Increasing Ablation Distance Peripheral to the Saphenofemoral Junction May Result in a Diminished Rate of EHITs

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Background: The treatment of venous insufficiency using endovenous laser ablation or radiofrequency ablation may result in endothermal heat induced thrombosis (EHIT), a form of deep venous thrombosis. This study sought to assess the effect of ablation distance peripheral to the deep venous system on the incidence of EHIT.

Methods: This study was a retrospective review of a prospectively maintained database from 4/2007 to 7/2011. Consecutive patients undergoing great saphenous vein (GSV) or small saphenous vein (SSV) ablation were evaluated. Previous to 2/2011, all venous ablations were performed 2cm peripheral to the saphenofemoral or saphenopopliteal junctions (Group I). Subsequent to 2/2011, ablations were performed 2.5cm peripheral to the respective deep system junctions (Group II). The primary outcome was the development of EHIT II or greater, i.e. thrombus protruding into the deep venous system. Secondary outcomes included procedure-site complications such as hematomas and saphenous nerve injury. Chi-square tests were performed for all discrete variables, and unpaired Students t-tests were performed for all continuous variables. $P<.05$ was considered statistically significant.

Results: A total of 3,526 procedures were performed, Group I (N=2672) and Group II (N=854). General demographics and CEAP classification did not differ significantly between the two groups. EHIT demonstrated a trend towards diminished frequency in Group II (Group I: 2.8% vs Group II: 1.6%, $P=.077$). There were no reported cases of EHIT III or IV in this patient cohort. Patients in Group I were treated using anticoagulation 56% of the time, and patients in Group II were treated using anticoagulation 100% of the time. The frequency of procedure site complications was low and did not differ significantly between the two groups.

Conclusions: This study suggests that changing the treatment distance from 2cm to 2.5cm peripheral to the deep venous junction may result in a diminished incidence of EHIT. Ongoing evaluation is required to validate these results and to reaffirm the durability of the technique.

Venous Endovascular Simulation Training - Initial Observations

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Objectives: Endovascular simulation training has been advocated as a method to improve the endovascular skills of interventional trainees but only procedures involving arteries have been reported. We describe our experience in venous endovascular simulation training for performance of diagnostic venography and inferior vena cava (IVC) filter placement.

Methods: Endovascular simulation performance data on 4 vascular surgery fellows and one radiology resident were evaluated over a 14-month period. Simulated diagnostic and therapeutic procedures were performed in the IVC and renal veins using a VIST endovascular simulator (Mentice Inc., Gotenburg, Sweden). All procedures were proctored by a faculty observer with immediate formative feedback. Internal (simulator based) and external (physician developed) metrics were measured and obtained. Paired Student's *t*-test was used to compare combined initial (procedure 1) vs. final (procedure 20) performances. A postperformance questionnaire was completed by all of the trainees.

Results: 100 simulated endovascular venous procedures were performed. Each trainee performed 20 nonselective cavagrams, 20 selective bilateral renal vein venograms, and 20 IVC filter placements. The Table below lists the values ÷ SD for procedures 1 and 20. Compared to their clinical experience a greater number of simulated diagnostic venous procedures and IVC filter placements were performed (100 vs 25, $P<.001$). Time to completion for simulated nonselective cavagram, selective bilateral renal vein venography and IVC filter placement decreased significantly from procedure 1 to 20 ($P<.05$). By procedure 20 total procedure and fluoroscopy times had been reduced by more than 50% ($P<.006$ and $P=.07$). Combined wire, catheter, and fluoroscopic errors were significantly reduced by the final procedure ($P<.04$). Procedural checklist (quantitative assessment) and global rating scale scores (qualitative assessment) were increased significantly by procedure 20 ($P<.005$) (instructional effectiveness). Questionnaire feedback indicated that venous endovascular simulator training coupled with immediate formative feedback improved endovascular skill sets and should be incorporated into fellow and resident training. The simulation program was reported as being useful for acquiring both basic and advanced endovascular skills in the venous system.

Conclusions: Initial observations indicate endovascular simulation training improved the skill sets of vascular surgery and radiology trainees performing specific simulated venous procedures (diagnostic venography and IVC filter placement). Endovascular simulation training in the venous system offers an effective method in which to enhance skills training in catheter-based techniques.

Table.

Variable	*Procedure 1*	*Procedure 20*
Total procedure time (sec)	2195 ± 455	1066 ± 270
Total fluoroscopy time (sec)	948 ± 435	477 ± 82
IVC cavagram (sec)	487 ± 166	187 ± 66
Bilateral renal vein venograpy (sec)	1265 ± 571	450 ± 162
IVC filter placement (sec)	2029 ± 487	989 ± 273
Combined errors (#)	8 ± 4	1 ± 2
IVC Filter movement (mm)	17 ± 15	7 ± 12
Procedural checklist score (max 42)	23 ± 5	41 ± 5
Global rating scale score (max 95)	41 ± 5	87 ± 14

Left Common Iliac Vein Compression Is Not Uncommon CT Finding

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Background: Left Common Iliac compression (LCIVC) is a known clinical entity that can be associated with venous thrombosis. The incidence of LCIVC is variable based on the methods of evaluation. In the current study we evaluated the incidence of LCIVC based on CT scans done in a university hospital and correlated the presence of compression with clinical findings.

Methods: All CT scan done were reviewed for the presence of LCIVC. The diameter of the left CIV at the point of crossing with the right common iliac artery was measured and compared to the diameter of the right CIV at the same level and to that of the left CIV distal to the point of compression. Stenosis of the left CIV at the point of crossing was calculated. The computer medical records of all patients were reviewed. Data was entered on an excel sheet. SPSS version 19 was used for analysis.

Results: A total of 495 CT scans were reviewed. Only 300 patients had full medical records and CT scans involving the abdomen and pelvis. The average age is 51.9 years, 174 (58%) were females. 32 (10.7%) had swelling in left leg. 119 (39.7%) patients were overweight with 29.3% had BMI more than 30. Leg swelling was increased in patients with BMI > 40 and history of DVT but not associated with the presence of LCIVC. Diameters of IVC, RCIV, and distal LCIV decreases with age in contrast to the diameter of the LCIV at crossing which increases with age. The diameter iliac veins and IVC are smaller in females than males, (Table I). The diameter of the left CIV at the compression site shows a stenosis of 43.1% and 38.2% when compared to the distal left CIV and right CIV, respectively. The incidence of different degrees of LCIV stenosis as compared the distal LCIV and RCIV in males and females summarized in Table II.

Conclusion: LCIVC is a common CT finding. Generally it is more frequent in females at different degrees of stenosis. LCIVC decreases with age. Swelling of the left leg is not related to the presence of LCIVC or to the degree of stenosis. Swelling is associated with morbid obesity and history of DVT.

Table I.

Diameter (mm)	*All patients*	*Males*	*Females*	P
LCIV crossing	7.5	8.6	6.6	0.001
LCIV distal	13.6	13.8	13.4	NS
R CIV	12.1	12.9	11.6	0.001
IVC	15.3	16.6	14.4	0.001

Table II.

Site stenosis	*Overall*	*Males (M)*	*Females (F)*	P *value (M vs F)*
vs distal L CIV	43.1%	36.6%	48.5%	.0001
>90%	12 (4%)	2 (1.6%)	10 (5.7%)	NS
>70%	59 (19.7%)	14 (11.1%)	45 (25.9%)	.002
>50%	134 (44.7%)	42 (33.3%)	92 (52.9%)	.001
vs R CIV	38.2%	32.1%	42.7%	.003
>90%	5 (1.7%)	1 (0.8%)	2 (2.3%)	NS
>70%	48 (16%)	14 (19.5%)	34 (19.5%)	.049
>50%	110 (36.7%)	37 (29.4%)	72 (42%)	.026

Responsiveness of Individual Questions From The Venous Clinical Severity Score And The Aberdeen Varicose Vein Questionnaire

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