Bronchial polyps

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Carcinoma of the bronchus is by far the most common intrabronchial lesion causing obstruction of the respiratory passages. Benign tumours and malignant neoplasms originating in connective tissue are much less frequently seen and, when they occur, present difficult problems of diagnosis and of management often solved only at thoracotomy. The patients reported here presented with symptoms due to bronchial obstruction caused by intrabronchial polyps which were not neoplastic. The symptoms were treated by endoscopic removal of the lesions without thoracic exploration.

CASE REPORTS

CASE 1 A labourer, aged 62 years, attended the chest clinic complaining of dyspnoea on effort, which had been present for one month. He had had a minor degree of cough without sputum for some years, but in the three weeks preceding admission he expectorated a good deal of yellow-green sputum. During this period he had also had pain in the right side of the chest and had occasionally felt cold and shivery. He gave no relevant history of previous illnesses either in himself or his family. He smoked a pipe and had never worked underground in the coal-mines. His general condition was good, although he had lost some weight; there was no clubbing of the fingers. The trachea was deviated to the left and there was complete dullness to percussion at the right lung base. A radiograph of the chest showed dense uniform shadowing of the lower part of the right lung. A small amount of amber fluid was removed from the right pleural cavity by paracentesis. Malignant cells were not identified in this material.

Bronchoscopy was carried out (E. A. D.) two weeks after this initial attendance at the clinic. The presumptive diagnosis was carcinoma of the bronchus. There was a foetor in the bronchial tree and a large amount of pus was seen coming from the right main bronchus. This was sucked out and the mucosa of the right middle and lower bronchi was seen to be intensely congested. A granulomatous mass, 2 cm. in length, was seen protruding from the lower lobe bronchus which it was obstructing in a ball-valve manner. This lesion was removed and more pus was seen in the lower lobe bronchus.

Histology Section of this lesion showed it to be a polyp of the bronchial tree. The core consisted of

vascular oedematous fibrous tissue in which were a few foci of acute and chronic inflammatory infiltration. The whole of the polyp was clothed by columnar ciliated epithelium of respiratory type which descended into clefts on the surface of the mass (Figs. 1 and 2). No epithelial atypia was seen and there was no squamous metaplasia. There was no evidence of malignancy in the connective tissue core of the polyp.

A large amount of purulent sputum was drained from the chest in the week after the bronchoscopy, and clearing of the radiological lesions was seen to begin on the day after operation. Three weeks later the patient felt very well and was producing very little sputum, although on examination there were still diminished resonance and breath sounds at the base of the right lung. A second bronchoscopy (E. A. D.) was carried out three weeks after the first. There was no odour in the bronchial tree and no pus was seen. The mucosa of the right lower lobe bronchus was still thickened and the interbronchial septa were wide and fleshy. A radiograph taken at this time showed almost complete clearing of the basal shadow.

The patient was discharged from hospital 34 days after admission. Eighteen months after discharge he was still well and free of respiratory symptoms.

CASE 2 A woman of 34 was admitted to hospital complaining of tiredness and the loss of 40 lb. (18 kg.) in weight over the preceding seven months. She was dyspnoeic on effort. She gave a history of having had a chronic cough with sputum since childhood. There was a family history of tuberculosis but tubercle bacilli had never been detected in her sputum and there was no radiological evidence of tuberculosis. A radiograph of the chest showed streaking in the left lower lobe. There was no improvement in her condition after a course of chloramphenicol and no change in the radiological appearances. A radiograph taken two weeks later showed a diffuse opacity at the base of the left lung, and a bronchogram showed obstruction to the left lower lobe bronchus.

Bronchoscopy was carried out (E. A. D.) and the floor of the left lower lobe bronchus was seen to be heaped up and granular and the bronchial lumen was obstructed. The mucosa was removed piecemeal.

Histology The mucosa was of polypoid type. There was a core of vascular oedematous connective tissue heavily infiltrated by lymphocytes and plasma

FIG. 1. Case 1. The edge of the polyp with deep infolding of the mucosa but little inflammatory reaction. Haematoxylin and eosin, $\times 70$.

FIG. 2. Case 1. Detail of the ciliated respiratory epithelium clothing the polyp. Haematoxylin and eosin, $\times 720$.

FIG. 3. Case 2. Section showing the polypoid nature of the lesion with intense chronic inflammatory infiltration. Haematoxylin and eosin, $\times 70$.

cells and clothed by a layer of pseudostratified ciliated columnar epithelium (Fig. 3). On the surface of the epithelium was a layer of mucus in which were embedded many polymorphonuclear leucocytes.

There was considerable improvement in her clinical condition, but when bronchoscopy (E. A. D.) was repeated two weeks later there was still some obstruction in the middle and posterior basal bronchi of the left lung, and further fragments of mucosa, showing a similar histological appearance, were removed. Four days later the radiological appearance of the chest was almost clear, although a bronchogram after a further week showed crowding, irregularity, and dilatation of the left lower lobe bronchi; however, there were no blockages in the lumina. The patient was discharged from hospital clinically much improved, and on radiological examination five weeks later there was only a faint posterior opacity seen in the left lower lobe.

When seen at the follow-up clinic 14 months after discharge from hospital, she still complained of cough and a little sputum but was better in health than at the time of admission. A film of the chest still showed faint opacities in the left lower lobe, and these were regarded as indicative of the bronchiectasis noted before she left hospital.

DISCUSSION

Both of these patients presented with respiratory symptoms attributable to blockage of a bronchus, and each was relieved by the bronchoscopic removal of polypoid material from a lower lobe bronchus. These lesions are extremely rare, and none of us could remember having seen one at any time previously. Fried (1959), in his monograph on intrathoracic neoplasms, made no mention of polyps, and Holinger (1960), in a similar monograph, described them as uncommon lesions, frequently associated with suppuration, and analogous to nasal polyps, a view shared by Šálek, Pazderka, and Žák (1958), who described two cases seen in 10 years' experience at the surgical clinic of Charles University in Prague.

Our two patients presented different clinical pictures, which could be correlated with the different types of polypoid hyperplasia of the bronchial mucosa seen on histological examination. In the first patient there had been no symptoms referable to the respiratory tract until the episode that led to his admission, and a presumptive clinical and radiological diagnosis of bronchial carcinoma was made. The polyp was apparently solitary and was attached to the wall of the bronchus only by a thin peduncle at one end. It was easily removed *in toto* at a single operation which was followed by a clinical and radiological improvement. In the second patient there was a long history of bronchial infection extending back to childhood, and the polypoid tissue causing bronchial obstruction was more clearly related to a persistent inflammatory state in the bronchial wall. She showed considerable relief of her acute symptoms but it is unlikely that more permanent relief will be experienced. These two lesions, the solitary bronchial polyp seen in case 1 and the polypoid chronic bronchitis of case 2, are to some extent separable.

Pollak, Cohen, and Gnassi (1938) described a man of 55, who complained of cough and was found radiologically to have an opacity in the right upper lobe. An irregular mass of tissue was seen at bronchoscopy in the right upper lobe bronchus, but he died of respiratory infection before any attempt at surgical treatment could be made. At necropsy a pedunculated growth arising from and obstructing the right upper lobe bronchus was found. On section this proved to comprise fibrous tissue with inflammatory infiltration and oedema. It was covered by a transitional type of epithelium such as is often seen in the infected bronchial tree. Björk (1952) described a patient whose history, course, and anatomical features were very similar

to those in our case 1. A man of 50 had complained of cough for several months. Three weeks before admission he had had fever and an intense exacerbation of his cough, both of which had subsided on treatment with sulphonamides. He was free from dyspnoea and had a good appetite. Radiological examination of the chest showed atelectasis of the left upper lobe, and at bronchoscopy a polyp, $2.5 \times 1.5 \times 1$ cm., was found attached by a narrow stalk to the wall of the bronchus. On section this lesion was shown to be covered by respiratory epithelium which dipped deeply into many clefts and ducts in the oedematous fibrous core. There was moderate subepithelial inflammatory infiltration. Radiographs of the chest six days after operation showed the affected area to be clearing; three months later clearing was complete. Three years afterwards he was very well and a further bronchoscopy showed the anatomy of the bronchial tree to be normal. The two Czechoslovakian patients (Šálek *et al.*, 1958) were also men, and in each the lesion was removed at thoracotomy. The first was a man aged 61 who had had a cough for 10 years. Radiographs of the chest showed collapse of the middle and upper lobes of the right lung, and at bronchoscopy a mobile tumour the size of a cherry was seen in the main bronchus. Thoracotomy was performed and the two affected lobes were removed. Section of the polyp showed a vascular fibrous core with a few fat cells and a little chronic inflammatory infiltration; the polyp was covered by ciliated columnar epithelium which dipped into the clefts in the core. Four years afterwards he was alive and free from symptoms. The second patient was a man aged 36 who had complained of cough for five years. A polyp, $4 \times 1.1 \times 1.2$ cm., was removed from the left main bronchus at bronchotomy. Section of this lesion showed it to have a sparse fibrous stroma covered partly by ciliated columnar epithelium and partly by squamous epithelium. Cords of squamous cells and 'cysto-papillary' formations extended into the stroma.

These four patients and our own patient form a group in which the principal cause of the respiratory disease was a solitary polypoid lesion causing bronchial obstruction not associated with evidence of extensive chronic bronchial inflammation. The nature of these lesions is uncertain. Histologically they do not appear to be neoplastic and are distinguishable from benign tumours of the bronchus, adenoma and fibroma, that may present in a similar manner (Powers, Godwin, and Langston, 1956). It is unlikely that they are of inflammatory origin although apparently solitary

polypoid lesions of the bronchial mucosa may occur in chronically inflamed bronchi (Citroni and di Guglielmo, 1955) and may be recurrent (Peroni, 1934). It is more probable that an analogy may be drawn with the polypoid lesions of the skin and mucous membranes, of unknown aetiology, which consist of a fibrous core surrounded by a thin layer of stratified squamous epithelium, or with the very common polyps of the cervix and corpus uteri, and that a localized overgrowth of the epithelium is perpetuated by being drawn away from its base so that a core of oedematous connective tissue can form. Clinically, the importance of these lesions is that they mimic carcinoma of the bronchus. It is difficult to suggest any clinical diagnostic criterion that may be used except that they are benign in character and can be removed, with clinical cure, by endoscopic means. This is an indication for bronchoscopy in the routine investigation of patients clinically thought to be examples of carcinoma of the bronchus; some may be benign lesions which, because of their mechanical effects, are capable of causing death if untreated (Pollak *et al.*, 1938).

Our second case is an example of a more common lesion that we would like to term polypoid chronic bronchitis. In these patients there is a long-standing history of chronic respiratory infection (Jackson and Jackson, 1932; Citroni and di Guglielmo, 1955), and the polypoid mucosa, although it may reach major dimensions and, if in a suitable situation, cause bronchial obstruction, is heavily infiltrated with chronic inflammatory cells. Peroni (1934) distinguished two types of chronic inflammatory reaction in the bronchial tree, one more superficial and the other involving the connective tissues deep to the mucous membrane. It is this second type of deep inflammation that is likely to cause elevation of the bronchial epithelium and the formation of multiple polyps. Alteration of the chronically inflamed bronchial epithelium in such a manner is not uncommon although, as we have pointed out, it rarely reaches such proportions as to cause mechanical obstruction of the bronchial lumen. We made a survey of 275 bronchial biopsies, mostly taken in the investigation of suspected carcinoma of the lung, which were seen in the laboratory of this hospital between 1956 and 1961. In 172 of these cases a diagnosis of carcinoma of the bronchus was confirmed histologically. In nine cases, six of carcinoma of the lung, two subsequently shown to be simple chronic inflammatory lesions, and one of chronic pulmonary tuberculosis, the bronchial epithelium showed the beginnings of polypoid change. The alterations in the micro-

FIG. 4. A polypoid excrescence in the mucosa adjacent to a squamous carcinoma of the bronchus. Squamous metaplasia may be seen on the surface of the lesion. Haematoxylin and eosin, $\times 70$.

scopic anatomy of the epithelium ranged from the development of a wavy outline to the mucosa with minimal rounded elevation of the epithelium filled by oedematous submucosal connective tissue, through larger rounded elevations (Fig. 4) usually multiple but sometimes single, to the polypoid appearance seen in our case 2. This type of mucosal response to inflammation, while not generally recognized in the respiratory tract, is a not uncommon feature in the urinary tract where it is styled ureteritis or urethritis cystica.

Therapy in these patients is, of course, difficult. No 'cure' for chronic bronchitis is yet known, and the place of surgery is only in the relief of obstruction to the bronchial tree where, as in our second case, this is sufficiently severe to cause clinical manifestations.

SUMMARY

Two patients are presented in whom acute respiratory illness was due to obstruction of a lower lobe bronchus by a polyp. Both tumours were removed at bronchoscopy with good clinical results. In one patient the polyp was regarded as a solitary

phenomenon of unknown aetiology and the prognosis was assessed as good. In the other, the lesion was regarded as an unusual manifestation of chronic inflammatory disease of the bronchial tree and, while there was marked improvement in the acute condition, no hope of relief of the underlying chronic bronchitis could be held out.

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