt all such cases should be bronchoscoped except where there is definite radiological evidence, confirmed by a positive sputum, of tuberculosis. And many tuberculous patients are bronchoscoped at the request of the chest specialist to exclude bronchial ulceration, bronchiectasis, malignancy, etc.

A well nourished man of 42 was sent to me several years ago for investigation of repeated haemoptysis. He had been treated as a probable case of tuberculosis, with bed rest for six months, despite negative X-ray and sputum tests. Bronchoscopic examination showed a small varicosity in the left main bronchus about the size of the head of a match. When this was touched with the end of the scope it started to bleed. It was treated with silver nitrate and the patient returned to normal activity without further bleeding.

Another man had been in a tuberculosis annex for two periods of six and three months because of haemoptyses following any moderate exertion. He had no cough, expectoration or fever and the only pathology shown by X-ray examination was increased bronchial markings at the right base. The bronchoscopic examination was negative so lipiodol was injected in the right base through a nasal catheter. This showed a definite bronchiectasis of saccular type despite the fact the patient had neither cough nor expectoration. These cases are classified as bronchiectasis siccata or a dry bronchiectasis.

I believe all cases of bronchiectasis should be bronchoscoped to exclude the possibility of a malignancy or a foreign body being the etiological factor. Also, aspiration of the thick purulent secretions, before lipiodol injection, results in a better filling of the bronchiectastic cavities.

Several years ago a patient with advanced saccular bronchiectasis of the left lower lobe was bronchoscoped at the Nova Scotia Sanatorium. We found the left main bronchus almost occluded by a growth just below the upper lobe bronchial orifice. A biopsy of this showed it to be a squamous epithelioma.

Other cases of bronchiectases have shown the presence of a half peanut, a piece of tooth, a head of timothy, and a small stone.

The only apparent cure for an established bronchiectasis is surgical removal of the affected part. However, patients who are not fit for, or will not submit to surgery may be greatly helped by repeated aspirations and injection of penicillin or streptomycin solution directly into the involved bronchi.

A bronchoscopic aspiration is also important as a pre-operative preparation where postural drainage does not result in satisfactory emptying of the bronchiectastic cavities. Such an aspiration preceding surgery may prevent complications caused by flooding of the other lung with thick purulent secretion.

When treating asthmatic patients, one should keep in mind the saying of Dr. Chevalier Jackson, "all is not asthma that wheezes." There are many reports in the literature of cases in which the so-called asthmatic symptoms were not caused by an allergic factor but by organic changes in the tracheo-bronchial tract or adjacent structures. Endobronchial growth and foreign bodies were the commonest non-allergic causes found.

The following is a good illustration of the above precept. A 45 year old man entered the hospital complaining of attacks of shortness of breath, associated with cough and expectoration over a period of seven years. He had been treated by many doctors over this period and had been told that he had chronic bronchitis, asthma, emphysema, and bronchiectasis. His attacks were relieved by injections of adrenalin, and he was depending on the use of patented asthma remedy to tide him over the ordinary attacks. He had been treated for pneumonia on three occasions during the previous two years. Bronchoscopic examination showed congestion of the mucous membrane of the right main bronchus with granulation tissue around the bronchial orifice of the dorsal segment of the lower lobe. No foreign body could be seen but in attempting a biopsy the instrument brought out a minute piece of bone. This provoked uncontrollable coughing and we had to stop. Several weeks later, under general anaesthesia, a piece of chicken bone was removed. This cured the attacks of breathlessness and severe cough and the patient felt so well that he refused to have a lipoidol examination at a later date.

Cases of obscure thoracic disease may be saved months of convalescence from ensuing complications, by an early bronchoscopic examination. A good example of this is a 32 year old man who entered the hospital in March, 1945, complaining of cough, pain in the right side of his chest, loss of weight and marked fatigue. For some weeks he had been raising about a tablespoonful of sputum daily and had coughed up a slight amount of blood on one occasion. His temperature was 99.2 and physical examination negative except for slightly diminished breath sounds with fine rales at the base of the right lung.

The chest X-ray was reported as showing the presence of infiltration in the third right interspace possibly of a recent exudative nature and a localized infiltration in the fourth right intercostal space-mid zone. Re-examination was advised in one month.

Seven weeks later he was re-admitted to hospital complaining of increased fatigue, cough and profuse expectoration of a heavy yellowish green sputum. His temperature was 101. An X-ray was reported as showing evidence of a pleural effusion at the right base. On the fifth day a bronchoscopic examination showed considerable mucopurulent secretion present in the right main bronchus. Aspiration of this revealed the evidence of a foreign body in the bronchus. This was so large that difficulty was experienced in removing it through the larynx. It was a flat piece of bone about  $\frac{3}{4}$ " x  $\frac{1}{2}$ " x  $\frac{1}{8}$ ". Two days later his temperature had dropped from 103 to normal. There was much less cough and sputum and he was discharged two weeks later.

The patient was re-admitted in March, 1946, one year after his first admission, complaining of a dull pain in the right chest. He stated that he had been quite well for 7 months until he caught a cold at Christmas time. Shortly after this he experienced pain in the right side and this gradually became so severe that he has been unable to work. He has no cough or expectoration.

X-ray examination showed lower half of right lung field obscured by generalized haziness suggestive of thickened pleura.

A bronchoscopic examination revealed some irregular thickening of the M.M. of the right main bronchus, but no ulceration or granulation tissue was present. Lipoidol injection showed some saccular bronchiectasis of the right lower lobe.

He was treated with 5 million units of penicillin intramuscularly along with aerosol penicillin and was practically symptom free after seven weeks hospitalization.

It is unfortunate that this patient did not have a bronchoscopic examination on first admission. Actually it was considered and advised but when the X-ray examination reported an exudative infiltration it was felt that bronchoscopy should be postponed.

Another interesting case is that of a 57 year old woman who entered hospital in 1939 complaining of cough, slight expectoration and pain in right chest. Her condition had been diagnosed chronic pleurisy right base in 1935. X-ray showed generalized exaggeration of the broncho-vascular markings at the right base suggesting bronchial infection.

A lipiodol injection revealed normal filling of the left bronchi but the posterior divisions of the right lower lobe were not defined.

A bronchoscopic examination showed stenosis of the right lower lobe bronchus, just below the level of the middle lobe orifice, due to pressure from without. There was also ulceration and granulation tissue present. Our diagnosis was bronchogenic carcinoma despite the fact that biopsy of the tissue showed only chronic inflammatory changes.

She was readmitted in August, 1947, eight years later complaining of persistent cough, occasional haemoptyses during the interval, and of a recent severe attack of breathlessness which required a week's bed rest.

The X-ray showed increased descending bronchial markings on the right with calcification at the hilum. Left side normal.

Bronchoscopic examination revealed no evidence of the previously noted pathology in the right bronchial tract. However, a broncholith was removed from the left main bronchus, just above the level of the upper lobe orifice. This had been present for some time as there was roughness of the M.M. with a slight amount of granulation tissue present. The laboratory reported the specimen as a pea sized mass of amorphous material, completely calcified and having no tissue structure.

On reviewing this case, our impression is that the pathology present in the right bronchus in 1939 was caused by a calcified gland eroding into the bronchus. At some later date this erupted into the bronchus and later migrated to the left main bronchus.

Bronchoscopy has certain limitations in that all parts of the bronchial tree are not accessible to visual inspection, but as a rule the trachea, main bronchi and the segmental bronchi can be examined directly.

The examination should be preceded by a careful radiological examination, clinical investigation, and consultations as the information thus obtained may result in the visualization of a minute lesion that might otherwise be missed.

# Surgical Treatment of Non-Tuberculous Pulmonary Suppuration

V. O. MADER, M.D., F.R.C.S (c)

IN discussing the treatment of non-tuberculous pulmonary suppuration I propose to limit my remarks to lung abscess and bronchiectasis.

Abscess of the lung is not related to any specific organism. One of many organisms may be the initial etiological agent and other organisms soon invade and become established. A pulmonary abscess may be said to be putrid, or non-putrid, and the basis of difference is purely a bacteriological one. Generally speaking the putrid abscess results from infection by the bronchial route whereas the non-putrid type is due to blood-borne infection.

A further classification frequently used and useful, divides all lung abscesses into two groups:

- (1) localized.
- (2) extensive.

All are usually localized to begin with but the putrid form frequently becomes extensive and then should more properly be referred to as lung gangrene. Another useful and simple classification is based on the route and cause of the infection. This classification recognizes three groupings:

- (1) Inhalation or Inspiratory—following operations, foreign bodies, etc.
- (2) Respiratory—following pneumonia, tonsillitis, sinus disease.
- (3) Embolic—Infarction, pregnancy, operations, etc.

The diagnosis is arrived at by the methods outlined by the previous contributors to this symposium, history, physical examination, X-ray findings, bronchogram, bronchoscopic examination and laboratory studies.

The treatment of lung abscess may at first be non-surgical, consisting of bed rest, supportive care, postural drainage, bronchoscopic aspirations, transfusions, and specific medication—neosalvarsan, sulphonamides and antibiotics. If these measures do not give satisfactory results in a short time, and if the patient fails to improve after a reasonable trial period, or progression of the disease occurs, or progression occurs after improvement has once commenced, surgical treatment is indicated. If these danger signals are not heeded immediately, valuable time is lost and the mortality and morbidity rates will increase accordingly.

*Surgical Treatment.* This consists first of localizing the most peripheral point of the abscess by fluororoentgenography. This point is marked by silver nitrate or by injecting a minute amount of methylene blue into the skin. The operative technique is carried out in one or two stages. The rib or ribs over the area are resected along with the intercostal bundles. If it can be demonstrated beyond doubt that there is pleural symphysis, the lung may be explored at the primary operation. Otherwise the wound is packed with iodoform gauze and the skin sutured over it. After an interval of several days, depending on the patient's condition, usually about ten days, the wound is reopened and the gauze removed. The pleural space has become obliterated and a trans-pleural opening can now be made into the abscess by actual cautery or knife. This can be performed—without danger of leak into the pleural cavity and consequent empyema. In addition to surgical drainage occasionally lobectomy may have to be done for lung gangrene.

In summary, we should note that abscess of the lung must not be neglected, nor should a temporizing plan be followed. Non-surgical and surgical treatment do not constitute two separate programmes, both belong to one programme directed against the disease. If an abscess fails to show prompt and continued improvement or if regression occurs after improvement, immediate open drainage should be instituted. Chronicity should not be permitted to develop since the sequellae and the consequences are severe and may require extensive pulmonary resection and even extensive chest wall operations.

*Bronchiectasis.* By definition bronchiectasis means dilated bronchi but on the average over three-quarters of all cases are associated with abscesses ranging from those of microscopic size to those of grosse dimensions. These abscesses are very different from the pulmonary abscesses previously referred to which are parenchymal in origin, whereas the "bronchiectatic abscess" is lined with epithelium.

Bronchiectasis is not characterized by a high mortality, but the resulting morbidity is exceedingly high. Symptoms and effects may be so severe that life may be utterly miserable for the patient and even his associates. Definite invalidism and premature death are not uncommon. Arthritis, pulmonary osteoarthropathy, brain abscess, and amyloid disease complicate cases of long standing and may overshadow the primary condition.

Bronchiectasis may be considered under several classifications, as, for example,

- |                                 |                          |
|---------------------------------|--------------------------|
| (1)                             | (2)                      |
| 1. Bronchiectasis of childhood. | 1. Primary (congenital). |
| 2. Bronchiectasis of the adult. | 2. Secondary.            |

The large number of explanations given in the literature for the cause of the condition leads one to the conclusion that it is highly complex and that its evolution is not yet completely understood.

Bronchiectasis in childhood is usually divided into two main groups, (1) the congenital cystic type and (2) the type following infection. Both these types may have numerous underlying causes, but it seems clear that the congenital cystic type is a distinct entity, and the type following infection is similar to the adult or secondary type.

Bronchiectasis in the adult results from a large group of factors related not only to the lungs, bronchi, and trachea, but also to the upper respiratory system. A good classification based on etiology is as follows:

#### **Classification of Etiological Factors (Judd)**

- (1) Those related to extrathoracic structures:
  - (a) Chronic tonsillitis and chronic oral infections.
  - (b) Chronic sinus disease.
  - (c) Acute upper respiratory disease.
- (2) Those related to the trachea and bronchi:
  - (a) Acute tracheal infections, as whooping cough.
  - (b) Intra bronchial obstructions, as foreign bodies or tumors.
  - (c) Bronchial strictures and stenoses; intrinsic changes in the bronchial wall; functional obstruction, such as asthma.

- (d) Peribronchial and extra bronchial tumors, benign or malignant; enlarged pulmonary or mediastinal glands.
- (3) Those related to the lung and pleura:
  - (a) Abscess, pneumonitis, silicosis, pneumonia.
  - (b) Tuberculosis.
  - (c) Chronic empyema, fistula.

Bronchiectatic lesions may be either saccular or cylindrical. In the saccular type the terminal bronchi are ballooned out to form a collection of small abscess-like cavities, like a cluster of grapes. The cylindrical type is more diffuse and usually involves more segments of the bronchus than the saccular type.

Non-surgical treatment or "palliative treatment" of pulmonary bronchiectasis does not aim at a cure of the condition, but merely to relieve symptoms. It is impossible to cure the disease by other than surgical means. It therefore follows that the non-surgical regime either becomes a mode of management in inoperable cases or a part of the preoperative preparation of the patient. It consists of regular postural drainage, bronchoscopic aspirations, specific therapy, and general supportive care. The only specific therapies at present of value are penicillin, streptomycin, and nearsphenamine. Although none of these drugs has proven of sufficient value to bring about a cure they have proven of temporary help palliatively and are indispensable in preparation for operation.

*Surgical Treatment:* The only procedure which has given satisfactory results is the one that aims at total removal of the diseased areas. Sub-total lobectomy, lobectomy, or occasionally pneumonectomy fulfil this requirement. The operative mortality has been reduced to a level so satisfactory that the operation can now be recommended with confidence.

The preparation of the patient for operation in addition to the studies referred to in this symposium by my confreres must include (1) Complete sputum examination, (2) Complete blood studies, (3) Vital capacity, (4) Pulmonary circulation time, (5) Electrocardiograph. A preliminary course of intensive postural drainage accompanied by a course of penicillin given both parenterally and by the aerosol bronchial route is then begun. A few days before operation a small pneumothorax is introduced.

The choice of anaesthetic is extremely important. The anaesthetist must be an expert and thoroughly familiar with controlled intra tracheal anaesthesia. We prefer cyclopropane, since it can be given with a high oxygen concentration. The job of the anaesthetist ranks equally with the surgeon in intra-thoracic surgery, and cooperation of the two must be constant throughout the operation.

I do not propose to discuss the operative technique in detail in the time at my disposal. Briefly, the incision, usually a postero-lateral one, is made over the most suitable rib to approach the lesion, whether a lung segment or a lobe is to be removed. After the pleural cavity is opened, adhesions are separated over the diseased segment or lobe. The hilar structures are dissected out and individually ligated if possible. Special attention is paid to the closure of the bronchus, which must be done with meticulous care. All bare areas are covered with pleura, even if plastic methods have to be

resorted to. Penicillin is put into the pleural cavity and the lung is re-expanded before the chest is closed

*Post-operative Treatment.* Blood transfusion is begun during the operation and is continued in the post-operative period, having regard for the amount of blood loss. It must not be overdone, and the amount of intravenous fluid administered should be carefully controlled. The oxygen tent is used routinely, and in addition to giving a high concentration of oxygen the constant temperature and controlled humidity gives great comfort to the patient. Penicillin is continued. Sedatives are given sparingly, especially respiratory depressants.

The pre-operative and post-operative X-ray plates of a series of cases of lung abscess and bronchiectasis were demonstrated.

- (1) Brown. Huge lung abscess, drained, cured.
- (2) Cameron. Lung abscesses, multiple, complicated by brain abscess, died. No operation.
- (3) Porter, age 10. Extensive right lower lobe bronchiectasis following inspiration of a peanut at age 4. Lobectomy, cured.
- (4) Burton. Bilateral lower lobe bronchiectasis. Left lower lobectomy, great improvement. Right lower lobectomy planned for spring 1948.
- (5) McNeil. Dorsal segmental resection, followed by lower lobectomy. Cured.
- (6) Dacey. Right upper lobe bronchiectasis. Right upper lobectomy followed by extreme mediastinal retraction giving severe cardiovascular symptoms. Right upper thoracoplasty. Cured.
- (7) Sampson. Bronchiectasis involving the whole right lung. Total pneumonectomy. Cured. Thoracoplasty may have to be carried out later due to mediastinal retraction.

# Bronchiectasis

T. M. SIENIEWICZ, M.D., F.C.C.P.

**E**CTASIS or dilation of the bronchial tubes may be cylindrical, fusiform, sacculated, or mixed. It can be congenital, which is very rare.

This is a very common disease and is probably second to pulmonary tuberculosis as a chronic disease of the lungs. It is therefore of considerable importance clinically. It is now considered a surgical disease, because most cases are treated surgically.

*Etiology:* It is usually secondary to a lesion involving the bronchi, the parenchyma and the pleura.

Four factors act in the production of this lesion:

- (1) a lesion which softens or impairs the integrity of the bronchial wall.
- (2) a distending force—expiratory cough.
- (3) a traction on the wall from without—pulmonary fibrosis and pleural adhesions.
- (4) infection.

The following conditions usually precede and determine bronchiectasis: pneumonia, influenza, upper respiratory infection, scarlet fever, measles, whooping cough, asthma, foreign body and lung abscess, and pulmonary tuberculosis.

On the other hand this disease may occur with no known preceding illness or infection.

*Pathology:* This condition can be of an acute form as seen in an influenza epidemic. In a recently reported serious streptococcal pneumonia epidemic, which occurred in a large Naval Camp, 40 per cent of their bronchiectasis cases had symptoms for a period of six months, or less. The chronic form is certainly the more common. More than 50 per cent are unilateral. Bronchography and the study of the surgical specimens have revealed that this disease is principally a segmental one, and that a whole lobe is rarely involved. Basal segments of the lower lobes are most commonly affected. The lingula of the left upper lobe and the bronchi of the right middle lobe, are very often involved as well. Alexander feels that this disease is usually bi-lateral. Churchill says that bronchiectasis, once it comes under observation, progresses slowly, if at all. Progression from this point on will be due to associated suppurative changes in the pulmonary parenchyma.

The ectatic cavities contain purulent secretions which on cultural study will show the very frequent occurrence of streptococcus viridans. This finding may be peculiar to our local area. A great many different organisms appear in these sputa which fortunately are often sensitive to penicillin. On occasions gram-negative organisms are found to be predominant. The hemophilus influenza bacillus may, therefore, give a pure culture. This group is sensitive to streptomycin. Virulent anaerobic organisms are present in foul sputum.

The wall of the affected bronchus may become ulcerated. Fibrosis and abscesses may be found in the parenchyma. As a result of increased tension in the pulmonary circulation, right ventricular strain will occur and eventually congestive heart failure. Metastatic abscesses may occur. Recurring episodes of pneumonitis occur frequently.

The majority of cases become established in the first two decades of life. Those occurring in middle life are invariably secondary to an obstruction in the bronchus, caused by a tuberculous process or a tumor.

Of those who develop bronchiectasis in the first decade of life only 9 per cent reach the age of 40. Seventy-eight per cent of bronchiectasis cases die directly from their disease.

*Symptoms:* When fully developed symptoms are distinctive; (a) cough and expectoration are usually paroxysmal; often the drainage of sputum takes place at regular intervals. It is not often foul. (b) haemoptysis; frank bleeding occurs commonly. (c) dyspnoea on exertion is common. (d) fever, malaise and a dry non-productive cough will occur when drainage from a segment is blocked off; (e) occasionally one sees a dry bronchiectasis in which the only symptom is a frank haemoptysis; (f) the general health remains good until the time is reached when extensive changes have occurred in the parenchyma of the lung, or serious metastatic complications have occurred.

*Physical Signs:* (a) rales in bronchi—sibilant and sonorous rhonchi; (b) rales in the parenchyma; (c) dulness from atelectasis and pneumonitis; (d) breath sounds may be greatly diminished because of filled bronchi, a fibrosis and emphysema; or there may be signs of cavitation; (e) signs may change following a drainage of cavities; and (f) there may be evidence of cyanosis, incurvation of nails and clubbing of fingers.

*Radiological Findings:* (a) increased markings along the paths of the bronchi; (b) atelectasis is a frequent finding, and is often located behind the heart shadow and is not seen; (c) patchy flocculent shadows.

The accompanying pneumonitis, atelectasis and fibrosis are the factors causing X-ray shadows.

*Diagnosis:* Usually the clinical story is strongly suggestive of bronchiectasis, but the radiological and bronchoscopic examinations are invaluable in diagnosis. Bronchoscopic examination should be performed in every suspected case. It will reveal information on inflammatory changes, causes of obstruction; it will localize disease to the lobe or segment from which purulent secretions can be seen draining; it permits direct aspiration of secretions, and removal of sections for microscopic study. Finally, it permits the introduction of lipiodol for bronchographic study.

*Bronchography:* This is an essential diagnostic procedure and it is the only certain method by which a diagnosis can be made. The method of introduction of this oil can be via the bronchoscope, a catheter or simply by a supra glottal route.

Adequate filling of all five lobes is most important. In this way, every important broncho-pulmonary segmental branch of the bronchial tree will be delineated. Normal bronchi begin to eliminate the oil at once, and very quickly the oil gets into the alveoli. The pathological bronchi have lost their power to eliminate and these tubes fill solidly and thereby give the appearance of a "leafless tree," or the broken stumps of dead limbs. Early changes may be difficult to interpret.

This examination is important not only for purposes of surgery, but also for the preoperative or palliative treatment for the purpose of postural drainage.

*Treatment:* Non-surgical—This form of treatment is employed in those cases where surgical treatment is contra-indicated for such causes as age, general condition, involvement of too many lobes, or some other serious complication. This schedule is also good preoperatively.

1. Postural drainage,—in the morning on arising,—before each meal and at bedtime. Special tables can be used for this purpose.
2. Potassium iodide, saturated solution, to modify the sputum.
3. Bronchoscopic drainage at weekly intervals, especially pre-operatively.
4. Adrenalin by inhalation may be of definite value in those cases with bronchospasm before drainage, as above, is carried out.
5. Antibiotic drug therapy by inhalation, or aerosol method is of great value. This will result in a striking reduction of the volume of sputum in most cases.

We use a concentration of 10,000 units per cubic centimeter, and a daily total of 200,000 to 300,000 units is nebulized. The daily dose of streptomycin is 500,000 to 1,000,000 units.

A combination of 200,000 units of penicillin and 500,000 units of streptomycin in 20 to 30 cc. of normal saline solution, may be of great value. Recurrences of sputum after cessation of treatment are common. The bacterial flora, however, is modified. Parenteral administration is of value in complicating pneumonitis.

6. Sulfonamides, particularly sulfadiazine, for pneumonitis.

*Surgical Treatment:* Here lies our great hope for a cure. Many are cured. Pre-war operative mortality was down to 3 per cent. Now, with penicillin and streptomycin, the marked advances at the hands of the thoracic surgeons—and the anaesthetists, one does not even think of an operative death. Here is one of the major advances in medicine.

A word about prophylaxis. The paediatrician must of necessity play his part well. Respiratory diseases in children should be treated carefully and thoroughly. He should make sure that all parts of the lungs are ventilating well. Bronchoscopic drainage should be used as often as necessary.

At the end of the paper X-ray films and diagrams were shown. The purpose of this demonstration was to show the important bronchopulmonary segments in both lungs. These were enumerated as follows:

*In the Right Lung:* The upper lobe is made up of 3 principal segments—apical, antero-lateral and postero-lateral. Middle lobe of 2 segments— anterior middle and lateral middle. Lower lobe of 5 segments—the dorsal leading to the apex of the lower lobe, the cardiac, and the 3 basic, namely, anterior, middle and posterior.

*In the Left Lung:* Upper lobe is made up of 2 segments—apicoposterior and anterolateral.

The Lingula corresponds to the middle lobe on the right and it has 2 segments, the anterior middle and the lateral middle. Lower lobe is made up of 4 segments—the dorsal and the 3 basic, anterior, middle and posterior.

Various types of lesions such as virus pneumonitis, lung abscess, neoplasm and the bronchograms of bronchiectatic lesions were shown involving all of the above mentioned bronchopulmonary segments.

# Carcinoma of The Lung

V. D. SCHAFFNER

Kentville

CANCER statistics would indicate that the incidence of carcinoma of the lung stands next to carcinoma of the stomach as a malignant invader of the various organs of the human body. In Nova Scotia, I suspect that such a high ratio does not hold and that we will see *relatively* little carcinoma of the lung so long as the majority of our population make a livelihood on the farm, in the woods and on the sea. When our open country-side is covered with large industrial plants, if it ever is, I expect that the relative incidence will increase. However, sufficient malignant disease of the lung does exist to warrant some discussion of this most important problem. Unfortunately many cases have died, without the true nature of the disease having been recognized and many have been recognized too late to hope for a cure.

It was not until 1933 when Dr. Evarts Graham performed the first successful pneumonectomy for cancer of the lung that a correct diagnosis was of anything more than academic interest, as all so afflicted were doomed to die. That patient, I believe, is still alive and the results of operation since that time have been extremely encouraging.

It would appear that carcinoma of the lung is definitely on the increase, and that the increase in rates noted cannot be accounted for by an accelerated interest in the problem and improved diagnostic methods of the past few years.

It is very predominantly a disease of males, the ratio of males to females being about 6 to 1. Like most other cancer it occurs mostly in the 4th to the 6th decade, but again like any cancer may occur at any age.

By far the greatest percentage of cases is to be found in large urban, industrial centres with a relatively low ratio in the country. It would appear that the irritating effect of industrial dusts and smoke might be an etiological factor in the development of lung cancer. The various pneumoconioses are complicated in a fairly large percentage of cases by carcinoma of the lung. The chronic infective processes of the lungs and bronchi appear to have no influence on the development of lung cancer. The incidence among tuberculous patients is low. Tuberculosis may even have an inhibitory effect on the development of cancer. Oertel did considerable work on the effect of tuberculosis on malignant disease of the lung and to any of you who might be interested in this aspect of the disease, I would refer you to his work.

It is not within the scope of this paper to go into the pathology of carcinoma of the lung. That I will leave to the pathologists themselves. In the past, carcinoma of the lung was divided into three large groups, the squamous cell carcinoma growing from the squamous cell epithelium of the bronchus, the adeno-carcinoma, growing from the mucous glands of the bronchus, and the alveolar epithelial carcinoma. It is doubtful if there is such a thing as alveolar epithelium and as a consequence there could be no such thing as a carcinoma arising from the lung paranchyma itself, and it therefore follows that all primary cancers of the lung are bronchogenic in origin. Some pathologists believe that all cancers of the lung develop as a metaplasia of the basal cells of the bronchial mucosa. I regret that I do not know enough pathology to argue the exact cellular origin of bronchogenic

carcinoma, but I do believe that the term "bronchogenic carcinoma" should be used rather than "primary carcinoma of the lung." The so-called bronchial adenomata have been extensively discussed of late. This is a tumor of the lung that clinically, in its early stage, cannot be distinguished from bronchogenic carcinoma. By some it is regarded as benign and by others malignant. The tumor grows slowly and metastasizes only locally. The fact that it metastasizes at all, would in my opinion, make it a malignant tumor. Although this tumor type is rare, we have operated upon two of them.

The symptoms of bronchogenic carcinoma are not characteristic but suggestive, and as a consequence cannot be relied upon for a diagnosis. The most common symptom is cough. In this day and age of excessive cigarette smoking, cough is almost a universal act of normal individuals and as a consequence causes little concern to either the person that has one or the physician consulted. It does become important however when a person that never had a cough before develops one, or when the character of a cough changes in an individual that had had "a little cough for ages."

The cough associated with cancer is at first dry and irritating, later to become productive of the sputum characteristic of the complication produced by the growth. Unfortunately on account of its almost universal occurrence, a cough does not cause much alarm on the part of a patient or his physician, and as a result this first and most important symptom is often passed off as a "cigarette cough" or some such, without sufficient analysis of events as they are actually occurring. A physician who prescribes a cough mixture without proper investigation may be driving coffin nails.

The second most common symptom of primary carcinoma is pain or discomfort in the chest. This is rather characteristic and when described should always arouse suspicion. The pain of bronchogenic carcinoma, at first, is always a dull steady ache of a localized nature, and is not affected by the respiratory excursion as is pleural pain. It is only after infective complications appear that pleural pain becomes apparent. The pain is due to bronchial compression or distension. It is wise never to regard lightly a localized steady pain in the chest. Shoulder girdle pain is usually indicative of malignant infiltration of the superior pulmonary sulcus and as a consequence is a bad omen. Most patients, if not all, who complain of such pain are inoperable from the point of view of cure.

Haemoptysis is a rather common symptom of primary bronchogenic carcinoma. It is seldom seen with secondary carcinoma. The bleeding usually consists of streaking, but occasionally massive haemorrhage will occur. Fortunately this is a symptom that usually alarms a patient regardless of how little the bleeding might be and when the physician is consulted, he is quite willing to undergo complete investigation. This, of course, should be undertaken without delay.

Beside these local symptoms, general symptoms usually exist such as weight loss, weakness, fatigue, night sweats, fever, etc. These symptoms may be those of the growth itself or those of its complications, such as atelectasis, abscess, extension, etc.

The physical signs are not characteristic. There may be none at all even with relatively large growths. With obstructing growths the signs are those of a pneumonitis, atelectasis or abscess. The ordinary X-ray plate is usually suggestive but far from characteristic. Seldom is the growth itself seen except in the ones that grow in the periphery of the lung from the smaller

terminal bronchi. The X-ray picture is, most frequently, that of pneumonitis, atelectasis or abscess due to the infective processes occasioned by partial or complete blocking of the bronchus. Bronchograms are helpful. They may show the primary or secondary bronchi coming off at angles that suggest neoplasm. With growths partially obstructing a bronchus, filling defects may be seen and with the more advanced lesions complete obstruction of the iodized oil is to be observed.

Bronchoscopy is an extremely valuable diagnostic aid and is performed in all cases suspected of malignant disease. By this procedure one can quite accurately determine whether the trachea and mediastinum are fixed, and the site of secondary invasion. The various primary bronchi can be observed and the nature of the discharged secretions recorded, thus adding evidence of the exact site of the growth, even when it cannot be visualized. In about 40-50% of cases the growth can be visualized and a biopsy taken for definite and complete diagnosis. Recently the examination of bronchial washings obtained through the bronchoscope has given positive diagnosis of carcinoma in as high as 90% of cases. This is a decided diagnostic advance. When pneumothorax is possible, examination of the lung, mediastinum and pleura with the thoracoscope may be of some help, but I have not found it remarkably so. Other diagnostic procedures such as sputum examination, pleural fluid examination, punch biopsys are sometimes used. In my opinion, the punch or aspiration biopsy is dangerous and uncertain and should be condemned.

There will be times even after the most complete and exhaustive study that a positive diagnosis cannot be made. Under such circumstances immediate exploratory thoracotomy should be done. Under direct examination the presence or absence of carcinoma can usually, but not always be determined. Even if the diagnosis of carcinoma cannot be absolutely settled, lung resection should be resorted to. It is not an error to resect a lung for suspected carcinoma and later to be confronted with a pathological diagnosis of chronic abscess, bronchiectasis, or chronic atelectasis, as lung resection is the proper treatment for all the conditions named. I can recall at least two cases in which, from the history and investigative findings, a diagnosis of carcinoma was made. At the time of operation the appearance of the lung and the feeling of a hard mass within it also suggested such a diagnosis, although no positive biopsy had been obtained. Lung resection was done in both cases with uneventful recoveries. Both were cured of their disease. One of these patients has been working aboard an oil tanker as engineer for three or four years now and in a letter received from him from France, some months ago he tells me he is absolutely well without disability of any kind. The pathology of his lung was chronic abscess and in the other, diffuse bronchiectasis without evidence of malignant growth.

Before briefly discussing treatment, I would like to make one point in regard to diagnosis and investigation and that is to condemn the present day tendency with these cases "to wait and see." It has been pointed out that the symptoms, signs and X-ray appearances are uncertain. Under such circumstances a patient who has suggestive symptoms and findings deserves complete investigation and not, as is frequently the case, put to bed for two or three months and then re-X-rayed. Prolonged observation has no place in the diagnosis of bronchogenic carcinoma. By so doing a patient is fre-

quently robbed of his only chance for survival. It is surprising that even competent X-ray men will, at times, read a plate and report suspicious evidence of carcinoma and recommend re-examination in one or two months, as though a positive diagnosis is all that matters.

Again it must be warned that the X-ray appearance may in no way, indicate the extent of the growth and a diagnosis of operability or non-operability should not be made on X-ray evidence alone, provided indisputable evidence of extensive mediastinal involvement does not exist. A small growth obstructing the main stem or primary bronchus, may give the appearance of extensive lung involvement due to the atelectasis or pneumonitis produced. A more peripheral growth may appear less extensive and quite operable from the point of view of cure and yet extensive metastases may exist.

My remarks regarding treatment will be brief. Should anyone wish to discuss the matter further I will be pleased to go into more detail. No one has yet been able to produce proof that a bronchogenic carcinoma has ever been cured by any form of radiation therapy. It is doubtful if this type of therapy has even prolonged life. Even in the obviously inoperable cases, I do not advocate its use.

The only treatment of any avail is radical excision of the involved lung. As pointed out earlier this was first accomplished by Dr. Evarts Graham in 1933 and since that date large series of cases have been done by a relatively large number of surgeons, with very encouraging results. Many patients, who had bronchogenic carcinoma are alive to-day and will never die from such disease or its results.

When bronchogenic carcinoma is proven, the proper operation, in my opinion, is removal of the entire lung and the mediastinal glands on that side. Thoracic surgeons of excellent standing will at times perform lobectomy under certain special circumstances, but study of the lymphatic supply around the pulmonary hilus makes this a less rational procedure.

Bronchogenic carcinoma that has not metastasized can be cured with no greater risk to the patient than uncomplicated gastric resection, provided the operation is performed by one competent to do it and with competent anaesthetic facilities. A competent anaesthetist, with all modern facilities, and I might say, special training, is as important as the surgeon. No branch of anaesthesia is more difficult, and requires more skill in the handling, than intrathoracic surgery.

A decision concerning the treatment of apparently localized bronchogenic carcinoma is obvious. When proven metastasis are present, it is not easy to decide what should be done in the best interests of the patient. Metastasis may be so extensive that no hope can be held for cure and yet the patient may be made relatively well for a reasonable period of time. If a patient is obviously going to succumb early as a result of metastasis no operative procedure is indicated. If on the other hand a patient is very ill and miserable as a result of a complication such as lung abscess, atelectasis or bronchiectasis, resection is probably justifiable even if a cure cannot be hoped for from the outset. One such case we did was relieved entirely from her distressing symptoms for nearly two years, and enjoyed a very happy and important period in her life.

At the last meeting of the American Association for thoracic surgery held in St. Louis in June, the action of a drug, known as "Methyl-Bis," on

bronchogenic carcinoma was reported. It would appear that this drug may have some beneficial effect on inoperable cases. It is extremely toxic and dangerous to use, and is not yet available for general use.

In conclusion I would like to stress that (1) Bronchogenic carcinoma is, in its early stages, curable. (2) The operative mortality is reasonable and becoming better all the time. (3) The only effective treatment is radical resection. (4) The symptoms, signs and X-ray appearances are not characteristic. (5) Immediate complete investigation is imperative in all suspected cases. (6) Under no circumstances should a diagnosis be delayed while waiting for more definite clinical or X-ray evidence.

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### Western Counties Medical Society

Another successful meeting of the Western Counties Medical Society was held on the evening of November 19th in the new Wagner's Restaurant, Yarmouth.

Doctor P. E. Belliveau graced the chair and everything went very smoothly. The meal was superb, probably one of the best, if not the best, ever served in town. The attendance was large.

A pleasing feature was the Father and Son team of speakers from Halifax, Doctors N. A. and C. L. Gosse, who spoke on Diseases of the Stomach and Infections of the Urinary Tract respectively. Both these papers were intensely interesting and very practical. We are indeed indebted to these and other Halifax doctors who have ably served in making our meetings so successful.

A short discussion on Health Insurance was led by Doctor Belliveau. One pertinent point he brought out was the importance of the Society being represented at all executive meetings. It was suggested that the local Society be contacted when a meeting is to be called so that the Secretary or President can appoint an alternate if the regular members are not able to attend.

D. F. Macdonald  
Secretary-Treasurer

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### Letter of Explanation re Minutes Published in November Bulletin

I have received from Doctor Norman H. Gosse a letter in which he asks me to explain his intentions with reference to his remarks published on page 309 of the November Bulletin.

Doctor Gosse writes as follows:

"On page 309 a reference of mine to Dr. A. B. Campbell's fairness is made to appear as if I were drawing invidious distinction as between him and his predecessors in the office which he now holds. Nothing was further from the truth in fact or in intuition."

H. G. GRANT, M D  
Secretary

## Personal Interest Notes

**D**r. Frederick John Hogg, resident in surgery at Queen Mary Veterans' Hospital, Montreal, will go to Antigonish early in January to take over the practice in surgery at St. Martha's Hospital left vacant by the departure of Doctor Basil K. Coady.

Doctor Hogg is a native of Sherbrooke, Quebec, but his father comes from Charlottetown, and his wife's people are from Newcastle, N. B. He obtained his M.D., C.M. from McGill in 1939. He did post-graduate work at the general hospital and McGregor Clinic in Hamilton, Ontario, and entered the Canadian Army Medical Corps in 1942. Recently he took his F.C.R.S. (C.) course at the Montreal General Hospital.

Doctor H. C. Still recently arrived from London to be associated with Doctor A. M. Marshall in Halifax. He has just completed a post-graduate course at Guy's Hospital in London.

Doctor R. O. Jones of Halifax addressed a meeting of the Parent's Institute at the Community Centre under the auspices of the Nova Scotia Home and School Federation and the Department of Education at Annapolis Royal recently.

Doctor T. C. Lockwood of Lockeport was guest of honour at a special dinner on October 9th in celebration of his 90th birthday. Doctor Lockwood was born in Canning, Kings County, in 1857, and after obtaining his B.A. and M.A. at Mt. Allison University entered the Halifax Medical School and later took his degree in medicine at the Bellevue Hospital Medical College, graduating in 1885. He practised in various places before going to Lockeport in 1887. Doctor Lockwood was Mayor of the town for 15 years, serving the first time for nine years and later for a six year period. He served as a member of the Board of School Commissioners during the time which he was mayor, and for several terms later as a government appointee. For about twenty years Doctor Lockwood served as physician to the Marine Hospital and was Medical Health Officer for the town for about 15 years.

The Bulletin extends congratulations to Doctor and Mrs. G. M. Murray of Elmsdale on the birth of twin daughters on November 5th.

### **Appointed To New Post At Victoria General Hospital**

Announcement is made that Doctor William Denbman Stevenson, Hamilton, has been appointed to the teaching staff of Dalhousie Medical School in Neurosurgery and will head the brain and nerve surgery department of the new Victoria General Hospital which he will organize and direct. He will take over his appointment here by the beginning of 1948 and comes with a high achievement in his special field of surgery.

Doctor Stevenson, a native of Hamilton, and son of Doctor W. O. Stevenson of that city, received his M.D. degree from the University of Toronto in 1937. He was an interne at the Hamilton General Hospital for one year, following which he specialized in general surgery and was made a Fellow of the Royal College of Surgeons of Canada in 1942.

He served with the R.C.A.M.C. as a neurosurgeon for nearly four years, being on the staff of the No. 1 Canadian Neurosurgical Hospital at Basingstoke, England, and also as a member of the mobile Neurosurgical Unit which followed the Canadian Army over into Germany. When his services were no longer required at the end of the war, he returned home from Wilshemshaven, Germany.

For a year and a half he has been associated with Doctor Kenneth McKenzie at the Toronto General Hospital and in June of this year, he received his Master of Surgery degree from the University of Toronto.

At present Doctor Stevenson is completing post-graduate work at Yale University and at the Boston Children's Hospital.

Doctor G. Ritchie Douglas has returned to resume his practice in New Glasgow. Since his discharge from the R.C.A.F. he has been taking special studies in Montreal and recently was made a Fellow in the Royal College of Surgeons of Canada.

Doctor G. V. Burton of Yarmouth, who was a patient at the Victoria General Hospital in Halifax during October, following a successful major operation, has resumed his practice.

The marriage took place at Halifax on November 22nd of Miss Diana Joan Walker, only daughter of the President of King's College, Canon A. Stanley Walker, and Mrs. Walker, and Doctor Arthur Drysdale Johnson, son of Mrs. T. R. Johnson and the late Doctor Johnson of Great Village. Doctor Johnson graduated from Dalhousie Medical School in May of this year, and is now practising at Parrsboro.

Doctor and Mrs. Leo Green, of Fairview, Halifax County, left recently for Northampton, Mass., where Doctor Green will take a year's post-graduate work in internal medicine at the Cooley-Dickenson Hospital.

## Obituary

**D**OCTOR JAMES WILLIAM SUTHERLAND died suddenly at his home in Amherst on November 25th. He had been called out on a night case and returning at seven o'clock in the morning was overcome by a heart seizure and passed away before eleven o'clock. Doctor Sutherland was born at Malagash in 1901, son of the late Mr. and Mrs. Neil M. Sutherland. He graduated from Dalhousie Medical School in 1927 and had practised in Amherst more than twenty years although his practice was interrupted during the last war when he was medical officer of the North Nova Scotia Highlanders and went overseas with that unit. He was always devoted to his patients and his quiet manner in the sick room and in the hospital won him their high regard. In addition to his medical duties he was active in community work and served in the town council for a term. He was also interested in athletics and coached the Amherst High School football team some years ago. He is survived by his wife, the former Miss Gwendolyn Crawford, R.N., of Amherst; two sons, Roderick who is taking his pre-medical course at Dalhousie University, and Hugh at home, and two daughters, Joyce and Pamela, also at home, two brothers, Doctor Donald R. Sutherland of Yarmouth and George of Lennoxville, Quebec, and one sister, Mrs. Douglas Reid.

The BULLETIN extends sympathy to Doctor F. R. Little of Halifax on the death of his mother Mrs. H. R. Little, on November 27th, after an illness which lasted for the past six years; and to Doctor D. C. P. Cantelope of Lunenburg on the death of his brother, Mr. Walter Cantelope on November 29th.

# THE NOVA SCOTIA MEDICAL BULLETIN

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Abbreviations used: Ab. for abstract; anon. for anonymous; biog. for biographical note; C. for correspondence; C.R. for case report; diagr. for diagram; Ed. for editorial; illus. for illustration; Pers. for personal item; Obit. for obituary; port. for portrait; rev. for review.

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