but it is not absolutely pathognomonic of chronic appendicitis, as it may occur in other inflammatory conditions of the colon.

7. In every case in which direct signs were present the appendix was found at operation to be diseased.

8. Non-visualization of the appendix during the radiological examination was invariably found at operation to be associated with obliteration of its lumen by recent or old inflammation.

9. Unhealed dysenteric lesions caused a high incidence of indirect signs.

10. In the eight Type C cases radiological evidence of an abnormal appendix was found in every instance and confirmed at operation.

REFERENCES

- ¹ MacLean, A. Bruce: *British Medical Journal*, 1932, ii, 1055.
² Wood, Franklin G.: *Ibid.*, 1935, i, 640.

BENIGN NEOPLASMS OF THE BRONCHUS WITH RECORDS OF NINE CASES

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In 1929 Myerson¹ wrote:

"Within the past few years the number of neoplasms that have been observed and completely removed by means of the bronchoscope has appreciably increased; with the more general recourse to bronchoscopy in obscure conditions of the chest this is to be expected. Benign neoplasms are benign only in the histological sense. As they grow they cause obstruction of the air passages and interfere with the pulmonary function and the vital capacity of the patient, so that the recognition and removal of one of these neoplasms constitutes a life-saving measure."

In 1933 Wessler and Rabin² reported seventeen cases, and noted that not more than thirty reports of such cases had appeared in the literature. In this article we record nine cases which we have observed bronchoscopically and treated in our clinic.

Compared with the malignant new growth the benign one is uncommon, nevertheless not so rare as the literature would lead one to believe. In the past four years and a half we have bronchoscoped 150 cases of new growth, and of these nine have been benign or supposedly benign. This gives a figure of 6 per cent. As Myerson rightly points out, these benign tumours are benign in their histology only; in their mechanical effect on the lung they are a very grave menace to the patient, and if left to follow their course and grow they will cause permanent damage to the bronchi and lungs, and give rise to complications which will endanger and often terminate the life of the patient. The sooner they are recognized and removed the smaller will be the amount of permanent damage done to the lung. To be prepared to recognize these growths in their early stage careful consideration must be given to the symptoms and signs which they may produce.

Symptomatology

In most series of cases reported in the literature, as in our own series, the incidence in the two sexes is more or less equal. In malignant cases the incidence markedly predominates in the male. In our first series of fifty cases recorded in the *Journal* two years ago³ only 8 per

cent. were in women, and of these one was benign. It is therefore obvious that although the incidence of benign growth is somewhat the same for both sexes, a growth found in a woman has a greater probability of being a benign one than in a male. Most of the cases present symptoms before the end of the third decade, although they may not be recognized until the fourth or fifth decade.

At first, when the growth is very small, it produces no symptoms at all, except perhaps a cough which has no particular characteristic to associate with the lesion; occasionally at this stage an asthmatic wheeze may be present which, if the chest generally is clear of added sounds on auscultation, should suggest the possible presence of an intrabronchial foreign body. Paul⁴ reports such a case in which "asthma" was the prominent symptom for a long period.

Whilst the tumour remains small and causes no obstruction no symptoms will occur unless the tumour bleeds, and this is a very frequent occurrence, and often the first symptom for which the patient consults his doctor. The haemoptysis is often repeated. It occurred in six of our nine cases, and in twelve out of seventeen in Wessler and Rabin's series. The latter authors consider that the haemoptysis in these cases is of a characteristic type, and describe it as of sudden onset, without any warning, and unassociated with other symptoms of pulmonary or bronchial disease, with a strikingly abrupt cessation without any subsequent period of streaking or staining of the sputum, as is commonly the case when blood is derived from actual disease of the lungs. They offer the following explanation for this type of bleeding. Haemorrhage from a benign tumour occurs in a main bronchus and the blood exudes from very small submucous vascular spaces. It is possible that bleeding of this character is slow, and that the blood is expectorated before it can pass down into the smaller bronchi; this is also prevented by the presence of the occluding tumour below the point of bleeding. All the blood is promptly expectorated, and little or none is aspirated into the smaller tubes. With a more brisk haemorrhage, especially when there is not complete bronchial occlusion, it is possible for the blood to be aspirated and to undergo changes resulting in the expectoration of dark blood for some days.

If the tumour does not grow haemoptysis may remain the only symptom for many years; in one of our cases it had remained the sole symptom for more than twenty years. The haemoptysis may be quite slight or so severe and frequent as to exsanguinate the patient. As the tumour grows the danger to the patient increases, for when it reaches a size big enough to occlude the bronchus complications of bronchial obstruction will arise. The first may be a simple atelectasis of the lobe or of the whole lung distal to the occlusion. The atelectasis is often of sudden onset, accompanied by pain, cough, and dyspnoea, and with physical signs in chest which are frequently mistaken for those of consolidation. Wessler and Rabin report five cases in which the first symptom was a pneumonia, and suggest that this was in fact the onset of atelectasis. It must be remembered that this type of onset is also not uncommon in malignant tumours, being purely a mechanical happening.

Burrell and Trail⁵ report a case of benign new growth causing an atelectasis of the left lung. Ashbury⁶ reports a case in which a patient on three occasions had a massive collapse of the lung due to a benign growth. This onset was present in two or possibly three of our cases, the atelectasis being of the right upper lobe in Case 8, whilst in Case 3 there is little doubt that the preliminary pneumonia was in fact a collapse. Usually the onset of obstruction is slow and gradual, with the

result that the inevitable and dangerous complication of obstruction—namely, pulmonary suppuration—appears insidiously. When this has occurred the patient presents the signs and symptoms of bronchial dilatation, constant cough, profuse purulent sputum (often blood-stained), clubbed fingers, and all the associated physical signs.

The suppuration may spread from lung to pleura and give rise to an empyema, as reported by Lloyd⁷ and Paul.⁴ As these suppurative complications are the late- and end-results of the disease it is not surprising that in most of the old reports from the literature on this subject bronchiectasis was present in a high proportion of the cases—in Geipel's⁸ series, for instance, all eight cases had bronchiectasis. At the present time, when all cases of haemoptysis of doubtful origin and obscure pulmonary disease are, or should be, investigated by bronchoscopic examination, these tumours are recognized at an earlier stage, before they have given rise to such marked changes; thus, in our cases, only three presented signs of pulmonary suppuration.

Histology

Perhaps the most difficult point about these cases is the exact determination of the histology of the growth. We have found, as has also been found by Wessler and Rabin,⁹ Jackson,¹⁰ and Peroni,¹¹ that different pathologists presented with the same section from a case will give entirely different reports. Case 1 (see below) was reported from the first section as suspicious of carcinoma and later thought to be possibly a haemangio-endothelioma. Cases 4 and 5 were both regarded as suspicious of malignancy.

Nevertheless, one must acknowledge that in all these cases, clinically simple, a dogmatic report of malignancy was not given, whereas in all those cases reported as definitely malignant the diagnosis was proved at necropsy. It is quite obvious that when considering the reports of such sections one must be very critical, and must take into account the length of history, the age, and the subsequent progress of the patient. Dependent as one is in diagnosis on the clinical and bronchoscopic appearances, histology, and length of history, one would not be prepared to dogmatize on the non-malignancy in the space of time covered by this series, for it is not unknown that in instances recorded as simple the patients have later died of malignant disease. The subject is rendered even more difficult by the reports of Kramer,¹² who suggests that these benign growths may become malignant, and also by the fact that we have no data for determining the length of history of a malignant growth before it comes under observation. From the literature adenoma would seem to be the commonest growth, followed closely by fibroma, and then by inflammatory polyps.

It has been suggested that the inflammatory polyps are secondary to suppuration, but against this is the fact that in bronchiectasis and abscess it is very rare to find any polyps. (In 300 cases of pulmonary suppuration—abscess and bronchiectasis—examined bronchoscopically we have but once seen a polyp associated, whilst the granulations met with in foreign body rapidly clear after removal of the cause.)

As we have stated above, the diagnosis must be made on an assessment of all the points available, the most important being a bronchoscopic examination. It is true that in many cases a lipiodol examination will show a block in malignant or simple growth of the bronchus; but as a negative picture is unsafe to rely upon, and if a block is shown bronchoscopy will be recommended, it seems wiser that a bronchoscopy rather than a bronchogram should be the primary examination in any suspected case. The bronchoscopic appearance is such that one is able in many cases to surmise from the aspect of the

growth whether it be simple or malignant—certainly in the case of adenoma and haemangioma—but the point of most value is the tendency to alarming haemorrhage on instrumentation, and this occurred in four of our cases. We have not known it in a malignant case.

Treatment

In this respect two features must be remembered: in the first place, the sooner the tumours are removed the greater the chance of complete recovery (that is, before permanent changes have taken place in the lungs); and, secondly, if left they may become malignant and will almost certainly lead sooner or later to pathological changes in the lung. From the literature it would seem that the fibromata lend themselves to piecemeal removal via the bronchoscope. Jackson,¹³ Wessler and Jacher,¹⁴ Orton,¹⁵ Jesberg,¹⁶ Zinn,¹⁷ and Negus¹⁸ report such cases. The inflammatory polyps may be removed and cauterized with silver nitrate. The adenomata and haemangio-endotheliomata in our experience are not to be removed in this manner because of the very severe bleeding which takes place when they are cut. We have dealt with them successfully by diathermy and the insertion of radon.

Case Records

Below is given a brief review of the nine instances of benign neoplasm of the bronchus with which we have come into contact during the last four and a half years.

1. *Male, aged 58; Shipwright.*—Recurrent haemoptysis for twenty-one years, varying in amount from 5 to 30 ounces. Chronic cough with some expectoration for same period. April 7th, 1932: *Bronchoscopy.* A pedunculated tumour is present in the right main bronchus at level of middle lobe. *Section.* Numerous small areas of cells suggestive of polygonal-cell carcinoma. Very severe haemorrhage followed removal of piece for section. This was at first thought to be malignant, but on further consideration in view of history it was considered as possibly a haemangio-endothelioma. July 1st, 1932: Severe haemorrhage followed diathermy, and complete removal was impossible. Patient was upset by the haemorrhages and refused further treatment. He is living, and still has occasional haemorrhages. (Twenty-four years.)

2. *Male, aged 58; Boot-repairer.*—Admitted March, 1932, with an abscess of left upper lobe. Cough for twenty years. Recurrent haemoptysis two years (1/2 pint to 2 pints). Between March and December he had eighteen treatments, and the abscess healed. December 31st, 1932: A tumour was seen well up the upper lobe bronchus. *Section.* Reported as non-malignant—inflammatory. Since that time he has had several applications of radon. A small polyp is still present. The man is well and working. (Five years.)

3. *Female, aged 22; Waitress.*—Admitted to a general hospital, March, 1931, with lobar pneumonia right base, with a small pleural effusion, which cleared, and patient discharged fit. Readmitted a few months later with intercostal neuralgia. In 1932 admitted again with swinging temperature and signs of effusion or collapse at right base. Lipiodol showed blocked bronchus. In autumn of 1932 readmitted again with high temperature. Bronchoscopy was followed by very severe haemorrhage. Admitted to Victoria Park Hospital February 9th, 1933. General condition fair; early clubbing of fingers. Heart enlarged to right. *Bronchoscopy.* This showed a large polyp completely occluding right bronchus at level of middle lobe bronchus. Alarming haemorrhage followed taking a piece for section. *Section.* Reported as haemangio-endothelioma. Treated with radon and diathermy. By October, 1933, growth had nearly gone. March, 1934; October, 1934; March, 1935: bronchus clear on all occasions. Patient well and working. (Four and a quarter years.)

4. *Female, aged 53; Housewife.*—Admitted Victoria Park Hospital September 11th, 1933. Cough and expectoration since June, 1932; haemorrhage August, 1933. Lipiodol had shown a partial obstruction and bronchiectasis right lower lobe. *Bronchoscopy.* A tumour blocking the right lower lobe bronchus at level of middle lobe bronchus. *Section.* Reported as doubtfully oat-celled carcinoma. Between October, 1933,

and March, 1935, treatment with radon and diathermy. There is now no growth visible; patient is well and without sputum. (Three years.)

5. *Female, aged 30.*—Admitted Victoria Park Hospital, November 16th, 1933. Since pleurisy in 1930 has had morning cough with slight expectoration, occasionally blood-stained. No loss of weight. Rather severe haemoptysis for some weeks before admission. On admission there was obstruction to, and pneumonitis of, left lower lobe. *Bronchoscopy.* A tumour obstructing left lower lobe bronchus. Alarming haemorrhage followed instrumentation. *Section.* "This appears to be a carcinoma of bronchus, but is not typical. There is a greater tendency than usual to an acinous formation of the cells, which are mainly columnar in shape." Treated with diathermy and radon. This patient is well, leading a normal life, without sputum, but there is still a tumour present, though it is reduced in size. (Five years.)

6. *Male, aged 45; Fruiterer.*—Influenza in January, 1933, cough and occasional expectoration since that date. Repeated haemoptysis since May, 1933, with pain in chest. Admitted Victoria Park Hospital September 29th, 1933. *Bronchoscopy.* A polypoid tumour in two parts at level of middle lobe bronchus. *Section.* Squamous-celled carcinoma. Treated with radon. In four months gained a stone and a half in weight. Is now fit and working, and no tumour is seen. (Two and a half years.)

7. *Male, aged 45; Manager of Bootshop.*—Transferred to Victoria Park Hospital from a country hospital February 9th, 1933. He had pneumonia three years ago. Cough has continued. In June, 1932, it became much worse; and at the end of the month he coughed dark blood for first time, and was admitted to Watford Hospital in November. On admission to Victoria Park Hospital: Temperature 100°. Clubbing of fingers. Left lung dull all over. Heart enlarged to the left. *Bronchoscopy.* A hard, pedunculated polyp obstructs the left lower lobe bronchus, from behind which pus exudes freely. *Section.* Tissue covered with stratified squamous epithelium, from which processes pass deeply into the fibro-cellular tissue beneath. In parts of section numerous leucocytes are seen, suggesting inflammation: thought to be a papilloma. At the second bronchoscopy the polyp was removed. This was followed by the expectoration of quantities of thin pus containing masses of yellowish granules, which were composed of clumps of acid-fast organisms (not *B. tuberculosis*). The man died shortly afterwards, and the condition was found to be due to a dermoid in which a process had grown into a bronchus, become segregated, and caused obstruction and pulmonary suppuration, from which the patient died.

8. *Female, aged 21; Domestic.*—Admitted to Victoria Park Hospital July, 1934, with a collapsed upper right lobe: thought to be due to a tuberculous gland. History of six months' morning cough, no expectoration, some loss of weight, night sweats, fainting, and vomiting, and a sharp stabbing pain in right chest. *Bronchoscopy.* Showed a mass blocking upper lobe bronchus—? gland, ? neoplasm. *Section.* Disintegrated portions of bronchial epithelium, connective tissue, and cartilage; no evidence of malignancy. A second section was returned definitely as haemangio-endothelioma. Treatment: diathermy and radon. Satisfactory progress. (One and a half years.)

9. *Female, aged 41.*—Had ? influenza fourteen years ago with ? pleural effusion, which was not tapped. After this illness she had recurrent attacks of pleurisy, always on the right, with occasional haemoptysis. The sputum gradually became offensive, and there were periodical febrile attacks, with tightness and wheeziness of chest. Two years ago was supposed to have had pneumonia on the right side, and later was admitted to Black Notley Sanatorium for investigation. Admitted to Victoria Park Hospital on June 7th, 1935. *Bronchoscopy.* A large polyp is seen blocking the right lower lobe bronchus below the middle lobe. Aspiration produced about 5 ounces of thick, offensive pus. *Section.* Reported as granuloma. Lipiodol shows most of lower lobe converted into a bronchiectatic abscess.

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REFERENCES

- ¹ Myerson, M. C.: *Arch. Otolaryng.*, 1929, ix, 376.
- ² Wessler, H., and Rabin, C. B.: *Amer. Journ. Med. Sci.*, 1932, clxxxiii, 164.
- ³ Morlock, H. V., and Pinchin, A. J. S.: *British Medical Journal*, 1933, i, 911.
- ⁴ Paul, F.: *Monats. f. Ohren.*, 1930, lxiv, 669.
- ⁵ Burrell, L. S. T., and Trail, R. R.: *Lancet*, 1927, ii, 1180.
- ⁶ Ashbury, H. E.: *Amer. Journ. Roentgenol.*, 1929, xxi, 452.
- ⁷ Lloyd, M. S.: *New York State Journ. Med.*, 1931, xxxi, 471.
- ⁸ Geipel, P. Frankfurt: *Zeit. f. Path.*, 1931, xlii, 516.
- ⁹ Wessler and Rabin: *Loc. cit.*
- ¹⁰ Jackson, C., and Jackson, C. L.: *Journ. Amer. Med. Assoc.*, 1932, xcix, 1747.
- ¹¹ Peroni, A.: *Arch. Otolaryng.*, 1934, xix, 1.
- ¹² Kramer, R.: *Ann. Otol., Rhinol., and Laryngol.*, 1930, xxxix, 689.
- ¹³ Jackson, Chevalier: *Peroral Endoscopy and Laryng. Surgery*, 1915, p. 432.
- ¹⁴ Wessler, H., and Jacher, L.: *Clinical Roentgenology*, 1923, p. 151.
- ¹⁵ Orton, H. B.: *Laryngoscope*, 1924, xxxiv, 97.
- ¹⁶ Jesberg, S.: *Ann. Otol., Rhinol., and Laryngol.*, 1926, xxxv, 905.
- ¹⁷ Zinn, W. P.: *Ibid.*, 1927, xxxvi, 278.
- ¹⁸ Negus, V. E.: *Lancet*, 1927, ii, 1180.

SOME POINTS IN CONNEXION WITH SCLEROCORNEAL TREPHINING

BY

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My first sclerocorneal trephining for glaucoma were performed in August, 1909, and even now I get inquiries from different parts of the world as to details of the procedure. I have from the first employed a 2 mm. trephine and still do so, as it gives room enough to deal with uveal tissue if necessary. I cannot, however, emphasize too strongly that to drag uveal tissue into the trephine hole is to ask for trouble. If the trephine disk is seized with the same grip as the bulging iris and the two are cut with one snip of the scissors, uveal impaction will rarely, if ever, take place. This is cardinal.

Friends continue to send me mechanical trephines. Much as I appreciate their doing so, I am bound to state my strong preference for the hand-controlled instrument. I maintain that in skilful hands it is easy to use and much safer than the machine-driven apparatus. It also renders it easy to ensure that the trephine blade makes its first entry on the corneal side of the wound, a very important detail. Some surgeons advocate and practise making a very tiny conjunctival incision, pulling the flap down with a special instrument, and working at the bottom of the hole thus made. I still prefer the method I originally described of making a long concentric incision, and of dissecting down to the sclera and taking up as thick a pad as possible, while clearly exposing the limbus area. I do not believe that the other method presents any practical advantages, while it certainly involves working under great difficulties, especially when splitting the cornea. No part of the operation is more important than this latter procedure, for the further forward we can get the more sure we are of entering the anterior chamber and so of establishing reliable filtration.

I still advocate a small peripheral iridectomy, as the opening provided furnishes a sluice through which the aqueous can escape without carrying uveal tissue in front of it and so favouring impaction. I have for years adopted Foster Moore's suggestion of a continuous suture, carefully iodining the thread before and after each penetration of the conjunctival edges.

Impaction of Uveal Tissue

One question that most frequently reaches me is: "What can be done in those cases in which, after an apparently successful trephining, uveal tissue becomes