

Pseudoaneurysm formation after *Pasteurella multocida* lower extremity vascular bypass graft infection

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ABSTRACT

Prosthetic vascular bypass graft infection is a rare complication requiring prompt identification and isolation of the organism. A 66-year-old woman developed left lower extremity pain and a pulsatile pseudoaneurysm 7 months after left common femoral to peroneal artery bypass with prosthetic polytetrafluoroethylene graft, requiring re-exploration and a jump graft. *Pasteurella multocida* was isolated from blood and tissue culture specimens, and the patient admitted to a new kitten that frequently bit her lower extremities. Treatment included intravenous administration of ertapenem for 6 weeks followed by lifelong oral antibiotic suppression, which may offer the best chance for limb salvage when total graft explantation would result in amputation. (J Vasc Surg Cases and Innovative Techniques 2019;5:232-4.)

Keywords: Pseudoaneurysm; *Pasteurella multocida*; Graft infection; Vascular bypass graft

Prosthetic vascular bypass graft infection is a rare surgical complication that requires timely identification, organism isolation, and often surgical intervention. We present an uncommon case of lower extremity vascular bypass graft infection with *Pasteurella multocida* resulting in anastomotic pseudoaneurysm. The patient gave consent for publication of this case report.

CASE REPORT

A 66-year-old woman presented to the outpatient vascular surgery service for left lower extremity atherosclerotic disease with rest pain and underwent an elective left common femoral to peroneal artery bypass with a prosthetic polytetrafluoroethylene graft and great saphenous vein patch. A prosthetic graft was chosen because of the patient's diminutive and unsuitable native saphenous veins. She returned to the outpatient clinic approximately 4 months postoperatively with symptoms of acute limb ischemia and was found to have acute thrombosis of the graft at the distal anastomotic site, which required thrombolysis with tissue plasminogen activator through a femoral catheter, followed by four-compartment fasciotomy for reperfusion injury and compartment syndrome. During a routine follow-up visit approximately 3 months later and 7 months after her initial bypass surgery, she complained of leg swelling, increasing left lower extremity pain, and a palpable pulsatile



Fig. Peripheral angiogram of the left lower extremity reveals a pseudoaneurysm at the distal anastomosis of the left common femoral to peroneal polytetrafluoroethylene bypass graft, probably caused by *Pasteurella multocida* infection.

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Table. Selected case reports of *Pasteurella multocida*-associated vascular infections

Author	Year	Structure involved	Potential source of <i>P. multocida</i>	Intervention	Therapy and outcome
Kalish and Sands ¹⁹	1983	Aortobifemoral graft	Dog licking patient's hands and feet	Surgical removal of right limb of aortobifemoral graft	Ampicillin 12 g IV daily for 19 days; oral ampicillin for several months
Kessler et al ²⁶	2004	Right iliac limb of aortobifemoral graft	Cat bite to affected extremity	Surgical removal of right limb of aortobifemoral graft with placement of right axillary-popliteal graft	Ampicillin and then ceftriaxone IV for 6 weeks, followed by oral doxycycline suppression
Koelemay ¹⁶	2009	Native abdominal aorta (mycotic aneurysm)	Cat (unknown bite, scratch, or other exposure)	Open abdominal aortic aneurysm repair with rifampin-soaked Dacron tube graft and omental patch	Perforation of duodenum on POD 4; alive in good clinical condition 1 year later
Schneider et al ²⁴	2012	Left transposed upper basilic vein fistula with polytetrafluoroethylene	Cat bite	Excision of graft, arterial-venous anastomoses oversewn, wounds left open to heal by secondary intention	Ceftriaxone 1 g IV daily; continued ceftriaxone as outpatient
Cho et al ¹⁵	2016	Native abdominal aorta (mycotic aneurysm)	Cat bite	Open abdominal aortic aneurysm repair with tube graft	Died on POD 13 of septic shock
Jayakrishnan et al ¹⁸	2016	Modular aortic endograft status post emergent EVAR	Cat bite or cat licking of abdominal wound	CT-guided pigtail catheter drainage of psoas and para-aortic abscesses	Ceftriaxone 2 g IV daily for 6 weeks followed by lifelong oral doxycycline; alive in good clinical condition 10 months later

CT, Computed tomography; EVAR, endovascular aneurysm repair; IV, intravenously; POD, postoperative day.

mass over her left calf. She underwent peripheral angiography the same day, which revealed a pseudoaneurysm near the peroneal artery distal anastomosis (Fig). She then underwent surgical exploration of the distal anastomosis, evacuation of the pseudoaneurysm, débridement of surrounding tissue, and placement of a prosthetic polytetrafluoroethylene jump graft to bypass the contaminated area. The choice of prosthetic material in a contaminated surgical field was again due to the patient's poor native vessels. Blood culture specimens and intraoperative tissue culture specimens grew *P. multocida* with no other species noted. Further questioning from the patient revealed that she had recently obtained a new pet kitten that frequently bit and scratched her legs in the weeks leading up to the onset of symptoms. This is the presumed source of her *P. multocida* infection. She was discharged and treated with outpatient intravenous ertapenem infusion for 6 weeks and is now maintained on 500 mg of cephalexin twice daily for lifelong suppression therapy. Her last follow-up was recently completed approximately 21 months after bypass revision and her graft remains patent; the wounds remain closed, and she is free of any signs of further infection. Of note, the patient admits that she still occasionally sustains cat bites and scratches from her pet.

DISCUSSION

Prosthetic vascular bypass graft infection most commonly results from skin flora such as *Streptococcus* and *Staphylococcus* secondary to wound breakdown or trauma overlying the graft.¹ *P. multocida* is isolated in the normal oral flora of domestic cats,^{2,3} dogs,⁴ and exotic animals, such as rabbits, cougars, lions, and tigers.⁵⁻⁷ It has been implicated as the causative agent in a broad spectrum of clinical presentations, including infection after solid organ transplantation,^{8,9} bacteremia and septic shock,¹⁰⁻¹² and cellulitis and lymphangitis.^{13,14} Within the realm of vascular surgery, *P. multocida* has been implicated as the cause of aortitis and mycotic aortic aneurysm,¹⁵⁻¹⁷ infected aortic endografts,¹⁸⁻²³ hemodialysis access grafts,²⁴ and peripheral vascular bypass grafts^{25,26} in several case reports. The Table shows selected similar published cases and their outcomes. However, the association between *P. multocida* and peripheral vascular pseudoaneurysm has been rarely reported.

Standard of care for these infections includes incision and drainage of any associated abscess, débridement of surrounding tissue, and explantation of the infected

prosthetic graft. Prolonged antimicrobial therapy with lifelong suppression offers the best chance for limb salvage in the case of infected extremity vascular bypass grafts when total graft explantation may otherwise result in limb amputation.

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