

Case Report

Life-threatening post-thrombectomy hypotension due to residual complications from a translumbar catheter

Allon N. Friedman¹ and Sabah D. Butty²

¹Department of Medicine, Indiana University School of Medicine, Indianapolis, IN 46202, USA and ²Department of Radiology, Indiana University School of Medicine, Indianapolis, IN 46202, USA

Correspondence and offprint requests to: Allon N. Friedman; E-mail: allfried@iupui.edu

Abstract

Translumbar catheters offer an alternative life-saving option in patients without conventional dialysis access, though their use and complication rates are poorly understood. We report the first case in the medical literature of a translumbar catheter inducing a central venous stenosis. This occult sequela converted what is usually a subclinical complication from an arteriovenous graft thrombectomy into a life-threatening one. This unusual clinical presentation highlights the need for clinicians to recognize the potential serious implications of translumbar catheter-induced occult central venous stenosis.

Keywords: arteriovenous graft; stenosis; thrombectomy; translumbar catheter

Background

Complications such as vascular stenosis or thrombosis frequently necessitate the abandonment of haemodialysis access sites. In patients with no remaining conventional access sites, haemodialysis catheters placed in the inferior vena cava (IVC) through a translumbar approach (so-called translumbar catheters) offer an alternative life-saving option. There is little information on translumbar catheter use or its complications, perhaps in part because such catheters are generally considered an access of 'last resort'. However, patients can live with such catheters for years and occasionally even regain the option of using more conventional access sites [1]. The following case describes how a previously unreported sequela of translumbar catheters converted a typically subclinical arteriovenous (AV) graft thrombectomy-related complication into a life-threatening one.

Case report

A 53-year-old black male with end-stage renal disease on chronic haemodialysis for 12 years presented to his neph-

rologist with acute onset of hypotension, weakness and gastroenterological symptoms. The patient had a history of hypertension, hepatitis C, prostatic hyperplasia, gastroesophageal reflux disease, a previous translumbar dialysis catheter placement due to multiple upper chest vascular thromboses and a remote trial of peritoneal dialysis for 2 years that was stopped for unclear reasons. He was in his usual state of health until 1 day prior to presentation when he underwent a successful mechanical thrombectomy using a percutaneous thrombolytic device (Arrow-Trerotola, Arrow International, Reading, PA) for a severe venous stenosis of his left thigh AV graft. Upon presentation to his outpatient haemodialysis unit the following morning, his blood pressure was 89/48 mmHg, markedly different from his baseline systolic pressure of 140–150 mmHg. Symptomatic hypotension precluded ultrafiltration that day. Though the patient's symptoms were initially attributed to the residual effects of anaesthesia, his course over the ensuing 2 weeks worsened as he manifested nausea, constipation, progressive weakness to the point of requiring a wheelchair and continued inability to remove any fluid due to persistent hypotension. A chest X-ray revealed only parenchymal chronic scarring. Twelve days after the thrombectomy, the patient was admitted to the hospital for further evaluation.

Upon admission, an abdominal and pelvic CT scan with contrast was performed to evaluate his GI symptoms. It revealed a thrombus within the IVC extending from the renal to the hepatic veins (Figure 1). Extensive venous collateralization was also noted, suggesting a chronic condition. Two days later, a diagnostic venography revealed acute on chronic thrombus material that completely occluded the IVC. An IVC thrombectomy was performed, and a repeat venography demonstrated the presence of a pre-occlusive chronic stenosis in the midportion of the IVC (Figure 2). An IVC stent was placed that resolved the stenosis and normalized blood flow. Of note, angiography did not reveal any residual stenosis in the patient's patent left thigh AV graft.

The IVC thrombectomy and stenting were accompanied by immediate normalization of the patient's blood pres-



Fig. 1. Occluded IVC (indicated by the arrow).



Fig. 2. Post-thrombectomy IVC stenosis (indicated by the arrow).

sure, leading again to successful ultrafiltration. The patient was discharged in excellent condition soon thereafter.

Discussion

On first glance, the patient's clinical presentation appears puzzling and not clearly related to his dialysis access. However, the subsequent medical evaluation revealed two processes—a chronic IVC stenosis with collateralization and a superimposed acute thrombus completely occluding the stenotic region—that in concert led to his life-threatening symptomatology. Each of these, in turn, arose directly from separate access complications.

Central venous stenosis has long been a recognized complication of haemodialysis catheter placement and may be related to endothelial denudation and injury and subsequent blood flow turbulence along the catheter shaft [2]. Though central venous stenosis is usually reported in the setting of internal jugular, subclavian or femoral catheters, there is no reason to believe that translumbar catheters cannot induce a similar effect. Such catheters are inserted via the translumbar spinal region directly into the IVC under fluoroscopic guidance. In this particular patient, the translumbar catheter was used for <1 year and was removed ~3 years prior to the current presentation. Based on the following reasons, it is eminently reasonable to conclude that the IVC stenosis was causally related to the translumbar catheter. First, the chronicity of the IVC stenosis (as demonstrated by venous collaterals) is consistent with an old injury arising from a remote catheter placement. Second, the translumbar catheter rested in the same region where the stenosis was later observed. Third, the patient had no other history of catheter placement within the IVC that could have precipitated a stenotic reaction. This, then, is the first medical report of a translumbar catheter-related central venous stenosis. The prevalence of such stenoses are unknown, but it is certainly plausible that they are as under-recognized as are other catheter-related central stenoses [3,4].

In fact, the IVC stenosis might never have become clinically relevant had an AV graft thrombectomy not been performed. A thrombectomy involves the maceration or fragmentation and removal of the thrombus via a variety of specialized devices. A well-recognized complication of such manoeuvres is the formation of microthrombi [5], some of which inevitably embolize distally. While on occasion these emboli can be clinically significant and even life-threatening [6–8], clinical experience demonstrates that the vast majority are not.

How, then, to explain the acute thrombus that developed at the IVC stenosis? The temporal link between the thrombectomy procedure and the subsequent rapid onset of symptoms helps establish causality. In all likelihood, the thrombectomy released microemboli that under normal circumstances would have dissipated into the venous system without consequences. However, these emboli were caught at the stenotic site where blood flow was stalled and perturbed and consequently propagated. Once complete vena caval thrombotic occlusion occurred, the patient would have been dependent entirely upon venous return from the collateral venous system developed over time around that circumvented the stenosis. This would explain the sudden development of hypotension that precluded effective ultrafiltration, a problem that immediately disappeared after the clot was dissolved.

This unusual clinical presentation highlights the need for clinicians to recognize potential complications associated with translumbar catheters. One such complication—occult central venous stenosis—may, under the proper circumstances, be life-threatening.

Acknowledgements. A.N.F. is supported by the National Institutes of Health (K23 RR019615).

Conflict of interest statement. None declared.

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Received for publication: 24.5.10; Accepted in revised form: 26.5.10