have patent bronchi running into the emphysematous area.

The condition is undoubtedly congenital in origin, and as is so often the case with all congenital abnormalities, other deformities were associated in case 1. Reid and Simon\(^1\) have pointed out that a normal development of the bronchi beyond the atresia is present, suggesting that the abnormality must occur before the fifth week of ovulatory age allowing normal development between the fifth and fifteenth week. ("However, recent evidence suggests that the atresia must have occurred in the proximal part of the segment after the lobe had developed its normal quota of bronchial generations."") In the case in which we carried out this examination (case 1), the number of generations of bronchi in an axial pathway was also within normal limits. Cases reported of this condition have not given a history of severe respiratory infection in childhood such as found in Macleod's\(^4\) syndrome which is thought by Reid and Simon\(^8\) to cause this condition.

The question arises as to whether surgical treatment is justifiable for this condition. There have not been any reports of infection developing in the blind bronchial stump. However, the emphysematous area is often large. This portion of lung is only ventilated by collateral drift, so that there is considerable air trapping and compression of the remaining normal lung.

The cases reported so far have not shown much impairment of respiratory function. Our case 1 was somewhat breathless and seems a little improved as he has been allowed to play at back instead of in goal with his school football team. His respiratory function tests show considerable improvement in FEV 1 sec., 89 percent from 69 percent.

All previous cases reported have been in the left upper lobe. Boyden\(^8\) states that this is the commonest site for all congenital abnormalities in the lung, but there is probably no reason why it should not be encountered in any segment. Unfortunately, in case 2 bronchograms have not been performed. However, at operation a dissection was made of the hilum of the right upper lobe, and no anterior segmental bronchus could be identified.

Certainly, it is important to be aware of the condition. It may be encountered unexpectedly at thoracotomy. No previous knowledge of this abnormality may then lead to resection of an unnecessary amount of lung, as in case 2 in which we removed the healthy middle lobe.

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Endocavitary Infusion Through Percutaneous Endobronchial Catheter*

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A "fungus ball" which developed in an inactive tuberculosis cavity, was treated with infusion of amphotericin-B and sodium iodide directly into the cavity through an indwelling percutaneously inserted endobronchial catheter for a period of three months with significant improvement. There were no ill effects from the drugs or the indwelling catheter.

Endobronchial infusion of medications is useful in the treatment of exudative tuberculosis, and even in some cases of lung abscess. Percutaneous endocavitary infusion through a cannula and syringe was probably practiced from 1855, and recently was used in a modified form, in two cases of pulmonary mycetoma. However, no report of endocavitary infusion through percutaneously inserted catheter has been made. However, no report of endocavitary infusion through percutaneously inserted catheter has been made.

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introduced endobranchial catheter is available. Hence, we will describe our experience with this technique.

CASE REPORT

A 75-year-old man was admitted to the Veterans Administration Hospital with a two-day history of hemoptysis. The patient had a previous history of cavitary disease in the right upper lobe due to tuberculosis and was on antimycobacterial chemotherapy, though cultures for tubercle bacilli were negative for three years. Physical examination revealed poor respiratory reserve and evidence of a right upper lobe cavity. Smears and cultures for tubercle bacilli were repeatedly negative. Chest x-ray examination confirmed the presence of a cavity. For two months he was treated with oxytetracycline (Terramycin) in addition to INH and PAS without improvement. At this time, a "fungus ball" was apparent (Fig 1) and cultures for Aspergillus were positive. Para-amino salicylic acid was then discontinued. For the next three months he was treated with nystatin (Mycostatin) aerosol inhalations with no clinical or radiologic signs of improvement. Though fungus cultures were negative, his sputum continued to be purulent and blood streaked. At this time, bronchogram was obtained (Fig 2) which showed free communication of the right upper lobe bronchus to the cavity. A decision was then made to pass a catheter into the cavity through the tracheobronchial tree for infusion of amphotericin-B, since the patient's general condition precluded pulmonary resection.

After sedation with pentobarbital, the patient was positioned on the fluoroscopy table. One ml of 1 percent lidocaine (Xylocaine) was injected into the skin overlying the cricothyroid membrane in the midline and 2 ml was injected into the trachea. A Seldinger needle was then introduced into the trachea through the cricothyroid membrane. With the patient in right lateral position, 5 ml propylidone (Dionosil) was injected through a Seldinger needle. The trachea and right upper lobe bronchus were thus visualized in the screen of image intensifier. Following this, a Seldinger guide wire was introduced into the trachea and the needle was removed. An Odman catheter was then threaded over the guidewire and manipulated into the right upper lobe cavity. To prevent dislodgment, about 5 cm of the catheter was left inside the cavity (Fig 3). An antibiotic ointment was then applied around the skin puncture site and the catheter anchored securely. The patient was given a total dose of 2.4 gm amphotericin-B over a period of 60 days through this catheter without any adverse effects. It was then discontinued because of lack of clinical improvement and increase in cavitary fluid. Sodium iodide solution was employed thereafter, first as a 1 percent solution and later as 2 percent solution. A total of 50 gm was given over a period of 30 days without electrolyte disturbances. At the end of this regimen the patient no longer produced purulent sputum or blood. Fungus cultures remained negative. He noted a general sense of well being and weight gain. The fluid in the cavity disappeared though a density remained. At no time during the 90 days of treatment did he experience any significant discomfort due to the indwelling catheter (Fig 4). The skin puncture site showed evidence of minimal infection, but did not require any specific treatment other than periodic dressing changes.

DISCUSSION

Selective endobronchial endovacitary catheterization...
tion was simple to perform. The catheter was maintained in position for three months with minimal discomfort. Selective localization of infusions permitted high concentrations of amphotericin B and sodium iodide without renal toxicity or electrolyte disturbances. Previous attempts to obtain high endobronchial or endocavitary concentrations of drugs were by: (1) endoscopy,1 (2) a special orotracheal instrument,2 (3) or percutaneous puncture of the cavities.3 While the first two methods required oropharyngeal anesthesia and combined disadvantages of endoscopy and intubation by special catheters, the latter technique is inapplicable or dangerous if there is no pleural symphysis over the cavity. The technique used by Ramirez4,4 obviates these difficulties by using the percutaneous endotracheal route. We proceeded a step further and selectively catheterized the bronchus and the cavity where the drug was needed most. In a review of literature it was found that a similar technique was used in performing selective bronchograms by Strekel and Grillo4 and Cope3. In addition, it may be possible to use this technique to obtain diagnostic material from selected bronchopulmonary segments for early diagnosis of inflammatory or neoplastic diseases by modifying the method employed by Fennessey.10

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