In Defense of Percussion*

H. J. ROBERTS, M.D., F.C.C.P.**

West Palm Beach, Florida

"I here present the Reader with a new sign I have discovered for detecting diseases of the chest. This consists in the Percussion of the human thorax, whereby, according to the character of the particular sounds then elicited, an opinion is formed of the internal state of that cavity. In making public my discoveries respecting this matter, I have been actuated neither by an itch for writing, nor a fondness for speculation, but by the desire of submitting to my brethren the fruits of seven years' observation and reflection. In doing so, I have not been unconscious of the dangers I must encounter; since it has always been the fate of those who have illustrated or improved the arts and sciences by their discoveries, to be beset by envy, malice, hatred, detraction, and calumny."

LEOPOLD AUENBÜGGER, (Inventum Novum ex Percussione Thoracis Humani, ut Signo Abscessus Interni Pectoris Morbis Detegendi, Vienna, 1781)

RADIOGRAPHY OF THE CHEST HOLDS an undeniably important place in the diagnosis of pulmonary disease. In view of the universal emphasis that it represents a virtual sine qua non therein, however, it seems timely to remind clinicians that careful percussion is rapidly becoming a neglected art—even though it still remains of considerable value in diagnosing certain common chest disorders, especially during their evolutionary stages when radiographic findings are apt to be minimal or absent. While subtle changes detectable by percussion of the heart (e.g., left atrial enlargement), the abdomen (e.g., shifting dullness in ascites, absence of liver dullness with intra-abdominal air), the deep tendon reflexes, the skull (e.g., the "cracked pot" sound of a fracture, the dull note associated with an organizing hemorrhage or space occupying lesion), and even the spine (e.g., tenderness associated with myeloma, leukemic infiltration or metastatic neoplasm) are often equated with diagnostic sophistication and expertness, this attitude is no longer extended to the chest by most contemporary physicians.

I have had occasion to attend or see in consultation literally scores of patients in whom striking discrepancies were found to exist between a classic history and the typical physical findings of acute pneumonia or pulmonary embolism on the one hand, and the minimal or absent findings in serial chest x-ray films, on the other. Moreover, the auscultatory findings in many of these acutely ill individuals were either absent or inconclusive, notwithstanding unequivocal dullness involving considerable areas of the chest. Percussion also has proved of decided diagnostic value in the case of early congestive heart failure wherein basilar dullness or impaired resonance neither was accompanied by impressive auscultatory findings nor complicated by pulmonary infarction, pleural effusion or pneumonitis. The finding of exquisite and persistent chest wall tenderness provides yet another neglected clue to the presence of acute pulmonary embolism with infarction.

In each of the above situations, the institution of specific therapy—antibiotic, anticoagulant, or cardiac—often resulted in prompt subsidence of the clinical features and percussion findings, even though the auscultatory and radiographic changes remained unimpressive or absent. The following patients illustrate these repeated experiences.

CASE REPORTS

I. Pneumonia

A 67-year-old physician developed considerable pleuritic pain, fever and dullness involving the lower two-thirds of the left lung. His initial chest x-ray films failed to reveal pneumonia. On antibiotic therapy, he showed prompt clinical improvement, with a progressive decrease in the extent of dullness. Chest x-ray films taken three

---

*From the Mannow Research Laboratory, Palm Beach Institute for Medical Research.
**Director, Palm Beach Institute for Medical Research; Consulting Staff, St. Mary's Hospital.
days later evidenced a small pneumatic infiltrate involving the left lower lung. No pleural effusion could be identified.

A 47-year-old woman exhibited fever, cough and dullness that extensively involved the lower left lung area. Crepitant rales were heard. Although her initial chest x-ray films did not demonstrate pneumonia, subsequent films confirmed the diagnosis. In the interim, however, she had responded in gratifying manner to antibiotic therapy.

A 40-year-old woman sought consultation for recurring high fever and cough approximately two weeks after contracting a respiratory infection. She had received oral antibiotic therapy intermittently. When first seen, she was febrile and evidenced extensive dullness involving the lower two-thirds of both lung fields, extensive crepitant rales, and a pleural friction sound over the posterior left hemithorax. Chest x-ray films taken shortly after hospitalization revealed bronchopneumonia that involved the left lower lung, but without pleural effusion. The right lung, however, was interpreted as being radiographically normal. Rapid symptomatic improvement followed the institution of parenteral penicillin and streptomycin. Over the ensuing two days, dullness was still found in the lower two thirds of both lung fields. Repeat chest x-ray films on the third day revealed beginning resolution of the pneumonia on the left, but still no pneumatic infiltrate on the right. Over the subsequent five days, there was a progressive caudad decrease and ultimate disappearance of the dullness, along with further radiographic improvement of the left lung.

A 55-year-old man was seen in consultation on the tenth postoperative day at a teaching hospital in another community because of increasing fever and leukocytosis following a partial gastrectomy and vagotomy for gastrointestinal hemorrhage. Prior to his profuse hematemesis, which necessitated 8 units of blood within a 24-hour period, he had a respiratory infection for which he took aspirin. The postoperative course was characterized by low-grade fever. Although it was initially considered to be an expected postoperative phenomenon, his rectal temperature rose to 103°F. and the white blood cell count increased from 8,300 to 24,000 per mm. During this period, he received penicillin and streptomycin, but without benefit. There was no overt abdominal complication; indeed, he was eating food and having normal bowel movements. Moderately large amounts of sedation had been administered for his apprehension.

When initially seen, the patient was obviously febrile and toxic. Further questioning revealed that he had expectorated small amounts of yellowish sputum on several occasions. On physical examination, he was found to have frank dullness over the lower one-half of the right lung field and the lower two-thirds of the left lung. Crepitant rales were occasionally heard on the right side. There was partial suppression of the breath sounds on the left side. Chest x-ray films taken shortly thereafter were interpreted by the radiologist as "completely normal." Neither the surgeon nor a previous medical consultant would concede that the cause of the fever was supradiaphragmatic—even though they had failed to percuss his chest. Nevertheless, it was the writer's firm opinion that bilateral pneumonia was present, and that it was variously related to the preoperative respiratory infection, probable inspissation of mucus, atelectasis resulting from the upper abdominal surgery, heavy sedation and the possible development of antibiotic-resistant organisms. There was no evidence for endocarditis, embolic phenomena or renal-tract infection. The patient was placed on methicillin and erythromycin, and encouraged to expectorate with the aid of iodides and steam. On this program, his temperature progressively normalized, especially after he expectorated copious mucopurulent plugs. Repeat chest x-ray films (taken two days after the initial series were interpreted as being consistent with pneumonia of the right lung. By the fifth day, neither the dullness, rales nor suppression of breath sounds were demonstrable.

II. Pulmonary infarction

A 57-year-old white woman developed thrombophlebitis of the left leg and thigh. It was followed by pleuritic pain, cough, pleural friction sound and dullness involving the lower two-thirds of the left lung. Chest x-ray films on two occasions failed to reveal an abnormality. Her pleuritic discomfort and chest dullness progressively disappeared following parenteral heparin and oral anticoagulant therapy.

A 34-year-old white woman experienced a probable pulmonary infarct involving the left lung following acute thrombophlebitis of the lower extremities. Although unequivocal dullness involved more than a third of the left lower chest and a transient pleural friction sound was audible, serial chest x-ray films did not even suggest pulmonary infarction. Exquisite tenderness to percussion of the chest wall was also found. These findings promptly subsided on anticoagulant therapy.

III. Congestive heart failure

A 63-year-old white man with essential hypertension and angina pectoris was seen in consultation shortly after he was hospitalized because of hemoptysis and nocturnal dyspnea of one week's duration. There was no associated or preceding
chest pain, peripheral edema, fever or expectoration. He had not smoked for ten years. In addition to overt dyspnea, there was frank dullness involving the lower two-thirds of both lung fields, extensive crepitant rales and occasional asthmatic breath sounds. His weight was 208 lb. The chest x-ray films on admission were interpreted as showing generalized increase in pulmonary density within the lower lung fields and "central vascular congestive" changes. There was no pleural effusion. By diuresis, his weight was reduced to 197 lb. the morning after receiving a mercurial diuretic injection, parenteral digitalis and a modified Karel diet. Concomitantly, he became asymptomatic, with disappearance of the extensive thoracic dullness. Only slight impairment of resonance and an occasional crepitant rale over the lowermost lung fields remained as evidence of the more dramatic findings present one day earlier.

A 60-year-old boat captain had been subject to increasing dyspnea and angina pectoris on effort for two years, and recurrent edema of the lower limbs for 18 months. He recently received partial diuretic therapy, and had reduced from 247 lb. to 227 lb. when first seen. On that occasion, he was found to have dullness over the right lower lung field, but no rales. Chest x-ray films revealed a spherical mass within the right interlobar fissure, consistent with localized pleural effusion. There was electrocardiographic evidence of left ventricular hypertrophy and strain. On a program of digitalization, reduction of salt and food intake, a parenteral diuretic, and oral diuretic therapy, his weight declined to 221 lb. when next seen. On that occasion, his right lower lung was totally resonant and the "vanishing tumor" had regressed almost completely.

It is my firm belief that the value of chest percussion has not diminished since its introduction into clinical medicine two centuries ago, and that it remains a truly indispensable component of the diagnostic armamentarium. This attitude only can prevail, however, if the clinician employs this basic discipline with diligence and earnestness, and develops sufficient confidence in his findings—at least within the realms mentioned—that he will not readily yield his clinical impressions to a radiologist's "negative" report. A practicing physician who does so surrenders a fundamental birthright. Furthermore, I would submit that one of the most valuable and humbling exercises to which radiology residents should be subjected for evaluating the limitations of chest radiography is the repeated comparison of their own findings by physical examination with those of concomitant x-ray films.

Unfortunately, many have come to limit and to equate the role of percussion of the chest with a page in medical history or the didactic teaching of physical diagnosis to medical students. There is the decided implication that the method remains largely of primary interest to those who must pass examinations or percuss wine barrels. These regressive perspectives have resulted largely from the following: (1) the erroneous extension of the admitted superiority of chest radiography in diagnosing minimal tuberculosis and small lung neoplasms to encompass all diseases of the lungs; (2) the "atrophy of disuse" of the percussion faculty occasioned by this de-emphasis and waning of interest after medical school, with the inevitable ensuing lack of confidence in its performance and interpretation; and (3) the increasing reluctance by physicians to make a flat-footed diagnosis of otherwise-typical early pneumonia, pulmonary infarction or congestive heart failure without radiographic confirmation because they fear criticism by evaluation committees. The very nature of the edema or inflammatory exudate in these disorders may render them insusceptible to radiographic contrast with the surrounding tissue.

Perhaps a common denominator concerning the fundamental matter of vigilance is involved in this matter, which also might be directed to the preservation of other cherished values in our heritage—professional, cultural, religious or national—that are continually being challenged or downgraded. This is no small issue in an era where reverence for the computer, automation and diagnostic technology increasingly challenges the personal physician who realizes that he must continue to concentrate on maintaining his clinical astuteness and improving his innate diagnostic faculties if he is to cope wisely and confi-
The following commentary by Trotter (The Collected Papers of Wilfred Trotter, F.R.S. London, Oxford University Press, 1946, p. 156) is appropriate: "Medicine is a composite subject. One of its elements is an experimental science, but a large part of it obeys the very different discipline of a practical art. In consequence it has often to deal with and act upon incompletely definable situations, and to develop the faculty of practical judgment on imperfect evidence—an activity characteristically absent from an experimental science. As long, therefore, as medicine continues to be so largely an activity of a non-scientific kind, every faculty of the active, rational mind is to be desired in the practice of it."

Another excerpt from Auenbrugger's classic treatise (loc. cit.) serves as a fitting conclusion to the present theme:

"Convinced by personal experience, I contend that the sign about which this book treats is of the utmost importance, not only for the diagnosis, but also for the treatment of diseases, so that it ranks in value immediately, after the examination of the pulse and the breathing. I contend that an abnormal tone in the thorax is, in every disease, a certain sign of the existence of serious danger."

For reprints, please write Dr. Roberts, 300 27th Street, West Palm Beach, Florida.

APEX CARDIOGRAM

The registration of low frequency movements of the thoracic wall, and a summary of the configuration of the apex cardiogram and its relationship to the phases of the cardiac cycle are discussed by the authors who analyze the changes observed in this type of record in 60 patients with ischemic heart disease. In 32 cases (53.3 per cent) an A wave exceeding 17 per cent of the total amplitude of the tracing was recorded, representing the maximum height of this deflection in 30 normal individuals. In the remaining 28 cases, the A wave was within normal limits at rest; however, in 14 given an exercise test, the A wave became definitely abnormal in nine. The effect of nitroglycerine was observed in 18 cases, all of which showed abnormally tall A waves, and in 14 of these, this deflection became normal following this medication.

CAVITARY CRYPTOCOCCOSIS

Two cases of cavitary cryptococcosis treated by lobectomy are reviewed. The paucity of pulmonary symptoms in patients with this disease is of interest. Cavitary cryptococcosis appears to be a very rare clinical manifestation of this fungal infection. Amphotericin B was not used in our cases, but since the organism is susceptible to the drug, it may be advisable in future cases to prescribe it, especially if there are postoperative complications.