

Septic embolization from stented arteriovenous fistula

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ABSTRACT

Anastomotic stenosis of an arteriovenous fistula is often amenable to percutaneous intervention (angioplasty and stenting) and unlikely to be complicated by infection. A 69-year-old man underwent pre-emptive arteriovenous fistula construction that required interval placement of a covered stent for juxta-anastomotic stenosis. The patient presented 1 year after the intervention with systemic sepsis that required stent graft explantation and revision. This is a unique case report showing an infected stent graft, placed to restore secondary patency, that was later found to be the source of bacteremia and septic pulmonary emboli. (J Vasc Surg Cases and Innovative Techniques 2019;5:195-6.)

Keywords: Infected stent graft; AVF stent graft; Covered stent infection

Anastomotic stenosis of an arteriovenous fistula (AVF) is often amenable to percutaneous intervention. Endovascular techniques such as angioplasty and stenting are the most common methods of salvage for hemodialysis access and are unlikely to be complicated by infection. Although fabric-covered stents are available, they are less frequently required.^{1,2}

CASE REPORT

A 69-year-old man with transitional cell carcinoma of the ureter underwent a left radical nephrectomy and cystectomy. He was referred to the vascular surgery service for an AVF before scheduled resection of a contralateral right renal cell carcinoma. Therefore, a right radiocephalic AVF was constructed and matured before oncologic resection. The right radical nephrectomy was uncomplicated, and hemodialysis was started immediately post-operatively without insertion of a hemodialysis catheter.

Four years later, the patient presented to an outside hospital with recurrent, high-grade, juxta-anastomotic stenosis of his AVF. He initially underwent thrombolysis and angioplasty, which salvaged only 3 months of AVF function. Repeated percutaneous thrombectomy and angioplasty resulted in a suboptimal result, requiring placement of a 6- × 60-mm covered stent (Fluency; Bard, Tempe, Ariz) deployed 1 cm from the anastomosis.

Successful hemodialysis exchanges using this AVF continued for 1 year, when the patient was admitted to our facility for workup of fevers (temperatures as high as 103°F) and chills refractory to antibiotics. He was hospitalized each month for 3 months and

was extensively evaluated for all possible infectious sources, including endocarditis and pneumonia, on each admission. Chest radiography and computed tomography demonstrated target lesions consistent with septic emboli. On the last admission, blood cultures reported methicillin-resistant *Staphylococcus aureus*. Findings on transesophageal echocardiography were unremarkable. The patient was again managed with antibiotics for fever of unknown origin, and a request for surgical consultation was placed for evaluation of the fistula as a potential source.

Clinical examination of the fistula demonstrated a short 3-cm area in the proximal forearm that was mildly tender and indurated. The fistula was functioning well with a strong thrill and was used routinely for hemodialysis. Duplex ultrasound demonstrated a dilated cephalic vein (15 mm) with a widely patent anastomosis and outflow into the upper arm. Duplex ultrasound evaluation of the indurated area exhibited a complex fluid collection surrounding the fistula at the site of the covered stent. No intraluminal vegetations or thrombi were appreciated. Other potential causes of septic embolization having been eliminated, the stent was suspected, and he was brought to the operating room.

Intraoperatively, inflammatory reaction surrounding the stent was marked by dense fibrosis (Fig) without purulence. The covered stent graft was excised. Cultures of the explanted arteriovenous graft revealed methicillin-resistant *S. aureus*. A proximal segment of unaffected, arterialized fistula vein was otherwise normal in appearance and was selected for construction of a proximal radiocephalic fistula, which continues to function well for hemodialysis. Repeated blood cultures have been negative, and he has experienced no further febrile episodes or other signs of residual infection. He was maintained on 6 weeks of antibiotics. The pulmonary abscesses resolved during 2 months.

Consent was obtained from the patient for publication of case details.

DISCUSSION

AVF infection is extremely rare (incidence rate of <1%), hence making it optimal for use in a population of patients in whom infections are the second leading cause of death.^{3,4} Inserting covered stents in autogenous fistulas theoretically converts the access to a prosthetic graft, reducing the infectious advantage and counteracting Fistula First.

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Fig. Display axial (**A**) and coronal (**B**) views of excised stent graft with dense surrounding fibrosis.

We hypothesize that this stent graft infection developed from translocation of skin flora introduced through repeated percutaneous access. Recurrent bacteremia from this endoluminal source resulted in dissemination of bacterial colonies, septicemia, and pulmonary parenchymal abscesses. Infection associated with covered stents in the setting of autogenous hemodialysis access is rare. The literature lacks sufficient data to identify the true incidence of this complication.

CONCLUSIONS

A stent graft that restored secondary patency for an autogenous AVF was initially unsuspected as the nidus for bacteremia and septic pulmonary emboli. The actual source was unrecognized for months. The infections resolved after excision of the covered stent graft with preservation of the AVF, which continues to function well.

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