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CASE REPORT

Upper Limb Swelling and Ipsilateral Recurrent Pleural Effusions in a Patient on Maintenance Haemodialysis: An Uncommon Aetiology Unveiled

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Abstract

Central venous stenosis is an established and often under-appreciated complication among patients undergoing haemodialysis, specially, among those with history of central venous catheter insertions. Patients may present with unilateral arm and hemi-facial swelling and recurrent ipsilateral pleural effusions. Prolonged bleeding after dialysis sessions and inadequate dialysis may raise the suspicion of central venous stenosis. A middle-aged man with end-stage renal disease on maintenance haemodialysis through arterio-venous fistula, who was on anti-tuberculosis treatment, presented for right upper limb swelling and recurrent right sided pleural effusions. His haemodialysis was initiated through jugular venous catheters. Computed tomography (CT) venography confirmed right brachiocephalic vein stenosis and he was sent to vascular surgery for intervention.

Key words: Angioplasty, Arterio-Venous Fistula, Central Venous Stenosis, Haemodialysis

Introduction

Central venous stenosis is an established but under-recognized complication among patients receiving maintenance haemodialysis. It is a known complication of indwelling intravascular and cardiac devices, such as peripherally inserted central catheters, long-term cuffed haemodialysis catheters and pacemaker wires.[1] Patients may present with unilateral arm, face and breast oedema, prolonged bleeding after dialysis sessions and ineffective dialysis[2]. Here, we present such a case.

Case Report

A 55-year-old man, known case of end-stage renal disease on maintenance haemodialysis through right radio-cephalic fistula was started with anti-tuberculosis treatment two months previously, due to fever, right sided recurrent exudative pleural effusions (Figure 1), high pleural fluid adenosine-deaminase activity and positive

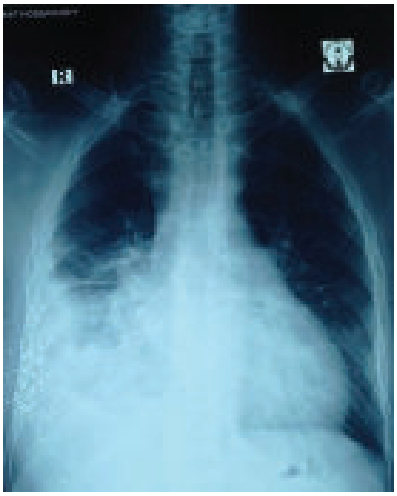

Figure 1: *Chest X-ray postero-anterior view showing right sided pleural effusion and multiple pellets in right lateral chest wall (had a history of gunshot injury)*

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QTF/TB-IGRA test. Prednisolone was added later-on for non-resolution of pleural effusions. His dialysis was initiated through right sided central venous catheters in neck veins. He presented to our centre with non-productive cough and shortness of breath without any chest pain, palpitation or haemoptysis. Patient was dyspnoeic, anaemic and oedematous. Jugular venous pressure was raised and right upper limb having arterio-venous fistula was also swollen (Figure 2). His chest examination findings were consisted with right sided pleural effusion.

Figure 2: *Swollen right upper limb of the patient in comparison to the left*

Figure 3: *Histopathology of pleural tissue showing fibro-collagenous tissue with infiltration of chronic inflammatory cells including histiocytes*

Eight hundred ml pleural fluid was aspirated; fluid was exudative, without organisms in Gram and acid-fast bacilli (AFB) staining and culture. GeneXpert was negative and no malignant cells were seen. Pleural biopsy (Figure 3) revealed fibro-collagenous tissue with infiltration of chronic inflammatory cells including histiocytes and there was no evidence of granuloma or malignancy. Computed tomography (CT) venogram confirmed right brachiocephalic vein stenosis (Figure 4). He was referred

Figure 4: *Computed tomography (CT) angiogram showing right brachiocephalic vein stenosis*

to vascular surgery for angioplasty of right brachiocephalic vein.

Discussion

Central venous stenosis is common among patients on maintenance haemodialysis. It results from prior central vein cannulation or intravascular cardiac device placements, though central venous stenosis without such prior events are also reported[1,3]. Factors that have been independently associated with central venous stenosis include the use of tunneled haemodialysis catheters, duration of central venous catheter dependence, the number of central venous catheter placements, presence of cardiac devices, younger age at dialysis initiation, previous history of fistula or graft and history of prior kidney transplant[1]. The prevalence of central venous stenosis varies between 4.3% and 41% depending on population studied and methods for investigation used[1]. Thickening of the venous wall, endoluminal obstruction and extrinsic compression are the pathophysiological factors contribute to central venous stenosis.

Central venous stenosis remains largely under-estimated, under-recognized and under-reported. Symptoms result from venous hypertension beyond the stenosis. If the arterio-venous fistula is on the same side and the patient is started on haemodialysis, clinical manifestation becomes visible with arm swelling, swelling of face, swelling of breast, inadequate dialysis and prolonged oozing of blood after dialysis sessions. Patients may present with ipsilateral recurrent pleural effusions as in the present case. Such cases usually have past history of central venous catheter placements.[3-5] Superficial venous dilatations of draining areas, pain, ulcerations and recurrent skin infections may occur as well[1].

Conventional venography remains the gold standard for the diagnosis of central venous stenosis but it is invasive. Non-invasive imaging techniques include magnetic resonance (MR) angiography, CT venography and duplex ultrasound. In our case, CT angiography could establish the diagnosis while Latif et al. adopted conventional venography.[3] KDOQI recommends central venous imaging, before the creation of permanent vascular access, in patients with end-stage renal disease, suspected to have central venous stenosis or who have had prior central venous catheter placements[6].

Therapeutic interventions are needed in patients with clinically confirmed stenosis and associated symptoms. The management option depends on the nature and location of the lesion. Endovascular intervention remains the recommended initial treatment option and includes percutaneous transluminal angioplasty with or without stent placements[3]. High-flow volumes across haemodialysis vascular accesses are linked to a high recurrence rate after initial interventional therapy. Such patients may require ligation of an otherwise well-functioning vascular access for reduction of flow. Open surgical techniques to treat central venous stenosis often use polytetrafluoroethylene (PFTE) grafts. Failed and refractory cases may warrant an alternative renal replacement therapy option.

Conclusion

Any patient with recurrent unilateral pleural effusions and upper arm swelling in the same side with arterio-venous fistula, with prior history of central venous catheter insertion, should raise suspicion of central venous stenosis.

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