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Percutaneous trans-jugular mechanical thrombectomy for the treatment of thrombosed upper arm fistulas

Sir,

Thrombosis of arterio-venous haemodialysis fistulas represents a challenging condition for patients and their nephrologists. Endovascular treatment of such conditions has shown good results, and is nowadays considered a viable therapeutic choice.

We present two cases of thrombosed upper arm fistulas approached and treated from the ipsilateral internal jugular vein (IJV).

Case 1

A 50-year-old woman was referred with acute thrombosis of a brachio-basilic haemodialysis fistula, located in the right upper arm. The access had been created 5 years previously and several percutaneous transluminal angioplasties (PTA) had been performed, the last one performed 3 months previously. The patient had a renal transplantation 15 days ago. The fistula had been thrombosed for the last 24 h. Ultrasound (US) examination disclosed a thrombosis of the venous portion of the fistula. The vessels were very deeply located; we then decided to obviate a difficult puncture using the jugular vein in order to approach the thrombosed tract.

We used a micropuncture set (Cook Europe, Bjaeverskov, Denmark) and US guidance to puncture the ipsilateral internal jugular vein; once canalized in retrograde fashion, the subclavian vein by using a 5-French cobra C2 catheter (Glidecath, Terumo Europe) and a 0.035 inch curved stiff type hydrophilic guidewire (Radifocus guidewire M; Terumo, Europe), we inserted a 8-French, 24 cm long sheath (Arrow Europe) up to the axillary vein. We confirmed the thrombosis of the venous portion of the fistula. Then we began performing a manual thromboaspiration by using an 8-French guiding catheter (Cordis Europe, Roden, The Netherlands). Once the flow was completely restored, PTA of the underlying stenosis was successfully carried out by means of balloon catheters of 5 mm diameter (Boston-Scientific/Europe, Buülach, Switzerland). No immediate complications occurred. The patient did not need any haemodialysis. The fistulas remain objectively patent with normal thrill up to the date of this report (follow-up 5 months).

Case 2

A 79-year-old obese male was referred with acute thrombosis of a brachio-cephalic haemodialysis fistula, located in the left upper arm. The access was created 4 months previously. The fistula had been thrombosed for 24 h. Ultrasound (US) examination showed evidence of a complete thrombosis of the venous portion of the fistula, from the anastomosis to the axillary tract. On palpation, the vessels showed a deep location; we decided to use the jugular approach in order to obviate the difficult puncture of the access. We used the same technique as previously described. We confirmed the complete thrombosis of the venous portion of the fistula, from the anastomosis to the axillary tract. With this post-anastomotic high grade stenosis, we negotiated the anastomosis with

the previously described catheter and wire, and left a 0.018 inch wire with the tip in the brachial artery, with the aim of maintaining a way through the anastomosis. Then we began performing manual thromboaspiration by using an 8-French guiding catheter. Once the flow was completely restored, PTAs of the underlying stenoses were successfully carried out by means of balloon catheters of 7 mm diameter.

No immediate complications occurred. The patient had normal haemodialysis sessions up to the date of this report (follow-up 7 months).

Discussion

Thromboses of grafts or native fistulas are common conditions. Many factors such as arterial hypotension, low cardiac outflow, coagulative disorders, and atherosclerosis are advocated as predisposing causes. Also pseudoaneurysms located at the venous portion could lead to thrombosis due to the related turbulent haemodynamics. Underlying stenoses are present in more than 85% of the thromboses [1]. Technical success and long-term patency of percutaneous treatment of thrombosed grafts are comparable to surgical management.

Percutaneous treatment of thrombosed native fistulas is commonly performed puncturing the thrombosed portion, sometimes using US guidance, by means of either one or two accesses; in the latter case, two sheaths are inserted in opposite fashion in order to allow access to both sides of the fistula, either arterial or venous [1,2]. Sometimes this approach can be difficult because of the lack of flow within the vessel, or because of difficult anatomic conditions such as deep-located vessels in fat patients.

Zaetta *et al.* [3], in the year 1998, reported for the first time the use of a central access (jugular vein) in the treatment of thrombosed humeral axillar graft, pushing the thrombus towards the lung. This technique is similar to ours but not the same; the authors did not puncture the jugular vein approaching the thrombosed tract from above, but negotiated the thrombosed tract from a distal venous puncture. They then used the central access to capture the tip of the wire located in the innominate vein, performing a 'through and through' technique. This article received a lot of criticisms, because of the risky technique used [4]. The criticisms covered two points, either the risk of pushing thrombi into the lung and or jugular vein puncture. For the latter one related to our presentation, the risk of damaging jugular veins, essential for durable placement of central catheters, by insertion of large sheaths just to de clot peripheral grafts that are easily punctured, was considered extremely questionable. We totally agree with critical points that Zaetta and colleagues received, however, we think that there is a space for IJV in the treatment of native fistulas, in particular, for those located in the upper arm.

We have already reported our experience with the use of IJV in the interventional management of malfunctioning arterio-venous fistulas by using PTA [5]. After 3 years of experience on either forearm or upper arm malfunctioning arteriovenous fistulas, we note that lesions located in the upper arm, either stenoses or thromboses as in these cases, are the most suitable for an IJV approach, especially in the case of deep location of the vessels in fat patients. This approach preserves the access, obviating troublesome punctures of the fistula with two large sheaths, and allows the operator to work with the hands more distally from the

radiation dose, hypothetically reducing the related radiation dose for the operators.

Further studies and more patients are needed to assess the role of this access in the treatment of fistulas, but our experience seems to be very encouraging.

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