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MYCOTIC ANEURYSM OF POPLITEAL ARTERY AND AORTOFEMORAL BYPASS GRAFT

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ABSTRACT

Mycotic aneurysm could be divided into three types according to their etiology: spetic-embolic, cryptogenic and traumatic type. During the period from 1972 to 1974 two cases of mycotic aneurysms have been seen at the Ohio Valley Medical Center — one following a subacute bacterial endocarditis and another one was two years following surgery for aortofemoral bypass graft. The clinical course of both patients are discussed. The prognosis of mycotic aneurysm is always fatal without surgical intervention.

Mycotic aneursym is a rare entity which is occasionally reported in the literatures. As far as these case reports go the pathology could be divided into three categories according to their etiology, even though the pathology is essentially the same.

1. The septic-embolic or primary mycotic aneursym in which the aneursym is secondary to the sepsis which settles in the wall of the artery and destroys the lamina media and finally developing an aneursym. This type of mycotic aneursym is usually seen in any type of septicemia.
2. The cryptogenic or secondary mycotic aneursym in which the sepsis takes place in the pre-existing aneursym of the arterial wall usually due to arteriosclerotic disease.
3. Traumatic or mixed type mycotic aneursym in which the sepsis and arterial wall damage takes palce at the same time. This type of mycotic aneursym is seen in narcotic addicts.

The prognosis of this pathology is always fatal without surgical intervention. The mortality rate in the series are reported by Perdue, Anderson and Mundth are shown in Table 1.

During the last three years from 1971 to 1973, two cases of mycotic aneursym were seen at the Ohio Valley Medical Center — one secondary to subacute bracterial endocarditis in the popliteal artery and another one due to septicemia with staphylococcus aureus in a previously performed aortofemoral bypass graft.

CASE I: This 76 year old white male, non-diabetic, was admitted to the hospital on 9/27/74 with a chief complaint of low back pain, duration of one month prior to admisssion. In the past history he had two transient ischemic attacks. He had carcinoma of the prostate in 1972. He had a heart attack in 1970 and has had occasional angina which was under medical control. In May, 1974 the patient was admitted for an episode of transient ischemic attack. The SMA-6 and 12, skull x-rays, brain scan, C.B.C., urinalysis were within normal limits. VDRL was negative. Chest x-ray showed cardiac enlargement. EKG showed old anterolateral mycardial infarction.

On this admission the patient complained of low back pain and slight dyspnea on effort. On examination the jugular veins were slightly distended. There was a systolic murmur over the tricuspid area. Blood pressure was 155/65. Pulse 100 per minute and regular. Straight leg raising 75 degrees in the left and 80 degrees in the right. Circulation was satisfactory.

Patient was worked up and further studies including SMA-12 and 6 urinalysis were within normal limits. C.B.C. showed a Hemoglobin of 9.5 grams, Hematocrit of 28, otherwise within normal limits. Lumbosacral x-ray series showed anarrowing of the disc spaces between L-3,4 and L-4,5. D.I.P. not remarkable. Bone scan showed increased uptake of D-11 and 12, as well as L-3,4. Lung scan was negative.

During the second week of admission patient developed a low grade fever with spikes of 103° for about four days. Blood cultures six times revealed Gamma Streptococcus (non-hemolytic).

Patient was treated with 20 million units of Penicillin and 0.5 grams of Streptomycin daily. A few days later patient developed some petechia in the right foot. During the fourth week of admission the systolic murmur became more audible and the patient experienced pain in his right leg most prominent in the popliteal and calf areas. The Homan's sign was negative and clinical examination of the right leg showed nothing remarkable. During the fifth week of admission the patient developed a pulsatile mass in the right popliteal area. Considering the positive culture of blood, the systolic murmur and subacute

Table 1. Comparison of Mortality Rates Between the Operated and Non-operated:

	PERDUE	ANDERSON	MUNDTH
Total No. of cases reported:	16	16	17
Number of cases operated:	10	15	14
Number of cases who survived:	9	12	7
Number of cases who died:	1	3	7
Number of cases not operated:	6	1	3
Number of cases who survived:	0	0	0
Number of cases who died:	6	1	3

bacterial endocarditis, mycotic aneursym of the popliteal area was diagonsed and confirmed subsequently by the arteriogram (Fig. 1).

On 11/3/74 when the patient was afebrile for a period of about three weeks he underwent surgery. The popliteal area was opened medially, the aneursym identified and found to be five centimeters in greatest diameter extending just between the anterior tribial and the posterior tibial arteries adherent to the surrounding tissues including the vein. The aneursym was resected with the attached vein and was sent to Pathology for diagnosis (Fig. 2). A saphenous reverse vein graft from the same thigh was used for the femoropopliteal bypass graft. The superficial femoral vein was ligated at its highest connection with the deep femoral vein. After surgery the dorsalis pedis, as well as the posterior tibial pulse were palpable and the postoperative course of the patient initially was satisfactory except for slight swelling of the right foot which was thought to be due to the superficial femoral vein ligation. The day after surgery the patient experienced urinary retention which was treated by a Foley catheter. Patient was ready to be discharged from the hospital but on 12/1/74 seventeen days after surgery he suddenly had a cardiac arrest with ventricular fibrillation while he was on his way from the chair to the bed. The patient was resuscitated and transferred to CCU. EKG showed a new ischemic change. Patient became comatose for the rest of his hospital course. Since the possibility of a ruptured intracranial aneursym was suggested, a spinal tap was done and revealed R.B.C. 1/cu.mm and W.B.C. 1/cu.mm. These findings did not support such a possibility. On 12/5/74 patient developed another cardiopulmonary arrest. All attempts at resuscitation failed and he expired. The request for autopsy was not granted. The cause of cardiac arrest and death was still uncertain but arteriosclerotic heart disease or pulmonary embolism were considered to be the most likely possibilities.

CASE II: This 66 year old white male was admitted to the hospital on 5/6/73 complaining of a mass in his left inguinal area which developed three days prior to admission. The histroy of present illness went back to 9/6/71 at which time the patient was admitted for severe ischemic vascular disease in the left leg. He underwent surgery in which an aortofemoral bypass graft using a 10 Dacron was performed with a left lumbar sympathectomy. Postoperatively he had satisfactory circulation thru the left leg. The wound was completely healed and he was discharged on 10/9/71. On 5/2/73, 1½ years later the patient was admitted with chills, fever and back pain. Blood culture showed Staphylococcus aureus possibly from a carbuncle on the back of his neck which had been drained in another hospital many weeks before. Patient was treated with Kelfin intravenously. On the

Fig. 1. Arteriogram showing aneurysm of popliteal area.

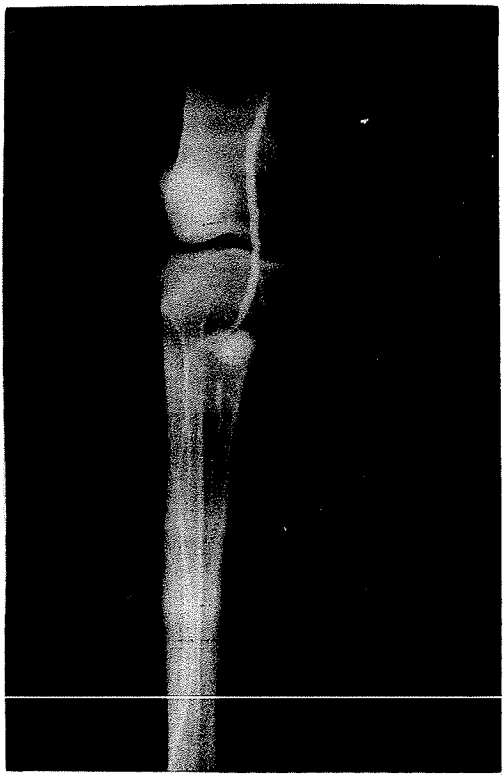

Fig. 2.B. The lower third shows inflammatory cells.

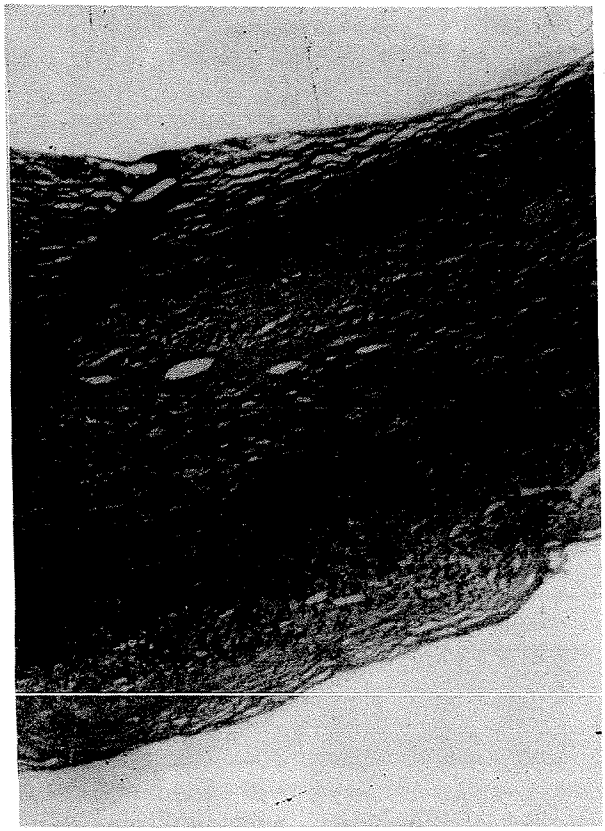

Fig. 2. A. Partially organized clot in which some inflammatory cells are still present.

fifth day of admission he became afebrile and was continuously afebrile for a subsequent week. Patient was discharged on 5/12/73 on oral cephalothin. On 5/16/73 patient was then readmitted to the hospital because of this mass in his left groin which was at the site of the previous scar of the aortofemoral anatomosis. On examination the mass was soft, pulsatile, tender and 2XI-½ inches in size. On 5/17/73 patient was brought to the operating room and the left inguinal area was opened. There was a pus collection over the graft which was drained and the area was irrigated with Kanamycin. Culture of this drainage showed Staphylococcus aureus. On 5/18/73 patient started bleeding from the same area on and off for five days in an amount of 50 to 250 cc's. On 5/22/73 patient was brought to the operating room again for exploration of the anastomosis in the inguinal area. It was found that the bleeding was from a mycotic aneursym in the anastomosis of the femoral artery to the graft. Bleeding was controlled by resuturing of the anastomosis and the area was irrigated intensively by Kantrex solution. Postoperatively the bleeding stopped but patient still had some purulent drainage from the wound. Patient was discharged from the hospital on 6/29/73, but he was readmitted on 8/6/73, because of massive hemorrhage from the same area. Bleeding was controlled by applying pressure. However, the left leg became gangrenous and nonviable due to occlusion of the graft. Patient underwent a left midthigh amputation and postoperatively still had drainage fom the graft site. Finally on 11/11/73, patient underwent surgery because of the draining sinus of the left groin due to an infected graft. The graft was removed through a left retroperitoneal dissection. The postoperative course at this time was uneventful and patient was discharged from the hospital on 12/7/73. He continued to do well.

Discussion:

In the first case popliteal mycotic aneurysm developed about three weeks after subacute bacterial endocarditis which is rather classical for the septicembolic type of mycotic aneurysm. The subacute bacterial endocarditis in this case was confirmed by heart murmur, petechia, positive blood culture of Gamma Streptococcus. It should be mentioned that the tender mass in the popliteal region was not present when the signs of subacute bacterial endocarditis and petechial hemorrhage in the right foot developed. Utilization of a reverse vein graft which was done in this case is the most acceptable type of surgery. This patient died because of cardiac arrest which occurred seventeen days postsurgery with cerberal hypoxia.

The second case is somewhat more complicated. The development of mycotic aneursym was secondary to the septicemia which occurred subsequent to the draining of a carbuncle. Isolation of Staphylococcus aureus from a blood culture two week earlier and finding the same organism in the groin mass at the anastomosis raised the impression that during the speticemia infection of the arterial anastomosis had taken place and thereafter the infection extended out of the arterial wall and collected locally outside of the artery. In other words, the groin collection was secondary to septicemia and via the anastomosis line a mycotic aneursym was initially developing at the same time. One of the problem in this case was that the course of antibiotic therapy for septicemia was not sufficient to eradicate the organism. As a comment, every patient with arterial surgery should be watched carefully for any event of septicemia and once this occurs prolonged intensive doses of antibiotics should be given until three subsequent blood cultures become negative and clinically patient becomes afebrile for one week. Prophylactic antibiotics should be given in infected or potentially infected conditions during surgical treatment in patience who have arterial plastic prostheses.

Regardless of etiological factors, once a mycotic aneurysm develops, careful attention should be paid to find any other mycotic aneurysms which may develop in other parts of the body, because multiple mycotic aneurysms, could develop in the same patient.

Finally, in the first case, ligation of femoral vein is a matter of controversy, and the alternative way is the repair of the vein using the saphenous vein.

In the second case the better way of management of infected — graft in the groin is, removing the graft and performiing the extra — anatomical by-pass such as axillofemoral, graft using the reverse saphenous vein for the groin anastomosis.

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