Deep vein thrombosis (DVT) is a predisposing condition of pulmonary embolism which can be fatal. Usually, DVT is found in the lower extremities. However, DVT can be occurred in the upper extremities. The usual predisposing conditions of the upper extremity DVT include insertion of central venous catheters and pacemaker wires. Here, we report a case of upper extremity DVT after in vitro fertilization and embryo transfer. The patient was successfully controlled with subcutaneous administration of low molecular weight heparin.

**KEY WORDS:** Deep vein thrombosis · Upper extremities · in vitro fertilization · Low molecular weight heparin.
Fig. 1. The longitudinal image of the right neck shows thrombosis of the right internal jugular vein with partial obstruction of the lumen (A: before compression, B: color flow mapping, and C: after compression). The follow up ultrasound scan reveals normalized internal jugular vein (D: before compression, E: color flow mapping, and F: after compression).

Fig. 2. The transverse image demonstrates thrombosis of the right internal jugular vein with partial obstruction (A: before compression, and B: after compression). The follow up ultrasound scan shows normalized internal jugular vein (C: before compression, and D: after compression).
after 5 days. She was maintained with LMWH twice a day until delivery and she had twin babies without further complications. The follow up ultrasound scan showed normalized internal jugular vein (Fig. 1 D, E and F) (Fig. 2C and D).

**DISCUSSION**

Compared to lower extremity DVT, upper extremity DVT (UEDVT) is uncommon disease and represents about 10% of all DVTs.\(^2\) It can be associated with mechanical or anatomical factors (e.g. insertion of central venous catheters or narrowing of veins by cervical rib) and hypercoagulable states (e.g. antithrombin deficiency, malignancy and antiphospholipid syndromes).\(^6\) Moreover, it can be occurred after ART.\(^4\) Exogenous gonadotropins and gonadotropin-releasing analogs are used for the follicular induction and maturation in ART.\(^6\) Some patients who undergo ART develop ovarian hyperstimulation syndrome (OHSS), which is characterized by ovarian enlargement, hydrothorax, ascites, hemoconcentration, renal impairment, hepatic dysfunction, hypoalbuminemia, and venous thrombosis.\(^6\) It can be occurred during 2% to 6% of treatment cycles. Rarely, the hypercoagulable state produced by OHSS may cause DVT.\(^5\) Because her hypercoagulability profiles were normal and she underwent IVF and ET, the UEDVT can be associated with ART. However, her symptoms associated with OHSS were mild.

UEDVT can be associated with pulmonary embolism (PE) and its incidence was reported about up to one third of patients with UEDVT.\(^1\) Because the patient’s vital signs were normal and there was a little evidence of PE, the possibility of PE was assessed as low. Moreover echocardiographic exam showed normal right ventricular function and normal pulmonary arterial pressure assessed by maximal tricuspid regurgitation velocity.

The patient was treated with LMWH inpatient and outpatient settings. Because LMWH has improved bioavailability, longer half-life, and dose-independent renal clearance, it is associated with weight-based subcutaneous administration, a more predictable anticoagulant action, and making unmonitored.\(^7\) LMWH has emerged as an effective alternative to conventional unfractionated heparin as initial therapy for DVT.\(^8\) It is also suitable for outpatient therapy because of improved bioavailability and more predictable anticoagulant action.\(^9\) Moreover, serious potential complications of conventional heparin therapy seem less common with LMWH.\(^10\) Because LMWH does not cross the placental barrier, available data support the safety of LMWH for the developing fetus.\(^11,12\) So LMWH was successfully used for initial treatment for UEDVT and secondary prophylaxis of PE during pregnancy in this patient.

**REFERENCES**