Preoperative Diagnosis of Tuberculous Endobronchitis

A Radiologic Study

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Since the advent of antimicrobial agents, the incidence of tuberculous lesions in the bronchi as seen bronchoscopically has markedly decreased. The lack of epithelial lesions, however, does not negate the possibility of there being active submucosal tubercles. Thomson and Kent (1958) reported 44 cases with proved histological evidence of endobronchial disease. In all these 44 cases, preoperative bronchoscopy was essentially normal; however, 10 of the patients had shown some evidence of endobronchial disease on previous examination. It is not surprising that normal bronchoscopy findings are reported in spite of an active endobronchial disease. This is because with antimicrobial therapy, there is rapid healing or repair of an epithelial surface. Hardy and Samson (1956) described a quiescent bronchus which was essentially negative on endoscopic examination, but was not a healed bronchus in a histopathologic sense. In a review of 602 resected specimens, Olson and co-workers (1953) reported that 37.9 per cent of patients with normal bronchoscopic findings showed evidence of endobronchial disease on microscopic examination of the resected specimen.

FIGURE 1: Bronchotomogram for cavitary disease, apicoposterior segment, left upper lobe. Note the irregularity of apicoposterior segmental bronchus with failure to fill the cavity. It was interpreted as due to tuberculous endobronchitis. An apicoposterior segmental resection was done and active endobronchial disease confirmed histologically.

FIGURE 2: Bronchotomogram for residual necrotic disease, posterior segment, right upper lobe. Note the narrowing of right upper lobe bronchus and corrugations in the floor due to tuberculous endobronchitis. This necessitated right upper lobectomy. Active tuberculous endobronchitis proved histologically.
What is the significance of these occult tuberculous lesions in the bronchi? Perhaps the most dreaded complication of tuberculous endobronchitis is the post-operative development of a bronchopleural fistula due to the breaking down of the stump. If viable tubercle bacilli remain within a cavity despite long-term chemotherapy, then the bronchial tree is constantly contaminated and the possibility is great that tuberculous endobronchitis will ensue and persist and such cases will continue to pose a problem for the clinician.

It is my impression that preoperative diagnosis of endobronchial tuberculosis can be made in a large number of cases by bronchography and bronchotomography in spite of negative bronchoscopic findings. Bronchograms have been done by trans-glottic method using Dionosil as contrast media. Immediately a straight skiagram and tomogram (laminogram) at the most representative level is taken. The following x-ray films are illustrated.

In this country with high incidence of tuberculosis, many patients have had inadequate and irregular chemotherapy prior to hospitalization and harbor drug-resistant tubercle bacilli. Proper evaluation of the existence of tuberculous endobronchitis is essential to decide the extent and type of surgery in these cases. In 33 bronchoscopically negative and histologically proved cases of tuberculous endobronchitis, preoperative diagnosis of tuberculous endobronchitis could be made in 24 (75 per cent) cases by bronchotomography. The chief radiological criteria of tuberculous endobronchitis are: 1) irregularity and corrugations of bronchial

![FIGURE 3: Bronchogram for atelectatic right upper lobe. Note the clear outline of right upper lobe bronchus, interpreted as absence of endobronchial disease. Right upper lobectomy was done and no evidence of tuberculous endobronchitis detected histologically.](image)

![FIGURE 4: Bronchotomogram reveals bronchiectasis and extensive cavitary disease left upper lobe. Note the marked irregularity of the left upper lobe bronchial mucosa. Left upper lobectomy was done and histopathology revealed extensive endobronchial tuberculosis.](image)
mucosa as compared with the smooth outline of adjoining healthy segments; 2) narrowing and failure to fill the involved segments when the surrounding healthy segments are properly filled.

SUMMARY

Preoperative diagnosis of tuberculous endobronchitis is important to decide the type and extent of surgery in the treatment of pulmonary tuberculosis. In a great majority of cases it can be assessed by preoperative bronchotomography in spite of negative bronchoscopic findings.

RESUMEN

El diagnóstico preoperatorio de la traqueobronquitis tuberculosa es importante para decidir el tipo y la extensión de la cirugía en tratamiento de la tuberculosis pulmonar. En la gran mayoría de los casos puede apreciarse por la broncomotografía a pesar de los hallazgos broncoscópicos negativos.

RESUMÉ

Le diagnostic préopératoire d'atteinte tuberculées de l'endobronche est important pour décider du type et de l'étendue de la chirurgie dans le traitement de la tuberculose pulmonaire. Dans la grande majorité des cas il peut être établi par la broncomotomie préopératoire alors que les constatations bronchoscopiques restent négatives.

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BIBLIOGRAPHY


ANOMALOUS PULMONARY VENOUS DRAINAGE

The authors studied 43 proved cases of anomalous pulmonary venous drainage. This condition is practically always associated with other malformations, especially atrial septal defect. The veins usually connect with the right atrium, but they may connect with the venae cavae, the azygos, the portal vein, the coronary sinuses, etc.

This condition was arbitrarily separated into four types: 1) the condition is isolated; 2) it is associated with atrial septal defect; 3) all of the pulmonary venous system connects with the right half of the heart; 4) it coexists with more serious malformations of the heart such as tetralogy of Fallot, pulmonary stenosis, etc.

The study which affords the best diagnostic features in any type is catherization of the heart, and especially the test consisting of the temporary occlusion of one or several veins, that is, the identification of the veins connecting abnormally and its eventual occlusion with the Dotter-Lukas catheter.

The occlusion of one of the veins and the persistence of a left-to-right shunt permits one to suspect that: a) there is more than one vein connecting abnormally; b) there is an associated atrial septal defect. The temporary occlusion of the right branch of the pulmonary artery interrupts the arteriovenous shunt at the atrial level if there were an atrial septal defect.


ACCLIMATIZATION TO CARBON DIOXIDE

Although a sufficiently steady state for respiratory response measurements is reached within 5 to 10 minutes, the tissues probably to do come into complete equilibrium for days. The renal compensations are also very slow, as noted above. For this reason, it is unsafe to presume that changes in arterial pH in the first few hours of hypoxemia or hypercapnia resemble the long-term adjustments of true acclimatization. Transient alterations in respiratory exchange ratio, urinary composition, and arterial pH, for example, do not persist into the truly acclimatized state.