Middle Lobe Disease*

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This paper is based on 19 patients who had right middle lobectomy for disease limited to the middle lobe, 16 of whom were treated in the past year. The apparent increase in frequency of recognition of disease limited to the middle lobe prompted this review which has brought to light several interesting findings. Ten of the patients had bronchectasis limited to the middle lobe, six had lung abscess, and three had tuberculosis. Their ages ranged from five to 68 years with a medium of 38 years.

Etiology

As has been pointed out by Graham and others, the reason inflammatory pulmonary disease limits itself to the right middle lobe is an anatomic one. The lymph nodes are so arranged about the middle lobe bronchus near its origin that only moderate enlargement of them will cause complete bronchial occlusion. Such an arrangement is not present in any other portion of the lung.

When an inflammatory process involves the right middle lobe, complete bronchial occlusion often follows by enlargement of peribronchial lymph nodes, preventing bronchial drainage. The immediate result is a swollen, dense middle lobe, often with early abscess formation. If the acute process subsides and the bronchus reopens, bronchectasis may be present. Fourteen of our 19 patients gave a history of acute onset of their disease. All 10 patients with bronchectasis had chronic cough productive of purulent sputum. Three of the 10 had had hemoptysis. The illness of all six patients with lung abscess began as an acute pneumonic process characterized by chest pain, productive cough and fever. Two had hemoptysis.

The three patients with tuberculosis of the right middle lobe had acute onset but the acute episodes had subsided when we saw them. The sputa of the two adult patients were negative for tubercle bacilli while that of the third patient, a five year old boy, was not examined.

One of the most striking findings in the review of this small series of cases was the relatively normal appearance of regular frontal x-ray films of the chest in patients with bronchectasis

limited to the middle lobe. The usual x-ray report was increased bronchovesicular markings on the right side. Adequate bronchograms with five lobe filling, of course, establishes the diagnosis.

Of the six patients with abscess, the x-ray interpretation of three was consolidation of right middle lobe; of two, consolidation with abscess formation; of one, atelectasis with abscess formation. The usual bronchoscopic findings in these patients were constriction of the right middle lobe orifice and pus coming from that orifice.

Therapy Without Surgery

No attempt was made to treat the patients with bronchiectasis by medical therapy. The six with abscess of the right middle lobe were all given blood transfusions in sufficient amount to raise the hematocrit to 50 per cent. Crystalline penicillin in dosage of 100,000 units every three hours was given. Five of the patients had symptomatic improvement on this regimen, but none showed signs of clearing of the diseased right middle lobe. The sixth patient spiked a fever to 104 degrees F. daily and went progressively downhill in spite of therapy until his diseased middle lobe was removed.

The diagnosis of tuberculosis was not made in any of the three patients with tuberculosis of the right middle lobe, although repeated sputum examinations for tuberculosis were made in two of them. Penicillin had no effect on these patients.

Operative Technique

The operative technique for right middle lobectomy is essentially the same as for the removal of other lobes. However, because of the arrangement and intimacy of the lymph nodes about the middle lobe bronchus and artery due to inflammatory changes, it may become hazardous to persist in the isolation of the individual hilar structures in the usual fashion. When this problem arises, it has been found expeditious to place a clamp across the hilar structures of the middle lobe and cut distal to the clamp, removing the lobe without isolation of the individual structures. The clamp is then removed and the vessels and bronchus caught individually and treated in the usual manner. No complications have arisen from this technique in the few instances that it has been used.

Results

Of the 10 patients with bronchiectasis of the right middle lobe, all had an excellent result. No patient had empyema or other complications. Of the six patients with abscess of the right middle lobe, four had an excellent result. One has had two episodes of right chest pain with fever and infiltration in the anterior segment
of the right upper lobe as manifested by x-ray inspection. Penicillin was effective in treatment in each instance.

The second patient, a 66 year old man who developed right middle lobe abscess while in a general hospital being treated for bilateral gangrene of the feet due to frostbite, developed a localized empyema two months after operation. The space obliterated a short time after drainage. Thus, this complication did not prove to be a serious one. Of the three patients with tuberculosis of the right middle lobe, two had excellent results. One, a five year old boy, had spread to left upper lobe which cleared with streptomycin therapy.

Case Histories

R.M., a white female of 28 years, was admitted April 11, 1949 and discharged April 30, 1949. Two months before admission she developed fever, cough, dyspnea and pain in right side of her chest. Penicillin therapy relieved symptoms but nonproductive cough persisted. Two days before admission fever and right lower chest pain recurred and cough was productive of a small amount of thick yellow sputum. There were 4,210,000 erythrocytes with hemoglobin of 11 grams, and 19,200 leucocyte cells. Bronchoscopy on April 12, 1949 revealed pus exuding from the middle lobe orifice. Right middle lobectomy was done on April 19, 1949. Recovery was uneventful and she was discharged on the eleventh post-operative day. Pathological diagnosis was lung abscess from unresolved pneumonia.

J.K., a white male of 62 years, was admitted on September 4, and discharged on September 26, 1948. He was well until four weeks before admission when he developed fever, dyspnea, cough productive of rusty sputum and pain on the right side of his chest. He received penicillin therapy with some relief of symptoms, but fever, dyspnea, and productive cough persisted. On admission he had 3,990,000 erythrocytes, hemoglobin 65 per cent and 18,900 leucocyte cells. His temperature reached 103 degrees F. daily and his condition became worse in spite of blood transfusions, penicillin, and streptomycin therapy. Right middle lobectomy was done on September 9, 1948. He made a slow recovery and was able to return to work after several months.

A.R. This 35 year old white female school teacher was well until January 1949. Annual chest x-ray inspections were required by her employer. In January 1949, she developed an upper respiratory infection with slight cough. One month later she had a small amount of blood streaked sputum. X-ray inspection of the chest at that time showed evidence of pneumonitis in the right lower lung field. She was treated with penicillin without change in the appearance of the shadow. She was asymptomatic on admission April 3, 1949. Six sputum examinations were negative for tubercle bacilli. Bronchoscopy revealed constriction of the right middle lobe orifice. Right middle lobectomy was done on April 7, 1949. She made an uneventful recovery and was discharged on the twelfth post-operative day. The pathological diagnosis was tuberculosis with cavitation.

Father H., a white priest of 38 years, was admitted on December 14, 1948 and discharged January 2, 1949. He had cough with morning expectoration of purulent material for years with pneumonia in November 1948.
Bronchoscopy revealed bronchiectasis and atelectasis of the right middle lobe. Right middle lobectomy was done on December 17, 1948 with uneventful recovery. The pathological diagnosis was bronchiectasis.

SUMMARY

The anatomic arrangement of lymph nodes about the middle lobe bronchus, the moderate enlargement of which produces bronchial occlusion, appears to be the reason for inflammatory disease limiting itself to the right middle lobe.

Most patients with inflammatory disease limited to the middle lobe give a history of an acute pneumatic onset, the symptoms of which never clear completely or recur after the cessation of penicillin therapy.

The changes in the frontal x-ray film of the chest are often negligible in patients with bronchiectasis limited to the middle lobe and the symptoms are often much more severe than one might expect from the amount of pulmonary tissue involved.

The technique of dividing the hilar structures of the middle lobe distal to a clamp, removing the clamp, and then treating the vessels and bronchus individually has been found to give satisfactory results when adherent lymph nodes made the usual isolation and individual ligation method too hazardous.

Right middle lobectomy is the only satisfactory method of treatment of inflammatory lesions of the middle lobe with bronchial obstruction which fail to clear by medical therapy.

RESUMEN

La situación anatómica de los ganglios linfáticos alrededor del bronquio del lóbulo medio que por su crecimiento puede producir oclusión bronquial, parece ser la razón de que la enfermedad se limite al lóbulo medio derecho.

La mayoría de los enfermos con enfermedad inflamatoria limitada al lóbulo medio, tienen historia de principio agudo neumónico, cuyos síntomas nunca se aclaran por completo o recurren al cesar el tratamiento con penicilina.

Las alteraciones que pueden notarse en la película radiográfica posterior a menudo son insignificantes en los enfermos con bronquiectasis limitada al lóbulo medio y los síntomas son mucho más severos de lo que uno esperaría por el volumen de pulmón comprometido.

La técnica de seccionar las estructuras hilar del lóbulo medio distalmente a un clamp, retirar ésta y entonces tratar los vasos y el bronquio individualmente, se ha encontrado que dá resultados satisfactorios cuando los ganglios adherentes hacen el asilamiento y la ligadura individual demasiado peligrosos.