FICC Port

DOMENICO MERLICCO

VYGON
Value Life

Policlinico Foggia

GAVeCeLT ROMA 2022

INDICAZIONI AL FICC-PORT

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- Sindrome della Vena Cava Superiore
- Cancro mammario bilaterale
- Trombosi/linfedemi di entrambi gli arti superiori
- Vene del braccio di piccolo calibro e port toracico controindicato
- IRC (creazione di FAV)
- Il port toracico può essere controindicato nei follow-up oncologici con la RMN delle mammelle poiché il reservoir crea degli artefatti. (Femoral placement of totally implantable venous power ports as an alternative implantation site for patients with central vein occlusions. Jan P. Goltz, et al. Support Care Cancer (2014) 22:383–387)

Cannulation of the superficial femoral vein at mid-thigh when catheterization of the superior vena cava system is contraindicated. Linfang Zhao, et al. J Vasc Access. 2020 Jul;21(4):524-528.

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METODO RaFeVA

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Eseguire sempre il metodo RaFeVa

- valutazione dei diametri delle vene periferiche e centrali → escludere stenosi o compressioni ab estrinseche
- escludere trombosi parziali delle vene periferiche/centrali (instauratesi in precedenti incannulamenti)
- escludere anomalie anatomiche

Table 1. The seven steps of the Rapid Femoral Vein Assessment (RaFeVA).

	Vascular structures to be assessed	Visualization of the vein
Step 1	Common femoral artery Common femoral vein	Short axis
Step 2	Common femoral vein External iliac vein	Long axis
Step 3	Common femoral artery Common femoral vein Saphenous vein	Short axis
Step 4	Superficial femoral artery Deep femoral artery Common femoral vein	Short axis
Step 5	Superficial femoral artery Deep femoral artery Superficial femoral vein Deep femoral vein	Short axis
Step 6	Superficial femoral artery Superficial femoral vein	Short axis
Step 7	Superficial femoral artery Superficial femoral vein	Oblique axis

SIF PROTOCOLLO PER IMPIANTO FICC

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Table I. The seven steps of the SIF Protocol.

Step 1	*Preprocedural evaluation*—choice of the vein by systematic ultrasound examination of the veins of the groin and the thigh (RaFeVA protocol) and choice of the ideal exit site (Femoral ZIM)
Step 2	*Appropriate aseptic technique*—hand hygiene, skin antisepsis with 2% chlorhexidine in 70% alcohol, maximal barrier precautions
Step 3	*Ultrasound-guided insertion*—ultrasound-guided venipuncture, ultrasound verification of the correct direction of the guidewire (tip navigation)
Step 4	*Intra-procedural assessment of tip location*—if the tip must be in IVC, use length estimation by anthropometric measurement and consider post-procedural x-ray; if the tip must be in RA or at IVC/RAJ, use intracavitary ECG and/or by transthoracic echocardiography (in subcostal view, using the "bubble test")
Step 5	*Adequate protection of the exit site*—reduction of the risk of bleeding and risk of contamination by sealing with cyanoacrylate glue
Step 6	*Proper securement of the catheter*—stabilization of the catheter using skin-adhesive sutureless devices, transparent dressing with integrated securement, or subcutaneous anchorage
Step 7	*Appropriate coverage of the exit site*—semi-permeable transparent dressing, preferably with high breathability

FEMORAL ZIM

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Puntura Ecoguidata
Vena Femorale «Comune» nel 1/3 superiore della coscia
o della Vena Femorale «Superficiale» a 2/3 di coscia

IMPIANTO: ESPERIENZA PERSONALE

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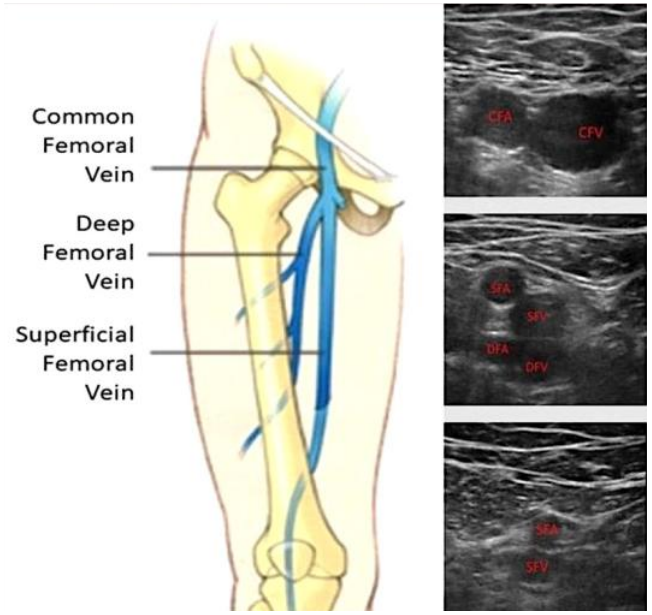
Puntura Ecoguidata Real-time:

- 98% la Vena Femorale Comune
- 2% la Vena Femorale Superficiale



Vein Level	Diameter (mm)		
	Mean	SD	Range
CFV	10.57	2.88	3.80–23.60
High SFV	7.10	1.96	2.60–14.80
Mid SFV	6.41	1.72	2.00–13.20
Low SFV	6.52	1.74	2.00–14.20
Popliteal vein	6.80	2.11	1.50–15.70

Note.—CFV = common femoral vein, SFV = superficial femoral vein.

PUNTURA ECOGUIDATA REALTIME

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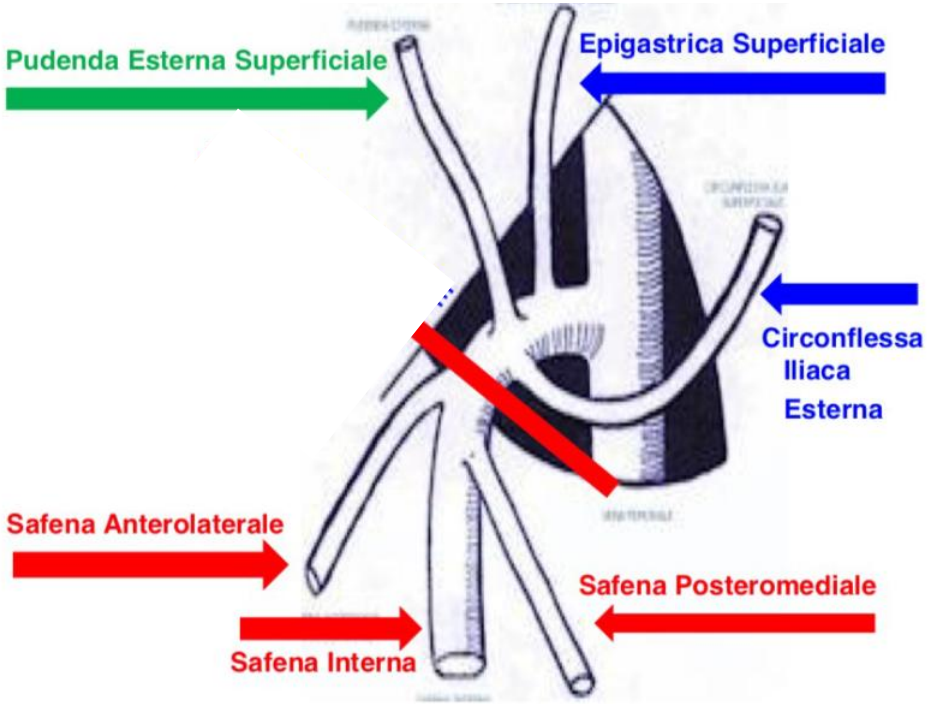


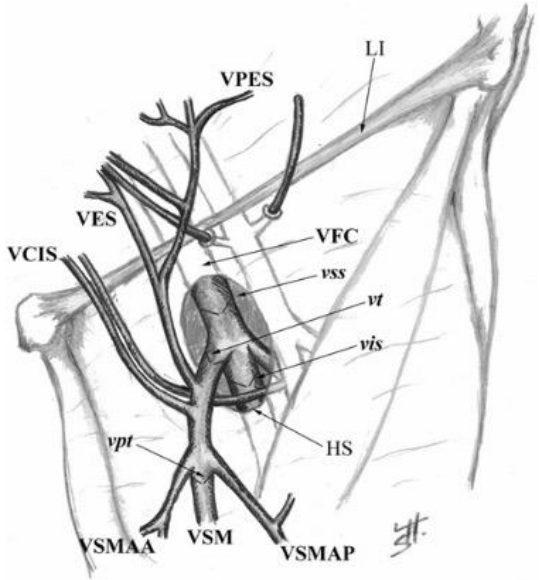
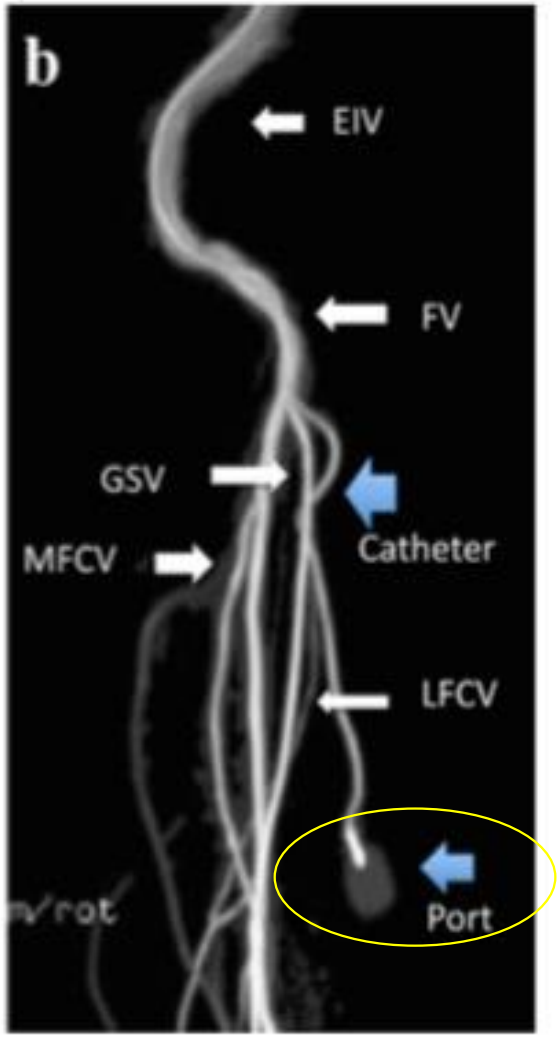


Figure 3 Schema of *confluens venosus subinguinalis* including valves. HS: *hiatus saphenus*; LI: *ligamentum inguinale*; VCIS: *vena circumflexa ilium superficialis*; VES: *vena epigastrica superficialis*; VFC: *vena femoralis communis*; VPES: *vena pudenda externa superficialis*; VSM: *vena saphena magna*; VSMAA: *vena saphena magna accessoria anterior*; VSMAP: *vena saphena magna accessoria posterior*; vis: valvula infrasaphenica; vp: *valvula preterminalis*; vt: *valvula terminalis*; vss: valvula suprasaphenica



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Totally Implantable Venous Access Port Via the Femoral Vein in a Femoral Port Position With CT-Venography.
Kazuya Kato, et al. J Surg Oncol. 2016 Dec;114(8):1024-1028.

Tip Navigation e Location

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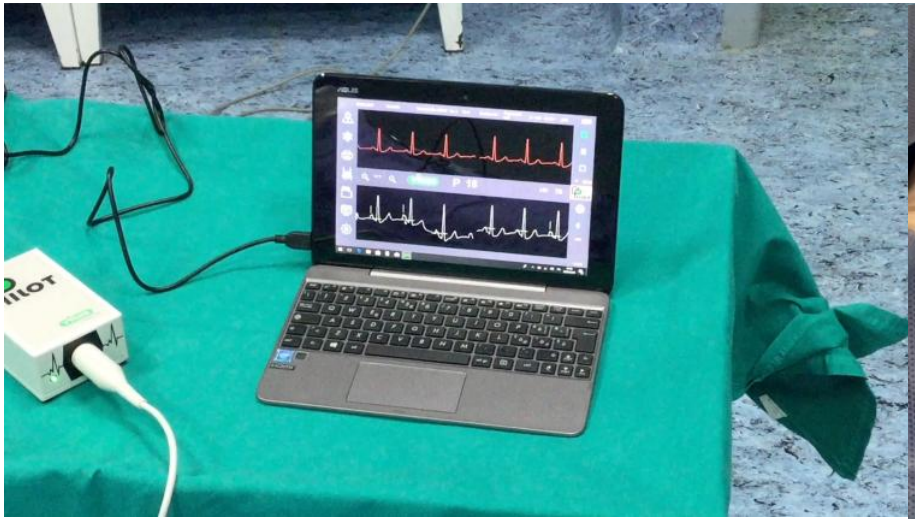

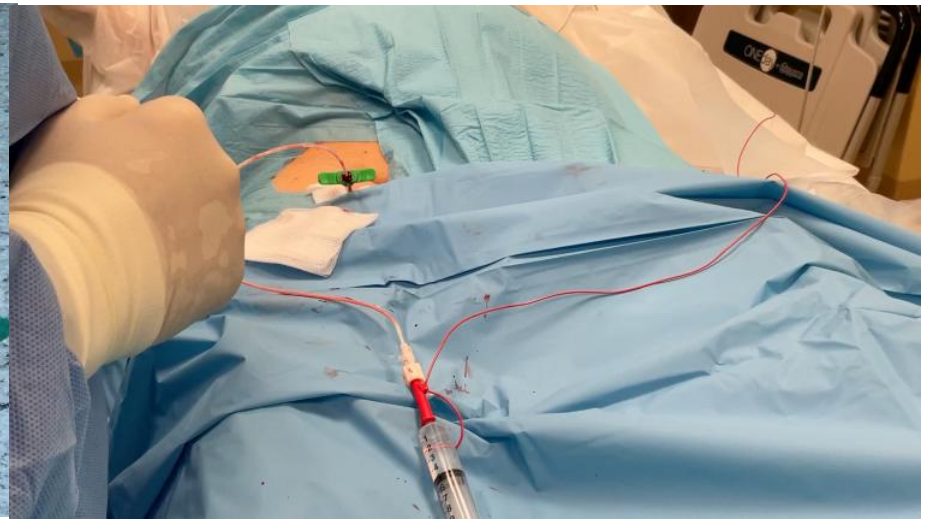

Use of intracavitary-ECG for tip location of femorally inserted central catheters. Mark D Weber, et al.
J Vasc Access . 2022 Jan;23(1):166-170.

BUBBLE TEST

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- Ecocardiogramma con microbolle
- Test eseguibile e ripetibile su tutti i pazienti
- Utile se non si dispone di monitor-Ecg con software dedicato (PILOT)
- Visione asse lungo in-plane della VCI dalla regione sottocostale destra

American Journal of Emergency Medicine 33 (2015) 315–319

Contents lists available at ScienceDirect

American Journal of Emergency Medicine

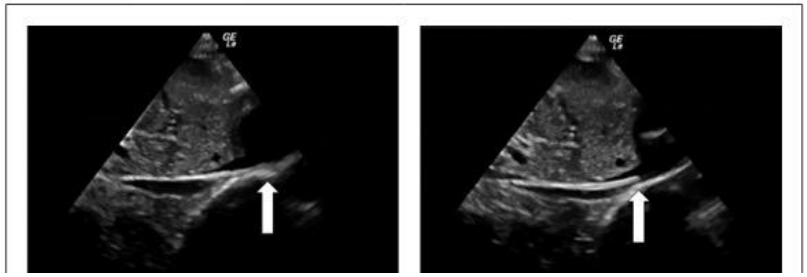
journal homepage: www.elsevier.com/locate/ajem

Original Contribution

The bubble study: ultrasound confirmation of central venous catheter placement ☆,☆☆,★,★★

Petra E. Duran-Gehri... Goggans, MD [a], Huynh Tran, MD [b], C...

Negative test (=incorrect tip position)
No bubbles: caution non-intravenous tip!
Laminar flow>2 sec: misplacement
Immediate turbulent flow: RA
Positive test (=correct tip position)
Laminar flow<2 sec



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LA TASCA SOTTOCUTANEA

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- Creata nella Green Zone di Dawson
- La tasca sottocutanea deve essere «appena più grande» del reservoir (2 cm)

Il confezionamento di una «piccola tasca»
minimizza il rischio di rotazione del reservoir

LA TASCA SOTTOCUTANEA

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unabtasca troppo superficiale potrebbe provocare ischemia del derma e dell'epidermide

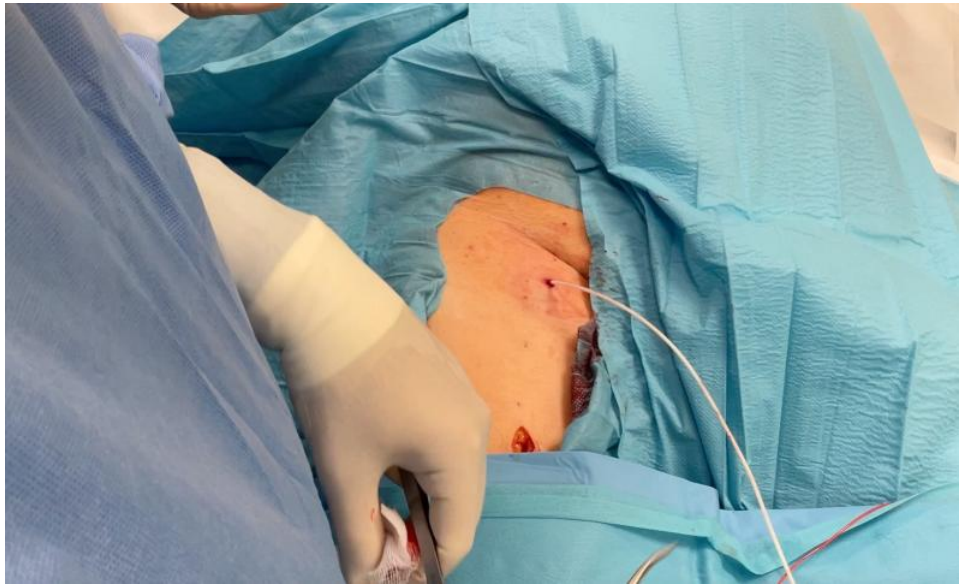

Foto di Deiscenza della tasca per ischemia di epidermide e derma

TUNNELLIZZAZIONE DEL CVC

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Green Zone di R. B. Dawson

TUNNELLIZZAZIONE RETROGRADA (SIAS)

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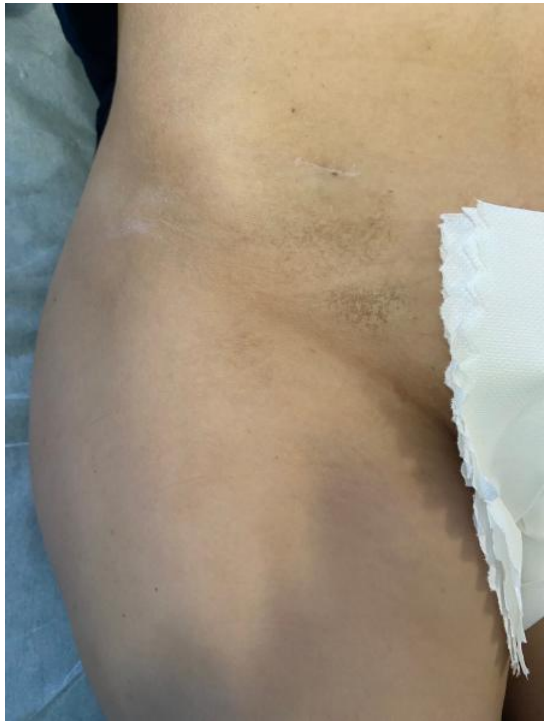
Policlinico Riuniti di Foggia



TUNNELLIZZAZIONE ANTEROGRADA (METÀ COSCIA)

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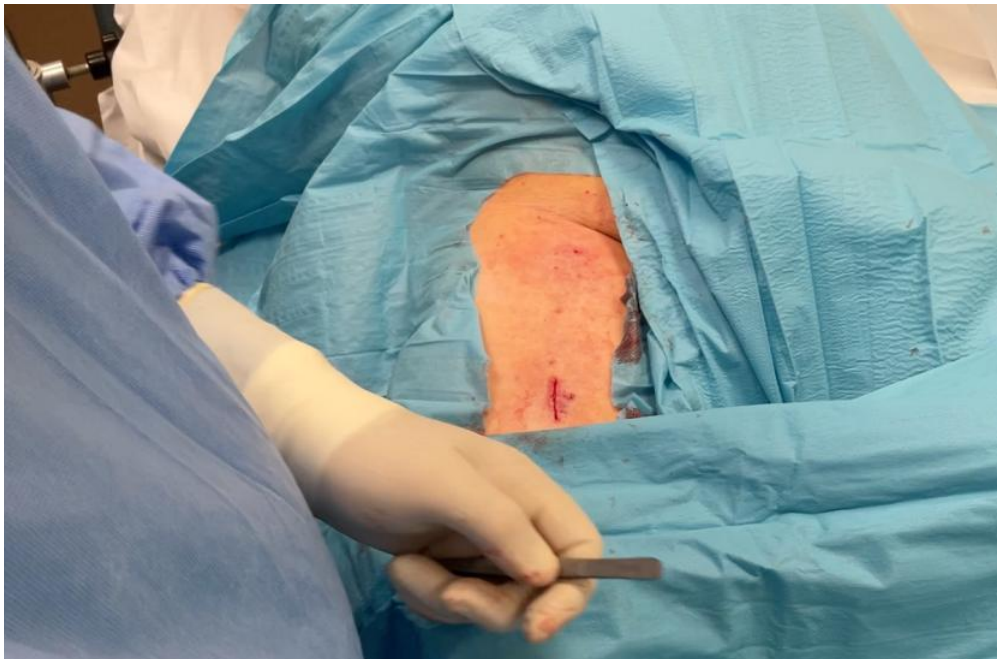
SUTURA DELLA TASCA SOTTOCUTANEA

Domenico MERLICCO
Policlinico Riuniti di Foggia

- L'incisione chirurgica viene suturata per il sottocute con un monofilamento riassorbibile in PDS 5/0 e per la cute la colla di cianoacrilato



PICC PORT: COMPLICANZE IMMEDIATE E PRECOCI

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- Ecchimosi locale: 10% degli impianti

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Policlinico Riuniti di Foggia

Techniques in vascular access

JVA | The Journal of Vascular Access

Cannulation of the superficial femoral vein at mid-thigh when catheterization of the superior vena cava system is contraindicated

Linfang Zhao, Xiuzhu Cao and Yapping Wang

The Journal of Vascular Access
1–5

DOI: 10.1177/1129729819896473
journals.sagepub.com/home/jva
SAGE

Table 1. Baseline characteristics of the subjects.

Characteristics	n	%
Gender		
Male	89	73.55
Female	32	26.45
Age (years)	64.50 ± 13.53	
Diagnosis		
Lung cancer	66	54.55
Mediastinal tumor	5	4.13
Uremia and renal failure	7	5.79
Breast cancer	6	4.96
Esophageal cancer	4	3.31
Other cancers	9	7.44
Diabetes	4	3.31
Others	20	16.53
Vein		
Right femoral vein	99	81.82
Left femoral vein	22	18.18
Type of catheter		
Power-injectable single-lumen	45	37.19
Power-injectable dual-lumen	44	36.36
Silicone-valved single-lumen	30	24.19
Power-injectable triple-lumen	2	1.65
Causes of catheterization		
Superior vena cava stenosis	78	64.46
Peripheral venous thrombosis of both upper limbs	12	9.92
Poor condition of peripheral veins of both upper limbs	15	12.40
Bilateral upper limb vein need protection	7	5.79
Bilateral breast cancer	6	4.96
Others	3	2.48

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Table 2. Complications during the period of indwelling.

Object	Puncture site	Example/total	Rate	p value
Dislodgment	Upper limb	209/2094	9.98	0.051
	Thigh	5/121	4.13	
Infection	Upper limb	134/2094	6.40	0.042
	Thigh	2/121	1.65	
Occlusion	Upper limb	53/2094	2.53	0.002
	Thigh	9/121	7.44	
Bleeding	Upper limb	21/2094	1.00	1.000
	Thigh	1/121	0.83	
Catheter-related thrombosis	Upper limb	12/2094	0.57	1.000
	Thigh	1/121	0.83	
Catheter-related skin problem	Upper limb	17/2094	0.81	1.000
	Thigh	1/121	0.83	
Primary malposition	Upper arm	126/2094	6.02	0.045
	Thigh	2/121	1.65	

Table 3. Complications between different types of PICC.

Object	Type of FICC	Example/total	Rate	p value
Dislodgment	Tip-opened power injectable	3/91	3.30	0.783
	Silicone valved	2/30	6.67	
Infection	Tip-opened power injectable	2/91	2.20	1.000
	Silicone valved	0/30	0	
Occlusion	Tip-opened power injectable	7/91	7.69	1.000
	Silicone valved	2/30	6.67	
Bleeding	Tip-opened power injectable	1/91	1.10	1.000
	Silicone valved	0/30	0	
Catheter-related thrombus	Tip-opened power injectable	1/91	1.10	1.000
	Silicone valved	0/30	0	
Catheter-related skin problems	Tip-opened power injectable	1/91	1.10	1.000
	Silicone valved	0/30	0	
Primary malposition	Tip-opened power injectable	1/91	1.10	0.436
	Silicone valved	1/30	3.33	

PICC: peripherally inserted central venous catheter; FICC: femoral-inserted central catheters.

Anesthesiology 2007; 107:181–2

Ultrasound-guided "Low Approach" Femoral Vein Catheterization in Critical Care Patients Results in High Incidence of Deep Vein Thrombosis

To the Editor:—Central venous access has traditionally been performed using puncture of a central vein, passing the needle along the anticipated line of the relevant vein using surface anatomical landmarks and by knowing the expected anatomical relation of the vein to its palpable, companion artery.[1,2] If the surface landmark technique is not helpful, ultrasonic devices are widely used to cannulate central veins. Furthermore, reports have advocated that real-time ultrasound-guided placement of central venous catheter can be achieved quickly with low failure and complication rates in critical care patients.[3]

The low femoral approach for catheterization of the femoral vein 10–15 cm below the inguinal ligament has been used for renal therapy in the intensive care unit.[4] At this point, the companion artery is not palpable, and the anatomical landmarks guiding location of the femoral vein are also absent. Therefore, when performing this technique, the use of ultrasound guidance is considered indispensable. Finally, there are no extensive data indicating whether the application of the low femoral approach may result in a lower incidence the rate of central venous catheter–associated infection and/or thrombosis as compared with the classic method of catheterization of the femoral vein, which was ultrasonographic and clinical evidence of deep vein thrombosis (DVT); or if there was a known anatomic abnormality, a known hypercoagulable state, or history of congestive heart failure.

Forty patients (aged 40.3 ± 10.4 yr; body mass index, 22 ± 4.1 kg/m^2; 18 female) underwent with the classic approach, and 40 patients (aged 41 ± 11.2 yr; body mass index, 22.5 ± 5 kg/m^2; 16 female; all *P* nonsignificant) were catheterized by the low femoral approach (10–15 cm below the inguinal ligament). Catheters were placed in both positions with the aid of ultrasound. All patients were receiving prophylactic treatment with low-molecular-weight heparin. Visualization of thrombus formation, noncompressibility of the vein, no spontaneous Doppler flow, and lack of augmentation response were used as diagnostic criteria of DVT. Central venous catheter–associated bloodstream infections were defined as only those bloodstream infections for which other sources were excluded by careful examination of the patient record, and where a culture of the catheter tip demonstrated substantial colonies of an organism identical to those found in the bloodstream.[5] The mean observational period was 40 ± 15 days. All patients were monitored every 48 h after the placement of the catheter for identification of a possible clot formation,

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However, the incidence of DVT was significantly higher in the low femoral group compared with the classic group (13 patients [32.5%] vs. 4 patients [10%], respectively; P 0.001). In 9 of the 13 patients of the low femoral group and in 1 of 4 patients of the classic group, the thrombus was located around the catheter and was detectable after 9±4.5 days of insertion (fig. 1).

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Sonographic Assessment of Lower Limb Vein Diameters: Implications for the Diagnosis and Characterization of Deep Venous Thrombosis

Barbara S. Hertzberg[1]
Mark A. Kliewer[1]
David M. DeLong[1]
Kathleen J. Lalouche[1,2]
Erik K. Paulson[1]
M. Gena Frederick[1]
Barbara A. Carroll[1]

OBJECTIVE. The goals of this study were to define the normal range of diameters in the deep veins of the thigh and to compare this range with diameters of veins with acute thrombus and of veins with chronic changes from prior deep venous thrombosis (DVT).

SUBJECTS AND METHODS. The anteroposterior diameter of the vein and adjacent artery was measured at five predefined levels in 975 legs of patients referred for sonographic examination for suspected DVT. The mean vein diameter and mean vein-to-artery ratio were calculated for normal veins, vein segments with acute DVT, and vein segments with chronic changes from prior DVT.

RESULTS. The diameter of normal deep leg veins was largest at the level of the common femoral vein (mean diameter, 10.5 mm). The diameter progressively decreased until the mid superficial femoral vein and remained relatively constant (mean diameter, 6.4–6.8 mm) more caudally. Similarly, vein-to-artery ratios progressed from a mean ratio of 1.3 in the common femoral vein to 1.2 at other levels. We found no significant differences in vein diameter between the right and the left legs. Vein segments with acute thrombus were larger than corresponding segments of normal veins. However, we found considerable overlap in the ranges of diameter of veins with and without acute DVT. At corresponding levels, veins with chronic DVT tended to be narrower than normal veins; however, the differences were small, and this diameter range also substantially overlaps that of normal veins.

CONCLUSION. When grouped, veins with acute DVT were larger than normal veins. Likewise, veins with chronic DVT were smaller than normal veins. Because we found that the ranges of diameters of veins overlapped for different groups of veins, size alone is unlikely to provide compelling evidence for the diagnosis of acute versus chronic DVT, except at extreme diameters. Diameters of veins as revealed by sonography should be interpreted in the context of other sonographic findings.

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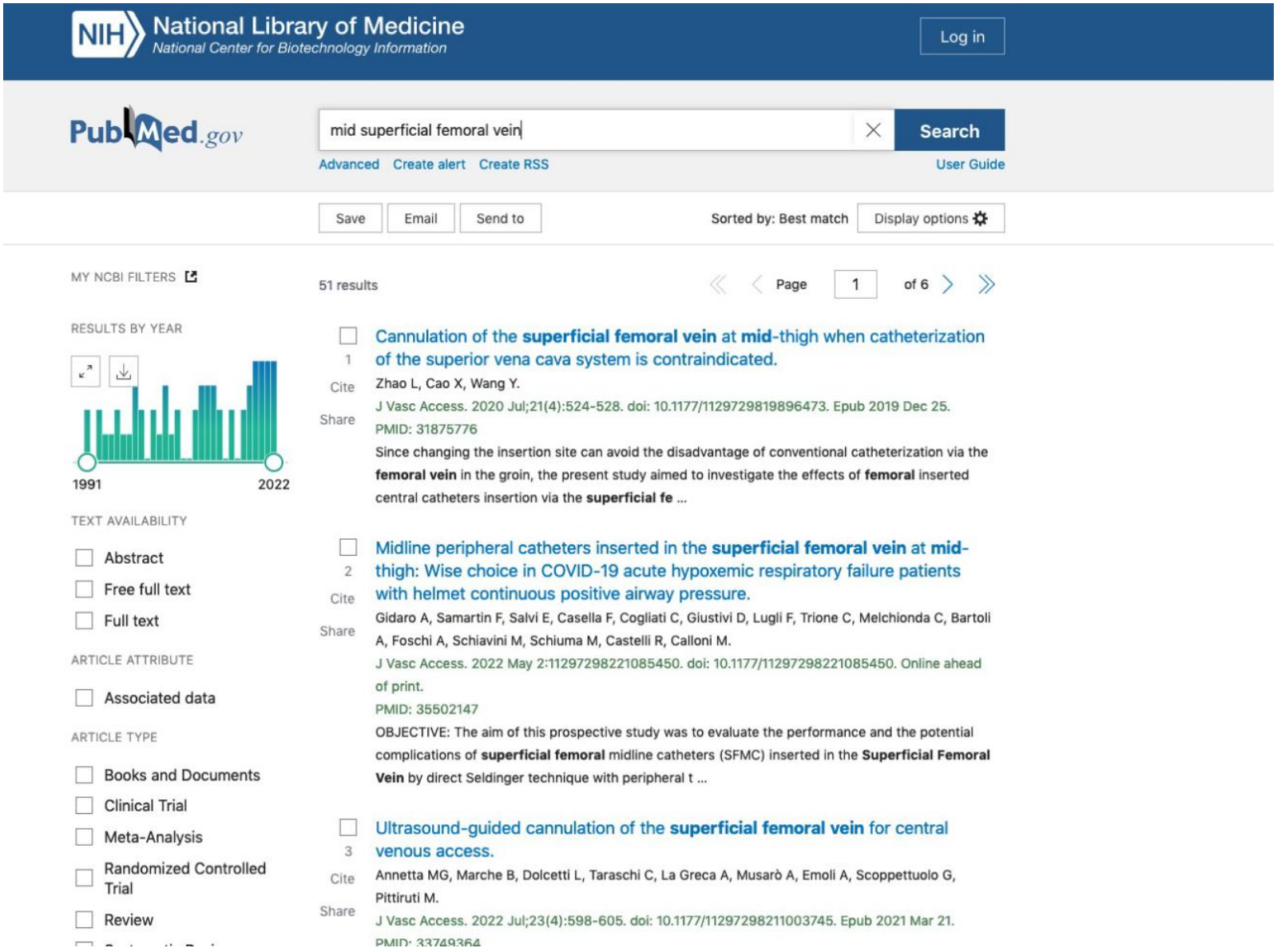
IL DIAMETRO, LA VELOCITÀ E LA PORTATA DEL CFV VARIAVANO SIGNIFICATIVAMENTE IN FUNZIONE DI ETÀ, SESSO, ETNIA, ALTEZZA E BMI.



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- 5 years
- 10 years
- Custom Range

Additional filters

Reset all filters

4 Cite Share

Rapid **Femoral Vein** Assessment (RaFeVA): A systematic protocol for ultrasound evaluation of the veins of the lower limb, so to optimize the insertion of femorally inserted central catheters.

Brescia F, Pittiruti M, Ostroff M, Biasucci DG.

J Vasc Access. 2021 Nov;22(6):863-872. doi: 10.1177/1129729820965063. Epub 2020 Oct 16.

PMID: 33063616

In this paper we describe a new protocol-named RaFeVA (Rapid **Femoral Vein** Assessment)-for the systematic US assessment of the veins in the inguinal area and at **mid**-thigh, designed to evaluate patency and caliber of the common and **superficial femoral** ...

5 Cite Share

The feasibility and safety of PICCs accessed via the **superficial femoral vein** in patients with superior vena cava syndrome.

Wan Y, Chu Y, Qiu Y, Chen Q, Zhou W, Song Q.

J Vasc Access. 2018 Jan;19(1):34-39. doi: 10.5301/jva.5000810.

PMID: 29148000

METHODS: From October 2010 to December 2014, 221 cancer patients with SVCS in our center received real-time ultrasound-guidance of the **superficial femoral vein** inserted central catheters (FICCs) at the **mid**-thigh. ...CONCLUSIONS: Real-time ultrasound-gu ...

6 Cite Share

Superficial Femoral Artery Aneurysm as a Cause of Deep **Vein** Thrombosis Treated With a Covered Stent.

Mercado-Alamo A, Zaitoun A, Neupane S, Davis T.

J Invasive Cardiol. 2018 Nov;30(11):E124-E125.

PMID: 30373955 **Free article.**

Deep **vein** thrombosis due to **superficial femoral** artery aneurysm is an extremely rare condition that develops due to aneurysm direct compression of a segment of the venous system. ...Imaging revealed a 3.2 cm SFA aneurysm with secondary mass effect on the left ...

7 Cite Share

Case report: End of life care via a **mid**-thigh **femoral** midline catheter.

Ostroff M, Aberger K, Moureau N.

J Vasc Access. 2021 Aug 31:11297298211043410. doi: 10.1177/11297298211043410. Online ahead of print.

PMID: 34463188

Upper extremity peripheral vascular access options are often limited in the chronically ill patient population with end stage cancer, patients with severe contractures, tracheostomies, and feeding tubes and patients referred for palliative care are just some examples of patients ...

8 Cite

Venous morbidity after **superficial femoral**-popliteal **vein** harvest.

Wells JK, Hagino RT, Bargmann KM, Jackson MR, Valentine RJ, Kakish HB, Clagett GP.

J Vasc Surg. 1999 Feb;29(2):282-89; discussion 289-91. doi: 10.1016/s0741-5214(99)70381-2.

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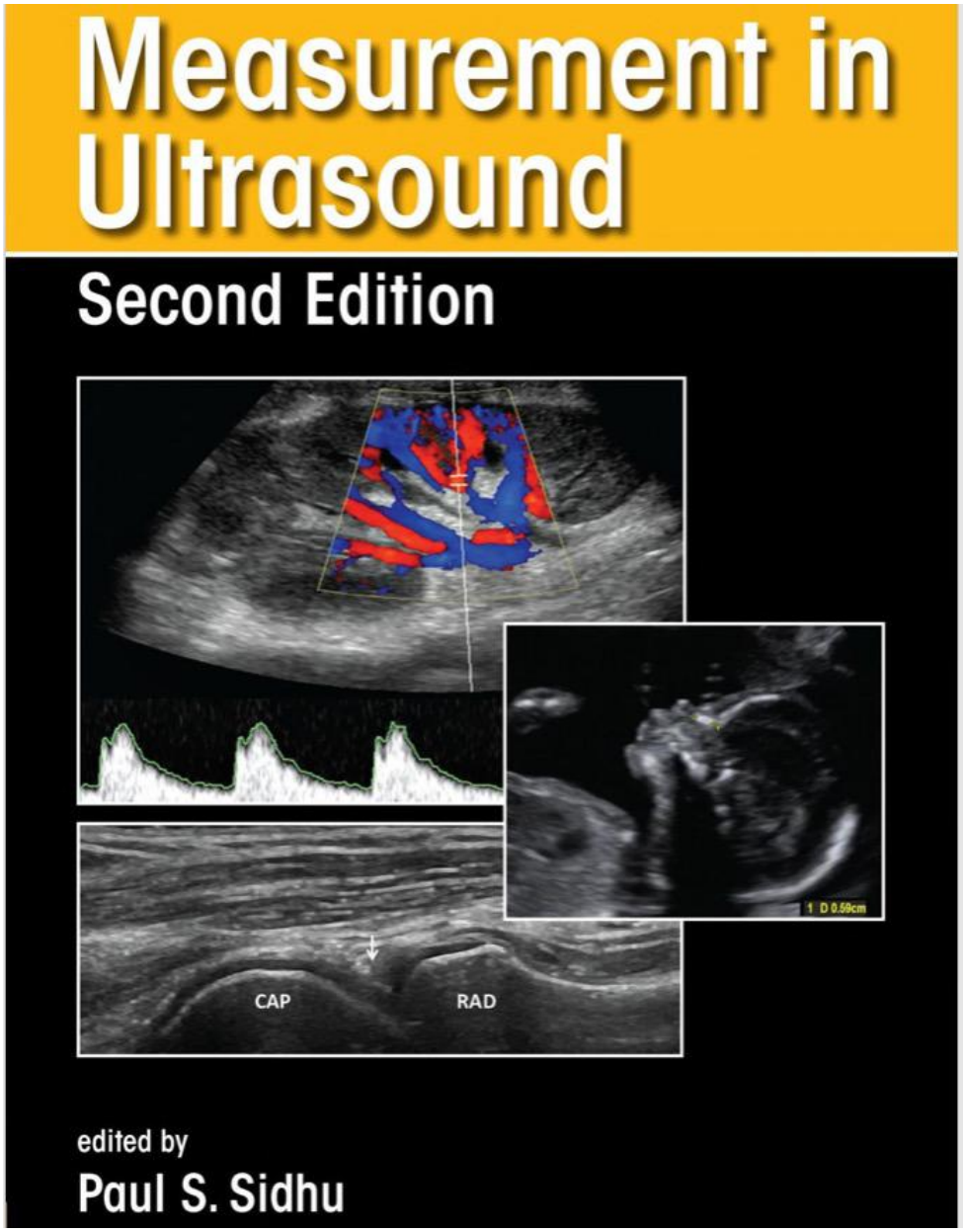

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	Vein diameter	Vein/artery ratio
Vessel	**Mean ± SD (mm)**	**Mean ± SD**
Common femoral vein	10.57 ± 2.88	1.34 ± 0.37
High superficial femoral vein	7.10 ± 1.96	1.24 ± 0.36
Mid superficial femoral vein	6.41 ± 1.72	1.21 ± 0.33
Low superficial femoral vein	6.52 ± 1.74	1.19 ± 0.32
Popliteal femoral vein	6.80 ± 2.11	1.22 ± 0.36

(From Hertzberg BS et al., 1997)

Clinical Anatomy (2018)

ORIGINAL COMMUNICATION

Human Femoral Vein Diameter and Topography of Valves and Tributaries: A Post Mortem Analysis

JONAS KEILER,[1*] MARKO SCHULZE,[1] HORST CLAASSEN,[2] AND ANDREAS WREE[1]

[1]Department of Anatomy, Rostock University Medical Center, Rostock, Germany
[2]Department of Anatomy and Cell Biology, Faculty of Medicine, Martin Luther University Halle-Wittenberg, Halle, Germany

The femoral vein (FV) is a clinically important vessel. Failure of its valves can lead to chronic venous insufficiency (CVI) with severe manifestations such as painful ulcers. Although they are crucial for identifying suitable implant sites for therapeutic valves, studies on the topography of FV tributaries and valves are rare. Moreover, the femoral vein diameter (FVD) must be known to assess the morphometric requirements for valve implants. To reassess the anatomical requirements for valve implants, 155 FVs from 82 human corpses were examined. FVDs and tributary and valve topographies were assessed using a laboratory straightedge. The FVD increased from 6 mm in the distal femoropopliteal vein to 11 mm in the iliofemoral vein proximal to the saphenofemoral junction (SFJ). Diameters were significantly bigger in males than females. Height correlated positively with FVD. Distal to the SFJ, within a distance of 38 cm, one to eight valves were present. Up to two valves were present within 10 cm proximal to the SFJ. Individual tributary and valve topography must be considered to ensure appropriate design and successful implantation of a venous valve for CVI therapy in the FV. A suitable implant site would be proximal to the SFJ via an infrainguinal transfemoral access. Clin. Anat. 00:000–000, 2018. © 2018 Wiley Periodicals, Inc.

Key words: femoral vein; iliac vein; lower extremity; popliteal vein; thigh; venous valves

INTRODUCTION

The severest manifestations of chronic venous insufficiency (CVI) are painful ulcers caused by increased transmural pressure in the postcapillary vessels, which in turn is caused by hypertension in the lower limb veins. The prevalence of CVI is difficult to estimate and varies among countries (Beebe-Dimmer et al., 2005); 0.1–0.3% of the general population in Western countries suffer from CVI-caused ulcers (Charit and Schulze, 2016). Long-term complications such as deeper wound infections have severe effects on the health of affected patients (Eberhardt and Raffetto, 2014; Pugliese, 2016) and also have a serious economic impact (Ruckley, 1997). However, conventional surgical therapy is not always feasible, especially in elderly, multimorbid patients. Since the 1980s, various attempts have been made to develop stent-based venous valve implants with biogenic or artificial materials for minimally invasive transluminal

Additional Supporting Information may be found online in the supporting information tab for this article.

*Correspondence to: Jonas Keiler, Department of Anatomy, Rostock University Medical Center, Gertrudenstraße 9, 18057 Rostock. E-mail: jonas.keiler@uni-rostock.de

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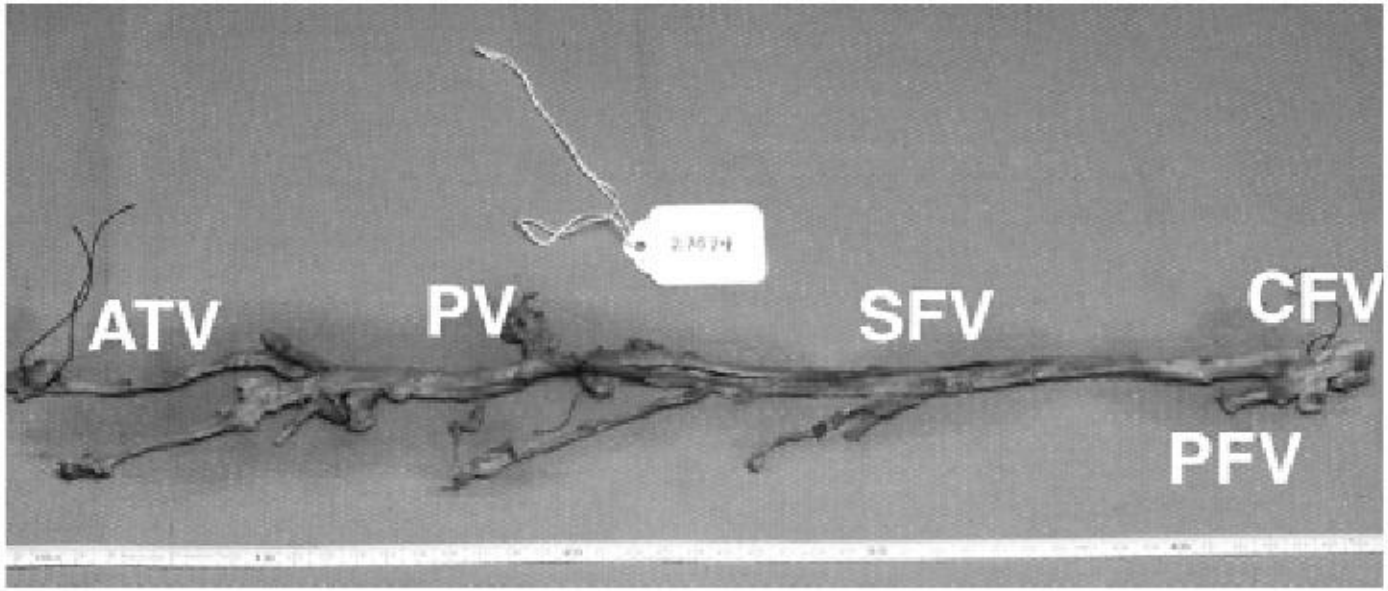

Fig 4. Cadaveric specimen of deep veins of the legs: the common femoral vein, profunda femoris vein, superficial femoral vein, popliteal vein, and anterior tibial vein.

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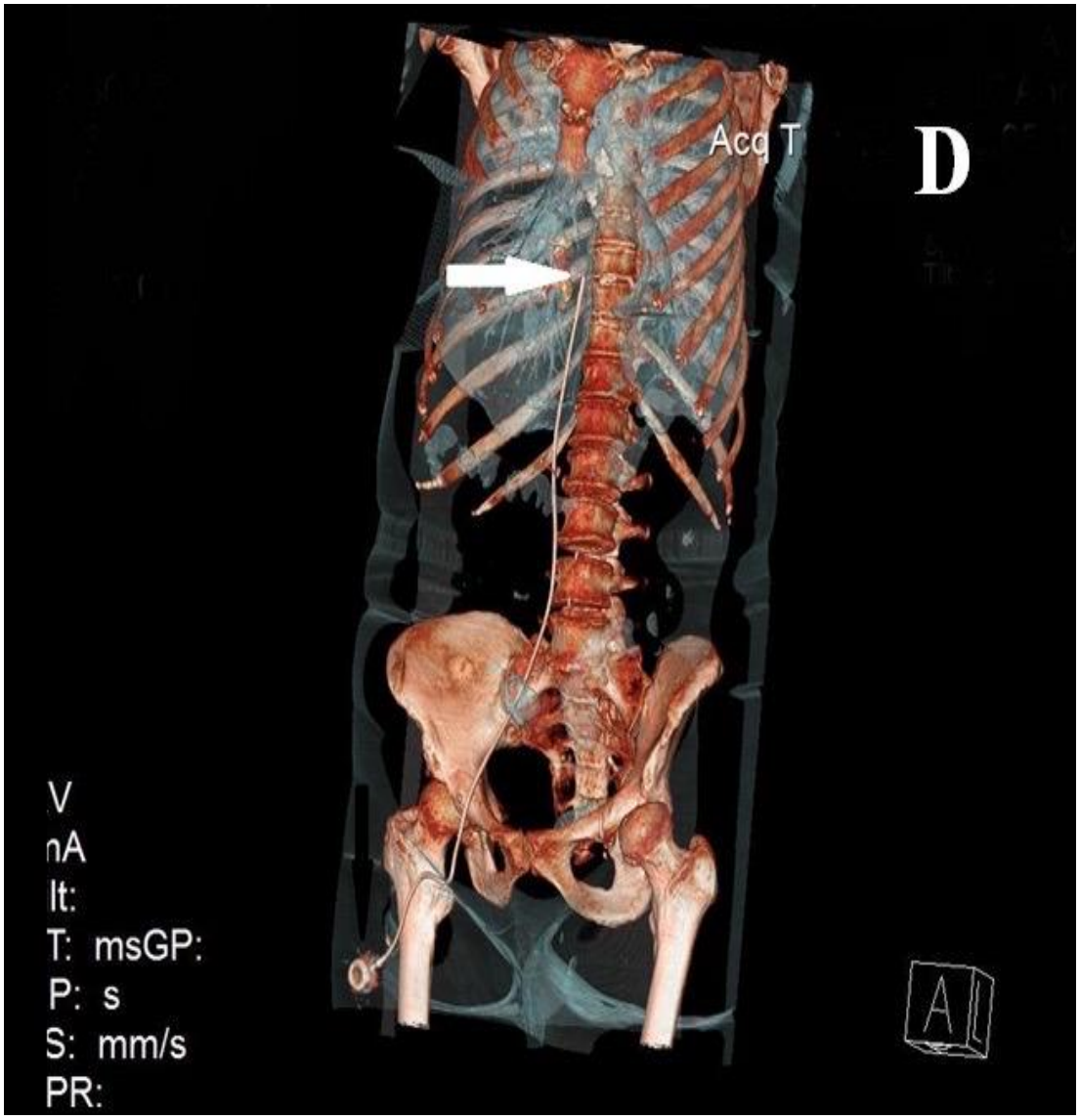
TABLE 1. Characteristics of Body Donors and Femoral Vein Diameters (FVD) for Overall, Male, and Female Cohorts

		Overall cohort (n = 82)		Male cohort (n = 46)		Female cohort (n = 36)	
Age [yr]	Range	45–97		45–97		67–96	
	Mean	81.9 ± 9.2		79.4 ± 9.6		85.2 ± 7.3	
Body height [cm]	Range	135–190		158–190		135–175	
	Mean	169.4 ± 10.1		175.2 ± 7.2		161.9 ± 8.0	
Male [%]		56.1		100		0	
Segment		**Mean FVD**	**Range**	**Mean FVD**	**Range**	**Mean FVD**	**Range**
6–10 cm proximal		11.2 ± 1.8	7.6–15.6	11.8 ± 1.6	8.5–15.6	10.5 ± 1.7	7.6–13.3
1–5 cm proximal		11.6 ± 2.1	5.7–18.8	12.5 ± 2.2	6.7–18.8	10.6 ± 1.6	5.7–15.3
0–5 cm distal		10.6 ± 2.2	5.2–16.9	11.5 ± 2.2	7.0–16.9	9.5 ± 1.5	5.2–14.1
6–10 cm distal		8.2 ± 1.9	2.9–13.5	8.8 ± 1.7	5.3–13.5	7.4 ± 1.8	2.9–11.0
11–15 cm distal		7.6 ± 1.7	1.8–1	8.1 ± 1.7	4.1–1	7.0 ± 1.6	1.8–10.7
16–20 cm distal		7.7 ± 1.6	2.9–12.1	8.2 ± 1.5	4.5–12.1	7.1 ± 1.5	2.9–10.4
21–25 cm distal		7.4 ± 1.7	2.5–11.5	7.8 ± 1.5	4.0–11.5	6.9 ± 1.7	2.5–9.9
26–30 cm distal		7.0 ± 1.6	1.9–11.5	7.8 ± 1.5	4.5–11.5	6.3 ± 1.4	1.9–9.6
31–35 cm distal		6.8 ± 1.6	2.9–10.5	7.1 ± 1.6	3.5–10.5	6.4 ± 1.4	2.9–9.2
36–40 cm distal		6.2 ± 1.6	2.2–10.1	6.7 ± 1.5	3.0–10.1	5.6 ± 1.5	2.2–8.6
41–45 cm distal		6.0 ± 1.5	2.5–9.5	6.1 ± 1.5	2.5–8.9	5.7 ± 1.4	3.8–9.5

Mean values in mm are given with standard deviation and ranges. Point of reference is the saphenofemoral junction (orifice of the great saphenous vein).



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