Filling of the heart chambers and great vessels with contrast substance reveals their anatomical structure, and permits differentiation of vascular from non-vascular mediastinal lesions. The method, contrast substance used, and procedure, have been described. Angiocardiography has revealed that our knowledge of the position of the heart chambers and the border-forming structures of the cardiac silhouette in the normal and abnormal was not in complete accord with text book descriptions. This type of examination allows a demonstration of (1) congenital anomalies, (2) anatomical variations, (3) chamber enlargement, cardiac hypertrophy, or both, (4) constricted and expanded cardio-vascular lesions, and (5) the differentiation of the vascular from the non-vascular mediastinal lesions.

The following cases illustrate cardio-vascular lesions:

Case 1: E. H., a white female, aged 93, was admitted to this hospital on 4/25/41, and died on 5/14/42. A history was unobtainable, because of patient’s poor memory, but she claimed “she did not have a care in the world, and never felt better in her life.” She was transferred from another hospital with a diagnosis of a Pott’s fracture of the ankle, and for custodial care.

Physical examination revealed a slight, aged, white female, poorly nourished and developed. Her pupils reacted to light and accommodation. Ears, nose and throat showed no abnormality. Examination of the chest showed shallow lung excursion, distant breath sounds, and no rales. Her heart sounds were distant and of poor quality. A2 was accentuated. Pulse rate was 72, blood pressure 92/100. Her abdomen was essentially negative. Her extremities showed slight pretibial edema, and her right ankle showed evidence of a recent Pott’s fracture. There was no deformity of either ankle or foot. Vessels were not palpable in either foot.

Laboratory work revealed a blood sugar of 82.5 mgm.%; blood urea nitrogen 29.4 mgm.%; Wassermann was negative; Kline doubtful.

The patient received custodial care and physiotherapy, and her course was uneventful until April 20, 1942, when she had a moderate hemoptysis. Examination of the chest at this time was essentially negative, except for moist rales in both bases, posteriorly. Later the same day, she began to bring up copious quantities of bright red frothy blood. It was decided that the patient was probably bleeding from an open vessel from the pharynx or tracheo-bronchial tree. A nose and throat consultation showed no pathology or bleeding vessel.
On April 21, 1942, a roentgenographic examination of the chest revealed a large circumscribed area of absent aeration in the central portion of the left lung, which extended from the axillary portion of the chest to the hilum, merging with the mediastinal structures. In the lateral projection, the circumscribed area of absent aeration was superimposed over the heart and the superior mediastinum. While an aneurysm could not be excluded, the area of diminished aeration was thought to be an encapsulated effusion.

Clinically, it was thought that the mass in the chest might be a dissecting aneurysm or mediastinal tumor, though most likely an effusion. On April 24, 1942, a chest tap was performed, and blood appeared in the syringe, under considerable pressure. A specimen showed no neoplastic cells, revealed a red blood count of 3.6, Hgb 56%, white blood count of 11,000 and a negative culture. On April 25, 1942, an aneurysmal dilatation of the abdominal aorta was palpated, just above the umbilicus, which was tender. A film of the chest on May 5, 1942, showed no change when compared with the previous examination. Because of the history, a diagnosis of an aneurysm was made. It was decided to make angiographic studies. On May 11, 1942, these studies were performed without any after effects, and revealed the following:

Angiocardiographic examination (Fig. 1) was made in the supine position, with contrast substance injected into the left external jugular vein. At the end of 4 seconds, contrast substance was visualized in the entire right heart, pulmonary aorta, right and left pulmonary arteries. Contrast substance was also visualized in the left jugular vein, collateral circulation in the neck, left subclavian and superior vena cava. The cardiac silhouette was very small. The contrast substance in the right heart was relatively large.

At the end of 12 seconds, contrast substance was distributed throughout the entire thoracic portion of the aorta and the left heart. The ascending portion of the aorta was tortuous. The descending portion showed a large aneurysm at the left lateral aspect of the aorta; the aneurysm extended from the 6th to the 9th rib. The contrast substance in the aneurysm did not fill the entire opacity in the left hemithorax. The outline of the contrast substance warranted the description of saccular. The appearance, however, was not truly saccular. Lateral to the opacified portion of the aneurysm was a thick clot. Because of the age of the patient, and the clinical history, this was considered as an arteriosclerotic aneurysm.

Contrast substance was demonstrated in the abdominal aorta down to the bifurcation and in the iliac vessels. The right kidney was unusually small. The vessels to the right kidney in the region of the hilum were visualized. Other abdominal vessels were also visualized. There were no evidences of an aneurysm of the abdominal aorta.

On May 13, 1942, the pulse and blood pressure were unobtainable in the afternoon, and patient was non-responsive. Later, the abdominal aorta was palpable and pulsating. Systolic pressure was 120. The chest was clear, but the outlook grave. Patient expired at 11:45 p.m.

Post-mortem examination by Dr. M. Bevans revealed the following:

The right lung presented no specific abnormalities. The posterior aspect of the left lung was firmly adherent to and invaded by a large aneurysm of the descending aorta. Dissection of the bronchi failed to reveal any communication between the aneurysm and the bronchi. The
Figure 1. Female, aged 32. (A). There is a large mass in the central portion of the left chest. (B). Angiocardiographic examination. A large aneurysm with a thick clot is visualized arising from the descending aorta.
aorta presented slight to moderate atherosclerosis in its ascending portion, there being one focal sclerotic plaque about 2 x 2 cm, just superior to the anterior aortic cusp. There was no wrinkling or "tree-barking" of the ascending aorta. The arch of the aorta began to reveal extensive atherosclerosis with ulceration and superimposed thrombus formation. This process became more marked as one examined distally, so that the descending aorta was practically completely involved by an ulcerating atherosclerosis. About 8 cm below the arch of the aorta, extending laterally to the left and invading and compressing the posterior aspect of the left lower lobe of the lung, was an aneurysm of the aorta which measured 8 x 6 x 4 cm, and which was lined with a laminated thrombus. No communication could be traced from this aneurysm to the adjacent lung. In the lower portion of the descending aorta, just about 3 cm. above the bifurcation into the common iliac vessels, were found two small aneurysmal outpouchings, each measuring 2 x 2 cm, and each lined with a laminated thrombus.

Microscopic examination of the aorta revealed a questionable luetic aortitis.

Case 2: B. W., a colored female, aged 73, was transferred from the third (NYU) medical division of Bellevue Hospital, for diagnostic angiocardiology.

She was in fairly good health until about 8 months prior to her admission, when she suddenly became very dyspnoeic and lost her voice. Following this, she began to experience dysphagia, and was able to take liquid nourishment only. She had no episodes of vomiting. The dysphagia lasted for approximately 2 weeks. It then disappeared and she was able to eat all types of food. The patient noticed that her voice had become progressively hoarse since the onset of the dysphagia, but had improved slightly while in the hospital. Her dyspnoea was related principally to the ingestion of food and this, too, improved somewhat in the past few weeks. Her past history was non-contributory. She was married and had 2 living daughters; she admitted to having had 3 stillbirths, and 5 miscarriages. A review of systems was essentially negative, except for a non-productive cough, and slight dyspnoea on exertion. Venereal infection was denied.

The physical examination showed a fairly well developed, poorly nourished, 73 year old negress, lying propped up in bed, in no acute distress. She had a facial asymmetry, with lips pulled to the right. Her right eye was lower than the left, having the appearance of a right facial palsy. Her pupils were slightly irregular, equal, and reacted well to light and accommodation. She had bilateral nuclear cataracts. The sclera were clear, and there was no lid-lag. The fundi were not visualized, due to the cataracts. Ears, nose and mouth were essentially negative, except for carious teeth, and a deviation of the tongue to the right. The neck showed bilateral engorged veins, more marked on the right. These veins extended over the upper posterior chest, and right upper anterior chest wall. There was a small, firm, stony nodule in the left lobe of the thyroid. The trachea was slightly movable to the right, and on palpation and auscultation, revealed no thrills or bruits. There were a few shoddy cervical glands and a few small matted glands in the left axilla. Examination of the thorax revealed a kyphoscoliosis with the convexity to the right. Percussion was impaired in the upper portion of the right hemithorax. Breath sounds were diminished in this area—
there were no rales or ronchi. There was a "sensation" of a thrill in the 2nd right interspace. The remaining portion of the lungs was clear to percussion and auscultation. Examination of the heart revealed the apex beat to be in the 5th intercostal space, 8 cm. from the midsternal line. The heart was not enlarged to percussion. A. was greater than P., and there were systolic blowing murmurs at the base and apex. The apex beat was 88 and was equal to the pulse rate. The blood pressure in the right arm was 140/94, left arm 160/100. The abdomen was soft and showed marked weight loss. The liver was palpable 1 finger below the costal margin. There was right costovertebral tenderness. The extremities showed crepitation and swelling of the right knee, and clubbing of the right index finger. Neurological examination was negative except for impaired vibratory sensation.

Laboratory work revealed a sugar of 99 mgm.%; blood urea nitrogen 19.5 mgm.%; Wassermann was doubtful and Kline was positive. E K G showed a regular sinus rhythm.

The clinical impression of the mass in the right upper lung field was that of an aneurysm of the innominate artery; a teratoma and a dermoid cyst were considered as possibilities.

A roentgenographic examination of the chest revealed the following:

There was a large oval mass occupying the major portion of the upper third of the right pulmonic field. The mass was situated anteriorly, sharply demarcated, compressing and deviating the trachea to the left. The lower left portion of this mass merged with the aorta. The upper portion of the mass extended to the axillary portion of the apical and sub apical portions of the chest. The heart was slightly enlarged. The aorta was sclerotic. There were calcareous plaques in the transverse portion of the arch, in the arch, and in the thoracic portion of the aorta. The thoracic portion of the aorta was tortuous.

Circulation tests prior to angiocardiography were as follows: Ether, 13 seconds; Macasol, 22 seconds; Decholin, 22 seconds; Saccharine, 23 seconds.

Angiocardiographic examination in the PA projection (Fig. 2), at the end of 10 and 22 seconds revealed the following:

Contrast substance in the right heart was faintly visualized and showed an hypertrophy of the musculature of the right heart. The pulmonary arteries were visualized. There was an extensive collateral circulation in the right clavicular, right axillary and upper mediastinal regions. The axillary vein was of normal calibre. The brachial vein was markedly reduced in size. The subclavian was irregular and tortuous. There was a loss of vessel lumen at the junction of the subclavian and superior vena cava. The superior vena cava was markedly reduced in size and showed evidences of external pressure. There was an extensive collateral circulation in the lower portion of the axilla, with communicating branches to the superior vena cava. The hemi-azygos was visualized. A collateral leading to the dome of the right diaphragm was also visualized.

At the end of 22 seconds, the left heart was completely visualized. There was no hypertrophy of the left ventricle. The aorta contained contrast substance, and its tortuosity was well visualized. In addition, there was a large circular area of contrast substance within the mass previously described occupying the upper portion of the right hemithorax, which measured approximately 7 cm. in diameter. The contrast
substance was surrounded by a fairly thick wall below and laterally, and by a thick wall above and medially.

The mass in the upper portion of the hemithorax was diagnosed as an aneurysm with a thick clot. From the location, the possibility of an aneurysm of the innominate artery was more plausible than a saccular

**Figure 2, Female, aged 73:** (A), There is a large oval mass occupying the apical and sub-apical portions of the right hemithorax, compressing and deviating the trachea to the left.—(B), Kymographic examination shows pulsations along lateral margin of mass synchronous with those of the aorta.—(C), Angiocardiographic examination: the right heart and collateral circulation are visualized at the end of 10 seconds.—(D), The left heart and aneurysm of the innominate artery are visualized at the end of 22 seconds. Verified post-mortem.
aneurysm arising from the arch. Unfortunately, roentgen studies in the oblique position were not made.

The patient was returned to Bellevue Hospital, where she died two weeks later. Post mortem examination at Bellevue Hospital revealed a luetic aneurysm of the innominate artery with thrombus formation.

Case 3: G. K., a white male, aged 45, was admitted to this hospital on March 22, 1945, with a chief complaint of epileptiform seizures for 13 years. His family history was non-contributory. He had been married for 19 years, and had 2 children, living and well. He admitted having a penile sore 10 to 15 years ago, but denied any serious illness. He travelled in the tropics, had never had any tropical disease, except for a watery diarrhea which persisted for quite a while several years ago. A number of years ago he began having dizzy spells, about 10 a day, for which he claimed to have received arm and hip injections over a long period. These attacks diminished in frequency to about once a week. During these spells he lost consciousness. Occasionally he had convulsions with severe attacks. He had no recollection of the attack when consciousness was regained. He had impairment of memory. He had no girdle or leg pains, no urinary or cardiac difficulties. There was no past surgical history, except for a T & A 19 years ago. He denied the use of alcoholics and smoked a pack of cigarettes a day.

Physical examination revealed a moderately well developed and nourished male, in no apparent distress. His eyes showed pin-point pupils which were round and equal, and did not react to light. The discs were normal. His heart was enlarged to the left in the 5th interspace, with evidences of a supra-cardiac area of dullness. The heart sounds were hyper-active, with A greater than P.,. There was a loud systolic murmur over the aortic area. Blood pressure was 154/78. The abdomen revealed a scar over the right inguinal region. The remaining portion of the general examination was essentially negative. Neurological examination showed motor and sensory function intact. Reflexes were hyper-active and equal. His memory was very poor.

Laboratory findings were: Hgb. 13.6; WBC 11,000 with a normal differential; ESR 2 mm. after 1 hour; blood urea nitrogen 14.5 mgm.%; blood Wassermann 1+; BSP showed a 10% retention after 30 minutes; urine and stool negative; spinal fluid showed 1 white blood cell, was negative for ammonium sulphate; total proteins 30.6 mgm.%; Wassermann and Colloidal Gold were negative; BMR was minus 9; EKG studies were essentially negative.

A roentgenographic examination of the skull showed no abnormal findings. One of the chest (Fig. 3) revealed a mass in the supra-cardiac portion of the mediastinum to the right of the spine, and a diagnosis of an aneurysm was made. Angiocardiographic studies confirmed this diagnosis and revealed the presence of multiple aneurysm of the aortic arch, one containing a large clot.

Circulations tests prior to angiocardiography were: Ether, 3 seconds; Macasol, 12 seconds; Decholin, 13-4/5 seconds; Saccharine, 12-3/5 seconds.

Angiocardiography in the PA projection (Fig. 3) at the end of 3 and 13 seconds revealed the following: The right and left heart and large vessels were visualized in both projections. In addition, a band of contrast substance was visualized in the right paratracheal area, corresponding to the mass in the supracardiac portion of the mediastinum,
observed on routine examination. This band of contrast substance was visualized at the end of 13 seconds. The absence of contrast substance at the end of 3 seconds precluded it from being venous in origin. The upper portion of the superior vena cava was displaced slightly laterally and formed the lateral margin of the mediastinal mass. The subclavian and axillary veins were dilated.

Examination in the left oblique projection at the end of 3 and 12 seconds visualized the right and left heart and large vessels. The superior

![Figure 3, Male, aged 45: (A), There is a mass in the supracardiac portion of the mediastinum, to the right of the spine.—(B), Angiocardiographic examination: the right heart and large vessels are visualized at the end of 3 seconds.—(C), The left heart and aorta are visualized at the end of 13 seconds. Contrast substance is also visualized in the right paratracheal area as a band like structure which may be a tortuous and dilated innominate artery.—(D), Angiocardiographic examination in the left oblique position at the end of 12 seconds shows 3 prominences to the aortic arch: multiple aneurysms.](image)
vena cava was dilated and displaced anteriorly. There were evidences of external pressure against the superior vena cava by an aneurysm arising from the junction of the ascending and transverse portions of the arch. The aortic arch presented three prominences; a large one with a calcified periphery containing very little contrast substance; a second superimposed aneurysm; and a third localized prominence on the upper surface of the transverse portion of the aorta. From this there extended upward a faint shadow of contrast substance, which corresponded to the broad band-like structure observed in the P-A projection.

Hospital course: Patient was inoculated with vivax malaria and after several courses received a total of 55 hours of fever over 103 degrees. The malaria was terminated with suitable anti-malarial drugs. During the course of his stay, the patient had several epileptiform seizures, with amnesia for the affair and with mild or no convulsions. For these seizures, the patient was started on dilantin and the dosage finally set at .3 of a gram a day, in divided doses. This treatment was found to definitely diminish the frequency of his seizures. He was discharged on the 66th hospital day to return in three months for a follow-up on his aortic aneurysm.

Diagnosis: Tabes dorsalis.
Multiple aneurysms of the aorta, due to syphilis.
Induced malaria.

**Case 4:** F. D., a colored female, aged 63, admitted from the Out Patient Department on April 19, 1945, for diagnostic angiocardiography, who, when first seen at the clinic on March 14, 1945 complained of pain over the abdomen and shoulders. The patient stated she was well until about 1 year ago, when she had pneumonia. During the early part of last year, she first started having pains, which were fleeting in nature, noted principally across her chest, back, neck, and in her abdomen. Because of this, she stated, she was admitted to Harlem Hospital on May 25, 1944, and a transcript from this hospital revealed that a diagnosis of coronary thrombosis was made. A roentgenographic examination of the chest at that time showed a bulge of the left ventricle. She was treated conservatively and discharged on June 23, 1944 from Harlem Hospital. Since her discharge, she had a "sick feeling," especially in bad weather, which became progressively worse. A review of systems was essentially negative, except for a slight hacking cough, some dyspnoea on moderate exertion, and frequent skipping of the heart.

A routine fluoroscopic examination of the chest at the clinic revealed a bulge of the left ventricle, and it was decided to determine if this were a ventricular aneurysm by angiocardiography.

Physical examination revealed an elderly colored woman, in no acute distress. Her pupils reacted to light and accommodation. Ears, nose and throat were essentially negative. Chest was clear to percussion and auscultation. Examination of the heart revealed a normal rate and rhythm. There was no enlargement to percussion. No murmurs were heard. Blood pressure was 120/80. Examination of the abdomen was essentially negative.

Laboratory work revealed the following: RBC 4.59; Hgb 83%; WBC 4-8 with a normal differential; ESR 31 mm. per hour, and 15 mm. per hour; blood urea nitrogen 14.4 mgm.%; sugar 95 mgm.%; Urine, negative; Wassermann and Kline, negative; EKG revealed severe myocardial damage and intraventricular block.
A roentgenographic examination of the chest (Fig. 4) disclosed no infiltration or consolidation, no pleural effusion and no tuberculosis. The heart was enlarged; the axis transverse; the shape oval; and the configuration was that of an aortic or hypertensive type heart. In addition, there was a localized prominence to the left ventricular border due to a ventricular aneurysm. This was verified by angiocardiographic studies. Kymographic examination showed no characteristic ventricular pulsations at the site of the bulge in the left ventricular border.

Circulation tests prior to angiocardiography were: Ether 5-1/4 seconds; Decholin 13-4/5 seconds; Saccharin 12-1/2 seconds; Macasol 13 seconds.

The following cases illustrate non-vascular lesions:

Case 5: A. A., a white male, aged 58, was admitted to this hospital on November 3, 1944 with a complaint of loss of weight, weakness, tiredness and persistent cough of 6 months duration. In October of 1939, while walking downstairs, he noticed that his knees were weak. He returned to bed and the next day found his legs were swollen, especially at the joints and that he was unable to move them. His arms and elbows were similarly involved. He was taken to Morrisania Hospital, where he remained for 2 months, and was told that he had had a "rheumatic attack". He returned home and remained in bed for seven months until his legs were strong enough to support him. His present illness began 6 months ago, when despite an enormous appetite he began to lose weight. His weight dropped from 160 to 140 pounds. He became weak, progressively more tired, slightly dyspneic, and at night slept with 3 pillows to relieve his cough. At night he felt hot and perspired a great deal. He had no chest pain and was not aware of any glandular enlargement. On November 2, 1944, he was admitted to Metropolitan Hospital. There it was found that his WBC was 400,000, with over 90% lymphocytes. He was transferred to this hospital on November 3, 1944. His family history was non-contributory. A review of systems revealed that he had had a cough for 20 years. Coughing spells occurred mostly at night and produced a teaspoonful of a whitish-yellow sputum during an episode. He had no history of hemoptysis, chest pain, night sweats or weight loss. He was told that he had bronchial asthma. However, he never had a frank asthmatic attack, and never received any type of injection. He had been taking variously colored capsules over a period of years. He never had pneumonia, but did take cold easily. In 1936, and again in 1943, he stated, he had gonorrheal infections. He denied a luetic history.

Physical examination revealed a poorly nourished, middle-aged man, in no acute distress. He was somewhat dyspneic. He had a right corneal opacity. His left pupil reacted to light and accommodation. His ears, nose and throat were essentially negative. He had markedly enlarged, discrete, rubbery glands in the anterior and posterior cervical, subaxillary, axillary and inguinal regions. His chest was emphysematous, hyper-resonant, and breath sounds were increased, particularly during the expiratory phase. Inconstant, scattered rales were heard throughout both lung fields. The cardiac borders were not percussable. The point of maximum intensity was heard in the 5th interspace at the midclavicular line on the left. Heart sounds were of fair quality, and the first sound was split at the apex. $A_2$ was greater than $P_2$, and there
Figure 4, Female, aged 63: (A), There is a prominence to the basal portion of the left ventricular border; ventricular aneurysm.—(B), Kymographic examination shows a loss of ventricular pulsations in the area corresponding to the site of the bulge in the ventricle.—(C), Angiocardiographic examination: the left heart and aorta are visualized at the end of 12 seconds. A ventricular aneurysm is visualized.
were no audible murmurs. His pulse rate was 78. Blood pressure was 125/84. Examination of the abdomen revealed the liver edge to be firm, smooth and tender, and it was palpable 4 cm. below the costal margin. The remaining portion of the physical examination was essentially negative.

Laboratory findings revealed the following: RBC 3.9; Hgb 79%; ESR 16; WBC 370,000 with 95% lymphocytes; blood urea nitrogen 25.8 mgm.%; uric acid 4.4 mgm.%; urine 1+ albumin; urine concentration test 1027; Bence-Jones test negative; BMR +37; Wassermann and Kline were negative; EKG showed mild myocardial damage.

A roentgenographic examination of the chest (Fig. 5) on November 6, 1944, revealed a large mediastinal and paravertebral mass on the left side merging with the aortic shadow and not differentiated from it. It

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**Figure 5. Male, aged 58:** (A), Large mediastinal and paratracheal mass, left side, merging with the aorta, and differentiated from it.—(B), Angiocardiographic examination: the right heart, pulmonary aorta, right and left, pulmonary arteries, pulmonary vessels and superior vena cava are visualized at the end of 3 seconds.—(C), The left heart and aorta are visualized at the end of 10 seconds. There is no contrast substance within the mass in the superior mediastinum; it is non-vascular.—(D), Marked regression of mediastinal mass following radiation therapy: chronic lymphatic leukemia.
was felt this might be enlarged nodes or an aneurysm. Oblique views a short time later did not distinguish the origin of this mass.

**Course:** On November 14, 1944, 11 days after admission, the patient began receiving roentgen therapy to the spleen. After 4 treatments, his WBC had dropped to 66,000. Clinically during this period the patient was in excellent spirits and had no complaints. He gained 3 pounds. His spleen, liver and lymph glands had not appreciably changed since admission. The radiation therapy was terminated on November 27, 1944. At this time the WBC was 66,000; RBC 3.45; Hgb 61%. Several days later the patient began to cough and was dyspneic. On December 8, 1944, his count was 400,000 with 95% mature lymphocytes. Radiation therapy was again instituted and on December 22, 1944, his WBC was 13,000 with 69% lymphocytes. There was no change in the appearance of the paratracheal mass.

On December 27, 1944, angiocardiographic studies were made, without ill effects and revealed the following:

Angiocardiographic examination in the PA projection (Fig. 5) at the end of 3 seconds, visualized the entire right heart, pulmonary aorta, right and left pulmonary arteries, and several pulmonary vessels, as well as the superior vena cava. The right heart was not enlarged. The upper surfaces of the right and left pulmonary arteries showed evidences of pressure from a mass in the superior mediastinum. At the end of 10 seconds, the left heart and aorta were visualized. The left heart was not enlarged. The musculature of the left ventricle measured approximately 8 mm. in thickness. The aorta was outlined within the mass in the superior mediastinum. The mass within the superior mediastinum contained no contrast substance, except for that within the aorta. Examination in the left oblique projection at the end of 9 seconds showed contrast substance in the left heart and aorta. The left auricle was visualized, as well as the vessels leading into it. The lumen of the ascending aorta measured approximately 4½ cm., while the transverse and descending portions measured 2½ cm. The large vessels leading from the aortic arch were visualized. There was no contrast substance within the mass. There was a slight fusiform dilatation of the ascending aorta. The large mass in the superior mediastinum did not fill with contrast substance; it was not vascular in origin.

The patient was discharged with a WBC of 20,000. He had gained 4 pounds; his cough and dyspnea had improved, and the lymph nodes throughout his body had decreased in size. There was no change in the size of the spleen.

The clinical improvement did not last. He was readmitted to the hospital in March and again in July, because of dyspnea, fatigue and generalized enlargement of nodes.

**Case 6:** M. H., a white female, aged 46, a registered nurse by profession, was referred by Dr. Louis R. Davidson for angiocardiographic study because of the presence of a mass in the upper and anterior mediastinum. She had always enjoyed good health. Twelve years ago she had had a normal BMR. Ten years ago, while in the Public Health Service, in the course of an annual examination, she had had a kymographic and roentgenographic examination of the chest; these were reported as normal. She was married 16 years ago; had one child; living and well. There is no previous surgical history.

During the past winter she had a laryngitis. Recently the patient
developed a cough which she thought was due to a sinus infection; this was followed by a wheeze. A roentgenographic examination of the chest revealed a large mass in the anterior superior mediastinum which extended to either side of the mid line. The trachea was compressed and deviated to the left. Other laboratory data revealed a normal EKG, and a −7 BMR.

Circulation tests were: Ether, 3 seconds; Macasol, 10 seconds; Decholin, 9½ seconds; Saccharine, 10 and 12 seconds.

Angiocardiographic examination (Fig. 6), revealed the following: The heart and large vessels were opacified in the PA and LAO projections at the end of 3 and 10 seconds. No contrast substance opacified any portion of the mediastinal mass, and therefore it was considered as non-vascular in origin.

Figure 6. Female, aged 46: There is a large mass in the superior mediastinum compressing and deviating the trachea to the right. The mass extends to either side of the mid-line, down to the aorta. Angiocardiographic examination at the end of 3 and 10 seconds failed to show any contrast substance within the mass; it is non-vascular. Surgery was instituted and the mass proved to be a retro-sternal thyroid.
Surgical intervention and excision of the mass by Dr. Louis R. Davidson proved it to be a large retrosternal thyroid.

SUMMARY

Six cases with angiocardiographic studies are illustrated: One with a cardiac lesion, two with non-vascular and three with vascular lesions. The cases illustrate a left ventricular aneurysm; two nonvascular mediastinal lesions: a retrosternal thyroid, and a chronic lymphatic leukemia; an aneurysm of the innominate artery; an arteriosclerotic aneurysm of the descending aorta; and multiple aneurysms of the aortic arch.

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RESUMEN

Se ilustran seis casos con estudios angiocardiográficos: Uno con una lesión cardiaca, dos con lesiones no vasculares y tres con lesiones vasculares. Los casos ilustran un aneurisma del ventrículo izquierdo; dos lesiones mediastínicas no vasculares: una glándula tiroides retro-esternal y una leucemia linfática crónica; un aneurisma de la arteria innominada; un aneurisma arterio-esclerótico de la aorta descendente; y aneurismas múltiples de la curvatura de la aorta.

REFERENCES