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Patency and Clinical Outcome After Stent Placement for Chronic Obstruction of the Inferior Vena Cava

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WHAT THIS PAPER ADDS

Patients with obstruction of the inferior vena cava may have symptoms of chronic venous disease of the lower limb, experience acute deep vein thrombosis, or be restricted from physical activity. Conservative treatment with anticoagulation and compression therapy may provide symptomatic relief and prevent recurrent thrombosis, but a number of patients will progress. In this study the feasibility, efficacy, and safety of stent placement for inferior vena cava obstruction were in line with the few other reports on this. Hence, the findings give further support to an endovascular treatment approach for these patients with otherwise poor long-term results.

Objective/background: The objective was to assess the technical success, patency, and clinical outcome after stent placement for chronic obstruction of the inferior vena cava (IVC).

Methods: A retrospective analysis was carried out of patients with chronic IVC obstruction verified with computed tomography and/or magnetic resonance venography, accepted for stent placement at the Norwegian National Unit for Reconstructive Deep Venous Surgery from March 2010 to September 2015. Clinical status was categorized according to the CEAP classification and symptom severity was assessed using venous clinical severity score (VCSS). Stent patency was evaluated by colour duplex ultrasound. Large -diameter Wallstents were placed in the IVC and concurrent iliac and femoral obstructions via right internal jugular and femoral vein access. Sixteen patients presented with symptoms of chronic venous disease. Four patients had symptoms assumed to be related to a reduced cardiac preload. Twelve patients had IVC occlusion and eight had stenosis. Median follow-up was 25 months (range 3–70 months).

Results: Stent placement in the IVC was successful in 19 of 20 patients. Primary patency after 24 months was 67% and secondary patency 83%. Fifteen of 19 patients had open stents at final follow-up. Re-interventions were performed in four patients and included catheter directed thrombolysis in all and adjunctive stenting in three. Thirteen of 19 patients (68%) reported a sustained and significant clinical improvement. Mean VCSS improved from 8.5 (range 3–25) at baseline to 7 (range 2–23) at final follow-up ($p = .007$). There were no peri-procedural or long-term complications.

Conclusion: The endovascular approach with stent placement for chronic IVC obstruction is a safe treatment option that should be offered to patients who otherwise have little opportunity for sustained clinical improvement.

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INTRODUCTION

Chronic obstruction of the inferior vena cava (IVC) is rare and may be caused by a congenital caval abnormality or previous IVC thrombosis.[1,2] Congenital aetiology, often termed atresia or agenesis, has an incidence of 0.0005–1%.[3] The incidence of post-thrombotic obstruction of the IVC is uncertain, but has been described *in utero*,[4,5] and in patients following femoral and umbilical vein catheterisation,[6,7] pancreatitis,[8] IVC compression,[9,10] placement of IVC filter,[11,12] and as a post-operative complication.[13] The most common clinical presentations of IVC obstruction are the lower limb(s) symptoms, typically seen in chronic venous disease (CVD), including post-thrombotic syndrome, with oedema, heaviness, venous claudication, and ulcers. However, patients may

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Table 1. Baseline parameters, clinical outcomes, stent patency, and re-interventions ($n = 20$).

Patient (sex/age)	Previous IVC thrombosis	Type of IVC obstruction	Thrombophilia	Femoropopliteal reflux baseline	CEAP		VCSS		Venous claudication		Final IVC stent patency	Re-intervention (*n*)
					Baseline	Final follow-up	Baseline	Final follow-up	Baseline	Final follow-up		
M/62	Yes	Occlusion	Homozygous FVL	Yes	6	6	25	21	No	No	Yes	3
M/57[a]	Yes	Occlusion	Protein C deficiency	Yes	6	NA	20	NA	No	NA	NA	0
F/56[b]	No	Stenosis	Homozygous FVL	Yes	6	6	17	17	Yes	Yes	No	0
M/15[b]	No	Stenosis	Protein S deficiency/ homozygous FVL	Yes	6	5	15	9	No	No	Yes	0
M/53	No	Occlusion	Homozygous FVL	Yes	6	5	15	7	No	No	Yes	0
F/43	Yes	Occlusion	Protein S deficiency	Yes	6	5	9	4	No	No	Yes	0
M/46	No	Stenosis	Homozygous FVL	Yes	5	5	11	8	Yes	No	Yes	0
M/57	Yes	Occlusion	No	Yes	5	5	10	8	No	No	Yes	0
M/43	No	Occlusion	NA	Yes	4	4	8	8	Yes	Yes	No	2
M/36	Yes	Occlusion	Homozygous FVL	Yes	3	3	7	8	Yes	Yes	No	1
F/20	No	Occlusion	AT deficiency	Yes	3	3	7	7	Yes	No	Yes	0
M/61	Yes	Stenosis	No	No	3	3	7	5	Yes	No	Yes	0
F/43[c]	Yes	Occlusion	NA	NA	3	3	6	6	No	No	NA	NA
F/36	Yes	Stenosis	No	No	3	0	6	3	Yes	No	Yes	0
F/34	Yes	Occlusion	Homozygous FVL	Yes	3	3	5	5	Yes	Yes	No	2
F/39	No	Stenosis	Heterozygous PT	NA	3	1	5	2	Yes	No	Yes	0
									Symptoms from reduced preload			
									Baseline	Final		
M/15	No	Occlusion	Homozygous FVL	No					Yes	No	Yes	0
M/18	No	Stenosis	Homozygous FVL	NA					Yes	No	Yes	0
F/28	No	Occlusion	NA	No					Yes	No	Yes	0
F/35	No	Occlusion	NA	No					Yes	No	Yes	0

Note. IVC = inferior vena cava; M = male; FVL = Factor V Leiden polymorphism; NA = not available; F = female; AT = antithrombin deficiency; PT = prothrombin polymorphism.

[a] Died of unrelated causes < 3 months.

[b] Failed recanalisation of left iliac vein, successfully recanalised right iliac vein.

[c] Technical failure, no stenting.

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