


## Venous Stents in Adolescents & Pregnancy

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## Disclosures

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## Pediatric & Adolescent Venous Stent

### Etiologies of venous obstructive lesion

- Associated with cong heart dz
  - Indication is mostly for access
  - Require frequent reintervention & re-dilation
- Post thrombotic obstruction/occlusion
  - Catheter related DVT
  - Hypercoagulability / syndromic children
  - Post operative
  - Anatomic anomalies (IVC interruption/hypoplasia)
- Traumatic
- Non-thrombotic (rare ... no literature support for peds)



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## PTS in Children

- Symptoms & function in pediatric PTS remains poorly characterized
- Tools evaluate signs, symptoms & function (endurance)
  - CAPRSure, modified Villalta, etc

Symptoms	Signs	Function
Fatigue	Limb circumference diff	Impaired endurance
Heaviness	Edema	
Swollen limb	Skin discoloration	
Paresthesia		
Tightness		
Skin redness		

- Stents in iliofem segments usually reserved for skeletally mature adolescents (Risser score 4&5)

### Venous Stents in Adolescents

- Iliocaval reconstruction
- N=14, mean age of 16.4 yrs (8-20)
  - C3 (14%); C4 (79%); C6 (7%)
- 7 had IVC atresia (??)
- Clinical success: 1 point improvement in CEAP
  - 6 months & 12 months 82%
- 1-yr primary patency 64%
- 1-yr assisted patency 100%

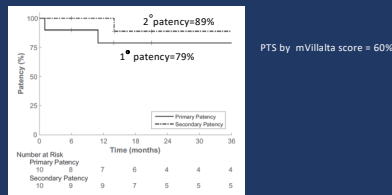
McDevitt JL et al. *Pediatr Radiol* 2019;49:808

### Iliac Vein Compression Syndrome in Adolescents

Case No.	Access Site	CDPT: Medication, Dose, Duration	PMI: Device, Medication, Dose	Predeployment Venousity	Stent Size and Type
1	Left popliteal	None	6-F AngioJet, IPA*	No	14mm x 4-cm S.M.A.R.T. Stent
2	Right LIV, bilateral popliteal†	IPA 1 mg/h for 1 d; IPA 0.5 mg/h for 1 d†	None	Yes	16mm x 9-cm Wallstent
3	Left popliteal, right CFV	IPA 0.5 mg/h for 2 d	6-F AngioJet, rheolytic mode	Yes	14mm x 8-cm S.M.A.R.T. Stent
4	Left popliteal	Urokinase 30,000-70,000 U/h for 2 d	None	No	12mm x 4-cm Wallstent
5	Left popliteal	IPA 0.5 mg/h for 2 d; IPA 0.5 mg/h for 2 d†	6-F AngioJet, RM; 8-F Trellis, IPA 2 mg†	Yes	16mm x 8-cm Wallstent, 12mm x 9-cm Wallstent†
6	Left popliteal	None	8-F Trellis, IPA, 12 mg; 6-F AngioJet, RM	No	14mm x 8-cm ProTige
7	Left CFV	None	None	Yes	14mm x 4-cm self-expanding
8	Left CFV	None	None	No	14mm x 4-cm S.M.A.R.T. Stent
9	Left popliteal	None	None	No	16mm x 9-cm Wallstent
10	Left CFV	None	None	Yes	14mm x 9-cm Wallstent

Goldman R et al. *J Vasc Interv Radiol* 2017, 28

### Iliac Vein Compression Syndrome in Adolescents



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### Venous stent for MTS in adolescents

- Review of the literature
- 22 patients in 10 studies
- Mean age 15 yrs (10-18)
- Indications:
  - Proximal DVT 12/22
- Subjective improvement in sx reported in all
  - Only 2 studies used validated outcome measures

Hansrani V et al *JVS-VL* 2020

### Pregnancy & Stent Patency

**Iliac vein stenting and pregnancy** [Check for updates](#)

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**ABSTRACT**  
 Venous stenting is the mainstay treatment of symptomatic iliofemoral venous outflow obstruction. However, because pregnancy and the postpartum period are hypercoagulable, concerns exist regarding stent placement in women of childbearing age. We performed a systematic review up to April 2023 of studies reporting on the performance of venous stents in women who subsequently became pregnant. The data collected included demographics, indication for stenting, stent characteristics, stent-related complications, incidence of venous thromboembolism, medical management during pregnancy, and follow-up. The indications for stenting included acute iliofemoral deep vein thrombosis in 39 patients (81%), nonthrombotic ilio-ven lesions in 35 (71%), and post-thrombotic lesions in 2 patients. A total of 76 women with 87 subsequent pregnancies after stenting were included. Of the 76 women, 1 (1.3%) experienced stent occlusion, 1 (1.32%) developed appropriate nonocclusion in stent thrombosis, and 2 (2.6%) experienced persistent stent compression. The only patency loss occurred because of inadequate anticoagulation therapy in a patient with antiphospholipid antibodies. The two cases of persistent compression occurred in an arterial stent and a balloon-foreneted VIC stent (Stent Solution Scientific). Venous stents performed well through pregnancy and can be safely used in women of childbearing age. Given the increased risk of venous thromboembolism and the low bleeding risk, it is prudent to implement anticoagulation therapy for all stented patients until more data are available. © Vasc Surg Venous Lymphat Disord 2023;11(2):84.

**Keywords:** Ilio-ven May-Thurner syndrome; Pregnancy; venous outflow obstruction; venous stenting

### Post Stent Pregnancy

- 87 pregnancies in 76 women
- Average interval between stenting & 1<sup>st</sup> pregnancy 20.8 ± 21.5 m
- Indications for stent
  - Acute IFDVT 39 (51%)
    - Anticoag (prophylactic vs therapeutic) according to risk profile
  - NIVL 35 (46%)
    - Prophylactic anticoag 24/35
    - Post thrombotic 2 (3%)
- Stent occlusion & DVT 1/87
- CFV DVT with patent stent 1

Villalba L et al *JVS Ven Lymph Dis* 2023

### Summary of literature

Investigator	Stenting indication, No.				Stent brand, No.							Stent location (no.)
	Patients No.	Pregnancies No.	Thrombotic lesion	Nonthrombotic lesion	Wallstent	Protégé	ViG	Venovo	Sinus Venous	Sinus Oblique		
Hartung et al. <sup>10</sup> 2009	6	8	3	3	6	0	0	0	0	0	0	LCIV-IVC (8)
Sergensen et al. <sup>11</sup> 2015	24	24	24	0	NR	NR	NR	NR	NR	NR	NR	NR
Dasari et al. <sup>12</sup> 2017	12	16	11	1	4	8	0	0	0	0	0	LCIV-IVC (2), LCIV-LEIV (6), LCIV-LEIV-LCPV (4)
Shammas et al. <sup>13</sup> 2020	1	1	0	1	0	0	0	1	0	0	0	LCIV (1)
Pappas et al. <sup>14</sup> 2022	15	17	0	15	15	0	0	3	0	0	0	LCIV-IVC (3), LCIV-LEIV (2), IVCLCIV-LEIV (5), LEIV-LCPV (5), IVCLCIV-REIV (5)
Soleranza et al. <sup>15</sup> 2022	8	8	0	8	7	0	1	0	0	0	0	LCIV-IVC (7), LCIV-LEIV (3), LCIV (4)
Villalba et al. <sup>16</sup> 2023	10	13	3	7	0	0	1	0	13	1	0	LCIV (5), LCIV-LEIV (4), LCIV-LEIV-LCPV (4), LCIV-LEIV-REIV (5)

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### Conclusion

- Rigorous data on peds/adolescent venous stenting & pregnancy after iliac vein stenting are lacking
- The data that exists shows:
  - Stent patency likely parallels that of adult population
    - Prophylactic/therapeutic anticoag recommended during pregnancy
- Stent compression does occur during pregnancy but there are no sequelae