Spontaneous Rupture of a Peripheral Artery: Report of Case

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The case history of a patient with apparent spontaneous rupture of the posterior tibial artery is presented, with a brief review of the previously reported cases.

Spontaneous rupture of a peripheral artery is a very rare condition. Bonnet, Martin, and Nikodievitch reported 2 cases and found reference to one other case report in the literature. The first of their cases was that of a soldier 51 years of age who had typhus fever several weeks prior to the development of gangrene of the right lower extremity. Amputation was performed eleven days after gangrene was noted but the patient died shortly after operation. A postmortem examination revealed a rupture of the external iliac artery and vein. The second patient was a farmer 73 years of age who had malaria and who shortly thereafter had experienced pain in the back of the right leg which soon began to swell and then became gangrenous. Amputation was performed and a rupture of the popliteal artery and vein was found.

A case of spontaneous rupture of the posterior tibial artery without apparent cause is reported herein.

Report of Case

A married white man, 38 years of age, in the wholesale grocery business, was admitted to the Mayo Clinic as an emergency patient on August 2, 1948.

The family history did not reveal that any member had suffered from a hemorrhagic disease or tendency. For sixteen years before coming to the clinic, the patient had noticed that he bruised easily, as a result of which small ecchymotic areas would develop on his body and especially on the lower extremities. Pain had developed four years previous to his registration but the calf of the right leg did not swell at that time. The pain had progressed rapidly upon elevation of the leg and the use of hot applications. Two years before he entered the clinic an episode of acute abdominal pain and distention had developed. Surgical exploration revealed hemoperitoneum but a bleeding point was not found. He had made an uneventful recovery after the operation.

Twelve days before admission a dull pain had developed in the right calf. The patient continued his work for the next three days. The pain became increasingly severe and while he was taking a hot bath he noted a rather sudden swelling of the right leg from the knee down. He was hospitalized in his home community the next day because of the pain and swelling, and shortly thereafter the involved leg became purple. The patient had been treated conservatively with elevation of the leg, rest in bed, and sedation but had continued on a downward course.

Careful and repeated questioning of the patient, his wife, and his brother on admission to the clinic and during his stay in the hospital failed to disclose any evidence of trauma to his leg.

Initial examination revealed a markedly asthenic, slightly icteric, and acutely ill man in great pain. The blood pressure reading was 135/100. Temperature, pulse, and respiration were normal. There were several small purpuric areas on the anterior thoracic wall, and the right leg was ecchymotic from 3 inches above the knee downward. There was no rigidity or tenderness of the abdomen. The liver, kidneys, and spleen could not be palpated. The lymph nodes in both inguinal regions were slightly enlarged. Results of rectal examination were negative. The peripheral arterial pulsations which are usually palpated were found to be normal. The right leg was moderately edematous and the skin was taut and warm. On palpation marked tenderness was noted in the calf of the right leg and the patient was unable to extend his leg. A soft systolic bruit was heard over the lower anterolateral aspect of the right leg.

The hemoglobin measured 9.5 grams per 100 cc. of blood, the erythrocytes numbered 2,600,000 per cu.mm., and the leukocytes 14,800 per cu.mm. of blood. Urinalysis revealed albuminuria, Grade 3.

Shortly after the initial examination the involved calf had increased 1.5 inches in diameter, and the pain also had increased. A diagnosis of active arterial bleeding was made, and immediate surgical intervention was considered necessary.

Arteriography was performed in the operating room with 25 cc. of a 35 per cent solution of diodrast injected into the right femoral artery; the posterior
tibial artery could be visualized only for about 1.5 inches from its origin. The artery was then exposed and found to have two perforations about 1.5 inches distal to the bifurcation of the popliteal artery. The posterior tibial artery was ligated and the involved section of the artery was removed and sent to the pathology laboratory for study. A hematoma of clotted and nonclotted blood was evacuated. An apparent cause for the perforations was not found at the time of the operation but it was noted that both arteries and veins in this region were very friable.

Morphologic study of the section of artery revealed an acute polymorphonuclear leukocytic exudation around the point of rupture but the arterial wall was damaged to such an extent that definite changes could not be visualized.

With the evacuation of the hematoma and ligation of the artery, there was relief of pain. Further studies were then carried out in an attempt to discover the cause of this condition.

Results of serologic examination were negative. The bleeding time was three minutes; the blood coagulation time (Lee-White method) was six minutes and thirty seconds. The prothrombin time (Quick method) was twenty-eight seconds; large doses of synthetic vitamin K were administered intravenously after operation and the prothrombin time returned to a normal level of twenty seconds. The platelet count was 130,000 per cu.mm. of blood and the level of ascorbic acid in the blood was 0.3 mg. per 100 cc. of plasma.

The fat content of the blood was within the normal range as was the urea content. The direct reaction for serum bilirubin (van den Bergh test) was negative and the indirect reaction disclosed 1.5 mg. of bilirubin per 100 cc. of serum one day after operation. This returned to normal before the patient was dismissed from the hospital. No sulfobromophthalein (bromsulfalein) was retained at the end of one hour. The sedimentation rate of erythrocytes was 30 mm. in one hour.

Study of special blood smears revealed hypochromasia with polychromatophilia and a differential count of 13 per cent lymphocytes, 7 per cent monocytes, and 80 per cent polymorphonuclear leukocytes; 69 per cent of the leukocytes were filament cells and 11 per cent were nonfilament cells. Sternal biopsy revealed normal bone marrow cells. The only abnormality indicated in a roentgenogram of the thorax was an elevation of the right side of the diaphragm.

After transfusion of blood and just prior to the patient's dismissal from the hospital, the hemoglobin measured 12.2 grams, and the erythrocytes numbered 4,600,000 per cu.mm. of blood and the leukocytes 7,700. The results of urinalysis were negative.

A section of the left ulnar artery that was removed and studied, was found to be normal. The patient made an uneventful recovery and was dismissed from the clinic on August 23, 1948.

The case reported is interesting in that a cause for the rupture of the artery was not apparent. Herrman reported a case of rupture of the deep epigastric artery and explained the rupture on the basis of the anatomic structure of the musculature of the abdominal wall. However, Bonnet, Martin, and Nikodievitch, who were unable to study the walls of the vessels at the point of rupture because of the condition of the specimens, studied the proximal portions of the vessels and concluded that there were two predisposing causes for rupture: (1) an atheroma involving the media of the artery and (2) the previous existence of a severe infection. They felt that the infection became localized in the atheroma and thus weakened the wall of the artery sufficiently to permit rupture. The extravasated blood caused periphlebitis and phlebitis in the contiguous veins.

Our patient did not give a history of localized trauma or previous infection and we did not discover a focus of infection. Atheromas were not present in the sections of artery that were studied. The possibility of localized arteritis or a small aneurysm at the point of rupture was not excluded but the presence of either seems unlikely.

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