CASE REPORT

Successful catheter directed thrombolysis in postpartum deep venous thrombosis complicated by nicoumalone-induced skin necrosis and failure in retrieval of inferior vena caval filter

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SUMMARY

Venous thromboembolism is an important cause for maternal morbidity and mortality in postpartum period. Though catheter-directed thrombolysis (CDT) is now considered as a safe and effective therapy for the management of deep venous thrombosis (DVT) but still it is not indicated in postpartum DVT. We are presenting a case of 22-year-old female patient who presented with post-partum lower limb DVT and managed successfully with CDT by using injection streptokinase and temporary inferior vena caval filter was inserted as prophylactic for pulmonary embolism as she had extensive DVT extending into inferior vena cava (IVC). During follow-up, she developed large skin necrosis in left lower limb which was managed by adding injection low-molecular-weight heparin. IVC filter also could not be retrieved even after trying all manoeuvres during follow-up after 2 weeks.

BACKGROUND

Venous thromboembolism (VTE) is one of the most common causes of maternal mortality in pregnancy and post-partum period with the prevalence of about 1–2/1 00 000 live-birth and more common in the developing world.¹ VTE is more common in post-partum period than antenatal period.² Acute deep venous thrombosis (DVT) is associated with significant morbidity due to development of post-thrombotic syndrome (PTS).³ Till recently anticoagulation with heparin, low-molecular-weight heparin (LMWH) and warfarin was primary mode of treatment of DVT.¹ But, catheter-directed thrombolysis (CDT) is the recent advancement in treatment of DVT as it can restore patency of vein and decrease the incidence of morbidity due to PTS.³ Only few reports are available of its use in puerperal DVT.³ Few patients with extensive proximal lower limb DVT may need inferior vena cava filter (IVCF) implantation to prevent pulmonary embolism (PE).² Oral anticoagulant-induced skin necrosis is very rare, seen in 0.01–0.1% of patients.³ We are presenting a very unusual case of post-partum DVT treated with CDT and mechanical thromboaspiration with IVCF implantation. But later she developed skin necrosis due to oral anti-coagulant and had difficulties in retrieval of IVCF.

CASE PRESENTATION

A 22-year-old primipara patient presented with swelling of both lower limb, started 15 days after

delivery. She had normal vaginal delivery and delivered a normal baby. She does not have any significant family history. On general examination, she had non-pitting, tensed swelling of bilateral lower limb (right>left) with tenderness on palpation and vitals are stable. Systemic examination was found to be normal. Blood investigation showed only presence of anaemia (Hb 9.2 gm/dL). Venous Duplex scan showed thrombosis of right common iliac (CI), external iliac (EI), common femoral (CF), superficial femoral (SF) and popliteal vein (PV). As the patient was very young and had extensive DVT, so we planned for CDT in this case. An 8F sheath was inserted through ultrasound guidance in right PV. Check venogram performed after sheath insertion confirmed the findings of venous Doppler with extensive thrombus on right side (figure 1A) and extension of thrombus to left CI, EI vein and infrarenal inferior vena cava (figure 1B). So an 8F sheath was inserted in the left femoral vein (FV). Thromboaspiration was performed on both the sides by using 6F multipurpose catheter over a Terumo wire. Retrievable IVCF (Cordis Optease) was inserted through left FV and was placed below the renal vein. After that, angioplasty was performed by balloon dilation with 4×40 mm peripheral angioplasty balloon at 4 atm in both CI, EI, CF vein and up to IVC. 5F multipurpose catheter was put in the CI vein on right side. Local thrombolysis was started with injection streptokinase 150 000 units/h (divided into 70 000 units/h through catheter and 30 000 units/h through sheath in right side and 50 000 units/h through sheath in left side) along with injection heparin 1000 units/h through sheath in right PV. Mechanical thromboaspiration was performed twice and CDT had been given for 106 h. Check venogram was performed periodically. On the fifth day of CDT, check venogram showed complete clearance of thrombi and swelling of both the limb reduced. As there was significant stenosis seen in the bilateral CI vein even after lysis of clot with CDT, so bilateral venous angioplasty was performed in this case. The patient was then started on oral nicoumalone (4 mg/day) under the cover of injection heparin. She was discharged on 10th day after admission and discharge INR was 1.7. Injection of heparin had been given for 7 days. Graded compression stocking was also advised. After 2–3 days of discharge, she had localised necrotic area over left leg which was superficial and

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Figure 1 (A) Venogram showing thrombosis in infrarenal inferior vena cava and proximal part of common iliac vein. (B) Venogram showing complete occlusion of left common iliac and external iliac vein with collaterals.

managed by regular dressing in home. When she came back after 2 weeks of discharge for IVCF retrieval, we diagnosed the lesion as nicoumalone-induced skin necrosis (figure 2) which was also proven by skin biopsy by presence of necrotic area in the subcutaneous tissue. The blood investigations including platelets count and routine coagulation profile was found to be within normal limit which exclude the presence of heparin-induced thrombocytopenia in this case. As she had precipitating factors for DVT and due to her poor socioeconomic condition, thrombotic work-up was not possible in this case, though it was advised by us. Retrieval of IVCF about 3 weeks after implantation was very difficult. We have tried through both right FV and right subclavian vein. But it was fibrosed with the IVC wall and could not be retrieved (figure 3). We managed the skin necrosis by starting LMWH and nicoumalone was also started again under cover of LMWH till INR was achieved >2 .

OUTCOME AND FOLLOW-UP

On follow-up over 3 months, she does not have PTS and the entire skin necrotic lesion also healed up and she had normal thrombotic profile.

DISCUSSION

The occurrence of DVT during postpartum period is not an unusual event; with incidence of 0.6/1000 which is even more than pregnancy.¹ Pain and oedema are the most common findings.¹ Though, the left leg is more commonly involved than the

right because of the compression of left CI vein by the right CI artery and gravid uterus, but in our case both the legs were involved.² Treatment of VTE during pregnancy and in the puerperal period is challenging. The management of acute DVT is aimed at the prevention of PE, restoration of circulation through the affected vein, prevention of recurrent thrombosis and preservation of venous valve function.² Although conventional heparin therapy is effective in preventing PE, immediate complete lysis of thrombus occurs in only 4% patients, partial lysis in 14% and the remainder have no clearing of thrombus.¹ About two-thirds of women with pregnancy-related DVT develop deep vein insufficiency in the affected leg.³ The advantages of CDT include a high local concentration of thrombolytic agents; resulting in rapid lysis and decreased risk of systemic bleeding complications.² Though conventionally, it is more useful than systemic infusion but there is no data pertaining to puerperal DVT. Major bleeding complications have only rarely been described. Previous studies had used injection urokinase or alteplase for CDT.¹⁻³ We used injection streptokinase in our case for CDT as it is available in our centre and is cheaper. Though our patient had received 16 million units of injection streptokinase over 106 h, there was only minor oozing of blood from the popliteal vein on the right side. Though early

Figure 2 Left leg showing nicoumalone-induced skin healing skin necrosis.

Figure 3 Inferior vena cava filter could not be retrieved by snaring.

endovascular CDT therapy, in combination with thrombectomy, angioplasty and/or stenting when indicated, may allow preservation of venous valve function and prevent subsequent PTS in these young women but there is certain disadvantage associated with CDT like greater expenses, bleeding complication and repeated venogram or duplex ultrasound.³ The role of such therapy for DVT in the postpartum period remains controversial because of increased risk of uterine bleeding is the major concern.² As residual thrombus is common after thrombolysis, so maceration of clot with angioplasty balloon is helpful in preventing recurrence in iliofemoral DVT what was performed in our case also.¹ We used graded compression stockings following thrombolysis as they are shown to reduce the incidence of PTS and our patient had no PTS at 3 months of follow-up.

The use of an IVCF in pregnant or puerperal women has likewise only been described in a few cases.³ The main risks of such filters are migration, perforation and thrombosis, but the latter two risks can be reduced with a retrievable filter.³ In a retrospective audit of prospectively collected data, including 560 inserted filters in 507 non-pregnant patients; major complications were seen only in two cases (0.4%).⁴ Failure of retrieval is seen in about 1–7% of cases in earlier study.^{4–6} We tried to snare it out via femoral as well as subclavian venous route. But, in our case, IVCF could not be retrieved as it was firmly adhered to the venous wall by fibrosis.

Cutaneous necrosis is a serious and infrequent complication of oral anticoagulant therapy and was first reported by Verhagen in 1954.⁷ This phenomenon occurs in 0.01–0.1% of patients on anticoagulant treatment, with a female predominance (75% of cases).⁸ In the pathogenesis of cutaneous necrosis induced by oral anticoagulants recent hypotheses favour the combined role of local factors and a transient unbalance of coagulation mechanisms leading to a hypercoagulable state.⁷ There exists a genetic factor that determines a decreased level of two vitamin K-dependent glycoproteins, namely proteins C and S.⁸ But, our patient had normal coagulation profile. The process usually starts with pain or pressure sensation in the affected area, followed by the abrupt appearance of cutaneous lesions between 3 and 10 days after starting the treatment.⁹ In our case it was started seven days after starting nicoumalone. The most frequently affected sites are the breast, buttocks and lower extremities as in our case where left leg was involved.⁸ Therapy includes substitution of oral anticoagulants for LMWH, vitamin K administration and wound care.⁹ Occasionally, an infusion of frozen fresh plasma is required. Debridement of necrotic tissue and in some instances skin grafts might be necessary.⁹ We have also treated our case in the same manner with restarting of oral nicoumalone by guarding under LMWH and local area care.

Where expertise exists, endovascular therapy consisting of CDT with angioplasty and stenting in selected cases could be considered as another therapeutic option in patients with acute postpartum DVT but it requires establishment by a randomised controlled trial (eg, versus LMWH or systemic thrombolytics) for CDT to become part of recommended care in pregnancy or

postpartum DVT. To the best of our knowledge, we are reporting the first case where both the success and complication of the management of postpartum DVT was seen.

Learning points

- ▶ Venous thromboembolism is one of the most common causes of maternal mortality in pregnancy and postpartum period with the prevalence of about 1–2/1 000 000 live-birth and more commonly seen in the developing nations.
- ▶ Though anticoagulation with heparin or low-molecular-weight heparin (LMWH) and warfarin was primary mode of treatment of deep venous thrombosis (DVT) but this report suggest that catheter-directed thrombolysis (CDT) can be a safe mode of management in postpartum DVT.
- ▶ Patients with extensive proximal lower limb DVT involving inferior vena cava may needs inferior vena cava filter implantation to prevent pulmonary embolism during CDT.
- ▶ Though oral anticoagulant-induced skin necrosis is very rare, seen in 0.01–0.1% of patients mostly in case with congenital proteins C and S deficiency but sometimes it could be found in patient without this disorder.

Contributors All authors were involved in the management of this case and approved the final version of this manuscript.

Competing interests None.

Patient consent Obtained.

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