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ABSTRACTS

This section of Thorax is published in collaboration with the two abstracting journals, Abstracts of World Medicine, and Abstracts of World Surgery, Obstetrics and Gynaecology, published by the British Medical Association. In this Journal some of the more important articles on subjects of interest to chest physicians and surgeons are selected for abstract, and these are classified into five sections.

Experimental
A study has been made of the pulmonary function of 10 patients before and after bronchography by means of "lipiodol." In only 1 patient was the alveolar-arterial PO2 gradient found to be definitely increased following the procedure, although 5 in addition to this one had an abnormally high gradient in the control study. Arterial carbon dioxide tension was essentially uninfluenced by lipiodol. The vital capacity was reduced by an average of 7.6% several hours after bronchography. Measurement of the saturation time on changing the inspired gas from room air to 100% oxygen revealed no significant effect after lipiodol. Lung-to-ear circulation time was similarly unchanged. All abnormal values returned to the control level within 24 hours except in one case in which the pre-lipiodol values were not reached until 48 hours later.

It is concluded that the presence of lipiodol has no significant influence on the respiratory gas exchange except in occasional patients with advanced pulmonary pathology.—[Authors' summary.]


Direct anastomosis of esophagus to oesophagus following resection is an operation which has recently been proved feasible in man, the blood supply of the gullet being richer than was previously thought, so that extensive mobilization can be carried out without necrosis.

Experimental operations were carried out on 46 dogs, the anatomy of the arterial supply in these animals being very similar to that in man. It was found possible to devascularize the entire thoracic oesophagus and to make an anastomosis without necrosis occurring. When the cervical oesophagus was also mobilized necrosis sometimes occurred, and when the abdominal oesophagus and the stomach (except for its right vessels) were also included necrosis was frequent. There was no necrosis if the cervical oesophagus was left untouched and the gullet below it, together with the stomach as far as the pylorus, devascularized. Nor did necrosis occur when the upper thoracic and lower cervical oesophagus was resested and the upper cervical stump anastomosed to the mobilized lower thoracic oesophagus, the stomach having been transplanted into the chest and obtaining its blood supply only from the right gastric and gastro-epiploic arteries.

Many of these dogs died from surgical shock or post-operative atelectasis, while most of those surviving the operation developed oesophageal and gastric dilatation, due to the concomitant vagotomy, and eventually died, but the experiments were not thereby invalidated. When necrosis occurred it was usually above the level of the azygos vein. M. Meredith Brown.

The Clinical Physiology of the Human Bronchi.
This paper is another contribution to the interesting series on research in bronchial physiology carried out by this team at Columbus, Ohio. Much of the work has been made possible because the authors practise unilateral vagus section as a palliative measure in patients with inoperable bronchiogenic carcinoma. In 7 patients with inoperable carcinoma unilateral vagotomy above the origin of the pulmonary plexus and immediately below the origin of the recurrent laryngeal nerve was performed, with the following results.
The cough reflex arising from the homolateral bronchial tree was abolished, suggesting that the afferent fibres transmitting bronchial impulses resulting in the initiation of the cough reflex are carried by the homolateral vagus nerve. In the majority pain of bronchial origin was abolished on the homolateral side; in 3 patients the pain was referred to the contralateral anterior cervical region. These findings would suggest that afferent pain fibres from the bronchial tree are carried by the homolateral vagus nerve and that certain of the afferent fibres from the tracheo-bronchial tree are carried by the contralateral vagus. Bronchograms made during inspiration and expiration showed no effects upon the normal respiratory movements of the bronchi. Bronchospasm persisted even after bilateral vagotomy. No gross changes were noted in the amount or consistency of the bronchial secretions.

Kenneth Marsh.


Bronchial obstruction was induced in guinea-pigs by inhalation either of histamine aerosols or (after previous sensitization by injection of egg albumen) of aerosols of egg albumen. The external appearance of the attacks of dyspnoea thus caused is the same, but the anatomical changes are different. In the histamine-induced asthma broncho-constriction is dominant and no oedema of the submucous tissue is present; in the egg-albumen-induced asthma such oedema is pronounced; there is eosinophil infiltration, and although the bronchial lumina are narrow, the author is not certain whether this is due to muscular spasm or to the surrounding oedema. [These differences have been described in detail by Kallos and Pagel (Acta med. scand., 1937, 91, 292.)]

In 12 cases of human asthma, the history of which is given in detail, bronchoscopy and biopsy were carried out. In 5 out of the first group of 6 cases an allergic cause for the asthma was found in the history, and skin reactions were positive in 3. Bronchoscopy was performed during an attack induced by the specific allergen. In all 6 considerable bronchial oedema was found, and hypersecretion was moderate. In the second group of 6 cases no allergic cause was found in the history and the skin reactions were negative. Bronchoscopy was carried out during intercurrent attacks. No oedema was found in these cases, except in one in which it was of an inflammatory nature; hypersecretion was very pronounced and there were signs of bronchospasm. The first group is classed as "allergic asthma," the second as "non-allergic." The conclusion is drawn that allergic asthma is characterized by bronchial oedema, and non-allergic asthma by bronchial spasm and hypersecretion.

Tuberculosis


Before 1947 resection in pulmonary tuberculosis had a mortality of about 28% and a morbidity rate of 51%. The hazards associated with resection are mainly consequent upon the disease itself: (1) progression of the infection; (2) opening of the bronchial stump, with failure to heal or late progressive ulceration and sloughing; (3) empyema from contamination at operation or due to a late progression of pleural tuberculosis. The greatest common factor in reducing these hazards is the effective use of streptomycin.

The indications for resection, by no means fully worked out, are: (1) collapse failures; (2) destroyed lung, which includes certain types of large cavity; (3) chronic bronchial disease, stenosis, bronchiecstasis, or pulmonary suppuration; and, somewhat less important, (4) diagnostic problems including neoplasms; (5) elective. This last big group includes cases in which lobectomy is carried out, in preference to some other collapse measure, for scarred and fibrose lobes that are liable to become the site of chronic suppurrative disease, hilar and mediastinal cavities, cavities reopening after the abandonment of an artificial pneumothorax, non-expandable lungs where decortication is combined with lobectomy, or tuberculomata.

A comparison between patients undergoing post-resection thoracoplasty and those not so treated reveals no more frequent reactivation of the disease in the latter group; however, thoracoplasty is now a routine operation after pneumonectomy and is performed in selected cases after lobectomy. Prolonged rest in bed in convalescence is considered essential.

The authors review 123 cases with an over-all mortality of 12:2% which was reduced to 5:7% with streptomycin; the morbidity rate of 22% became only 11:4% following the effective use of this antibiotic. C. A. Jackson.

Advocating conservatism in the surgery of pulmonary tuberculosis, the authors report 75 cases of segmental resection performed in a period of 24 years. The selection of cases requires fine judgment based on an assessment of the individual's resistance and general condition. The operation aims at removing the main offending focus of disease, enabling the patient to overcome residual indolent foci. To this end bed-rest for 6 months is advised.

Cavitating tuberculosis mainly affects three lung segments: the apical and posterior segments of the upper lobe and the superior segment of the lower lobe. In removing such diseased segments the transection of tuberculous tissue in adjacent lung may occur, but with streptomycin any spread or exacerbation of the disease appears to be controlled. Upon removal of a diseased and frequently contracted segment the danger of sudden overdistension of the remaining lung is minimal and the need for permanent collapse measures rendered unnecessary. There is less distortion of bronchial drainage than is liable to occur with a lobectomy. An essential pre-operative investigation is an adequate lateral tomogram for location of the lesion.

The technique of operation calls for an accurate anatomical knowledge, speed, and meticulous handling of the tissues; these, combined with extreme post-operative vigilance, reduce the complication incidence. Rapid re-expansion of remaining lung avoids the danger of fistula and empyema. To effect this expansion, active suction of any residual air space is practised. There was no complication in any of the last 41 consecutive cases. In this series streptomycin was given to 80% of the patients only, but should be given as a routine, as it accelerates maturity of the lesion and may aid bronchial healing.

Over a short follow-up period 65 (86.7%) patients' sputum became negative on culture; 2 cases of tuberculous spread and 6 of broncho-pneumonic fistula occurred, and there were 5 late exacerbations. Of the 3 deaths, only 1 was an operative fatality.


Between 1945 and 1949, 202 resections were performed in Detroit on patients ranging from 6 to 73 years of age, of whom as many as 43% had contralateral disease. The operative indications broadly fell into four groups: thoracoplasty failure (71), bronchostenosis (33), tuberculoma (26), lower-lobe disease (22), and a miscellaneous group including tuberculous bronchiectasis and destroyed lung. For upper-lobe lesions the authors preferred thoracoplasty whenever possible, the exceptions being in children, tension cavities, or when collapse therapy seemed unsuitable. Destroyed lung alone was rarely considered an indication unless associated with high-grade stenosis. Complications were few. Fistula (most frequently seen following right pneumonectomy (14)) occurred 27 times, haematoma 5 times, pericarditis or pericardial effusion 3 times.

The operative technique favoured the prone position; anaesthesia was induced with thio-panthone and curare and maintained with intravenous procaine and endotracheal nitrous oxide and oxygen. The bronchus was sutured with silk and the stump buried. Early ambulation is advised.

In the 202 patients followed up for 6 months to 5 years there was an immediate and late mortality of 12.4%. Contralateral or ipsilateral spread with extension of the disease occurred in 10.5% of pneumonectomies and 14% of lobectomies, while 85% of the living patients are clinically well with negative sputum; 68% have returned to their homes. C. A. Jackson.


In a combined medical and surgical tuberculosis clinic in Cleveland, Ohio, from March, 1947, to August, 1949, a total of 52 carefully selected patients was recommended for resection: 46 pneumonectomies and 7 lobectomies were performed. All operations were carried out under cover of streptomycin therapy, and all pneumonectomies and upper lobectomies were followed by some modified type of thoracoplasty, and lower lobectomies by permanent phrenic interruption. There was an over-all surgical mortality of 7.5% (4 cases).

Collapse measures were generally preferred to the more radical procedure unless there was an urgent and specific indication, such as destroyed lung with either extensive acute pneumonic disease (16 cases) or non-acute fibro cavernous
disease (10 cases), bronchial stenosis (14 cases), failure to collapse after fair trial of thoracoplasty or artificial pneumothorax (10 cases), tuberculoma, and grave haemorrhage. In chronic bronchial stenosis there is an absolute indication, whereas in the series with acute unilateral pneumonic tuberculosis resection offers the best chance of a successful treatment, and, although carrying a higher mortality (18.7% in this series of 16 cases), the results are encouraging.

Follow-up over a period of 6 months to 2½ years revealed only one case of contralateral cavitaton: 45 patients are living and sputum-negative. Remote deaths were due to cor pulmonale (1), murder (1), and sudden illness of unknown nature (1). The operative complications included 2 cases of bronchopleural fistula, 3 of tuberculous wound infection, and 1 of spread. The authors believe that the onset of a bronchial fistula, which at first is a small leak, produces a clinical picture of shock, upper abdominal pain, and fever; with these indications an immediate thoracoplasty with bronchial resuture is advised.

C. A. Jackson.


Although thoracoplasty continues to be deservedly popular in the treatment of pulmonary tuberculosis with cavitaton, there is an inevitable (though small) proportion of cases in which the cavity persists in the collapsed area. Further collapse therapy or resection is accepted as a means of treatment for these residual cavities, but there are occasions on which drainage or cavernostomy may be indicated. This article describes experience of cavernostomy in 22 patients.

There are various ways of draining such a cavity; the most satisfactory method involves the use of a U-shaped skin flap which can be turned into the cavity and prevents too rapid healing, besides making the interior available for inspection and application of drugs. A two-stage operation is advocated, great care being taken over the localization of the cavity, which is always close to the mediastinum after thoracoplasty. Once open, the cavity is packed; after several months it is much smaller and its lining is epithelized. Streptomycin prophylaxis (but apparently no local application) is recommended. If a sinus persists a deliberate muscle-plastic closure is attempted; this operation was used on 16 occasions, with success in all but 3 cases. T. Holmes Sellers.


The action of the inspiratory muscles, aided by the serous surfaces of the pleura, exerts a uniform centrifugal pull on the alveolar walls, drawing air into them by the bronchii. If the latter are obstructed or the alveoli full of fluid the effect is like that of trying to withdraw a syringe piston when the nozzle is shut, and damage to the alveolar walls results. This damage is increased if the pleural space is obliterated. However, when the rigidity of the chest wall is destroyed these forces are neutralized and alveolar integrity is preserved, even when mechanical obstruction exists. It is suggested that the retraction possible at the thoracic outlet accounts for the readiness with which apical lesions heal, and that the role of thoracoplasty is to provide such a relaxed screen between the lung and the atmosphere, approximating to an "atmospheric pneumothorax."

The ribs are approached by a short vertical axillary incision, and the upper three, in toto, are resected subperiosteally from costotransverse joint to cartilage, a number of special raspatories and retractors being used. Further ribs are removed according to the extent of the lesion, and complete apicolysis is carried out. The apex is then indolized by a helicoidal suture, and the periosteum destroyed by cautery. The extrafascial space is partially closed by suturing the borders of the serratus anterior and pectoralis minor and turning in axillary fat.

Advantages claimed are the cosmetic result, absence of muscle damage and shock, and satisfactory access. The technique may be applied not only in cases usually considered suitable for thoracoplasty but in "all forms of tuberculosis localized to supra- or subclavicular regions, exudative or productive, acute or chronic . . ." Complete cure, clinical and radiological, is claimed in 279 out of 387 patients (72%); 58 (15%) were improved but with residual cavities; and 41 (10.6%) were unsatisfactory. There were 9 deaths (2.4%), all due to myocardial failure, no "operative" mortality being admitted. Geoffrey Flavell.

In this paper on axillary thoracoplasty the authors, while not wholly subscribing to the views of Morelli on the physiological aspect, nevertheless agree that his surgical approach is elegant and atraumatic and provides good access for apicolyis on a plane parallel to the interlobar fissure, simulating, as nearly as possible, the elastic homogeneous relaxation of a good pneumothorax.

Indications are: upper-lobe cavitation not extending below the 5th space posteriorly; and the need for careful “staging” owing to functional insufficiency. In the latter the upper two ribs are removed, with minimal apicolyis, by the axillary route and the later ribs taken posteriorly.

Bacilli disappeared from the sputum and cavities from the tomogram in 76 of 86 cases of simple thoracoplasty and in 46 out of 49 cases of apicolyis; 3 patients became worse, or died, but this was attributed to bad selection.

Geoffrey Flavell.

Neoplasm


Alveolar-cell tumour of the lung is a rare neoplasm, only 52 cases having previously been described, under various designations, such as “primary multiple carcinoma,” “alveolar-cell carcinoma,” “columnar-cell carcinoma,” and “pulmonary adenomatosis.” This multiplicity of names has arisen from doubt about the point of origin of the tumour, as it is still debatable whether the pulmonary alveoli are normally lined by epithelium. In this condition, however, the thin interalveolar septa are unquestionably lined by columnar cells which form papillary projections into the alveoli, and the use of the term “alveolar-cell tumour” is therefore justifiable. The authors have reported 12 new cases, 8 of which were treated by some type of pulmonary resection and four found by a search of the post-mortem files of the Mayo Clinic. The ages of the patients varied from 30 to 62 years.

There is no typical radiological picture. The earliest x-ray finding is a small, poorly defined area of consolidation resembling a pneumonitis. As the disease progresses it may involve more and more tissue until the entire lobe is involved and other centres of involvement become apparent either in the same lobe, in the same lung, or in the opposite lung. These nodules may become confluent and give rise to the appearance of a single large mass or of extensive consolidation. As regards symptomatology, cough, which may be unproductive, is a constant feature. However, sputum is often present, and in 32% of the reported cases it was copious and of a white, frothy character.

This type of sputum, associated with a pulmonary shadow, is suggestive of the diagnosis. Haemoptysis and stabilisation are common, and dyspnœa is marked where the lung involvement is extensive. Bronchoscopy usually shows nothing of significance, but examination of the sputum or of bronchoscopic washings may enable a diagnosis to be reached. Cells from an alveolar-cell tumour are larger than the cells normally present in sputum and are frequently more irregular; the nuclei are not prominent and the cytoplasm is pink-staining and is occasionally distributed in a crescent around the nucleus. In several cases this crescent-shaped appearance has been so marked that the tumour cells have had the appearance of the cells of the squamous type of carcinoma. It is possible to be even more certain of the diagnosis when clumps of columnar cells, which have a free border of cytoplasm and in which the nuclei are not particularly irregular, are present.

Surgical resection is the only effective method of treatment available at the present time. It is as yet too early to evaluate the results in the authors’ 8 treated cases, but one patient was alive and well 2 years after resection, another 6 months after operation, and a third 3 months after operation. One patient died 2 years after operation from causes unrelated to her alveolar-cell tumour. In addition, it was noted at post-mortem in 2 patients who died after operation that there was no evidence of residual disease in the remaining pulmonary tissue.

L. G. Blair.


This report concerns 1,130 patients with supposed carcinoma of the bronchus investigated.
at the Massachusetts General Hospital during the 20-year period 1930-50. Of the total, 681 were eventually proved by biopsy, or at operation, or post mortem to be suffering from cancer. Of the proved cases, 294 (43.2%) were considered suitable for exploration, and in 171 (58%) of these the growth was resected; this represents 25% of proved cases. The operations performed for resection consisted of 114 pneumonectomies and 57 lobectomies. A lobectomy was performed: (1) when there was clinical evidence of diminished pulmonary or cardiac reserve; (2) when uncertainty of diagnosis existed and the lesion in question could be totally removed by lobectomy; (3) for peripheral lesions without evidence of lymph-node involvement; and (4) where the spread of the carcinoma was too extensive for total removal, but the primary tumour could readily be removed by lobectomy. In a proportion of the cases where diagnosis was uncertain, lobectomy was first carried out, followed by pneumonectomy if examination of the specimen showed this to be necessary. The over-all mortality rates for the 20-year period were: (1) exploratory thoracotomy 10.6%; (2) pneumonectomy 22.8%; and (3) lobectomy 14%. (The figures for the last 2 years in the case of both pneumonectomy and lobectomy are approximately 3.7%) The high over-all mortality rates are attributable to the inclusion of many cases treated before the modern operative procedure and ancillary treatment were fully developed. The gross survival rates for the 20-year period were 21.8% for pneumonectomy and 25.8% for lobectomy, though these include many recent cases. The authors demonstrate graphically the marked effect of inclusion of cases of adenoma upon the survival rates. The importance of lymph-node involvement is indicated by a 5-year survival rate of 34% among 29 patients with negative lymph nodes, as compared with no survivors amongst those in whom the lymph nodes were involved.

This is an important contribution, presenting the experience of a busy clinic over a long period. The paper contains many important statistical data which it is impossible to include in an abstract. The important question of lobectomy versus pneumonectomy is discussed in some detail, and the authors’ survival rates for lobectomy compare very favourably with those for pneumonectomy. It should be understood, however, that in cases suitable for lobectomy the disease is frequently less advanced than in those in which a pneumonectomy represents the only possible hope of its eradication.

W. P. Cleland.


The finding of malignant cells in the sputum of patients with metastatic pulmonary neoplasms is relatively rare. Of 400 cases in which sputum was found to contain malignant cells, 16 were cases of metastatic lung tumours. In a control series of 488 cases in which miscellaneous conditions were present and examination of sputum for malignant cells was negative, there were 30 cases of metastatic lung tumours. Of 100 patients whose sputum was reported as positive during the period in which the 488 cases in the control group were examined, only 4 were considered to have metastatic tumours of lung. The percentage accuracy of sputum diagnosis among the total of 34 with metastatic lung tumours was only 11.8%.

In order to explain this low incidence, histological sections were made of secondary tumours of lung removed at operation or at necropsy. The authors found that the bronchial epithelium frequently maintained its integrity over the surface of the metastatic tumour even when bronchial involvement was extensive. The epithelium was frequently flattened and in some areas had undergone squamous change; but, because its protective function was maintained, there was little opportunity for malignant cells to exfoliate and be removed with the sputum.

John Borrie.


The author discusses the history of treatment of carcinoma of the oesophagus and reports a case in detail. The operation he performed consisted of removal of the oesophagus from a point well above the lesion to the diaphragm, with mobilization of the stomach and restoration of continuity by an anastomosis of this organ to the cut upper end of the oesophagus in the neck. The approach was first through the bed of the sixth rib, then through the eighth intercostal space, with division of the diaphragm and splenectomy, after which the patient was turned on his back and the inner end of the clavicle and first and second ribs were removed. Mobilization and removal of the oesophagus

ABSTRACTS
were completed, and the anastomosis was made, through this incision. The patient stood the operation well and was quite fit 6 months later.

J. R. Belcher.


About 1 in every 4 oesophageal carcinomata arises in the cervical portion; men are affected more commonly than women, although at a later age. Early symptoms are minimal: the first may be a metastatic cervical lymph node. Persistent pain in the ear may precede dysphagia. Invasion of the larynx or of the recurrent nerve may cause hoarseness. While barium-swallow radioscopy may show a lesion, it often fails, especially if the growth is high. The diagnosis is made by examination and biopsy through a speculum or oesophagoscope. Lymph-node metastases are usually confined to the neck, the paratracheal, retropharyngeal, upper deep cervical, and, less often, inferior deep cervical groups being involved, often on both sides. Adequate surgical treatment should include a radical dissection of these fields.

The three methods of operation advised by the authors are as follows: (1) Block resection of cervical oesophagus, larynx, and trachea; hemithyroidectomy; and radical lymph-node dissection with removal of any nodes present along the opposite jugular vein. Later, reconstruction of the gullet by a skin tube. This procedure is indicated for post-cricoid or extensive growths, and also for extrinsic laryngeal cancer. Two skin flaps are turned, the shorter on the side of the lymph-node dissection. The patient is left with a permanent tracheotomy, and at first with an oesophageal stoma through which he is fed, gastrostomy being considered unnecessary. Six weeks later a skin tube is made by turning flaps covering the raw areas so left with split skin grafts. The case histories are given of 3 patients treated by this method, 2 of whom died of recurrence within 9 months, the other remaining well after 17 months. (2) Resection of cervical oesophagus alone, with regional lymphatics, and later reconstruction. (3) Resection of cervical and thoracic oesophagus, with anastomosis of stump to mobilized stomach, a formidable procedure not usually allowing radical lymphatic dissection, and applicable to growths at the level of the thoracic inlet.

M. Meredith Brown.


Tumours of neurogenic origin are relatively commonly encountered in thoracic surgery, and in this article 24 personal cases are described. Symptoms and diagnosis are briefly considered, but the major part of the discussion is concerned with classification and pathology. Three main groups of tumour are recognized: (1) tumours of nerve-sheath origin (easily the most common); (2) tumours of sympathetic origin; (3) paragangionic tumours (rarely encountered).

Tumours of nerve-sheath origin are referred to as neurilemmomata and may be diffuse, encapsulated, or malignant. Of these, the encapsulated spherical type is commonest and has been called a schwannoma, neurinoma, peripheral fibroblastoma or glioma, or specific nerve-sheath tumour. The mass is attached to a nerve and is removed easily if it is not eroding rib or intervertebral foramen. Cystic and degenerative changes may occur, and the haphazard arrangement of cells with irregular nuclei sometimes gives rise to a histological diagnosis of malignancy. The malignant types, known as neurogenous sarcoma, fibrosarcoma, or malignant neurinoma or schwannoma, probably do not occur in encapsulated forms, but are associated frequently with von Recklinghausen's disease.

Sympathetic-ganglion tumours, called ganglio-neuromata, are usually large, soft, and encapsulated, consisting of ganglion cells in a stroma of grey and white fibres. Some of the tumours are differentiated and others undifferentiated. Sympathicoblastoma, also known as neurocytoma, neuroblastoma, sympathicogonioma, or ganglioma embryonale sympathicum, commonly arises in the adrenal medulla. The tumour is soft, may have no capsule, and is essentially malignant.

Paraganglion cells are probably the forerunners of true ganglion cells and produce the phaeochromic reaction (reduction of chromates). Their tumours are rare and of large size, encapsulated, soft, and reddish-brown. In the case recorded the tumour was benign.

T. Holmes Sellors.


The authors point out that intrathoracic neurogenic tumours may arise from either the
cerebrospinal or autonomic nerves, and that although it is generally agreed that in most cases their origin is from the sheath of the intercostal nerves, whether they arise from the ectodermal or mesodermal component of this sheath is as yet undecided. They therefore advocate the use of the term neurinoma for these tumours. In 105 cases collected from the literature by Kent et al. in 1944, the incidence of malignancy was 37%, while in 8 of their own 19 cases the tumour was malignant. On the other hand, Blades (1946) found one malignant case in a series of 29. At the University Hospital, Oslo, between 1933 and 1947, 21 cases of intrathoracic neurogenic tumour were diagnosed, 12 being discovered accidentally during routine chest examination in patients who had no symptoms. Of the other 9 patients, 2 complained of dyspnoea and 5 of pain in the chest, while 2 had the symptoms and signs of the Pancoast syndrome. Most of the tumours were in the upper posterior mediastinum, but in 2 cases it arose on the anterior chest wall and in a further 2 it occurred in the sulcus and arose from the recurrent laryngeal nerve; these 4 were the only malignant tumours in the series. Operation was performed in 20 cases. There were 2 postoperative deaths and 2 recurrences; all the other patients remained free from recurrence. [Follow-up period not stated.] Originally the authors used a paravertebral extrapleural approach, but abandoned this for the transpleural approach. From their experience they draw the conclusion that those tumours which occur in the typical site and give rise to no symptoms are most often benign, while those causing symptoms and arising either on the anterior chest wall or in the superior sulcus are often malignant (4 out of 9 in the present series) and should be removed surgically. They point out the difficulty of estimating the frequency with which a change to malignancy occurs in a tumour initially innocent, since few untreated cases have been observed over a long enough period.

G. F. Chin.

Cartilaginous Tumors of Ribs and Sternum.


Cartilaginous tumours, benign or more often malignant, are the most common neoplasms of the bony chest wall; osteogenic sarcomata are rare. The origin of the former has been variously supposed to be from normal cartilage, from rests, or from periosteum.

The authors have compiled a comprehensive table giving details of 85 cases reported by others and adding 11 of their own: 60 cases were diagnosed as malignant; although the others were considered benign, many of them show features which make this doubtful. More men than women were affected. The earliest symptom was most commonly a swelling, later followed by pain; this order was sometimes reversed, and other cases presented no symptoms. The history was often long, sometimes even more than 10 years.

The lesion may originate in the sternum or in any rib; the most common site is near the costochondral junction, and multiple tumours are not rare. The most characteristic x-ray appearance in chondrosarcoma is of a large mass arising from bone, with irregular flecks of calcification. In differential diagnosis, among the many possibilities to be considered must be included the late effects of trauma such as a malunited fracture. Biopsy or gross examination of a specimen will usually show the cartilaginous nature of the lesion. Encapsulation, cystic areas of degeneration, satellite nodules, and compression and invasion of adjacent tissues occur; it is often very difficult to determine malignancy. There is no essential difference between chordoma and osteochondroma; chondrosarcomata may also form bone, but the more malignant the tumour the less the bone. The most important histological criteria of malignancy include plump and double nuclei, mitoses, and giant cartilage cells. Examination of many areas is essential, as some often appear benign. The authors prefer to use only the terms chordoma and chondrosarcoma.

Analysis of the table shows that the only treatment of value is radical, local resection, including muscle, adjacent bones, underlyng pleura, and, if necessary, lung. Long segments of ribs should be removed, as spread occurs both by the marrow and under the periosteum. Defects, even very large, can be repaired, if necessary by plastic manoeuvres. Fifteen of 92 patients operated on lived more than 2 years.

Chondromata, initially benign, may become malignant; other tumours are chondrosarcomata from the start. Metastases are uncommon, but local recurrence frequent.

A valuable table of features of prognostic significance concludes the article.

M. Meredith Brown.
Disorders of the Oesophagus


The literature contains few references to epibronchial diverticula. This is due not to the rarity of the lesion, but to the rarity of symptoms. Usually symptomless, owing to the fact that they are small, lie transversely, and do not fill on swallowing, these diverticula may, however, cause dyspnoea, retrosternal pain, and "paradoxical dysphagia" (solids are swallowed normally, because they do not enter the diverticulum, but fluids cause obstruction). It is usually believed that these are traction diverticula due to adherent tuberculous lymph nodes. In many cases, however, including that described here, no lymph node or evidence of inflammation is found. The authors therefore believe that the diverticulum may be congenital in origin, and aetio logically similar to oesophageo-tracheal fistula. Many are actually adherent to the left bronchus.

Diagnosis is established by barium-swallow examination. Oesophagoscopy is of doubtful value, owing to the smallness of the mouth of the diverticulum. Complications include perforation into the bronchus or great vessels and malignant degeneration.

Treatment is only necessary if symptoms are present. The authors recommend a right thoracotomy after excision of the 5th rib. Three alternatives are open—"diverticulopexy," invagination, or excision. The last method is preferred by the authors. R. T. Burkitt.


The authors collected reports of 75 acquired non-malignant oesophagotracheobronchial communications from the literature covering the years 1916-45, and add 4 cases of their own. Symptoms, signs, and results of investigations are analysed.

Excluding malignant disease, to which the majority of such cases are due, the causes fall into three main groups: (1) trauma, due to a foreign body in the trachea or oesophagus, to instrumentation, or to wounds; (2) oesophageal diverticulum, possibly resulting from mediastinal infection; (3) infection, both specific and non-specific.

The specific effects of the fistula include respiratory-tract infection, varying in degree, and cough and cyanosis accompanying swallowing. These disturbances may be associated with posture. Nutritional disturbances may result from oesophageal obstruction. For radiography iodized oil rather than barium should be used, in view of the irritative effect of the latter on the lung; bronchoscopy may be aided by injecting dye into the oesophagus; oesophagoscopy is also advisable. Portions of tissue may be removed from either the trachea or oesophagus for microscopical examination.

Of the 75 cases, 53 were not operated upon; in only 26 was the outcome stated, and in 16 of these death resulted. In 6 there was no improvement, and 4 patients were apparently cured. Of the 22 patients treated by operation, 15 were cured and 4 showed some improvement; 3 patients died.

When fistulae are due to specific infection, treatment of the infection is needed first. In surgical treatment difficulties may arise in administration of the anaesthetic in cases of large fistulae. Direct surgical repair is undertaken via a cervical, cervical plus mediastinal, or transpleural approach. The two channels are isolated, and repaired with interrupted fine silk sutures. Swallowing is allowed on the seventh day. In cases in which there is associated bronchiectasis the fistula in the bronchial tree may be removed with the affected lobe.

Details of 4 cases are appended. The first was a traumatic fistula of 5 years' duration in a girl of 18. A successful result followed closure of the fistula. The second, in a 46-year-old male, was also a traumatic fistula with probable cure by operation. The third case, in a 63-year-old white female, probably resulted from tuberculous infection. Excision of the fistula led to a satisfactory result. The fourth case, in a 24-year-old white male, was of 4 years' standing and probably caused by a mediastinal pyogenic abscess. J. E. Richardson.


The authors of this important article emphasize the frequency with which congenital atresia of the oesophagus occurs, and describe many of the salient features of this condition. In a district with a population of about 100,000, in which there are approximately 2,000 births annually, 5 cases have been referred to one of the authors as the consultant paediatrician for the area during
the course of 2 years, giving a minimum incidence of approximately 1 in 800 births. Since a number of cases probably died undiagnosed or, if diagnosed, were not referred for consultation, the true incidence was probably higher. The condition is very readily overlooked unless the possibility of its occurrence is borne in mind, its complications, atelectasis and pulmonary infection, often being regarded as the primary disease. Most cases are covered by the pathological classification of Vogt; other congenital anomalies may be present, but are rarely incompatible with life.

In discussing the clinical manifestations, the authors stress the fact that these infants bring up froth from the time of birth and, unlike normal babies, continue to do so. Any infant still bringing up frothy mucus 24 hours after birth should undergo investigation to exclude the possible diagnosis of oesophageal atresia. Atelectasis also demands similar investigation. A tympanic abdomen may be a suggestive sign, even in the early stages. Attacks of cyanosis and coughing on feeding, which are generally described as the typical feature, are in fact late signs, and since attempts at feeding rapidly lead to inhalation pneumonia they should not be made if atresia is suspected. The diagnosis is easily confirmed by passing a catheter, which meets an obstruction 3 1/2 in. (8.9 cm.) from the gums, 0.5 ml. of iodized oil being then injected through the catheter if radiological confirmation is required.

From the moment that the diagnosis is reached the pharynx must be kept clear by aspiration of mucus (a Dakin syringe attached to a catheter being probably the most convenient apparatus for this purpose) and penicillin treatment and a slow drip blood transfusion started. If the child cannot cough, postural drainage should be instituted. The aim of operation, which should be performed under intratracheal ether anaesthesia given by a skilled anaesthetist, is to repair the fistula via a right 5th intercostal incision and to anastomose the two segments of the oesophagus. Stress is laid on the importance of cutting back the lower segment to a site at which there is an adequate blood supply. An end-to-end anastomosis is performed, with 45-gauge stainless steel wire as the suture material.

The results of treatment in 10 cases are reported. Five of the infants died after operation. Of these, one infant had bilateral bronchopneumonia, another was premature and weighed only 4 lb. (1.8 kg.) at birth, and the remaining 3 all died of infection due to a leak at the anastomosis, which may have been the result of an inadequate blood supply to the lower segment of the oesophagus. The remaining 5 patients are alive, direct suture having been carried out in 4 cases and gastrostomy in the fifth, reconstruction of the oesophagus being deferred.

This is a most important article, bringing once again to the notice of the profession the facts that this is not a rare condition, that diagnosis is extremely easy, and that unless the patient can be brought to operation within the first few hours of birth, there can be no real hope of successful outcome. With early treatment the prospects of good results are high. The abstracter is in entire agreement with the authors’ view of the great importance of the symptom of “excess” mucus in newborn infants.

J. E. Richardson.


Experience gained during the last 10 years in 500 cases in which a caustic had been swallowed led the author to formulate a line of treatment. As a result of this, several lives have been saved, and the period under treatment has been greatly curtailed. In a case of corrosive oesophagitis, early recognition of the nature of the ingested caustic is important, so that it may be neutralized. It is essential to combat shock by the administration of morphine, serum, or plasma; penicillin or sulphonamides should be given. The cough reflex must not be abolished. Tracheostomy may be necessary. Pulmonary complications and sloughing of the oesophagus must be kept in mind. Gastrostomy may be necessary; when it is carried out the pyloric antrum must be explored, because stenoses may be encountered in this region. Where necessary, partial gastrectomy should be undertaken.

In less severe cases when the acute phase has passed, bouginage is started between the sixth and tenth days, according to the method of Salzer. Graduated gum-elastic bougies containing mercury or lead are introduced daily and left in situ for a period of 5 minutes, gradually increasing to 30 minutes. Good results are claimed in 75% of cases thus treated, the patency of the oesophagus being maintained.

Oesophageal stenosis is investigated radiologically and endoscopically. Dilatation is undertaken through an oesophagoscope by means of flexible bougies, or by using oesophagoscopes of different calibres. Where necessary, gastrectomy is performed and retrograde
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dilatation undertaken. The gastrostomy opening is placed near the cardia, and the cutaneous opening preferably to the left of the median plane. Ulceration is treated with a diet rich in vitamins and local application of silver nitrate or argyrol.

The cicatrical atresias are dealt with by a combination of thoracotomy and peroral or retrograde oesophagoscopy after careful radiological study. E. D. Dalziel Dickson.


The treatment of corrosive strictures of the oesophagus permits the use of a wide variety of reconstructive techniques and does not demand resection. Antethoracic procedures require to be carried out in multiple stages and in general the results are uncertain; and massive resections carry a high mortality and are subject to numerous complications from damage to neighbouring structures. On the other hand, carcinoma may develop in the scars of previous corrosive damage, and food may stagnate unless anastomosis is performed immediately above the stricture. Of 58 patients subjected to radical transthoracic resection of the stomach or oesophagus 15 (26%) died; while of 14 treated by palliative oesophagogastrostomy only one died. Such anastomosis presents no difficulty in the case of lesions of the middle and lower thirds, but for lesions of the upper third Sweet has held that anastomosis is not feasible unless preceded by oesophageal transection. The authors, however, find in such cases that if the stomach is passed behind instead of in front of the subclavian and other vessels it can be brought into the neck and sutured to the oesophagus without tension. They describe their technique as follows:

The chest is entered through the bed of the 8th left rib, the diaphragm opened, and mobilization of the stomach and the oesophagus to the aortic arch performed. Guide sutures from the fundus are brought out through the 2nd interspace in the midclavicular line, the stomach anchored posteriorly, and the diaphragm and chest closed. With the patient on his back, an incision is then made down the medial border of sternomastoid, curving out to the guide sutures in the second space. The medial part of the clavicle and upper two ribs are resected, and the cervical oesophagus secured. The neurovascular trunk (the jugular, carotid, and subclavian vessels and their branches, with the thoracic duct) is lifted forward, and a tunnel made with the finger tracking down closely beside the oesophagus until Sibson's fascia and the pleura are met. These are opened, the stomach drawn up the tunnel by its guide sutures, and a side-to-side anastomosis performed just above the stricture.

Reports of 2 successful cases are given, as well as of 2 others demonstrating the use of right-sided oesophagogastrostomy for middle-third stricture. The anatomy is fully discussed. Geoffrey Flavell.

Thoracic Surgery


In this paper the author states the case for early pulmonary resection in preference to drainage and medical treatment for chronic lung abscess, and discusses 55 cases seen in the Rikshospitalet, Oslo, from 1935 to 1948. Most abscesses occurred in patients between 30 and 55 years of age, and the duration varied from 4 months to 13 years, averaging 18 months. In 38 cases the abscesses were on the right side, generally in the apex of the lower lobe or axillary segments of the upper. Of 14 patients treated medically (most of them before penicillin was introduced) 5 were cured, 6 were not, and 3 died. In 21 out of 41 cases operated upon the abscesses were drained by pneumonotomy, and in 5 by pleurotomy. Of the former, 8 were cured, 7 were not, and 6 died; and of the latter, 2 were not cured, and 3 died. Thus one-third of the patients died and only one-third recovered. Pulmonary resection was carried out on 15 patients—lobectomy or segmented resection on 9, all of whom were cured, and pneumonectomy on 6, of whom 4 were cured and 2 died from aspiration at operation. Geoffrey Flavell.


Some years ago the authors advocated strongly the one-stage drainage of putrid lung abscess. They now analyse their results in 165 cases operated upon up to the end of 1944. There were 4 deaths after operation in this series; all except 11 cases were treated before penicillin became available. For purposes o
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The Use of Polythene in Thoracic Surgery.

This is an interesting experimental and clinical study, but poor translation reduces the value of the English transcript of the original in this bilingual international journal. The authors first give a full and able description of the chemistry of polythene, showing the potential variations in chemical and physical properties, which are known and shown to be reflected in the biological behaviour of the plastic in tissue, some polythene producing more tissue reaction than others. The variation in tissue reaction was investigated in experimental animals, using the endothermic fascia, the muscular aponeuroses, and the peritoneum of the rabbit as sites of implantation for histological study. Having found the experimental use of polythene safe, the authors embarked on clinical trials which established the usefulness of the material in certain well-chosen cases, notably in extrapleural pneumothorax, or in reconstruction of pleural defects after pneumonectomy and as a complement to surgical apicotomy. The inconvenience of the exudative reaction set up by the material is, according to the authors, negligible by contrast with the advantages the material offers in producing an immediate and thoroughly hermetic pleural seal and in accelerating the healing of the deeper layers of the "thorax breach." In apicotomy as an adjunct to collapse therapy "bags" or diaphragms made of polythene were filled with "spongostan," an absorbable haemosic made in Denmark. In the first stage of thoracoplasty the authors consider the use of polythene an advance. Finally attention is drawn to a paper by Linden (published after this paper went to press) in which the use of polythene bags previously filled with spongostan, thus simplifying the technique of operation, is described.

The use of polyvinyl-alcohol sponge in thoracic surgery was described by American authors last year.

G. Blaine.


"The most perfect local analgesia can never replace general anaesthesia." Ideal anaesthesia spares the patient both somatic and psychological shock. The method of choice in thoracic surgery is the protracted intravenous injection of "evipan sodium" (10% solution) in fractionated doses. Pulmonary tuberculosis is no

A Third Series of Radical Operations for Bronchietasis.

This third series of cases of operation on the lung includes 19 cases of lobectomy and 17 of pneumonectomy performed for bronchietasis, with only 1 death.

The author attributes the excellence of his results to the experience already gained by him and to improvement in technique. The cases chosen for operation were carefully investigated. Local analgesia with procaine, and alcohol block of the intercostal and vagal nerves by a technique elaborated by the author, were used. The structures of the root of the lung were carefully dissected out. The stump of the bronchus was closed with mattress sutures and covered with pleura. Sulphonamides and penicillin were used routinely. The technique used and the post-operative management of the cases is described in great detail, and illustrative cases are presented.

Z. W. Skomoroch.
contraindication. This gentle form of general anaesthesia diminishes immediate post-operative pain and usually produces retrograde amnesia.

A series of 3,700 chest operations have been performed under evipan sodium anaesthesia. The average dose for a first-stage thoracoplasty, in an average time of 64 minutes, was 1-21 g. The longest operation lasted for 2 hours and needed only 1-5 g. The average dose for a second stage, in an average time of 30 minutes, was 0-87 g. The minimum dose required for this operation was 0-4 g., and the maximum dose 1-8 g. The greatest dose ever employed was 2-8 g.

A sphygmomanometer cuff is kept round the arm on the side opposite to operation. Only if the veins are poor is the needle left in situ between injections, saline being then infused during the interval. After measuring the sleep-producing initial dose, the same amount is slowly injected again. The presence or absence of reaction to the clipping of towels to the skin indicates the depth of anaesthesia. If necessary, a small additional amount is injected before skin and muscles are cut. If the patient becomes tense during rib resection, a small amount (up to 1 ml.) is injected. Every subsequent dose depends on the combined observation of the surgeon and the anaesthetist. Respiration, pulse rate, and blood pressure are carefully watched. Depression of the respiratory centre must be avoided by using the minimal effective dose. In case of respiratory or circulatory trouble, analeptics (except nikethamide) are given, together with CO₂ and oxygen inhalation.

On the eve of operation a barbiturate is given, 1 hour before operation 2 tablets of evipan, and ½ hour before operation one ampoule of “scopolamine-eukodalephotonin forte” intramuscularly. The post-narcotic phase of excitement is prevented by intravenous injection of “pervitin.” Neither nausea nor post-operative respiratory complications have been noted. After this anaesthesia patients are quite willing to undergo a second operation with the same technique.

E. G. W. Hoffstaedt.


Surgical treatment in 30 cases of pulmonary coccidioidomycosis is reviewed. The condition may be complicated by (1) fibrosis, (2) formation of a localized coccidioidal granuloma (“coccidioma”), (3) dissemination, (4) pleural effusion, (5) bronchiectasis, (6) formation of a cavity (which may be acute or chronic and may rupture, develop a tension element, become secondarily infected, or cause severe haemoptysis). Diagnosis is made by complement-fixation test, culture, guinea-pig inoculation, the discovery of spherules in the sputum, or by examination of the lung tissue itself.

Five pneumonectomies, 11 lobectomies, 8 segmental resections, 5 wedge resections with decortication, and 1 decortication with thoracoplasty were performed, 27 patients undergoing operation for cavitation, 6 for empyema (in 5 of whom cavity resection was performed) and 3 to exclude carcinoma. One patient had an associated carcinoma, and 4 tuberculosis. In one case rapid parenchymal destruction made operation an emergency, and in another the blood complement-fixation titre was at dissemination level, but both did well. Only 1 death occurred, due to coronary occlusion post-operatively.

Surgery is indicated in the presence of any of the complications of cavity formation, non-expansile lung, or coccidioma, or on the failure of medical treatment (collapse therapy). It results in rapid rehabilitation and should not be withheld for fear of dissemination or because of associated tuberculosis. Geoffrey Flavell.
Abstracts

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