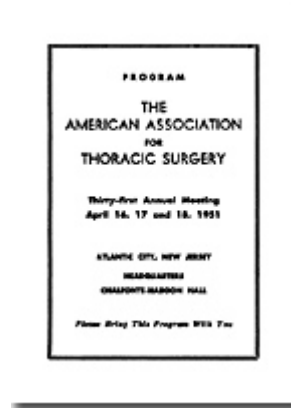


# 1951 ANNUAL MEETING PROGRAM



## Monday Morning, April 16, 1951

9:00 A.M. Business Meeting

9:30 A.M. Scientific Session

1. Progressive Changes of Pulmonary Function After Pneumonectomy: The Influence of Thoracoplasty, Pneumo-thorax, Oleothorax and Plastic Sponge Plombage on the Side of the Pneumonectomy.

EDWARD A. GAENSLER (*by invitation*) and JOHN W. STRIEDER,  
Boston, Mass.

It is generally recognized that significant overexpansion of the remaining lung after pneumonectomy is undesirable, both from a pulmonary functional standpoint and because of the danger of reactivation, if resection was carried out for tuberculosis. Previous detailed physiologic studies have chiefly dealt with single observations of the static cardiopulmonary status on one or two occasions after pneumonectomy.

For an understanding of the development of functional defects of the remaining lung and for a rational approach to the prevention of overexpansion, it was thought necessary to study the dynamic aspects of these changes of the single remaining lung, both before operation and at weekly and later monthly intervals after resection. To appreciate small changes of lung volume, an accurate technic of residual air determination was needed. Further, a method was required by which the residual air of both lungs could be studied separately and simultaneously before operation. These technics were developed and are described.

Forty patients were studied before and after pneumonectomy for diseases other than carcinoma. The total lung volume and its subdivisions, resting and maximal function, breathing reserve at rest and during exercise, and alveolar mixing were studied before operation in both lungs separately and in the remaining lung, at least at monthly intervals from five months to three years after operation.

The effects of postoperative management of the empty hemithorax were observed after the following procedures: no treatment, preoperative thoracoplasty, early and late postoperative thoracoplasty, oleothorax, pneumothorax and plastic sponge plombage.

The following conclusions were made: Some overexpansion of the remaining lung cannot be avoided without treatment of the contra-lateral side. The severity of this overexpansion varies greatly from patient to patient and its extent is not predictable before operation. The overdistention is most rapidly progressive during the first two months after operation and progresses only slowly after this period. Progressive overdistention is not always accompanied by decreasing maximal function.

Pneumothorax and oleothorax completely confined the remaining lung to its preoperative space and preoperative overdistention, due to contralateral atelectasis, could be corrected by these procedures. Early thoracoplasty prevented overdistention almost completely, while thoracoplasty four or more months after resection resulted only in a partial

return of the lung to its proper space. Pneumothorax and oleothorax caused no further loss of maximal function, while both early and late thoracoplasty further decreased the function of the remaining lung. The effect of plastic sponge plompage is still under investigation.

Eight patients were studied after extensive thoracoplasty over completely functionless lungs. It was concluded that while resection of a destroyed lung causes no loss of maximal function, thoracoplasty over such a lung results in a considerable further loss of total function.

## 2. Pulmonary Function in Traumatic Hemothorax Treated by Decortication.

JAMES H. FORSEE and MAJOR STEPHAN L. KYLAR  
(*by invitation*) Denver, Colo.

The war in Korea has resulted in a relatively large number of patients suffering from traumatic hemothorax with or without retained metallic foreign bodies being treated at Fitzsimons Army Hospital by pulmonary decortication. The estimation of pulmonary function based on roentgenographic evidence is notoriously inaccurate and studies in the form of external spirometry and bronchspirometry were undertaken to ascertain pre- and postoperative function values. These studies have also been employed as aids in the selection of patients with thoracic trauma for surgical intervention, and in evaluating the results of surgery. Streptokinase and streptodornase have been employed in several patients in preparation for decortication. The findings relative to pulmonary function in 17 patients furnished interesting data which was often not predictable.

## 3. Late Changes in Ventilatory Function Following Thoracoplasty.

S. R. POWERS, JR. (*by invitation*) and A. HIMMELSTEIN  
New York, N. Y.

Ventilatory function studies have been performed on a group of patients with pulmonary tuberculosis who were treated with a thoracoplasty between five and twenty-seven years ago. Many of them had similar studies done preoperatively and in the immediate postoperative period. A rather high incidence of progressive scoliosis and limitation of Ventilatory function was found. These changes are discussed in relation to: the number of ribs removed, the extent of the thoracoplasty, and the possible anatomical reasons for the changes observed. The results presented seem to warrant a reevaluation of the indications for thoracoplasty, especially in view of the more recent developments in the surgery of tuberculosis.

## 4. Lung Function Studies in Poudrage Treatment of Recurrent Spontaneous Pneumothorax.

LT. COL. JOHN PAUL (*by invitation*), EDWARD J. BEATTIE, JR.  
and BRIAN BLADES, Washington, D. C.

More than 30 patients with unilateral or bilateral recurrent spontaneous pneumothorax have been treated by thoracotomy and talcum powder poudrage during the past nine years. The patients have been operated upon only if they have had at least three attacks of idiopathic spontaneous pneumothorax. All patients have done well, and there have been no instances of recurrent pneumothorax after operation.

Lung function studies consisting of total and individual lung oxygen consumption per minute, minute ventilation, vital capacity, and maximum breathing capacity, have been determined before and after operation in three patients and before and after operation in one case of bilateral pneumothorax. All lungs were fully expanded when the lung function studies were done. In general, individual lung function studies done preoperatively have shown decreased minute ventilation and oxygen consumption of the involved lung. Lung function studies done postoperatively have shown no significant decrease attributable to the poudrage procedure.

## 5. Effect of Position on the Rise in Carbon Dioxide Tension During Thoracic Surgery and the Effect of Artificial Ventilation in the Several Positions.

HENRY K. BEEGHER, THOMAS J. QUINN, JR., JOHN P. BUNKER  
and GENESIO L. D'ALESSANDRO (*all by invitation*)  
Boston, Mass.

Our demonstration that carbon dioxide tension rises to serious levels during open thoracic surgery has now been confirmed in several places. In the present study the effect of the lateral, the prone and the supine positions on the

pCO<sub>2</sub> levels is investigated during thoracic surgery. The lateral position is found to offer the greatest obstacle to the elimination of carbon dioxide. The effectiveness of artificial ventilation (bag pressure type) is compared for the three positions.

## 6. Mucoïd Impaction of the Bronchi.

ROBERT R. SHAW, Dallas, Tex.

Mucoïd impaction of the bronchi is a newly recognized pathological entity within the lungs seen in patients who are either asthmatic or suffering from obstructive bronchitis. The underlying pathology is an impaction of viscid mucus into a bronchus distending the bronchus to much more than its normal size and actually destroying its walls.

This impaction takes place at the second order branch bronchus. Beyond the impaction there is cystic destruction of the lung. On roentgen examination the condition is indistinguishable from neoplasms, and even at surgery it may be difficult to distinguish between neoplasm and mucoïd impaction of the bronchus by palpating the underlying lung. Differentiation between the two conditions, however, is important since a much more limited resection can be done for this condition than would be desirable for neoplasm. Eight patients having this condition have been seen by us. Six have had pulmonary resection and two others have remained under observation. Significant points in the history, the underlying basic pathology, the life history of the condition and the indications for surgery are discussed.

## Monday Afternoon, April 16, 1951

2:00 P.M. Scientific Session.

## 7. Changes in Urine and Serum Electrolytes and Plasma Volume After Major Intrathoracic Operations.

ROBERT K. FINLEY, JR. (*by invitation*), JOHN Y. TEMPLETON, III  
(*by invitation*), ROBERT H. HOLLAND (*by invitation*) and  
JOHN H. GIBBON, Philadelphia, Pa.

Changes in serum electrolyte concentrations and urinary excretion and alterations in the plasma volume are as important after intro-thoracic operations as after major operations elsewhere in the body. In seventeen patients subjected to major thoracic operations studies have been made of the changes in the urinary excretion and serum levels of sodium, potassium and chloride ions and in the plasma volume, hematocrit and thiocyanate space. The blood lost during operation, estimated by weighing the sponges used, was replaced. In most patients total eosinophile counts were made in the pre- and postoperative periods, with observations on the eosinophile response to AGTH.

The usual changes in the eosinophile count were observed, with an immediate postoperative drop and a beginning rise to the pre-operative level between the first and fifth days, the average rise occurring on the fourth postoperative day. Changes in the urinary excretion of sodium and potassium were of longer duration. The urinary excretion of sodium was markedly decreased postoperatively and the urinary excretion of potassium was increased. The urinary sodium did not rise, or the potassium fall, until four to eight days after operation. This change appeared on the average between the sixth and seventh postoperative day. Urinary chloride excretion paralleled urinary sodium excretion in direction, but not quantitatively. The findings indicate longer duration of the measurable effects of 11-des-oxycorticosterone-like steroids than of the 11-oxysteroids.

Changes in the concentration of electrolytes in the serum were variable and not related to the urinary excretion. The plasma volume tended to fall, and the hematocrit to rise, in the immediate postoperative period. An attempt was made to compensate for the decreased plasma volume by administering plasma or a plasma substitute (ossein gelatin). The effects of such maintenance of the plasma volume were thought to be beneficial. However, maintaining a normal plasma volume in the postoperative period did not appear to alter the urinary electrolyte patterns. It is suggested that caution be used in administering electrolytes intravenously in an attempt to restore a normal serum level until urinary electrolyte excretion has returned to normal.

## 8. The Treatment of Cardiospasm: Analysis of a Twelve-Year Experience.

ARTHUR M. OLSEN (*by invitation*), STUART W. HARRINGTON,  
HERMAN J. MOERSCH and HOWARD A. ANDERSEN  
(*by invitation*) Rochester, Minn.

This paper is concerned with the results of treatment of 609 patients with cardiospasm who were seen at the Mayo Clinic between January 1, 1935 and January 1, 1947. In all of these patients, dilatation of the cardia was carried out. The dilatations were performed over a previously swallowed thread, and in the great majority of instances the cardia was forcefully dilated with the Plummer hydrostatic dilator. The evaluation of this method of treatment is based on follow-up observations extending from four to sixteen years. A detailed analysis of our results will be presented. In general, it may be stated that the majority of our patients have obtained satisfactory and lasting relief of dysphagia from the dilatations we have performed.

Seventeen patients were treated by various surgical procedures. The methods of surgical approach will be evaluated, especially with respect to late results. There are definite indications for the surgical treatment of cardiospasm, but the surgical methods often have their limitations.

In the course of this study a great deal of information has been accumulated which concerns the incidence, etiology, symptomatology, diagnosis and complications of this disease. This material will be considered in other communications, but certain pertinent facts will necessarily be included in this paper. Careful roentgenologic examination and endoscopic technics are necessary for accurate diagnosis. The evaluation of the therapy of cardiospasm requires that this condition be differentiated from diffuse spasm of the esophagus and other lesions of the lower part of the esophagus.

## 9. Consideration as to Etiology and Treatment of Achalasia of the Esophagus.

EARLE B. KAY, Cleveland, Ohio

Numerous theories have been evolved as to the etiology of achalasia for the esophagus most of which are obviously unproven. Certain observations have presented themselves to the author during the conservative and operative treatment of these patients which are felt to have some bearing on the etiology of this condition. Additional studies have been made in behalf of these observations which will be presented.

The observations as to etiology are also reflected in the types of therapy provided. The advantages and disadvantages as well as the complications of various types of surgical therapy are discussed in considerable detail, particularly the complication of postoperative regurgitant esophagitis and ulceration as seen in some patients following the Heineke-Mikulicz and Finney cardioplasty.

## 10. Complications and Surgical Treatment of Hiatus Hernia and Short Esophagus.

DONALD B. EFFLER, Cleveland, Ohio

A brief classification of hiatus hernia is presented. The thoracic stomach associated with short esophagus is differentiated from the para-esophageal or "pulsion" hiatus hernia.

A series of thirty-three cases of complicated hiatus hernia are presented. The complications are discussed and classified under (1) Bleeding manifestation; (2) Peptic ulcer; (3) Obstructive phenomena associated with incarceration or volvulus.

One method of transthoracic surgical repair is described. Emphasis is placed on the postoperative care and follow-up observation. There have been no operative mortalities and the morbidity has been gratifyingly low. Surgical correction has brought almost immediate relief of symptoms attributable to the hernias.

The complications of short esophagus with thoracic stomach are presented. Ten proven cases of short esophagus are reported, and the surgical procedures described.

11. Formation of a Temporary External Esophageal Fistula Over a T-Tube for Stenosing Esophagitis.

PHILIP THOREK (*by invitation*), Chicago, Ill.

A case of stenosing esophagitis is herein reported which resulted in almost complete obstruction of the lower end of the esophagus, and was associated with encapsulated fluid in the lower left chest (probably due to esophageal spillage).

Resection was considered impossible because of the patient's condition, the contaminated pleural cavity and the condition of the esophageal wall.

A temporary external esophageal fistula over a T-tube was created.

Bilateral vagotomy to diminish hypersecretion and hyperacidity was done.

The patient's condition continues to improve, the fistula is closed and the dysphagia has not recurred.

In a review of the literature no report could be found of a procedure of this type being done for stenosing esophagitis.

12. Endoscopic Sponge Biopsy.

MAX G. CARTER (*by invitation*), CLINTON A. PIPER  
(*by invitation*) and ROBERT NESBITT (*by invitation*)  
New Haven, Conn.

The sponge biopsy technic has been applied in a series of seventy-five patients subjected to diagnostic bronchoscopy or esophagoscopy. The diseases studied included lung abscess, bronchiectasis, bronchial adenoma, bronchiogenic carcinoma, pulmonary emphysema and both carcinoma and benign stricture of the esophagus. The series of tumors was not large enough for significant statistical interpretation, but diagnostic accuracy was high and there were no false positive reports.

"Onkasponge" biopsy proved superior to the Papanicolaou smear technic previously used by us. There were fewer inadequate specimens, preparation and staining of the sections were much simpler and accurate interpretation of the slides was easier. Greater diagnostic accuracy may be expected from the pathologist when using this method since the interpretation of "onkasponge" slides is comparable to that of tissue sections.

The technic of "onkasponge" biopsy is described and illustrative photomicrographs are presented.

## Tuesday Morning, April 17, 1951

9:00 A.M. Scientific Session.

13. Thoracoplasty Combined with Resection for Pulmonary Tuberculosis.

WILLIAM S. CONKLIN and JEROME T. GRISMER (*by invitation*)  
Portland, Oreg.

Pulmonary resection is considered indicated for some types of tuberculous pathology, particularly those which have failed or are likely to fail in their response to other types of treatment. Following pulmonary resection thoracoplasties have frequently been performed in order to: (1) Prevent overdistention of remaining portions of the lungs. (2) Prevent or control complications such as empyema and bronchopleural fistula. (3) Prevent excessive mediastinal displacement and cardiovascular embarrassment. (4) Control nonresected tuberculous lesions.

It appears that many radical resections (pneumonectomies) have been performed in recent years because middle and lower lobe lesions have been found at surgery when resection of only a diseased upper lobe had been planned preoperatively. We believe that only those lesions which are unlikely to respond to other types of management require resection and that as much functional lung tissue as possible should be conserved, even when tuberculous lesions, susceptible to other types of treatment, are grossly evident elsewhere in the lung.

Conservation of lung tissue is especially important when there are contralateral tuberculous lesions of questionable stability or when vital capacity is limited.

When resection and thoracoplasty are performed at the same operation, rather than separately, there appear to be these definite advantages : (1) The combined operation seems to be as well tolerated as resection alone. (2) It eliminates one additional major operative procedure with its attendant risk and expense. (3) It provides the protection of thoracoplasty to a patient who might refuse to have two operations. (4) The combined procedure allows better exposure of the uppermost ribs through an incision which is shorter than that generally used for thoracoplasty alone. There is less damage to the muscles of the shoulder girdle and postoperative deformity (scoliosis) is minimized. (5) It permits earlier, more rapid obliteration of the pleural dead space, decreasing the hazards of bronchopleural fistula and empyema. (6) It conforms the size of the intrapleural space to that of the remaining lung segments before these have become over-distended and adherent. When thoracoplasty is not performed until weeks after resection adhesions limit the mobility of the lung and only the upper portion tends to be collapsed or relaxed by the thoracoplasty. (7) With an "elective" upper lobectomy concomitant thoracoplasty need not be as radical as primary thoracoplasty for control of the disease. Hence less deformity and functional impairment results. (8) Radical resection (pneumonectomy) may be avoided in certain cases, conserving bronchopulmonary segments that are relatively uninvolved. (9) By eliminating an additional operative procedure it decreases the load on the hospital's surgical facilities and increases the number of patients who may be treated surgically in a given period of time.

Our technic for the combined resection and thoracoplasty involves an intercostal incision and resection of graded segments of the first four or five ribs. The chest wall collapse is "molded" to conform to the conserved portions of the lung. When additional thoracoplasty seems indicated (e.g., following pneumonectomy) this is generally performed approximately two weeks following the original operation. The combined procedure is applicable and has been used when all or part of an upper lobe and of adjoining lung segments are resected. It is also used with pneumonectomy. It is not recommended when only a lower lobe is being resected. Obviously it is applicable in resection for nontuberculous as well as those for tuberculous pathology.

Approximately 30 cases will be reported in which the combined procedure has been utilized.

#### 14. Results in 278 Patients Who Had Modern Type of Thoracoplasty for Tuberculosis.

WILLIAM M. LEES, STEPHEN C. H. YANG (*by invitation*),  
MICHAEL PAPOULAKOS (*by invitation*), JAN K. BOSCH  
(*by invitation*), JOHN ALEXANDER and ANGEL LARRALDE  
(*by invitation*), Ann Arbor, Mich.

The lack of information concerning what happens to patients five years or more after thoracoplasty for pulmonary tuberculosis prompted us to conduct this study. Patients were not selected in any way except that they were all from the Michigan State Sanatorium at Howell, Michigan, and all had the same type of operation prior to December 1944, so that a minimum of five years had elapsed between the operation and the time of the study. All patients submitted to x-rays and sputum cultures were obtained before they were included in the study.

Two hundred and seventy-eight patients were so followed, five to fifteen years after their thoracoplasty, the majority performed for cavitory disease. Seventy-five patients or 26.9% were dead at the time of the study. Of the 203 patients remaining alive, 174 or 85.7% had negative sputa. If the total group of 278 is considered, 19 patients with negative sputa who died five or more years after thoracoplasty may be added to the negative group. Thus of 278 patients, 193 or 69.4% had negative sputa five or more years after operation. 157 patients or 77.3% of the living patients were working full or part time and considered themselves well. Eleven or 5.4% stated they were well but could not work. An analysis of the entire group, including the causes of death, is presented.

#### 15. Simultaneous Decortication and Resection in Ineffective Pneumothorax.

ARNOLD O. RILEY (*by invitation*) and VICTOR KAUNITZ  
(*by invitation*), Mount Morris, New York

The present literature includes numerous papers concerning decortication as a definitive therapy in tuberculosis involving primarily arrested or healed pulmonary disease. This paper presents, we think, a new concept in indications for decortication in pulmonary tuberculosis.

Our concept includes two basic divisions of cases of unexpanded lungs. First, we consider those arrested or healed cases in which there has been such extensive parenchymal involvement that reexpansion of involved areas is not desired, or such extensive fibrosis of peel and parenchyma that decortication is technically difficult if not impossible. Second, we include those with positive sputa due to a varying extent of pulmonary disease in which pulmonary excision of involved segment or lobe is combined with decortication. In both of these groups a preliminary tailoring thoracoplasty is done to prevent overdistention and its attendant dangers, and to assure obliteration of pleural space. These indications are applied to simple noninfected unexpanded lungs as well as to tuberculous empyemata.

This paper includes a discussion of the incidents of pleural complications of pulmonary tuberculosis treated with pneumothorax and simple tuberculous effusions; older methods of treatment of these conditions; indications including those presently accepted plus the above concepts; preoperative evaluation, preparation, surgical technic, and postoperative care; case presentations (one case illustrating each indication) ; results of personal series (as of now, 14 cases); and summary.

#### 16. Decortication Preceding Thoracoplasty for Eradication of Long Standing (Up to Six Years) Chronic Tuberculosis and Mixed Infection Empyema.

F. DOUGLAS ACKMAN, Montreal, Canada

The unsatisfactory and crippling results of the Schede type of thoracoplasty for the long-standing chronic empyema engendered the plan to decorticate first and, by so doing, eliminate or reduce extensive thoracoplasty.

Encouragement for this idea was derived from the observation that in empyema cases where massive lower lobe adhesions held the lower lobe out, ordinary limited thoracoplasty has been most successful in entirely eliminating the empyema.

Results in the few cases (10) have been encouragingly successful generally requiring only limited thoracoplasty and twice making the thoracoplasty unnecessary.

#### 17. Simple Excision in the Treatment of Pulmonary Tuberculosis.

BERNARD J. RYAN (*by invitation*), EDGAR M. MEDLAR  
(*by invitation*), Sunmount, N. Y.  
and EDWARD S. WELLES, Saranac Lake, N. Y.

A series of approximately 25 cases in which very small wedges or subsegments of pulmonary lobes have been removed is presented. In most instances the operation has been performed in conjunction with long term combined streptomycin and para-aminosalicylic acid therapy. Some of the patients showed marked clearing of their disease on long term antimicrobial therapy and a small persistent residual necrotic focus was resected. In others, foci which showed little change by x-ray during antimicrobial therapy were removed. All postoperative sputum cultures have been negative. There have been no deaths or tuberculous complications.

Extensive bacteriologic and pathologic data have been obtained in each case. The rationale for this form of surgical therapy is closely correlated with Medlar's concepts of the pathogenesis and pathology of pulmonary tuberculosis. Illustrative cases are presented.

#### 18. Subscapular Paraffin Pack as a Supplement to Thoraco-plasty as a Collapse Procedure.

W. E. ADAMS, WILLIAM M. LEES .and JAMES M. FRITZ  
(*by invitation*), Chicago, Ill.

In the surgical treatment of pulmonary tuberculosis, thoracoplasty occupies an important position. When properly employed, successful control of the pulmonary lesion may be expected in a high percentage of cases. However, all too frequently an active process remains because of inadequate collapse, thus necessitating further surgical therapy.

During the past three and one-half years the usual thoracoplastic operation has been supplemented by a subscapular paraffin pack in collapse therapy for pulmonary tuberculosis. At first most procedures were

carried out in two or three stages. Later, after further experience, a one-stage operation which entailed resection of five, six or seven ribs and paraffin pack has been done.

The principal advantage obtained by the addition of wax is a definitely better ultimate collapse of the diseased part. In addition, fewer stages are required and thus an economy is effected. This method also involves resection of shorter segments of the transverse processes, thus lessening the degree of postoperative scoliosis.

At present, complications and risk of operation are no greater than in thoracoplasty without the addition of paraffin.

Our experience has been with a series of 27 patients. One of the earlier individuals who had a two-stage operation, expired shortly after the second stage from a continuation of the disease which had been active bilaterally. There has been one superficial wound infection which subsequently healed. Extrusion of a portion of the paraffin occurred in one case due to the accumulation of fluid. The end results in this case, however, were satisfactory. Indications and contraindications as well as safeguards will be discussed.

## TUESDAY AFTERNOON, APRIL 17, 1951

### Tuesday Afternoon, April 17, 1951

2:00 P.M. Executive Session.

3:00 P.M. Scientific Session.

Address of the President-ALFRED BLALOCK, Baltimore, Md.

#### 19. The Pathogenesis of Bronchopleural Fistulas Following Excisional Therapy for Pulmonary Tuberculosis.

G. N. STEMMERMANN (*by invitation*), C. DANIELS (*by invitation*) and O. AUERBACH, New York, N. Y.

Bronchopleural fistula is one of the common complications of excisional therapy for tuberculosis. If, as is often the case, it is associated with tuberculous empyema it is a serious threat to the patient since it serves as a source of spread to the contralateral lung. Observations in five cases, four of which were studied in detail at necropsy, are recorded. The possible sources of fistula are classified and discussed. The authors feel that erosion of the bronchial stump by tuberculous empyema and technical errors in stump closure are the major sources of fistulas. The former occurs late in the postoperative course whereas the latter occurs early. It is noted that late fistulas are associated with a grave prognosis. All five cases reported herein fall into the late category.

#### 20. Bronchiectasis: A Comparative Study of Tuberculous and Nontuberculous Pyogenic Suppurative Disease.

JOSEPH GORDON, Ray Brook, N. Y. and PHILIP C. PRATT (*by invitation*) Saranac Lake, N. Y.

The present treatment of chronic pulmonary tuberculosis by surgical extirpation has afforded an opportunity for study of the histo-pathology of the disease with renewed interest. This has naturally given rise to discussion of the term bronchiectasis as it is associated with pulmonary tuberculosis. It seems timely, therefore, to make a comparative study of tuberculous and nontuberculous bronchiectasis for purposes of clarification of terminology and for the recognition of essential differences.

It is immediately recognized that in pulmonary tuberculosis the disease is essentially parenchymal involving all units of the lung structure. On the other hand pyogenic nontuberculous bronchiectasis is essentially a tubular system disease with secondary changes in the immediately subjacent parenchyma.

This study includes (1) clinical comparison; (2) roentgenographic comparisons showing also differences in bronchograms; (3) studies of the injected pulmonary arterial systems as well as bronchi of excised lungs; and (4) the variable features of the histopathology. The pathogenic mechanisms operating in each instance are



considered in an effort to understand better their role and possible relationship to the prognosis of each disease entity.

## 21. The Prognosis of Residual Bronchiectasis After Incomplete Resection.

GEORGE P. ROSE MONO, W. EMORY BURNETT and  
JOAN-HUMPHREY LONG (*by invitation*), Philadelphia, Pa.

One hundred and ninety-six patients with bronchiectasis have had pulmonary resections in Temple University Hospital from 1936 through 1949. Fifty-five patients still have residual disease. The causes for this include: 1. Only palliation was anticipated. 2. Some patients with bilateral disease are between procedures. 3. Error in definitely diagnosing the extent of disease preoperatively. 4. Error in proper anatomic evaluation during operation.

This paper discusses the condition of these patients at the present time, one 14 years after surgery, and compares them with 104 patients who had all disease removed.

Of the 55 patients with residual disease, 14 (25%) have no cough and no subjective symptoms; 36 (65%) have less cough; and 5 (9%) are unimproved or worse.

Preoperative function studies have not proven to be a reliable index of postoperative dyspnea in cases where there is residual disease. Poor results have been generally confined to the group of patients having residual disease.

Every precaution should be taken to remove all diseased lung if possible. The result of removal of the most severely diseased portions of lung in extensive bronchiectasis is not completely predictable but usually results in worthwhile palliation.

7:00 P.M. Cocktail Party-Chalfonte-Haddon Hall.

8:00 P.M. Banquet-Chalfonte-Haddon Hall. Dancing.

## WEDNESDAY MORNING, APRIL 18, 1951

### Wednesday Morning, April 18, 1951

9:00 A.M. Scientific Session.

## 22. Radical Pneumonectomy.

WILLIAM G. CAHAN (*by invitation*), WILLIAM L. WATSON and  
JOHN L. POOL, New York, N. Y.

Radical pneumonectomy is the excision *en bloc* of a lung containing cancer along with the lymph nodes present in the mediastinal, paratracheal, peribronchial, subcorynal and pre-esophageal areas. The purpose of this procedure is to remove as much cancer as possible and to attempt to standardize the operation for cancer of the lung.

The mediastinal-or paratracheal-dissection begins superiorly at the thoracic inlet, and its anatomical boundaries are different for the right and left thorax. The subcorynal dissection includes the lymph nodes that lie beneath the coryna and also those available from the inferior margin of the contralateral bronchus. The pre-esophageal nodes are excised beginning at the diaphragm.

At Memorial Hospital, New York City, there have been 25 radical pneumonectomies performed since March 1949. In eight of these, lymph nodes containing metastases were found beyond the limits of dissection usually employed for total pneumonectomy. Although the lymph nodes in the remaining cases often appeared grossly negative, it was not felt that this was a justification for allowing them to remain in situ, for in several instances of those found to be positive, that fact was established by microscopic study alone.

After many more radical pneumonectomies have been performed, more intelligence will be derived about the pathways of carcinomatous spread and the value of this procedure in enhancing the possibility of cure for cancer of the lung.

### 23. A Preliminary Report of 26 Cases of Pulmonary Resection With Pleurectomy.

BERT H. COTTON and JOHN R. F. PENIDO (*by invitation*)  
Beverly Hills, Calif.

A preliminary report of 26 cases of pulmonary resection in combination with pleurectomy includes a discussion of the indications, complications, technical problems and results.

#### *Indications:*

Pulmonary tuberculosis with tuberculous empyema.....	9 cases
Pulmonary tuberculosis with mixed empyema and broncho- pleural fistula.....	2 cases
Bronchiectasis plus nonspecific empyema.....	1 case
Bronchiogenic carcinoma with cells in pleural effusion.....	5 cases
Endothelioma of the pleura.....	4 cases
Ruptured fungus cavities with empyema.....	5 cases

#### *Complications:*

Two cases of pulmonary tuberculosis plus empyema developed bronchopleural fistula. These were controlled by cauterization of the bronchial stump with closure of the fistula.

Two cases developed immediate postoperative shortness of breath out of proportion to the usual pneumonectomy, which we felt was due to the hemidiaphragmectomy.

#### *Technical Problems:*

These problems are discussed in detail. Some of the more interesting were: 1. When malignant tumors involve the lung and pleura, we have found a hemidiaphragmectomy, accomplished with the pneumonectomy and pleurectomy, makes the operation more definitive for removal of all malignant implantations. 2. In one case of endothelioma, it was necessary to perform a pneumonectomy, pleurectomy, hemidiaphragmectomy, adrenalectomy and left nephrectomy. The patient was well for 14 months before he died of cerebral hemorrhage from hypertension. 3. We have found it advantageous to make a small opening in the pleura, through which all the fluid or purulent material is removed. The opening is then closed. Thus, the chance of widespread contamination, by inadvertently tearing the pleura during the dissection, is greatly reduced. 4. The pericardium was entered when necessary to secure the vessels.

#### *Results:*

The 17 cases due to infection were cured and able to return to work. In the nine cases, in which malignant cells were found in the pleural fluid, four postoperative deaths occurred. These were due to -coronary thrombosis one month following surgery-cerebral hemorrhage 14 months after surgery-two cases by metastases of the malignant process, six and eight months postoperatively.

Three cases or 60% of pleural extension due to carcinoma of the lung are alive and well. The follow-up interval is from three years to six months. Two cases or 50% of the endotheliomas are alive and well. One case has been followed two years; the other is a recent case of only two months.

Many apparently hopeless cases were helped by this combination of surgical procedures. Others have been apparently cured and rehabilitated. We feel the favorable results warrant further investigation.

### 24. The Management of the Patient with Inoperable Cancer of the Chest.

RICHARD H. MEADE, JR. and RICHARD A. RASMUSSEN,  
Grand Rapids, Mich.

In considering the subject of cancer we are primarily concerned with the possibility of cure. At present most of the patients we see with cancer cannot be cured by our present methods of treatment. This admission of inadequacy does not release the physician from his responsibility for the care of the patient. He must do all that is in his power to help him. There are rare instances of patients with inoperable cancer within the chest who live a number of years in apparent health when all hope had been abandoned for them. There are a great many more whose tumors respond to radiotherapy, or to this in combination with other forms of treatment. Although these cases make up a pitifully small percentage of the total, they are rays of sunshine in a very dark

corner. Several cases of this type will be presented, and a general plan for the management of patients with inoperable cancer will be discussed.

#### 25. Radio Active Isotopes in the Palliative Management of Carcinomatosis of the Pleura.

EDWARD M. KENT and CAMPBELL MOSES (*by invitation*)  
Pittsburgh, Pa.

Preliminary studies have been conducted on the use of radioactive isotopes as a palliative measure to control excessive pleural effusion occurring as a result of carcinomatosis of the pleura. For this purpose, patients were chosen who had proven carcinoma with demonstrable evidence of carcinomatosis of the pleura. The primary carcinoma arose in a bronchus in the majority of the patients, however, in a few instances breast cancer was the primary lesion. Only those patients were selected for study who presented serious problems of management because of a rapidly forming pleural effusion which required frequently repeated aspirations. The studies conducted included (1) observations of the effectiveness of isotopes in reducing or controlling completely the formation of pleural effusion, (2) the rate of excretion of the isotopes, (3) the retention of radio activity in the pleural fluid, (4) microscopic observations of the effect of the agent on the surface implants in the pleural space.

The dosage of radioactive isotopes employed has been selected by arbitrary means. In most instances, a single injection has been utilized but, in a few patients, a second treatment was administered. In each patient studied the rate of excretion of the isotope was determined.

The preliminary conclusions which have been made possible include: (1) Complete suppression of the pleural effusion in most patients studied. (2) Evidence of a favorable effect on the rate of formation of pleural fluid in the remaining patients of the series. (3) The absence of adverse effects of radioactive isotopes on these patients. (4) The rate of excretion of radioactive isotopes when injected into the pleural cavity as well as the retention of radio activity in the pleural space.

#### 26. Identification of Regional Lymph Nodes in the Treatment of Bronchiogenic Carcinoma.

JOSEPH A. WEINBERG, Long Beach, Calif.

A method is described which is designed to facilitate the identification of regional lymph nodes of the lung for their removal during the operation of radical pneumonectomy. The procedure is a further application of the method devised by the author for use in radical gastric resection, previously reported with E. M. Greaney.

A solution of pontamine sky blue dye and hyaluronidase is injected into the pulmonary parenchyma as soon as the thorax is opened. The dye is taken up by the regional lymph nodes, imparting to them a blue color which makes them more easily distinguishable than they would be in their natural state. Many nodes which would remain obscured, even with acquired dust pigmentation, become readily identifiable after being colored by the dye.

The technic has been used in 40 operations on the lung during the past two years, 27 of which were for bronchiogenic carcinoma. In the course of the study, stained nodes have been seen and removed from the hilum; along the phrenic nerve; under the arch of the aorta; along the azygos vein, superior vena cava and trachea; under the coryna; the beginning of the subclavian artery; and less frequently in other accessible situations. In two cases in which death occurred within eleven days after operation, autopsy revealed stained nodes in the opposite hemithorax.

This method is offered as a means of more nearly approaching the ideal of planned resection of the lymph nodes, a phase of the operation which is of fundamental importance in the surgical treatment of bronchiogenic carcinoma.

#### 27. Pneumonectomy for Severe Irradiation Damage of Lung.

MARTIN BERGMAN (*by invitation*) and EVARTS A. GRAHAM,  
St. Louis, Mo.

The structural alterations resulting from exposure of a lung to relatively large quantities of irradiation produce symptoms of cough, dyspnea, chest pain and hemoptysis. Pulmonary function becomes markedly compromised.

While there is no known nonoperative treatment of radiation damage of the lung, pneumonectomy in a unilateral case is an effective therapeutic procedure. Two patients with this disease were greatly benefited by pneumonectomy. Both acquired the condition because of too much irradiation following breast operations for carcinoma.

The study of the surgically removed lungs showed a greatly increased number of thick elastic fibers. This finding appears to be an important criterion for the histologic diagnosis of irradiation damage. On the other hand, the presence of hyaline membranes, reported by others in autopsy material, is probably an artefact not seen in surgically removed lungs.

## Wednesday Afternoon, April 18, 1951

2:00 P.M. Scientific Session.

### 28. Reconstructive Surgery of the Trachea and Bronchi: Late Results With Dermal Grafts.

PAUL W. GEBAUER, Honolulu, Hawaii

This paper summarizes the late results of dermal grafts used for the relief of severe strictures of the trachea and bronchi. Of fifteen patients operated upon, dermal grafts were used in thirteen. One of these, a tracheal graft, died; two are less than one year postoperative, and ten are from 22 to 31 months postoperative. A functionally adequate tracheobronchial lumen, and relief from obstructive symptoms have been gained in each instance. In some patients the anatomic result has been practically faultless. The only deaths resulted from efforts to relieve asphyxiating tracheal stenosis. There have been no deaths in the bronchial graft series, no serious early complications, and no late complications which have not responded to treatment. Pulmonary resection subsequent to grafting has been performed only once, when clearing of an atelectasis consequent to the reopening of a bronchus, revealed bronchiectasis. The gross and histologic findings in this graft, which had been in situ almost one year, exceeded all expectations and have been reported. In the remaining patients pulmonary resection was obviated, or its extent diminished by the reconstruction of the main bronchial stenosis. Thoracoplasty has been performed on one patient, seven months after bronchial graft, for recurrent tuberculous infiltration in the residual lower lobe, without any complication.

Bronchoscopic epithelial biopsies of dermal grafts taken from five weeks to over two years after operation are reported.

The cases summarized in this paper represent a small segment of a large group of patients with tracheobronchial tuberculosis in whom clinical and pathologic studies have been done. These studies form a basis for an appraisal of the pathogenesis of bronchostenosis, its treatment, and related experimental studies which have been published.

A kodachrome movie (8 minutes) of an operation showing the preparation and insertion of a tracheobronchial dermal graft, and right upper lobectomy is presented.

### 29. Myxochondroma of the Trachea: A Case Report.

BYRON H. EVANS, Los Angeles, Calif.

A case is presented of the surgical management of an obstructing lesion of the upper trachea. The patient, a 59 year old man, had noted the presence of a tracheal wheeze for one year which had gradually become more severe with productive cough and dyspnea. The tumor was removed by direct surgical excision through the neck after a preliminary low tracheotomy had been done. The tracheal defect measuring 3 x 1.5 centimeters was then successfully repaired by the utilization of a full thickness skin graft taken from the inner aspect of the upper arm, reinforced by lacing with #28 stainless steel wire after the method of Gebauer. Recovery was uneventful with restoration of a normal contour to the trachea on x-ray examination and the preservation of an adequate speaking voice. The lesion proved to be a myxochondroma arising from the first tracheal cartilage.

### 30. Analysis of Twenty-four Cases of Acute Cardiac Arrest.

J. L. EHRENHAFT, D. W. EASTWOOD (*by invitation*) and  
L. E. MORRIS (*by invitation*) Iowa City, Iowa

Analysis of twenty-four cases of cardiac arrest occurring during anesthesia for various types of surgical procedures is presented. About half of this number received treatment which is believed to be adequate. The remainder were subjected to artificial circulation by varied approaches with varied lengths of survival. As a result of this study it has been found that hypoxia was the usual precipitating cause of the acute cardiac arrest. Early recognition and immediate institution of artificial circulation and adequate artificial ventilation are the most important steps in the resuscitation of the patients.

It has been shown in dog experiments that after producing acute cardiac arrest it is possible to restore normal cardiac action and that during the period of artificial circulation adequate arterial oxygen saturation can be maintained.

### 31. Constrictive Pericarditis and Constrictive Pleuritis Treated by Pericardectomy and Pulmonary Decortication.

RICHARD H. OVERHOLT, C. SIDNEY BURWELL (*by invitation*),  
JOHN W. WOODBURY (*by invitation*) and JAMES H. WALKER  
(*by invitation*), Boston, Mass.

Combined constrictive pericarditis and constrictive pleuritis may be produced by either infection or trauma. A case is presented representing the sequelae of a crushing injury to the chest. Attention is drawn to the necessity of resecting the constricting membranes both from the heart and the lungs if the maximum rehabilitation is to be accomplished. A transpleural approach through a left posterolateral incision affords ample exposure for resecting the constricting membranes from the left heart, right ventricle and the left lung. Cardiac catheterization data and ventilatory function studies were obtained before and after operation, and these demonstrated improvement in both the circulatory and pulmonary dynamics.

### 32. The Direct (Brock) Relief of Pulmonary Stenosis in Tetralogy of Fallot.

ROBERT P. GLOVER, CHARLES P. BAILEY and  
THOMAS J. E. O'NEILL (*by invitation*), Philadelphia, Pa.

This report is based upon twenty-three cases of Tetralogy of Fallot in which the Brock procedure or some modification was employed to overcome the pulmonary obstruction. In this group there were eight cases of valvular stenosis, six cases of arterial stenosis, and nine cases of infundibular stenosis. The exact pathology of infundibular stenosis is still subject to some dispute, and we are presenting the different types of such pathology which we have observed.

There were six deaths in this series, two of them occurring in deeply cyanotic infants under four months of age. In seven cases the cardiac contractions ceased before the heart was approached or manipulated. Notwithstanding, this relief of the obstruction was immediately undertaken and successfully accomplished in three cases.

It will be appreciated that during the course of operation in certain cases cardiac standstill will occur before an anastomotic procedure can be successfully completed, and so the mortality might be charged to the exploration alone. The approach used in the Brock procedure, however, lends itself readily to prompt relief of the pulmonic stenosis in most cases while at the same time it affords exposure of the heart necessary to resuscitation. Therefore, out of the total number of cases in which anesthesia is administered or a thoracotomy is performed the mortality arising from the Brock technic should be lower.

The results in our surviving patients have been gratifying in that the arterial oxygen level has approached a satisfactory saturation and work capacity of the individual is greater than that obtained in most of our observed cases of systemic-pulmonary anastomoses. Theoretical considerations would be in agreement with these observations because there is a reduction in the number of heart defects by this method whereas there is an increase in the number of defects in using the anastomosis procedures.

The anastomotic procedures have heretofore been highly successful in many instances and it is not our implication that they should be entirely discarded. There are many individuals who cannot be helped by the

direct approach, especially those with atresia of the pulmonary artery or right ventricular outflow tract as well as cases with tricuspid atresia and so their improvement will be dependent upon successful application of the vascular shunt operations.

### 33. Treatment of Coronary Artery Insufficiency by Implantation of the Internal Mammary Artery into the Left Ventricular Myocardium.

ARTHUR VINEBERG, Montreal, Canada

Many attempts have been made to augment the circulation of the ventricular myocardium in cases of coronary artery sclerosis. In the past there have been four main approaches to the problem, namely application of a vascular graft to the surface of the heart; cardiopericardioplexy; cardiac vein ligation; arterialization of the coronary venous system.

A different approach to the vascularization of the ventricular myocardium was first attempted by us in 1945. The left internal mammary artery was employed as a source of fresh arterial blood for the ventricular myocardium. The internal mammary artery was transected and detached from its chest wall bed. It was then placed within a tunnel in the ventricular myocardium. An anastomosis developed between the implanted internal mammary artery and the left coronary circulation. The presence of the anastomosis was proven by injection studies, radiographs, plastic casts and serial sections.

Anastomosis occurred in from 50 to 75% of the animals, dependent on the technic of implantation use. The value of an internal mammary-coronary anastomosis in animals was studied. This was gauged by the mortality rate and the appearance of ventricular infarct after ligation of the anterior descending branch of the left coronary artery. The mortality rate and the development of infarcts in such animals were dependent upon the size of the internal mammary coronary anastomosis. In no single case has an animal died or developed infarction following anterior descending branch ligation when a large anastomosis existed in a series of twenty-six animals.

In a control group without internal mammary implantation death occurred in 90% and a 5 x 5 centimeter infarction developed in the surviving 10%.

Glenn and associates have confirmed the occurrence of an internal mammary coronary anastomosis, however, they have suggested that the anastomosis is composed of granulation tissue and tends to disappear at the end of eight weeks. We have shown that the internal mammary artery sends out branches of arteriolar size which have been found to persist fifty-eight weeks after the implantation.

Experimental coronary insufficiency has been developed in dogs by wrapping a sclerosing type of cellophane around the origin of the anterior descending branch of the left coronary artery. Exercise tolerance was determined before and after operation. Four months after cellophane wrapping the exercise tolerance was reduced from an average of seven minutes to one and eight-tenths minutes. Four months after implantation of an internal mammary artery into the ventricular myocardium exercise tolerance of these animals returned to seven minutes.

Three cases of human coronary artery sclerosis with angina pectoris have been operated upon. The last two patients are doing well. A detailed report of these cases with indications for surgery will be given. A colored moving picture demonstrating details of the operative procedure will be shown.

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