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A 72-year-old man presented with acute left lower limb pain and swelling on the day of admission. His medical history was notable only for hypertension, with no known inherited thrombophilia or malignancy. Contrast-enhanced CT demonstrated non-massive pulmonary embolism and extensive occlusive thrombus extending continuously from the inferior vena cava (IVC) to the left femoral vein. Anticoagulation alone failed to improve symptoms. On hospital day 2, a suparenal IVC filter was placed, and mechanical thrombectomy using Indigo Cat8 was performed via the left popliteal vein. Given the large thrombus burden and profunda femoris vein involvement, flow from the femoral vein to the IVC was temporarily restored, and a Lumenex catheter was placed in the common femoral vein for catheter-directed thrombolysis (CDT) with heparin and argatroban, without urokinase. Repeat venography on day 4 showed femoral vein re-occlusion but patent flow from the common femoral vein to the IVC. Further Indigo aspiration removed substantial residual thrombus; IVUS revealed organized thrombus with recoil in the iliac vein, prompting venous stent placement from the left common to external iliac vein. CDT was continued via the common femoral vein due to concern for profunda involvement. Two days after stenting, venography confirmed flow from the femoral vein to the IVC, and residual thrombus was aspirated to complete the procedure. Symptoms resolved rapidly, PE resolved on follow-up CT, and stent patency with restored venous flow was confirmed. The patient was discharged on hospital day 13, with sustained stent patency on outpatient follow-up CT. Early endovascular intervention achieved rapid resolution of severe acute iliofemoral DVT within two weeks, illustrating the impact of newly available venous stents and mechanical thrombectomy devices in Japan.