

# HISTORICAL VIGNETTES IN VASCULAR SURGERY

Norman M. Rich, MD, Section Editor

## The first operation on the profunda femoris artery

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The importance of the deep femoral artery in the revascularization of the lower extremity has been recognized for many years.<sup>1,2</sup> In 1996, while we were preparing for an exhibit to celebrate the 50th anniversary of the Society for Vascular Surgery (SVS), we were contacted by Frank Leeds, longtime associate of Norman Freeman, about the first reconstruction on the profunda femoris artery by Freeman. Leeds also sent along the case record, operative report, anesthesia record, and correspondence with Peter Martin of London, another pioneer in profunda femoris artery surgery. Unfortunately, Leeds was unable to find the original arteriogram and, by the time he found an artist's rendering of the arteriogram, it was too late for the exhibit. The case record was then filed away.

With the *Journal of Vascular Surgery* establishing a new section on Historical Vignettes, it seems appropriate to reopen the file and set the record straight. More importantly, we need to give the recognition of "first" to a truly innovative vascular surgeon. The first operation on the profunda femoris artery was done by Norman Freeman at Franklin Hospital, San Francisco, on September 9, 1953. The case record is summarized as follows:

In July 1953, while working as an associate of Freeman, Leeds saw a 59-year-old public health nurse referred to them because of increased intermittent claudication with numbness and coldness of her right foot. The arteriogram done on July 23, 1953, showed occlusion of the right common femoral artery with extensive collateral circulation about the groin and thigh and, eventually, filling of the lower segment of the profunda femoris. A large obturator artery is easily identified (Fig). Filling began approximately 3 inches below the lesser trochanter. Marked calcification

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Competition of interest: none.

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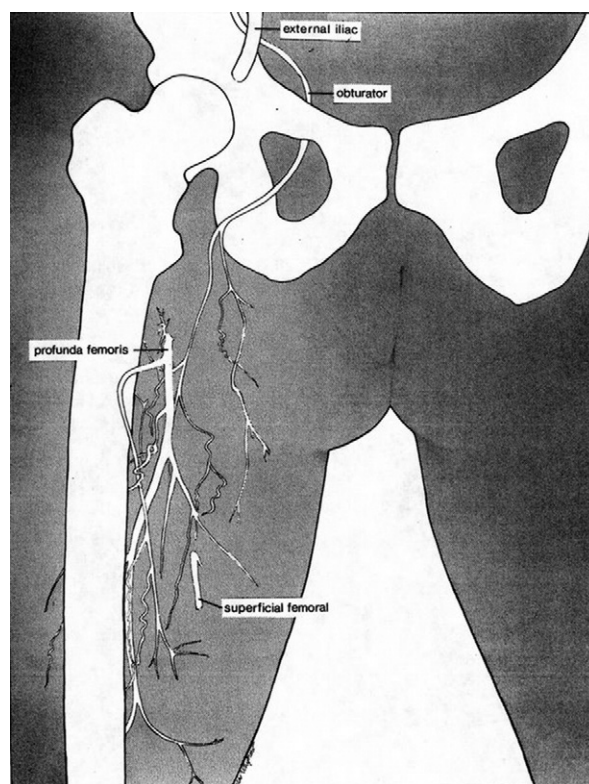


Fig. Artist rendering shows the arteriogram of the first profunda femoris reconstruction. See text for explanation.

was seen along the site of the superficial femoral artery, which did not fill except for a small segment in the middle thigh.

After examining the arteriogram, Freeman said, "She probably has had a longstanding occlusion of her superficial femoral artery, and her recent difficulty dates from the occlusion of the common femoral and profunda femoris. If we could only restore blood back to the profunda, she would probably do very well." They temporized, though, and instead performed a right lumbar sympathectomy the next day.

The patient was readmitted to the hospital 2 months later with rest pain and a numb, white foot when at heart level. The foot only showed the appearance of some color

when it was kept dependent over 2 minutes. The next day, Freeman performed a thromboendarterectomy of her right common and profunda femoris arteries. A review of the operative report shows the following features of the conduct of surgery at that period of time:

1. A right paramedian incision was made and the incision was carried over the femoral vessels down to the junction of the middle and lower third of the thigh. The rectus muscle was detached from the pubes and reflected laterally. The aorta and iliac arteries were then exposed.
2. The profunda femoris was free up to the second perforating branches. The first perforating branch was large and had many branches. The profunda femoris was solid down to the secondary branches. Arteriotomy was then made between the two perforating branches and an old liquid thrombus was found. The incision was extended farther down the thigh until the junction of the profunda and the second perforating branch was clearly exposed. With good back bleeding, Freeman considered the old thrombus at the profunda femoris artery to be contributing to the severe ischemia. A thromboendarterectomy of the common femoral and profunda femoral arteries was performed.
3. The superficial femoral artery was occluded and then was divided and the end closed with sutures.
4. Systemic heparinization was not administered, but a heparin-saline infusion was given through a polyethylene tube placed in the distal profunda femoris artery and maintained during the procedure. Heparin-saline also was injected retrograde to the aortoiliac artery before clamping of the artery.
5. The arteriotomy was closed primarily with 5-0 continuous sutures.
6. The entire operation took 7 hours to complete.

The patient was examined on October 17, 1962, at which time she had an excellent common femoral pulse bilaterally with no distal pulses. Her feet were warm and pink, and they did not blanch with elevation. She could walk indefinitely without claudication and was pain free. She last talked to Leeds on the phone on December 5, 1978, and said, "my feet are warm and pink." She died on June 10, 1980, and the cause of death was cerebrovascular accident and diabetes.

The correspondence between Prof Peter Martin of London and Frank Leeds was of interest. Martin is well known for his enthusiasm for profunda femoris reconstruction. After he read the article by Leeds and Gilfillan, he wrote to Leeds about more information on Freeman being the first to perform surgery on the profunda femoris artery. In a letter replying to Prof Martin on November 30, 1970, Leeds gave a detailed description of the first operation, which was summarized in this article.

Norman Freeman was an innovative pioneering vascular surgeon and a founder of the SVS.<sup>3</sup> He performed the first successful replacement of an abdominal aortic aneurysm with the use of iliac vein in February 1951, nearly 2 months ahead of Dubost, who replaced the aneurysm with a homograft on March 29, 1951.<sup>4,5</sup> In 1952, Freeman performed the first direct surgical revascularization procedure for renovascular hypertension by removal of an atheroma at the orifice of the renal artery at the time of aortoiliac endarterectomy.<sup>6</sup>

Vascular surgery as a specialty as we see it today was first advocated by Freeman, who wrote an editorial in *California Medicine* in 1948.<sup>3</sup> He was also first among surgeons to have a physiology laboratory to study peripheral circulation.<sup>3</sup> The profundaplasty described here adds one more "first" for Norman Freeman—the "first" American specialist in vascular surgery.

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