Aortic Aneurysm Secondary to Mediastinal Abscess
Report of Two Cases

D. E. Blickenstaff, M.D.* and Charles M. Nice, Jr., M.D., F.C.C.P.

New Orleans, Louisiana

Rupture of the esophagus continues to be a catastrophic event which demands early diagnosis if mortality rates are to be significantly decreased. The usual complications of esophageal perforation are well known. It is the purpose of this paper to present two unusual cases of esophageal perforation, both of which developed abscesses followed by the formation of thoracic aortic aneurysms. To our knowledge, this rare entity has not appeared in the literature prior to this time.

**Case Reports**

**Case 1**

This 14-year-old white boy was admitted to the hospital on July 1, 1960, with complaints of progressive pain in the neck and throat which began approximately six days prior to admission. His illness became progressively worse with nuchal rigidity, swelling of the base of the neck, dysphagia, chills and fever (103 to 105°F). He had a fishbone removed from his upper esophagus approximately seven days prior to admission.

On admission, he seemed coherent, but would not verbalize. The right base of the neck was swollen, tender, and hot. Temperature was 105°F. An upright chest x-ray film on July 2, 1960, revealed widening of the superior mediastinum (Fig. 1A). Spinal tap was done which revealed 4,200 lymphocytes per cmm. Initial blood culture grew out Staphylococcus aureus; however, subsequent blood cultures failed to grow out any pathogen.

He was taken to the operating room on July 2, 1960, where the posterior superior mediastinum was entered and drained of 40 to 50 ml of frank pus. Subsequent cultures of both cerebrospinal fluid and the purulent mediastinal material revealed Staphylococcus aureus.

He responded slowly but remarkably well to massive doses of antibiotics, steroids, and supportive measures, and became partially ambulatory. However, approximately three and one-half weeks after admission he developed a brassy cough and spiking temperatures. Serial upright roentgenograms of the chest showed progressive enlargement of a left paratracheal mass (Fig. 1B and 1C). He was returned to the operating room on July 24, 1960, where another attempt was made to drain the superior mediastinum. No purulent material was encountered at this time. A large pulsating mass was found superiorly and anteriorly to the heart and upon attempt to free the mediastinal leaf of the left pleura a rent developed in the mass, which was actually the posterolateral wall of the aortic arch. He lost copious amounts of blood and failed to respond to cardiac massage or rapid blood administration.

At necropsy, gross examination of the esophagus revealed only that the esophagus was adherent to the pericardium in the posterior mediastinum. Microscopic examination of the esophagus revealed a small nidus of foreign body giant cells, macrophages, and refractile fragments of a foreign substance within the inner circular smooth layer and extending into the submucosal layer. This nidus connected to the adventitial layer with a small tract containing acute and chronic inflammatory cells. Gross examination of the aorta revealed a large, fibrous mass surrounding the aorta and great vessels. The mass was connected directly to the under surface of the aorta and represented aneurysmal dilatation of the aortic arch. No attachment was noted to the esophagus. Microscopic examination of the aortic wall revealed replacement of normal tissue by granulation tissue. The heart valves were entirely normal.

**Case 2**

This 30-year-old colored woman was admitted to the hospital on June 5, 1963, because of a three-week history of epigastric pain, nausea, vomiting, chills and fever.

Admission blood pressure was 110/80, pulse was 135 and regular, and temperature was 103°F. A grade II systolic murmur was heard over the apex and over the pulmonic area. Physical examination was otherwise not remarkable. Blood cultures grew out Group A beta hemolytic streptococcus. She responded initially to massive doses of antibiotics; however, she continued to complain of epigastric pain. Initial chest x-ray films revealed only left lower lobe pneumonia which

*Instructor in Radiology, Tulane Medical School; Resident in Radiology, Charity Hospital.

**Professor and Chairman, Department of Radiology, Tulane University School of Medicine; Director of Diagnostic Radiology, Charity Hospital.
FIGURE 1: Mediastinal abscess invading aortic arch. (A) July 2, 1960. Mediastinal abscess one week after fishbone was removed from upper esophagus. This was drained surgically. (B) July 18, 1960. Persistent widening of mediastinum at the level of the aortic arch. At surgery no pus was found, but instead there was an aneurysmal dilatation of the aortic arch.
responded well to antibiotics. Examination of the upper gastrointestinal tract several days after admission was described as normal, but in retrospect it could be seen that there was anterior and left lateral deviation of the distal esophagus (Fig. 2A). The epigastric pain continued and approximately one week after admission the liver and spleen became palpable and progressive tenderness was elicited over these areas. Serial chest x-ray films at this time revealed an enlarging mass in the inferior aspect of the posterior mediastinum (Fig. 2B). A mediastinal abscess possibly involving the aorta was suspected.

Because of her deteriorating condition, an angiography was performed on June 19, 1963. A catheter was inserted into the left femoral vein and extended into the right atrium. Approximately six seconds following the introduction of the contrast material the thoracic and abdominal aorta were well filled with contrast material with the striking exception of a segment between T11 and L1, which did not opacify (Fig. 2C). A large, irregular, opaque mass was noted extending from the level of T4 to T12. Approximately 12 seconds following injection of contrast material it was seen that the large, irregular mass had become more opaque (Fig. 2D). Examination of the upper gastrointestinal tract on the same day also revealed a huge mediastinal mass deviating the distal esophagus anteriorly and to the left.

She was taken to the operating room on June 20, 1963, where exploration revealed a large retroperitoneal mass surrounding the thoracoabdominal aorta, extending above and below the diaphragm with a purulent abscess of the spleen and left lobe of the liver. This mass represented an infected hematoma surrounding a large aneurysm of the aorta at the level of the diaphragm. A perforation of the distal esophagus measuring 0.5 to 1.0 cm. in diameter was identified 1 to 3 cm. above the esophageal hiatus. She lost large amounts of blood and developed cardiac arrest which failed to respond to the usual measures. Necropsy was not granted.

**Discussion**

The two most frequent causes of perforation of the upper esophagus are (1) perforation by ingested foreign bodies, and, (2) iatrogenic perforations (instrumentation). These perforations usually remain localized and very rarely does infection involve the superior mediastinum. Case 1 represents perforation of the upper esophagus by a foreign body. We believe that the esophageal perforation progressed to a purulent mediastinitis which was ultimately responsible for the development of the
Figure 2: Abcess invading lower thoracic aorta. (A) Enlarging mass in lower mediastinum and upper abdomen. (C) Six seconds after injection of contrast medium through catheter in right atrium, the lower thoracic aorta and part of the mass are opacified. (D) Twelve seconds after injection there is pooling of contrast medium in the abscess.
Aneurysm of the aortic arch.

The most common cause of perforation of the lower esophagus is by spontaneous rupture, and this probably represents the most serious of all esophageal ruptures. It is postulated, from reviewing Case 2, that the aortic aneurysm developed as a result of an esophageal perforation which was responsible for the development of a suppurative mediastinitis and large abscess below the diaphragm. The symptom complex and pathologic operative findings discussed in Case 2 bear no relationship whatsoever to those rare cases discussed by Bagnuolo and Bennett, and Ramseyer, in which they discuss perforation of the esophagus by aortic aneurysms.

The question arises as to the possibility that both of these cases represent mycotic aneurysms. Mycotic aneurysms are due to bacterial infection of the arterial wall, usually associated with bacterial endocarditis. Most mycotic aneurysms are embolic in nature, and most probably necrosis of the wall is secondary to infected emboli which lodge in the vasa vasorum. Neither patient presented in this paper demonstrated any other clinical manifestation of subacute bacterial endocarditis, and the postmortem examination of the heart valves in Case 1 was described as normal.

REFERENCES

DIFFUSE FIBROSING ALVEOLITIS

Two patients with clinical, functional and histologic features of diffuse fibrosing alveolitis had serologic evidence of autoimmune reactions. Serologic tests for autoantibodies in a further 15 patients with diffuse fibrosing alveolitis showed a moderate incidence of positive reaction. The evidence for autoimmunity as a cause of this lung disease, although not decisive, does call for further studies on the role of immune mechanisms.


SILICOSIS COMBINED WITH MALIGNANT NEOPLASMS OF LUNG

Three cases are reported of silicosis combined with malignant neoplasms of the lung, of varying histogenesis. The evolution of the silicotic lesions seems ultimately to obey the known patterns of the neoplastic invasiveness. Nevertheless, when silicosis is concurrent, the specific lesions are liable to offer a higher resistance to neoplastic spread. A more obvious correlation between the two conditions could perhaps evidence itself in the lymph vessels, inasmuch as the silicotic lesions could induce an abnormal pattern for the spread of the new growth.


MYCOBACTERIOSES

The Mycobacterioses is a term used to cover disease due to all mycobacteria, including tubercle bacilli, as well as other mycobacteria such as those labelled atypical, anonymous, unclassified or non-tuberculous. It has been demonstrated that in Puerto Rico, the prevalence of infection with mycobacteria other than tubercle bacilli is very high. Persons infected with these mycobacteria may react to tuberculin and, at times, may show disease which is usually of low toxicity. These microorganisms can be identified only by their characteristics on culture.

The possibility of infection or disease produced by these mycobacteria should be considered in all persons suspected of having tuberculosis who have a weakly positive tuberculin reaction or who fail to respond to the usual antituberculosis chemotherapy. The disease due to these mycobacteria is not known to be transmitted from one person to another; therefore, these patients should not be hospitalized and should not be kept together with tuberculous patients.