

acteristic pulse and the pupils show no constant changes, though in many cases they are dilated.

Hysterical coma usually occurs in young women who have previously shown signs of hysteria. In falling they never hurt themselves. The eyelids are contracted, often tremulous, and when forcibly pulled open often expose eyeballs rolled up so that the whites alone are seen. The hands are apt to make grasping motions, and there are irregular, semipurposive movements of various parts of the body. A startling word may arouse the patient, but anæsthesia to pain (over one-half or all the body) is often complete.

Postepileptic coma is usually recognized with ease, because of the convulsions which precede it and which are usually known to have occurred at intervals before. The scars of previous falls may be found on the head.

Gas poisoning rarely presents any diagnostic difficulties, because the circumstances under which the patient is found make clear the cause of his condition. An odor of gas may hang about his breath for some hours.

Sunstroke is recognized by the state of the weather and the presence of a very high temperature (106°, 110°, 115° F., or even more). There is no other characteristic sign.

APPENDICES.

APPENDIX A.

DISEASES OF THE MEDIASTINUM

I. MEDIASTINAL TUMORS.

New growths of the mediastinal glands¹ usually manifest their presence by the following symptoms and signs:

- (1) Cachexia and substernal pain.
- (2) Evidence of pressure against:—
 - (a) The gullet.
 - (b) The windpipe or primary bronchi.
 - (c) The large venous trunks.
 - (d) Nerves which pass through the mediastinum.
 - (e) The subclavian arteries.
 - (f) The heart.
 - (g) The ribs, clavicle, or sternum.
- (3) Secondary deposits in the cervical or axillary glands.

(a) By pressure on the gullet swallowing may be rendered difficult or impossible (dysphagia).

(b) By pressure on the windpipe may be produced displacement of the latter to one side, or fixation so that it cannot be moved in any direction. The larynx may be drawn down into a noticeably low position, and the laryngoscope may demonstrate that the tracheal wall is bulged inward by the pressure of the new growth upon it.

Dyspnœa, either inspiratory or expiratory, or both, and often

¹Tuberculous glands not being here included.

of noisy strident type, may result from stenosis of the trachea or primary bronchi. Owing to pressure on one of the large bronchi, the resonance and breath sounds and fremitus may be diminished over the corresponding lung, in which finally abscess or gangrene

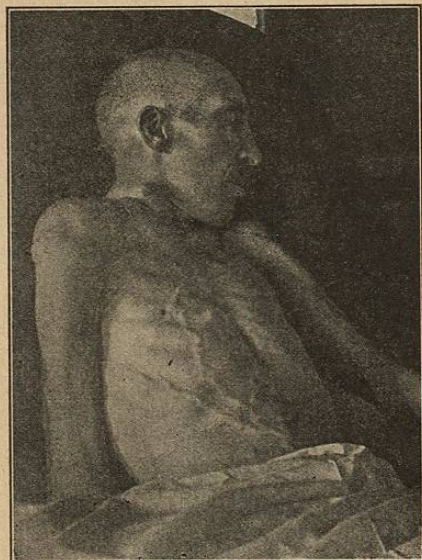


FIG. 236.—Sarcoma of Mediastinum and Cervical Gland. Vena cava superior obstructed.

may develop, owing to the retention and decomposition of the bronchial secretions.

(c) If the pulmonary veins are pressed upon, a systolic murmur may be audible in the left back, and congestion of the lungs may ensue.

Pressure on the innominate and subclavian veins produces cyanosis or œdema of the head, neck, shoulder, and arm, while the superficial veins of the chest may become enlarged and prominent owing to an attempt at collateral circulation, especially if the vena cava superior is pressed upon. Fluid may accumulate in one or

both pleural cavities if the vena azygos or thoracic duct is involved (see Fig. 236).

(d) Aphonia or hoarseness points to pressure on the recurrent laryngeal nerve, and on laryngoscopic examination one vocal cord may be found in the cadaveric position. Inequality of the pupils, due to pressure on the sympathetic nerves, is not uncommon, and severe pain along the distribution of the intercostals or running down the arm indicates that the spinal ganglia or brachial plexus are pressed upon. Much rarer are symptoms of pressure on the vagus (slowing or quickening of the heart) and on the phrenic nerve (hiccup, unilateral spasm, or paralysis of the diaphragm).

(e) Weakening or delay in one radial pulse may be due to pressure on the subclavian artery.

(f) Occasionally the heart itself may be pushed out of place.

(g) Pressure of the new growth against the bones of the chest may give rise to an area of percussion dulness under or near the manubrium, which, however, is not likely to show itself until late in the course of the disease when the new growth has reached a considerable size. In many cases there is tympanitic resonance instead of dulness over the affected area. The ribs or sternum may be pushed forward, but this is not usually the case. Occasionally the new growth, if very vascular, may pulsate like an aneurism or transmit the pulsations of the heart to the chest wall, and a systolic murmur may be heard over the pulsating area, so that the resemblance to aneurism is increased.

Differential Diagnosis.

Mediastinal tumors may be mistaken for

- (1) Aneurism of the aortic arch.
- (2) Syphilitic stenosis of a bronchus.
- (3) Phthisis.

Aneurism may be confounded with mediastinal new growths even by the most competent observers. Tactile thrill, diastolic shock, and tracheal tugging, if present, should suggest aneurism. If these signs are absent, aneurism may still be present but cannot

be surely diagnosed. The degree of anæmia and emaciation is usually greater in malignant disease than in aneurism, but this is not always the case. The presence of secondary nodules in the neck or armpit speaks strongly in favor of new growth.

Stenosis of a bronchus, due to syphilis and giving rise to dyspnoea, cough, stridor, pulmonary atelectasis, may be very difficult to distinguish from mediastinal growth, but the degree of anæmia and emaciation is usually less in syphilis, and the beneficial results of antisiphilitic treatment may render the diagnosis possible, especially if there is evidence of syphilis elsewhere in the body or in the history of the case.

Phthisis may be suggested by the weakness, emaciation, and persistent cough produced by mediastinal growths, but should be easily excluded by the examination of the lungs and sputa.

II. MEDIASTINITIS.

The acute suppurative forms of this rare disease do not give rise to any characteristic physical signs in the chest.

The evidences of chronic fibrous mediastinitis have been already sufficiently considered in connection with adhesive pericarditis.

III. TUBERCULOSIS OF THE MEDIASTINAL GLANDS.

Probably every case of pulmonary tuberculosis is preceded or accompanied by tuberculosis of the bronchial lymph glands, and in numberless cases the tuberculous process never gets beyond these glands but is choked off there. In post-mortem examinations of children, no matter what the cause of death, it is exceptional not to find the bronchial glands tuberculous.

Nevertheless the disease can but rarely be recognized during life. We may suspect it if, in a child showing tuberculous cervical glands or phthisis, we find evidence of pressure upon the right bronchus, increased tactile fremitus above the manubrium, lateral displacement of the trachea, or weakening of the pulse during inspiration. If a bronchus is compressed, the resonance, tactile

fremitus, and breath sounds are diminished over the corresponding lung. Wiederhofer lays stress upon an increase in the intensity of the expiratory murmur over the situation of the left primary bronchus.

APPENDIX B.

ACUTE ENDOCARDITIS.

Whether the disease be of the benign or of the malignant (septic) type, the results of physical examination of the heart are usually very equivocal. We may guess that endocarditis is present owing to the presence of a cause (rheumatism), of a fever not otherwise explained, of a rapid irregular pulse of low tension, but the physical signs over the heart will not usually assist our guess materially.

Murmurs are often present but have usually the characteristics of "functional" murmurs (systolic, limited, soft, without accentuation of the pulmonic second sound or cardiac enlargement). If we can observe the advent of a *diastolic* murmur in such a case, we may fairly attribute it to a fresh endocarditis of the aortic (very rarely of the pulmonic) valve, but if we have not had the opportunity to examine the heart previous to the onset of the present attack it is impossible to exclude a long-standing valvular lesion as the cause of the murmur.

If murmurs come and go from day to day, or suddenly increase in intensity, we may suspect an acute endocarditis, especially if a musical murmur is present or if there be evidence of embolism.

Inspection, palpation, and percussion usually yield no signs of importance. There is no enlargement of the heart, no accentuation of the second sounds, and no evidence of stasis.

APPENDIX C.

PHYSICAL EXAMINATION OF THE CHEST IN INFANTS.

(1) Tactile fremitus and voice sounds can be investigated only in case the child cries or crows. The cry-sound is intensified over solidified areas and may or may not be lost over fluid accumulations.

(2) Percussion must be very delicately performed if we are to avoid setting the whole chest in vibration with every stroke. It is best to strike wholly with the finger, keeping the hand (as well as the wrist and arm) unmoved.

(3) In listening to an infant's lungs patience and concentration are essential. The child is apt to stop breathing when the examination begins, and we have to wait patiently to catch the long-delayed inspiration "on the wing," as it were, before the long expiratory wail begins. The inspiration, when it does come, is unusually intense owing to the thinness of the chest in infancy.

(4) Long flexible rubber tubes connecting the chest-piece of the stethoscope with the ear-pieces are very convenient when examining a wriggling child (see Fig. 83, p. 117), as they make it possible to hold the chest-piece in position despite the constant movements of the struggling sufferer.

(5) It is advisable to examine first the back while the child is held in the mother's arms with its back to the physician.

(6) Children almost always cry if made to lie down flat. If we wish to bring out the cry sound in order to test the vocal and tactile fremitus, this is a simple and humane method of producing it. If, on the other hand, peace is what we most desire, it is best to avoid putting the child in a recumbent position.

(7) There is no type of breathing peculiar to children or infants. Puerile breathing is simply vesicular breathing heard very distinctly on account of the thinness of the chest. If, in a healthy child, the expiratory murmur is prolonged and high-pitched, this is probably because the child blows out the breath forcibly in the effort to breathe deeply as it is told to do. A young infant never

does this, and its breathing is like that of adults except that it is more rapid, more irregular, and better heard.

APPENDIX D.

RADIOSCOPY OF THE CHEST.

Radioscopy gives assistance in the diagnosis of diseases of the chest in two ways:

1. Through the use of the fluoroscopic screen.
2. Through the use of radiographs.

Those who are accustomed to the use of the fluoroscope gain far more information from it than from radiographs, but the record of the photographic plate is objective, permanent, and demonstrable, while the impressions gained from the fluoroscope are more apt to be modified by the personal equation.

For the present, therefore, we need both methods.

I shall not attempt to discuss the advantages of the various forms of apparatus used for producing Roentgen rays in a Crookes tube; the subject would carry me beyond my depth as well as beyond the limits of this book; but whatever form of instrument is used, the vacuum in the tube should be less perfect when we desire to use it for the chest than when searching for foreign bodies or studying fractures. We need a "low" or "soft" tube which gives rays of a relatively slight degree of penetration. With high penetration rays the outlines of the solid organs are less distinct because the rays traverse the heart and liver almost as easily as they do the lungs. If the penetrating power is less, the rays are arrested by the solid organs, but not by the lungs, and hence the outlines of the former become visible.

I. The Use of the Fluoroscope.

1. It is advisable to remain in a dark room or to wear smoked glasses for a short time before attempting to use the fluoroscope. This applies especially to beginners. Skilled observers do not need

such preparation of the retina, but many novices who complain at first that they can "see absolutely nothing" when they apply the fluoroscope to the chest, find their vision suddenly and permanently improved after fifteen minutes in a dark room. Practice increases our powers with the fluoroscope as much as it does with the microscope, and it is unreasonable to expect to see from the first all that an expert sees.

2. The patient should be placed at least two feet from the tube, else there is likely to be distortion and magnification of the shadows corresponding to the organs examined. The tube should be placed at such a height as to be opposite the most important object to be examined, and always in the median line.

3. Patients may be examined either in the upright position—the tube about two feet from the patient's back—the fluoroscope resting against the chest—or in the recumbent position, supported on a canvas cot with the tube underneath. I prefer the upright position. The patient's arms should always be extended forward so as to get the scapulæ out of the way.

4. To concentrate the light upon a spot of special interest, we may use a metal plate with a rectangular opening about two by three inches near one end. When this plate is held between the tube and the patient, so that the opening is opposite the spot to be examined, the rays pass through the opening, but are intercepted by the metal around it. The hand which holds this plate should be protected from the action of the rays.

5. To mark on the chest the outlines of the shadows seen with the fluoroscope, a pencil enclosed in a tube of brass is useful; the brass jacket makes the pencil visible and enables us to adjust its point to the outlines on the chest. An ordinary pencil is penetrated by the rays completely, and it is hard to draw with a pencil which we cannot see.

II. *The Normal Fluoroscopic Picture* (see Frontispiece).

The lungs appear as the lightest part of the field owing to the large amount of air they contain; at the end of full inspiration, they become still lighter. Against the light lung areas, the out-

lines of the ribs and of the vertebral column (with the sternum superimposed) are clearly visible. Less clear, but usually quite distinguishable, are the outlines of the heart and the upper border of the liver. A slight shadow (see Fig. 174) is often noticed just to the right and to the left of the heart in a position corresponding to the larger bronchi. The spleen is not usually to be made out clearly, but the upper surface of the diaphragm above it is generally visible. The contractions of the heart and the movements of the diaphragm are usually clear, and any restriction of the respiratory excursion on one side can be noted, though the fluoroscope has no advantages over the inspection of Litten's diaphragm shadow (see p. 76) for this purpose.

Abrams has noted that if the skin of the precordia is irritated by cold or pain, a reduction in the size of the heart occurs ("heart reflex") for a few seconds.

In children all these phenomena are especially clear, owing to the thinness of their chest walls and we note at once how much more horizontal the child's heart is than the adult's.

III. *The Fluoroscope in Disease.*

I shall mention first those diseases in which the fluoroscope furnishes us the most valuable information.

1. *Aneurism.*—Small aneurisms of the transverse or descending aorta may sometimes be recognized by the x -rays when no other method of physical examination yields satisfactory evidence. An abnormal shadow appears at one side of the sternum (see Fig. 237) and may sometimes be seen to pulsate. In other cases the fluoroscopic evidence is not the only evidence, but tends to confirm or dispel suspicions aroused by the ordinary methods of examination.

Aneurism of the heart itself is recognizable, according to F. H. Williams, by the fluoroscopic examination. No other method of examination gives us any evidence of such a lesion.

2. *Determination of the Cardiac Outlines in Patients with Emphysema and Fat Chest Walls.*—Emphysema spoils cardiac percussion and interferes with inspection and palpation. But in fluoro-