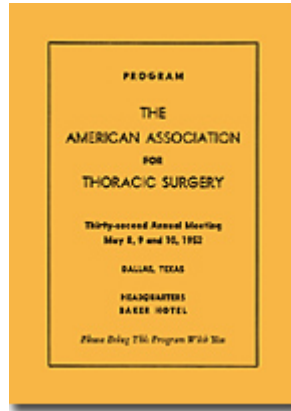


1952 ANNUAL MEETING PROGRAM



Thursday Morning, May 8, 1952

9:00 A.M. Business Meeting.

9:30 A.M. Scientific Session.

1. Experimental Methods for Detection of Changes of Blood Supply to the Heart.

ALFRED GOLDMAN, CLINTON SHAW (*by invitation*), ELIOT CORDAY (*by invitation*),
JOSHUA FIELDS (*by invitation*), S. REXFORD KENNAMER (*by invitation*),
ALLEN SMITH (*by invitation*), INGA LINDGREN (*by invitation*),
and MYRON PRINZMETAL (*by invitation*),
Los Angeles, Calif.

In an effort to determine the effects of increased blood supply which might be induced by therapeutic surgical procedures for ischemic heart muscle, an extensive investigation of the hearts of forty dogs subjected to ligation of the anterior descending coronary artery was carried out. This investigation showed that certain methods might be utilized to detect the effects of altered blood supply to cardiac muscle.

(1) High speed motion pictures were used (heart beats were slowed 120 times) so that subtle differences in motion of normal and ischemic muscle could be clearly seen.

(2) An exhaustive electrocardiograph study was made including limb and chest, direct pericardial, epicardial, intramural, and ventricular cavity leads. By means of a new technique it was possible to photograph simultaneously the beating ischemic heart together with the direct writing electrocardiogram.

(3) Careful comprehensive histological studies of all hearts were made to determine the extent of distribution of ischemic tissue.

Thus a unique and original correlation of physiological disturbances as seen in the motion pictures with electrocardiographic and pathological findings was made. The effect of slight changes in blood supply could be detected by all three methods.

Fundamental work of this type appears necessary for evaluating experimental surgical procedures intended to increase the blood supply to diseased heart muscle. For example-direct leads of the human heart could be made in the operating room, the ischemic area outlined and the immediate effects of surgical therapeutic measures evaluated.

These methods will be demonstrated by suitable colored pictures.

2. Artificial Oxygenation and Circulation During Complete Bypass of the Heart.

JAMES A. HELMSWORTH, ROGER T. SHERMAN (*by invitation*),
SAMUEL KAPLAN (*by invitation*) and LELAND C. CLARK (*by invitation*),
Cincinnati, Ohio

Approximately 50 dogs were subjected to total bypass of the heart for periods of 30 minutes. Observations during the experiments included determination of serum proteins, blood electrolytes, pH, and carbon dioxide and oxygen content. The nine survivors made a prompt and complete recovery.

A new method for the drainage of all venous blood from the right heart was employed. The operations on dogs with blood rendered incoagulable by heparin and the several steps in cannulation required specific modifications of surgical technic.

The Fels Oxygenator employed consisted of a unit for dispersion oxygenation, a chamber for bubble coalescence, and a pumping force achieved by cyclic alteration of the oxygen pressure in the closed system.

3. Some Physiological Aspects of the Artificial Heart Problem.

F. D. DODRIL, EDWARD HILL (*by invitation*) and
ROBERT GERISCH (*by invitation*), Detroit, Mich.

Considerable experience has been gained in the use of a multiple function artificial heart. Right-sided, left-sided and complete extra-corporeal substitutions have been carried out and some physiological data will be presented.

4. Technique of Producing Mitral Stenosis of Controlled Degree.

ROBERT G. ELLISON, ROBERT C. MAJOR, RAYMOND W. PICKERING
(*by invitation*) and WM. F. HAMILTON (*by invitation*),
Augusta, Ga.

The desirability of a practical technique of creating mitral stenosis for experimental studies has long been recognized. The advances in clinical methods of investigating cardiovascular disturbances and in cardiac surgery during the past ten years make it even more urgent that one study the disturbed dynamics in experimental animals. For years investigators have attempted to develop such a technique, but none has been entirely satisfactory.

Our earlier attempts ended unsuccessfully and the discarded techniques will be briefly described.

In an effort to produce the experimental disease in severe chronic form the ends of the sutures (silver wire encased in nylon tubing to lessen fraying) were drawn out through a cannula whose large, flat head was affixed to the chest wall and whose cardiac end prevented displacement of the heart as the ligatures were tightened. After the animals had recovered from the operation, pressures within the pulmonary artery and vein were recorded with optical manometers through angiostomy cannulas placed upon the vessels at the time of surgery. In some preparations the pulmonary arterial and pulmonary capillary (venous) pressures were studied by the method of cardiac catheterization.

Ligatures were tightened at weekly intervals without opening the thorax; thus varying degrees of stenosis were produced. These animals were studied to elucidate the mechanism of the increased pulmonary vascular resistance associated clinically with mitral stenosis and the mechanism by which blood is shunted away from anoxic lungs.

5. Surgical Approach for Stenotic Lesions of the Semilunar Valves by Excision and Cusp Replacement Under Direct Vision.

ROBERT S. LITWAK (*by invitation*) and HOWARD L. GADBOYS
(*by invitation*), Boston, Mass.

The purpose of this study was the development of more satisfactory technics for the relief of stenotic lesions of the semilunar valves. To date, attempts to relieve pulmonary and aortic valvular stenosis have been

confined to blind incision and/or dilatation of the valve. Restoration of function, therefore, has been dependent upon the inherent flexibility of the valve. Since the disease process often renders the valve rigid, such procedures may be expected to result in only limited improvement.

It is known that stenotic lesions of the semilunar valves do not evidence themselves clinically until the cross-sectional areas of their ostia are diminished approximately 75%.

Our aim was to resect approximately one-third (one cusp) of the stenosed valve in order to reduce the degree of obstruction, thereby increasing ventricular output. It was deemed essential to obtain this increased output without the production of a regurgitant lesion.

A clamp has been developed which permits resection of one-third of the valve (one cusp) and adjacent vascular wall under direct vision without interruption of the circulation. The basic design of the clamp as modified for pulmonary and aortic cusp resections renders intra-cardiac orientation quite simple. The dog heart has tolerated the clamp well.

Utilizing this instrument, cusp resections of both aortic and pulmonary valves have been carried out in a series of thirty-four animals at this writing. The valves have been reconstituted successfully using both homografts and autografts.

The animals have been scarified from one day to seven months following operation. The results will be presented.

The possible advantages which may develop from the use of this procedure in clinical surgery will be discussed.

6. Experimental Pulmonary Venous Occlusion.

C. ROLLINS HANLON, DAVID SABISTON (*by invitation*) and
DONALD R. BURKE (*by invitation*), St. Louis, Mo.

Ligation of pulmonary veins has been given limited therapeutic trial in patients and in experimental investigations on animals. Total ligation of pulmonary lobar veins is well tolerated, but ligation of the entire venous return from one lung has been reported to cause wet gangrene in patients and a uniformly fatal outcome in experimental animals. The animals were believed to die of shock due to blood loss in the affected lung.

The present experiments involve one stage ligation of all the veins of the left or right lung in dogs. The outcome of these experiments is somewhat at variance with published results. The effect of antibiotic medication in altering the prognosis of such lesions has been investigated. The practical implication of these studies is briefly discussed.

Thursday Afternoon, May 8, 1952

2:00 P.M. Scientific Session.

7. Localized Fibrous Mesothelioma of the Pleura.

O. THERON CLAGETT, JOHN R. MCDONALD (*by invitation*) and
HERBERT W. SCHMIDT, Rochester, Minn.

Localized fibrous mesotheliomas of the pleura are fibrogenic tumors of the thorax apparently originating from the pleura. This report concerns 24 such tumors which were surgically excised. The tumors were sufficiently cellular to suggest malignancy histologically, but there was no evidence of metastasis in our cases, although 4 lesions did recur locally. The tumors should not be confused with diffuse pleural mesotheliomas, which are definitely malignant. These fibrous mesotheliomas varied from 9 to 5,700 gin. in weight. In 16 of the 24 cases which we are reporting the outstanding symptoms that led the patient to consult a physician were swollen, painful joints. Duration of symptoms involving joints varied from four months to fifteen years. In 11 of these 16 cases clubbing of the fingers was present,

and in 7 recurrent bouts of chills and fever occurred. The symptoms of arthritis and chills and fever were completely cured by removal of the tumor. In 4 cases pleural effusion was found.

The tumors were closely associated with the visceral pleura in 18 cases and with the parietal pleura in 6 cases. They may appear as intra-pleural tumors attached to the pleura by a narrow pedicle, intrapulmonary tumors or mediastinal tumors. The pathologic, clinical and surgical aspects of this interesting group of thoracic tumors will be discussed.

8. Resection of the Trachea for Carcinoma-Report of Two Cases.

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

To our knowledge only eight cases of carcinoma of the trachea have been treated by resection. Consequently, two such cases are presented in detail and discussed.

One is a case of squamous cell carcinoma of the trachea which required total resection from the cricoid cartilage to one centimeter above the carina. Surgery was performed January, 1951.

The other case is one of adenocarcinoma which necessitated subtotal resection of the thoracic trachea. Surgery was performed on November 5, 1951.

Reconstruction was carried out in both cases with a stainless steel tube.

The surgical technique, immediate and other postoperative complications are discussed.

Both patients are alive and symptom free. Brief review of the methods of treatment is presented.

9. The Surgical Treatment of Carcinoma Involving the Hypopharynx, Larynx and Upper Esophagus.

ORVILLE F. GRIMES (*by invitation*) and H. BRODIE STEPHENS,
San Francisco, Calif.

Malignant disease involving the hypopharynx, larynx and upper esophagus presents difficult surgical problems. Early extension to cervical lymph nodes complicates an already formidable operative procedure by necessitating their en bloc removal.

The experience gained from the surgical treatment of 15 patients with malignant disease involving the hypopharynx, larynx, upper esophagus with or without regional lymph node metastases is presented. Modifications of the original procedure described by Wookey have become necessary in order to resect greater areas of malignant involvement.

The indications and contraindications for surgical intervention, the prognosis of treated cases and the futility of the use of roentgen therapy in patients exhibiting advanced malignant disease in and about the hypo-pharynx are discussed.

10. A Consideration of Palliative Treatment with Direct Attacks upon Carcinoma of the Esophagus.

MARK M. RAVITCH, HENRY T. BAHNSON (*by invitation*) and
THOMAS N. P. JOHNS (*by invitation*), Baltimore, Md.

The results of extirpation of carcinoma of the esophagus, to date have been so discouraging as to raise serious question concerning the value of the direct attack. Palliative gastrostomy has been properly abandoned as unsatisfactory. Simple dilatation and the Souttar tube have a limited application. The prime requisite of any palliative procedure is the restoration and maintenance of oral feeding. A number of shunting techniques including esophagojejunostomy, intra- or antethoracic may be employed. These may be expected to carry a much lower mortality rate than resection and can be performed in poor risk patients with non-resectable tumors. Since the results of resection are so poor it is quite probable that a wider application of shunting procedures will result in a greater number of comfortable patient-months in a given group of patients at the possible expense of the loss of an occasional cure.

11. A Pathologic Study of Large Tissue Sections of Bronchogenic Carcinoma.

EDWARD J. MCGRATH and EDWARD A. GALL (*by invitation*),
Cincinnati, Ohio

This study includes 86 lungs with neoplasm subjected to large tissue sections, the blocks ranging up to 8 x 12 cm. cut at 10 to 15 microns thickness.

The possibility of multicentric origin is manifest in 31 of the above cases. This is characterized by multiple foci of preinvasive carcinoma and/or multiple histologic types in a single lesion. The study also includes an investigation of submucosal and peribronchial extension as well as microscopic penetration of adjacent lobes, and their surgical significance.

12. The Use of Streptokinase-Streptodornase (Varidase) in the Management of Early Postoperative Partial Pulmonary Resections.

C. THOMAS READ (*by invitation*), Phoenix, Arizona

Previous experiences with SK-SD used within the thorax for purposes of lysing blood clots, exudates, and related coagula have shown these enzymes to be practical and frequently of considerable value in the management of certain thoracic problems. Other reports have dealt with their use relative to total lung resection, hemothorax, and em-pyema.

Since the enzymes uniquely lyse fibrinous deposits and nucleoprotein and may cause fistulae to become manifest, some hesitation has existed in the application of SK-SD to early postoperative partial lung resection case.

This report recounts our experience in the application of the enzymes in six instances of lobectomy and/or segmental resection. The diseases encountered at operation diagnosed histopathologically, were tuberculosis, coccidioidomycosis, and a granulomatous lesion possibly coccidioidomycosis.

The enzymes were instilled through the usual indwelling drainage tubes into the operated hemithoraces on the third postoperative day (three cases), fourth day (one case), sixth day (one case), and the seventh day (one case). In addition, one patient was reoperated and SK-SD was injected the next day.

The results were entirely satisfactory clinically and favorable from a roentgenological point of view. In no instance was there a chronic fistula created or evidence of a deleterious effect on the underlying disease process. All the wounds healed per primam and no leakage was manifest into or from the thoracotomy incisions. The cases have been followed from one to six months and their courses have not been altered in any way unfavorably.

Friday Morning, May 9, 1952

9:00 A.M. Scientific Session.

13. Traumatic Aneurysm of the Thoracic Aorta.

R. K. HOLLINGSWORTH and W. JOHNSTON (*by invitation*),
Martinsburg, West Virginia

Traumatic aneurysm of the thoracic aorta is a rare entity. While traumatic rupture of the aorta, also rare, has a predilection for either of two locations, the first portion or the junction of the arch with the descending aorta, all aneurysms reported have been in the first portion. The longest survival time from the date of injury has been eleven months.

In this communication, four cases of traumatic aneurysm of the distal portion of the arch are reported. In one case, reported in detail, it was possible, by serial X-ray studies, to watch the development of the aneurysm following chest trauma in an auto accident. Treatment was by cellophane wrapping of the aneurysm. The patient is alive and well two years later with no further change in size of the aneurysm. The second case is alive and well seven years following trauma, also an auto accident. No specific therapy was given to this patient. Proof of the traumatic nature of the lesion is present in a pre-injury X-ray of the chest. The third and fourth cases are likewise of interest.

A review of the literature and a discussion of the mechanism of the factors involved in the production of this lesion are included.

In view of the ever-increasing incidence of accidents of violence, it is felt that by calling the attention of the profession to this entity, more cases may be diagnosed while some surgical therapy is still possible.

14. Healing of Extensive Cardiac Wounds.

C. G. THOMAS, JR. (*by invitation*), Chapel Hill, N. C., and
S. E. ZIFFREN (*by invitation*), Iowa City, Iowa

The consequences of carrying out extensive incisions and partial excisions of the left ventricular wall were studied in a series of dogs. Following incisions and excisions of the entire thickness of the cardiac wall, periodic observations were made over a four-year interval. Particular attention was directed toward the incidence and prevention of wound dehiscence, development of mural thrombi and emboli, constructive pericarditis, and aneurysm. In general, healing followed a definite pattern depending upon the type of incision, characteristics of the myocardium, method of closure, and the elapse of time. Conclusions as to the optimum methods to minimize morbidity and mortality will be presented. The findings will be illustrative by photographs and photomicrographs.

15. Traumatic Hemopericardium and Constrictive Pericarditis.

JOHANN L. EHRENHAFT and RODMAN E. TABER, Iowa City, Iowa

The occurrence of hemopericardium due to nonpenetrating trauma has been recognized. Occasional case reports have appeared in the literature. The development of constrictive pericarditis as a late sequella of unrelieved hemopericardium is discussed. A case with extensive pre-operative and postoperative cardiovascular studies to illustrate this point is presented.

Attempts to produce constrictive pericarditis in dog experiments are reported. These were carried out by injection of homologous blood and lipid extract of dog blood into the pericardial sac.

16. Rupture of the Esophagus.

ROBERT A. ANDERSON (*by invitation*), Tulsa, Oklahoma, and
GEORGE M. CURTIS, Columbus, Ohio

This paper is concerned largely with so-called "spontaneous" rupture of the esophagus. The etiology, pathology, symptomatology, diagnosis and treatment of this condition are discussed.

It is suggested that the term "spontaneous" as applied to these cases is a misnomer in many of the cases because of the fact that by definition the rupture is not spontaneous and the cause of the rupture is apparent. It is emphasized that the findings in most of these cases are typical and that the diagnosis is usually made without too much difficulty if the condition is considered. A diagnostic triad that was first suggested by Barrett in his original paper is again emphasized.

As a result of our experience, it is felt that the treatment of choice for this condition is immediate thoracotomy with closure of the perforation. While there may be some disagreement on this point, a consideration of the pathology and physiology, together with the good clinical results after immediate operation will substantiate the fact that immediate thoracotomy will definitely reduce mortality and morbidity. A review of the more recent cases reported shows that nine out of the last twelve cases reported have survived. Two of the deaths were in cases where early operation was not carried out.

Four cases of rupture of the esophagus are reported and discussed. These cases underwent thoracotomy with repair of the perforation. All survived.

17. The Effects of Atelectasis on Pulmonary Arterial Blood Flow in Dogs.

RICHARD M. PETERS (*by invitation*) and ALBERT ROOS
(*by invitation*), St. Louis, Mo.

In a series of acute and chronic experiments the blood flow through atelectatic lungs was studied. In one group of dogs the right or left main stem bronchus was transected and sutured. From one day to six months

after operation oxygen content and saturation of left and right heart blood were determined and from these values the percentage flow to each lung calculated by application of the Fick principle. On some of the dogs intravenous angiograms were done at periods of from four to six months after operation. Significant and consistent reductions to 40-10% of original flow occur as early as 24 hours after ligation.

In a second group of dogs the acute effects of atelectasis in the open chest after oxygen breathing were studied. Calculations similar to those in the first group showed reduction to 40-0% of original flow occurs in 30-120 minutes. Pulmonary artery pressure showed no significant change from the control level.

18. Surgical Management of Pulmonary Emphysema.

GERALD L. CRENSHAW (*by invitation*) and DONALD F. ROWLES
(*by invitation*), Oakland, Calif.

This is a preliminary report of 14 surgically managed cases of pulmonary emphysema. Thoracotomy was performed for the purpose of supplying secondary nutrient blood through collaterals to the anemic emphysematous lung, which was accomplished by parietal pleurectomy and ploudrage. In some cases complete denervation and resection of bullae, blebs, and degenerated lung were also done.

A brief resume is given of the etiology, pathology, and routine management of pulmonary emphysema.

It has been noted in previous observations that there is an absence of emphysema in areas of lung where vascular adhesions have been present. In certain cases of tetralogy of Fallot life has been maintained where extensive parietal parenchymal vascularity has been abundant.

The procedure has been used in patients with far advanced pulmonary emphysema who were marked respiratory cripples. The surgery was tolerated satisfactorily because of positive pressure anesthesia. Clinical improvement has been so striking that only one side of the chest has had such management to date. Pulmonary function studies are presented. One postoperative death has occurred in this series.

Friday Afternoon, May 9, 1952

2:00 P.M. Executive Session.

3:00 P.M. Scientific Session.

Address of the President, Frank B. Berry, New York, N. Y.

19. The Care of Thoracic and Thoracoabdominal Wounds in the Combat Zone in Korea.

MAJOR EDWARD ERNEST ROCKEY, M. C. (*by invitation*),
A.P.O., San Francisco, Calif.

A detailed report of the management of thoracic and thoracoabdominal wounds in a combat zone, based on 162 consecutive cases handled at the Mobile Army Surgical Hospital, 8076 Army Unit, between July 17, 1951 and December 17, 1951, is presented. Emphasis on the value of conservative care is made. Indications for open thoracotomy, thoracoabdominal and abdominothoracic exploration are discussed. In many thoracoabdominal wounds laparotomy and evacuation of the pleural space through the diaphragmatic tear and closure of the diaphragm from below was found to be the procedure of choice. The type of thoracic and thoracoabdominal wounds seen and the methods of treatment applied are demonstrated by illustrative case histories supplemented by charts, diagrams and X-rays. Results are tabulated.

20. War Wounds of the Chest: Experiences with 1535 Korean Casualties in an Army Hospital Overseas.

MAJOR A. R. VALLE, M. C. (*by initiation*), Tokyo

During the present conflict, the handling of thoracic wounds has been essentially on precepts developed during World War II. However, the availability of newer antibiotics and of SK-SD had influenced our results appreciably. These experiences will be recounted.

Nine hundred and fifty-two patients developed hemothorax; 74% of these remained sterile and 26% became infected. Sixty-eight per cent of these patients were treated by thoracentesis and antibiotics alone, recovered and returned to duty. One hundred and fifty-two decortications were performed without a death. Eighty-eight per cent of these patients were considered as having good results and returned to duty, 6.5% had fair results and returned to limited duty and 5.5% were considered to have poor results and were sent to the Zone of Interior for further treatment. Ninety-two per cent of the patients who required decortication had closed intercostal tubes inserted in Korea. In view of the fact that 79% of the patients with hemothorax recovered when treated by thoracenteses and antibiotics, we believe that thoracentesis is the best early treatment for hemothorax and that, if this conservative treatment had been carried out more frequently instead of closed thoracotomy drainage, perhaps decortication could have been avoided in some cases.

One hundred and four patients had foreign bodies removed from their chests. Seventy-three thoracotomies for removal of foreign bodies were performed. Twenty of these patients also had partial lobectomies. All recovered uneventfully and returned to duty. Thirty-one patients had foreign bodies removed at decortication. All 104 patients returned to duty.

Twenty-six patients were thoracotomized in forward areas for removal of foreign bodies. These had either fair or poor results because of increased morbidity and diminished pulmonary function. When compared with the results obtained by delayed removal, it would seem that it is best to leave the foreign body undisturbed, if possible, for later removal.

There were no operative deaths. The overall mortality was 0.4%.

6:30 P.M. Cocktail Party-Baker Hotel.

Saturday Morning, May 10, 1952

9:00 A.M. Scientific Session.

21. Silicotic and Tuberculosilicotic Lesions Simulating Bronchogenic Carcinoma.

FREDERICK G. KERGIN, Toronto, Ont.

The massive densities which sometimes develop in the presence of pulmonary silicosis may be mistaken for a bronchogenic carcinoma; eight such cases have been reported. In only one of these published cases, that of Woodruff and Kelly, was the mass unilateral, and it proved to be a tuberculosilicotic lesion. At the Toronto General Hospital over the past five years seven male patients have been seen who showed on radiographic examination a unilateral density suggestive of bronchogenic carcinoma. All had a history of some exposure to silica although in three patients exposure had been of short duration and had terminated many years ago. In only one patient was there recognizable radiographic evidence of diffuse silicosis.

Six of these patients had symptoms characteristic of bronchogenic carcinoma and were subjected to thoracotomy. In five a pneumonectomy was performed; in the other patient biopsies were taken. Pathological studies showed that in three patients the density was a simple conglomerate lesion of silicosis and in the other three, a tuberculosilicotic lesion.

In the seventh patient without symptoms, the diagnosis of a massive silicotic lesion has been reached on clinical grounds and on the basis of serial roentgenograms, and since he has no disability he has not been treated surgically.

At operation these patients have shown small nodules scattered throughout the lung, which on section were typically silicotic, and in addition there has been a very solid area, segmental in distribution; a characteristic feature has been a very marked degree of fibrosis about the bronchovascular tree with hard fibrotic lymph nodes densely adherent to the bronchi. This characteristic fibrosis, of extreme density, has

rendered excisional therapy difficult, and because of it, lobectomy or segmental resection has proved impractical.

The cause of the massive density, in the presence of an underlying silicotic reaction, appears to be chronic obstructive pneumonitis due to fixation of a segmental bronchus, peribronchial fibrosis and partial or complete occlusion from pressure of a hard silicotic lymph node. There is some evidence to suggest that in the patients with tuberculosis, the tuberculous infection was a later invader.

There have been no deaths in this group of patients, and those treated by pneumonectomy have all been relieved of their symptoms.

22. The Elective Resection of Nodular Tuberculosis.

D. O. SHIELDS (*by invitation*) and JOHN S. CHAPMAN (*by invitation*),
Dallas, Texas

Data are presented to show that apical nodular tuberculosis is of such a character that its stability can never be certain, and this information is correlated with facts regarding known obturated cavities. The view is taken that in fact multiple nodular tuberculosis is in fact composed of numerous small obturated or inspissated cavities, and that the hazard of spread is equal to or is greater than in the case of the single tuberculoma. Hence if it is rational to remove single "inspissated or tuberculoma-like cavities", it is certainly rational to elect the resection of multiple nodules, particularly if there has already been evidence of instability. Results of these elective resections are given with follow-up information.

23. The Complications and the Results of Treatment of Bronchopleural Fistula Following Resection for Tuberculosis.

JAMES D. MURPHY, BARNEY B. BECKER (*by invitation*) and
H. V. SWINDELL (*by invitation*), Oteen, North Carolina

In spite of the development of chemotherapeutic agents, refinements in surgical technique and improvement in methods of anesthesia, postoperative bronchopleural fistula frequently occurs as a complication of resection for pulmonary tuberculosis. Despite the increased morbidity following development of a fistula, the over-all results of resection have been so favorable as to result in its adoption with increased frequency.

A number of studies have been made concerning the pathogenesis of bronchopleural fistula. Few reports have appeared concerning the subsequent course of this group of patients. If a substantial number of such casualties can be salvaged, resection will be used with more confidence.

This paper deals with the complications we have encountered as a result of bronchopleural fistula in 30 patients. These fistulae developed during a series of 169 resections performed at the Veterans Administration Hospital, Oteen, North Carolina, from October, 1945 to August, 1950. An average follow-up period of 30.5 months has been possible.

The most important complication of a fistula is spread or reactivation of the disease. This occurred in 17 of the 30 patients and caused the death of six patients. Extrapulmonary spread is less common but has proven uniformly fatal when it occurs.

The final results show that 9 of 30 patients who developed a fistula are dead. Eleven remain in the hospital. Ten have been discharged. The fistula has been closed in 16 patients.

Methods of treatment used in this series of patients and the results obtained are considered in detail. As a result of lessons learned with this group, some modifications in treatment have been made during the past year and are presented.

24. Plastic Sponge Prosthesis Following Resection in Pulmonary Tuberculosis.

JOSEPH W. GALE and ANTHONY R. CURRERI, Madison, Wis.

During the past seven years the authors have been performing an increasing number of resections for pulmonary tuberculosis. Through this period the importance of obliterating the dead space left through lobectomy or pneumonectomy has been recognized. It is well known that a dead space following any surgical procedure is to be avoided if possible. The necessity is still greater in tuberculosis where the disease is more widespread and involves the neighboring lobe or lobes. Over-expansion of the remaining lung tissue will frequently obliterate the dead space, but this occurs at the expense of the remaining tissue. Over-distention and emphysema are not desirable in the presence of tuberculous involvement, and old foci are more apt to reactivate. In the past this situation has been prevented by thoracoplasty at the time of or a few days following the primary resection. Rib resection not only demands a second operation in about 65 per cent of the cases, but adds to the complications with resultant deformity. This is particularly true in growing children.

Grindlay and Waugh, 1951, described the use of a plastic sponge which was very satisfactory when used as a framework for living tissue. In a discussion of this paper one of us felt that its use would be applicable to patients with tuberculosis undergoing resection. We began using this material in April, 1951, and have implanted it in the dead intrapleural space and in the extrapleural space in over 35 cases at the time of and following resection. The results have been most gratifying.

Studies have been made comparing the tissue reaction to the sponge with that to cellophane, cotton, silk, catgut, etc. It now appears that its value is far greater than that of paraffin, lucite balls, and other materials that have previously been used. It is easily sterilized and simple to handle. We are now engaged in getting molds made to duplicate the right and left lungs as well as the individual lobes. If we are successful in this effort, the efficiency and simplicity of the procedure will be greatly increased.

A detailed description of the technique is given, and the advantages and disadvantages, as well as complications, are discussed. Follow-up X-rays are shown.

25. The Role of the Inferior Esophageal Constrictor in the Production of Lower Esophageal Disease.

EARILE B. KAY, Cleveland, Ohio

There has been considerable controversy in the past as to the presence or absence of a sphincter-like mechanism at the cardia of the stomach, the esophagogastric junction, or in the lower esophagus. Observations are presented as to the presence of a sphincter-like mechanism in the lower esophagus, referred to as the inferior esophageal constrictor which appears to be a factor in the development of certain lower esophageal diseases such as achalasia, diverticula, and idiopathic strictures. These observations will be illustrated by slides and motion pictures.

26. The Delayed Restoration of Oral Alimentation in Children with an Esophageal Defect Remaining after Closure of a Tracheo-Esophageal Fistula.

N. LOGAN LEVEN and RICHARD L. VARCO, St. Paul, Minn.

The successful development, by Leven in 1939, of a surgical technique for saving the newborn with a tracheoesophageal fistula, inevitably posed a reconstructive problem for the future. At our institution 14 of these children have been saved from a hitherto uniformly fatal defect. During this interval an additional 50 tots have had primary restoration of esophageal continuity, as the preferred treatment and when feasible.

In that group cared for by the staged procedure, ten were judged to have grown large enough for the establishment of oral alimentation. Our experiences with this situation, the operative methods used, those limitations recognized in the cosmetic and functional results to date will be considered at some length in the paper. In brief, nine patients have had an antethoracic jejunal loop terminally anastomosed in stages to the residual cervical esophagus and then to the gastric area. The stomach was moved intrathoracically and joined at the superior mediastinal aperture to the gullet in one child. The only youngster to suffer necrosis of the jejunal loop, the tenth case, lost a short segment of the bowel. A sufficient length remained viable, however, that subsequent successful direct union in the usual fashion was carried out. No deaths or fistulae, of more than a few days' duration, have occurred. All patients have returned for follow-up visits at frequent intervals for periods up to about three years.

The weight gains, eating habits, psychological reaction to the operation, and other related items discussed in the paper are based, therefore, on numerous personal interviews by the authors with the parents and the children.

Saturday Afternoon, May 10, 1952

2:00 P.M. Scientific Session.

27. Surgical Treatment for Congenital Aortico-Pulmonary Fistula: Experimental and Clinical Aspects.

H. WILLIAM SCOTT, JR. and DAVID C. SABISTON (*by invitation*),
Baltimore, Md.

Aortico-pulmonary fistula resulting from a congenital defect in the aortic septum is an unusual malformation. The clinical syndrome associated with it is similar to that of patent ductus arteriosus of large caliber. In an effort to develop a method for closure of this window-like type of fistula experiments were carried out in a series of animals. The anomaly was reproduced in dogs by constructing a lateral anastomosis between the aorta and the pulmonary artery near the base of the heart. A number of these animals were re-explored at varying intervals and a technique for closure of the aortico-pulmonary fistula by division and suture was devised.

This technique has been employed successfully recently in the closure of a congenital aortico-pulmonary fistula measuring 16 mm. in diameter in a ten-month-old baby. Lantern slides.

28. Pulmonary Function after Bilateral Multiple Segmental Resection for Bronchiectasis.

RICHARD H. OVERHOLT, BENJAMIN ETSTEN (*by invitation*) and
JAMES H. WALKER (*by invitation*), Boston, Mass.

The degree of relief of toxicity and distressing symptoms in bilateral bronchiectasis parallels the extent of the surgeon's ability to remove the diseased tissue. Furthermore, in many cases, the conservation of all possible normal tissue is obligatory if crippling pulmonary function is to be avoided following bilateral excisional therapy. Prior to the development of safe techniques for segmental resection, it was often impossible to remove all the involved segments and still insure adequate function. Postoperative pulmonary function studies have been made of a number of patients who have had bilateral and multiple segmental resections. An analysis of these studies will be given. Results indicate that the postoperative pulmonary function parallels one's ability to preserve healthy segments.

29. The Indications for and the Results of Commissurotomy for Mitral Stenosis.

ROBERT P. GLOVER, THOMAS J. E. O'NEILL, JAMES M. HARRIS (*by invitation*)
and O. HENRY JANTON (*by invitation*),
Philadelphia, Pa.

With the development of any new and radical departure in the treatment of a common disease entity such as mitral stenosis there must be much initial conjecture and speculation as to its proper application. Since it has now become clear, after four years of surgical investigation, that over 75% of the patients submitted to surgery show definite improvement, in many instances of great magnitude, the time has come to examine in detail the factors responsible for these results. By such analysis obvious errors in the past may be aired and rectified and the entire program, both medical and surgical, may thereby be placed on a sound and coordinated basis.

In 1949, before this association, the surgical technique of commissurotomy was described as applied to the first seven cases so treated. The personal experience of the authors has now been expanded to include over 200 cases. Sufficient time has elapsed in over 150 of these (6 months to over 3 years) to permit certain conclusions to be drawn. It has become obvious that the greatest single factor in the successful performance of surgery for mitral stenosis is the proper selection of cases. The indications for such selection are therefore considered under eight major categories. The history, the age of the patient, the valvular defect or defects, the cardiac size, the electrocardiographic findings, the catheterization data, the functional capacity and complicating factors such as rheumatic activity, arrhythmias, and embolic episodes.

Results, both anatomical and functional, have been exhaustively studied and their correlation subjected to analysis. The overall mortality in the entire series has been less than 7% and that since January, 1951 (150 cases) has been approximately 4%.

30. The Cure of Two Aneurysms Associated with Patent Ductus with a Resume of Seventy Cases of Patent Ductus Surgically Treated.

EMILE HOLMAN and FRANK GERBODE, San Francisco, Calif.

In this paper there is included: (1) A report of an aneurysm of the ductus following two previous ligations complicated by a persistent staphylococcus albus infection; (2) A report of an aneurysm of the pulmonary artery opposite the patent ductus also associated with an endocarditis; (3) A report of identical patent ductus in identical twins; (4) Patent ductus with reversal of flow and with preponderant hypertrophy of the right ventricle; (5) An analysis of 70 ligations of the patent ductus indicating that 36 operations were performed for minor or no symptoms except for murmur, and 34 operations performed for major symptoms, with one death.

31. Anatomical (Histological) Basis and Efficient Clinical Surgical Techniques for the Restoration of the Coronary Circulation.

CHARLES P. BAILEY, R. C. TREUX (*by invitation*),
GEORGE GECKELER (*by invitation*) and NICHOLAS ANTONIUS (*by invitation*),
Philadelphia, Pa.

Gross (L), O'Shaughnessey, Beck, Thompson and Raisbeck, Fauteux, and Vineberg have all attempted to add to or to replace the diminished coronary circulation in arteriosclerotic disease. Their methods have varied, clinical results have been variable, and much doubt as to their logic and basic soundness exists even to the present time. It is the purpose of the authors to present: (1) The sound anatomical basis for certain of the procedures; (2) The clinical evaluation of the results in a small series operated on by apparently the most promising of these methods; (3) A modification of the original technique which renders the operation technically simpler, appreciably lessens the operating time, and presumably renders the percentage of clinical effectiveness greater.

32. Pulmonary Valvulotomy: Description of a New Operative Approach with Comments About Diagnostic Characteristics.

HARRIS B. SHUMACKER, JR., Indianapolis, Ind.

A series of nine valvulotomies, eight for pure pulmonic stenosis, and one for tetralogy of Fallot associated with a stenotic calcified valve, are analyzed. All patients survived. In the first seven cases the usual anterior intercostal approach with section of costal cartilages was used. In more than one-half some difficulty was encountered in dislocating the heart into the left chest so as to permit proper placement of sutures in the appropriate portion of the right ventricular wall. Such maneuvers were often associated with cardiac irregularities. In two cases it was necessary first to place traction sutures in the wall of the left ventricle in order to accomplish this end. Because of these experiences the heart was approached through a complete midsternal-splitting incision in the last two cases. Initial experiences suggest that it is a superior approach, giving far better exposure of the anterior surface of the right ventricle and pulmonary conus.

The eight cases of pure pulmonic stenosis have deviated widely from the classical picture as far as diagnostic features are concerned. In some there was no X-ray evidence of marked enlargement of the pulmonary artery segment. One patient, severely incapacitated, with marked cyanosis and hemoconcentration, had a small pulmonary artery and no thrill. The artery increased significantly in size immediately after valvulotomy and the patient has had an excellent response to operation. A number of patients have not shown diminished vascular markings in the periphery of the lung fields. Only two of the eight showed, on electrocardiographic study, definitely high P waves and one borderline P waves.

Comments will be made about the operative technique, the problem of diagnosis, postoperative complications and results of treatment.

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