

## Dialysezugänge - neue Devices



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## Take Home Message

Neue Devices sind hilfreich,  
um  
„vascular real estate“  
unserer PatientInnen zu erhalten

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### Take Home Message -2

Strategien zur Erhaltung von „vascular real estate“ sind notwendig UND waren schon immer möglich – nun mit neuen Devices folgende Ziele leichter erreichbar:

- Neue Zugangsoptionen schaffen → „vascular real estate“ expandieren
  - Shunt-Outcomes verbessern
  - Bestehende Zugänge erhalten
- Kathetereinsatz optimieren „Always right, never subclavia“
  - Katheterrate reduzieren

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### Vermehrung von AVF Optionen= Erhaltung von „vascular real estate“

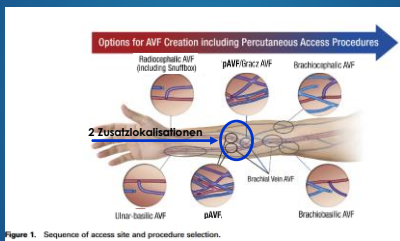


Figure 1. Sequence of access site and procedure selection. Shahverdiyev et al, September 2020, Vasc Interv Radiol

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### WavelinQ



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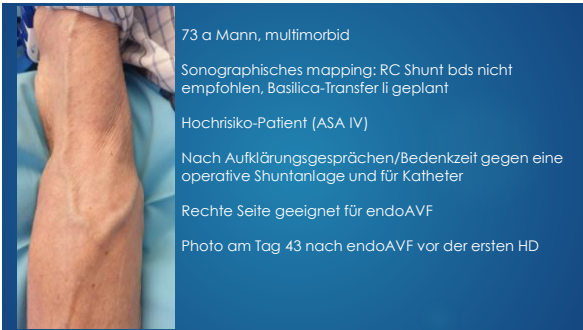
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**Table 3. Procedure Details by Percutaneous AVF Type**

Variable	Overall n (%)	WavelinQ n (%)	Ellipsys n (%)	P Value <sup>a</sup>
Technical success				.3500
Yes	99 (99)	34 (97)	65 (100)	
No	1 (1)	1 (2.9)	0 (0)	
Variable	Overall n (%)	WavelinQ n (%)	Ellipsys n (%)	P Value
AVF blood flow, mL/min <sup>b,c</sup>				
Day 1 (n WavelinQ = 34; n Ellipsys = 65)	450 (85-1400)	450 (85-1300)	400 (150-1400)	.6340
Day 2 (n WavelinQ = 28; n Ellipsys = 57)	640 (180-1450)	640 (200-1450)	640 (180-1300)	.7646
Week 4 (n WavelinQ = 24; n Ellipsys = 47)	780 (150-2600)	775 (150-2600)	780 (290-1300)	.8267
Months 2-3 (n WavelinQ = 19; n Ellipsys = 35)	822.5 (280-1700)	840 (365-1700)	800 (280-1500)	.2142
Month 6 (n WavelinQ = 13; n Ellipsys = 22)	790 (70-1600)	1000 (480-1600)	750 (70-1000)	.1156

Shahverdyan et al, JVIR 2020

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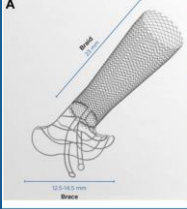
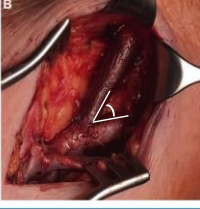
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### Optimierung der Shuntoutcomes VasQ-Device

Karydis et al. AJKD, 2020

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**Table 4. AVF Outcomes and Physiologic Characteristics**

Outcome/Characteristic	Treatment	Control	P
<b>Assisted maturation*</b>			
1 mo	85% (17/20)	85% (17/20)	0.9
3 mo	85% (17/20)	85% (16/20)	0.9
<b>Unassisted maturation*</b>			
1 mo	80% (16/20)	80% (16/20)	0.9
3 mo	80% (16/20)	80% (16/20)	0.9
<b>Functional patency*</b>			
3 mo	90% (9/10)	45% (5/11)	0.06
6 mo	100% (14/14)	55% (5/9)	0.01
<b>Cephalic vein volume flow, mL/min</b>			
1 mo	1,250.06 ± 398.6	1,208.35 ± 543.2	0.9
3 mo	1,500.71 ± 518.9	1,113.5 ± 661.6	0.08
6 mo	1,393.7 ± 673.6	1,046.88 ± 625.5	0.1
<b>Cephalic vein diameter, mm</b>			
1 mo	6.94 ± 1.4	6.85 ± 1.3	0.5
3 mo	8.27 ± 1.3	6.69 ± 1.8	0.03
6 mo	9.8 ± 2.5	7.56 ± 2.7	0.03
<b>AVF patency</b>			
Primary patency at 6 mo	80% (16/20)	66% (12/18)	0.5
Secondary patency at 6 mo	85% (17/20)	77% (14/18)	0.6

Note: Values given as percentage (number of risk or mean ± standard deviation).  
 Abbreviation: AVF, arteriovenous fistula.  
 \*Physiologic maturation defined as patent fistula with cephalic vein diameter ≥ 5 mm and AVF volume flow rate > 500 mL/min.  
 †Successful establishment on hemodialysis through study AVF using 2-needle cannulation in patients actively dialyzed with a patent fistula for two thirds or more of all dialysis runs for 3 months.

Karydis et al. AJKD, 2020

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### Patienten-/ fistelspezifisches Training zur Reduktion der Fehlkanülierungsraten durch 3D-Bioprinting

Fehlkanülierung → Fistelversagen (16%), Überbrückungskatheter (67%),  
neue Fistel (7%)

Bakhera et al. JVA 2022

85 Fehlkanülierungen bei 47 Patienten → Problemfisteln!

Coventry et al. BMC Nephrology 2019

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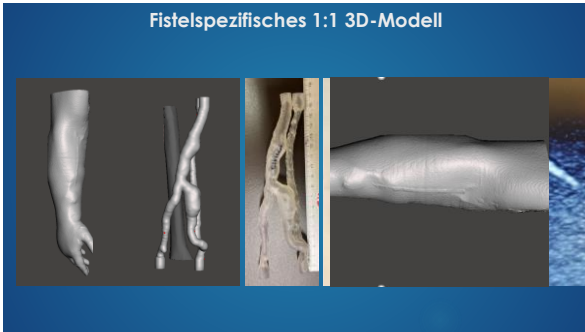
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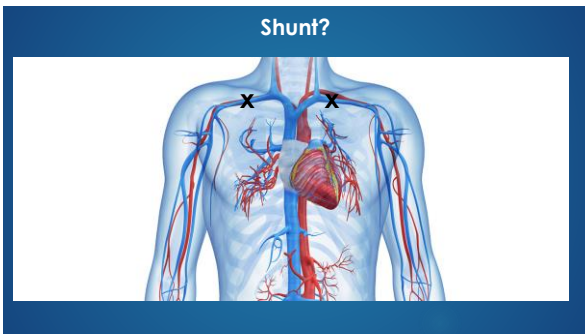
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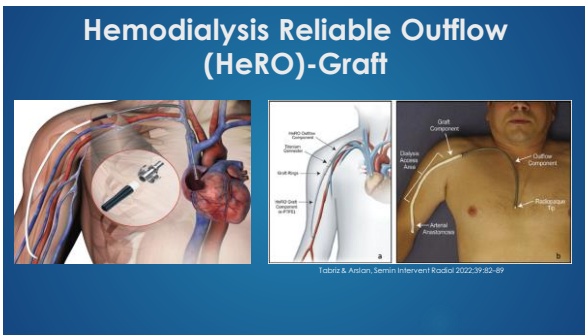
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### Super-HeRO

**Früh-punktierbare Prothesen**  
GORE® ACUSEAL / Gefinge® FLIXENE®

↓

KEIN Überbrückungskatheter notwendig

**Standard-Prothesen**  
GORE-TEX® / BD®-IMPRA®

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Überbrückungskatheter notwendig

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**Early cannulation grafts for haemodialysis: An updated systematic review**

The Journal of Vascular Access  
2018, Vol. 29(3) 133-137  
© The Author(s) 2018  
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sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1087800X18789171  
jva.sagepub.com/home/jva

**Julien Al Shakarchi<sup>1</sup> and Nicholas Inston<sup>2</sup>**

**JVA** The Journal of Vascular Access

- ▶ 19 Studien mit frühpunktierbaren Prothesen inkludiert
- ▶ Grafts innerhalb von 72 Std punktiert
- ▶ Offenheit im Vergleich zu Standard-PTFE: **kein Unterschied**
- ▶ Komplikationsraten im Vergleich zu Standard-PTFE: **kein Unterschied**
- ▶ **Keine** Überbrückungskatheter!

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### HeRO-Graft - Daten

**Im Vergleich zu tunnelierten HD-Kathetern**

- Um 69% weniger Infektionen
- 14-32% bessere Dialysequalität
- 50% Reduktion von Folgeinterventionen

**Im Vergleich zu AV-Prothesen**

Vergleichbare Komplikation- und Offenheitsraten

Tabriz & Arslan, Semin Intervent Radiol 2022;39:82-89

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### Katheter richtig einsetzen

Verwendung Zentralvenöser Katheter optimieren  
*Häufigste Intervention weltweit UND #1 Ursache für ZV-Pathologien*

„Always right, never subclavia“  
„Don't go left“  
„Stay right and safe“

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### Zentralvenöse Stenosen und Verschlüsse: Häufigkeit / Risikofaktoren

<b>Patient:</b>	<b>Katheter:</b>
Gerinnungsstörungen	Linke Seite
Adipositas	V. subclavia / V. femoralis
Malignom	Liegedauer/Verweilzeit
	Infektionen
	Dicker Katheter
	Nicht tunnelierter Katheter
	Häufigkeit der Implantationen/Punktionen
	Zu hoch liegende Katheterspitze (proximale VCS)

**10 – 64 %: je nach Studiendesign**

Agarwal, 2009, AJKD; Wilkin et al, 2003, Radiology; Krishna et al, 2014, AJKD; Salgado et al, 2004, AHJ Organs; Gunawansa et al, Ann Vasc Surg, 2018

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**KDOQI CLINICAL PRACTICE GUIDELINE FOR VASCULAR ACCESS: 2019 UPDATE**

**Guideline 3. Vascular Access Locations**

- When there are valid reasons for CVC use (Guideline Statement 2.2) and duration of use is expected to be prolonged (eg, >3 months) without anticipated use of AV access, CVC may be placed in the following locations in order of preference:
  - Internal jugular
  - External jugular
  - Femoral
  - Subclavian
  - Lumbar

*Note: In the absence of contraindication, prior pathology (eg, central stenosis) or intervention (eg, pacemaker) CVC insertion on the right side is preferable to the left side due to more direct anatomy. If one side has pathology that limits AV access creation but allows for CVC insertion, this side should be used for the CVC to preserve the other side for AV access creation.*

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### Thorakale Zentralvenen und/oder V. cava superior zu

Ziel:  
Keine elektiven Femoralis- oder linksseitigen thorakalen Katheter

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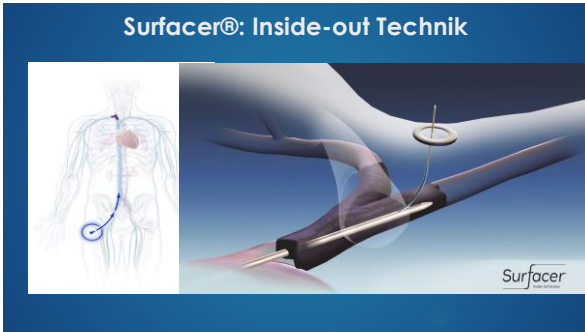
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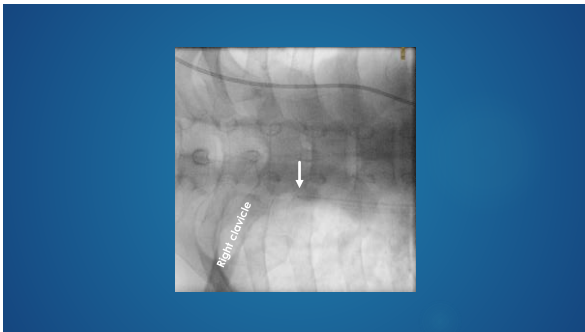
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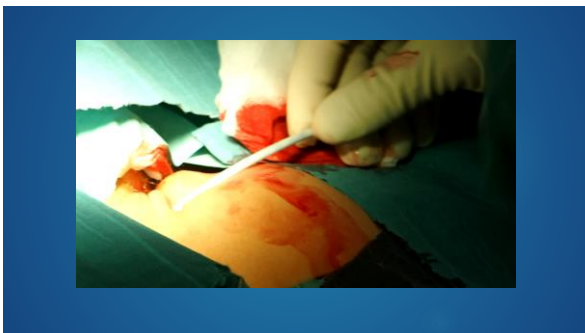
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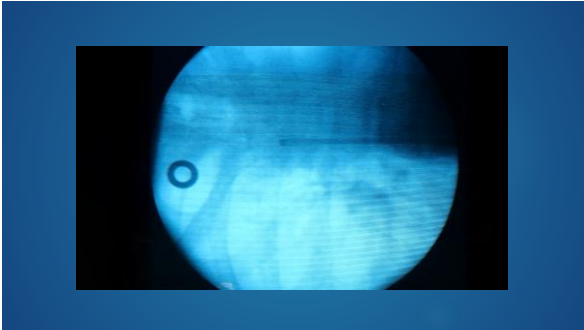
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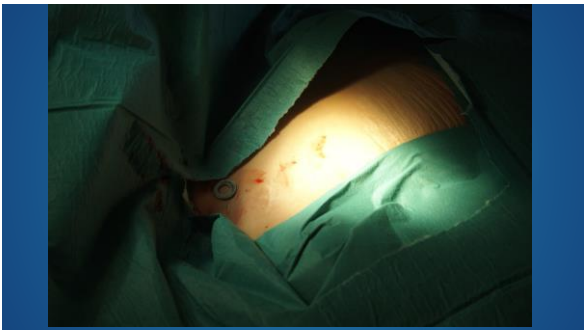
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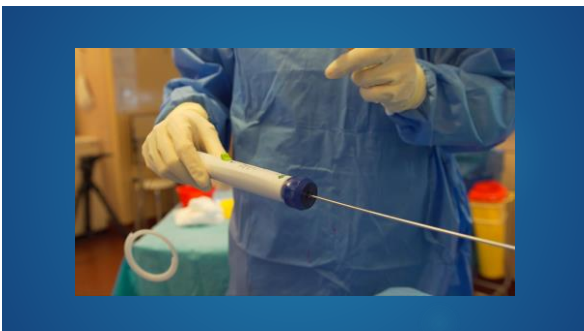
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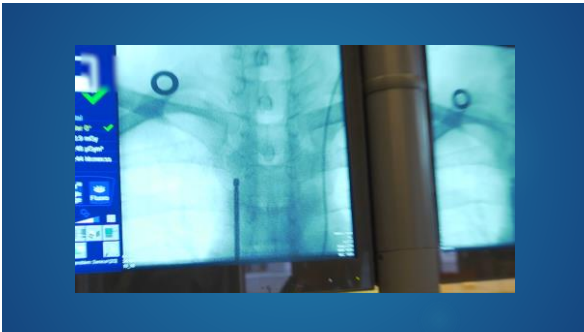
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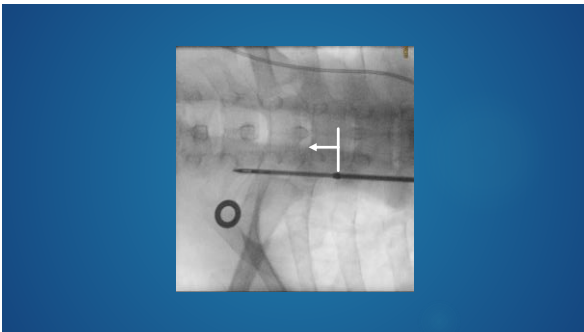
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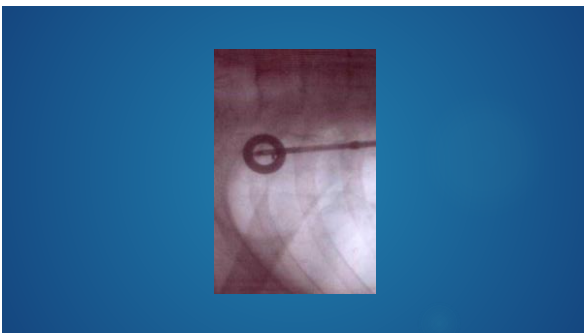
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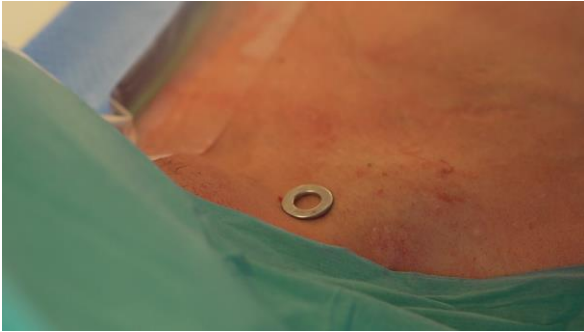
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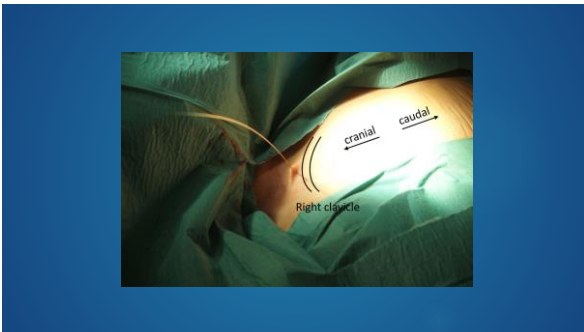
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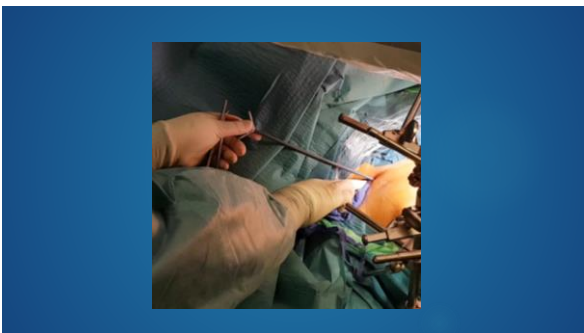
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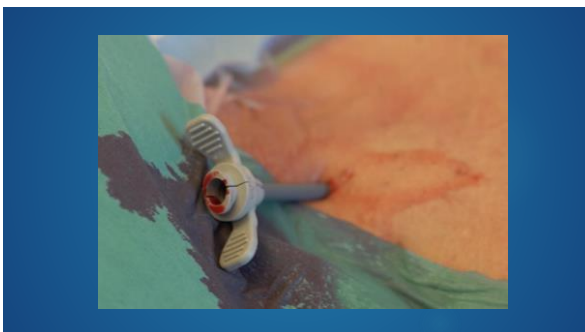
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### Einsatz von Inside-out Technik

**Dringlichkeit (therapeutisch)**

Running out vessel patient / bilaterale TZVO → Zugang ermöglichen

**Möglichkeit (präventiv)**

ZV-Okklusionen rechts thorakal → rechts tharakal bleiben, keine Anspruchnahme von Vv. subclaviae/femorales

**AKH-Wien: Bei 104/105 PatientInnen mit eingeschränkten Möglichkeiten wurde ein ZV-Zugang schnell und sicher implantiert (99% Erfolgsrate, 0 Komplikation) / „vascular real estate“ erhalten**

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<p><b>AJKD Am J Kidney Dis.75(4):480-487, 2019</b></p> <p><b>A Novel Inside-out Access Approach for Hemodialysis Catheter Placement in Patients With Thoracic Central Venous Occlusion</b></p> <p><small>Reza Ranaei-Shahmoradian, Bahram Mousavizadeh, Vahid Javanmard, Amir Ghobadi, Hajar Ghobadi, and Gholam Reza Ranaei</small></p>	<p><b>38/39 successful, no complications.</b> 7 patients &gt;1x, 1x discontinued: vascular tortuosity</p>
<p><b>The Surface® Inside-Out® Access System for right-sided catheter placement in dialysis patients with thoracic venous obstruction</b></p> <p><small>Reza Ranaei-Shahmoradian, Bahram Mousavizadeh, Vahid Javanmard, Amir Ghobadi, Hajar Ghobadi, and Gholam Reza Ranaei</small></p>	<p><b>8/9 successful, no complications.</b> 1x discontinued: vascular tortuosity</p>
<p><b>J Vasc Interv Radiol. 2020 Oct;31(10):1654-1660</b></p> <p><b>Prospective Evaluation of the Surface® Inside-Out Access Catheter System in Patients with Thoracic Venous Obstruction: Results from the SAVV Registry</b></p> <p><small>Masrour Ghobadi, Bahram Mousavizadeh, Vahid Javanmard, Amir Ghobadi, Hajar Ghobadi, and Gholam Reza Ranaei</small></p>	<p><b>29/30 successful, no complications.</b> 1x discontinued: vascular tortuosity</p>
<p><b>Efficiency and safety associated with the use of the Surface® Inside-Out® Access Catheter System: Results from a prospective, multicenter Food and Drug Administration-approved Investigational Device Exemption study</b></p> <p><small>Reza Ranaei-Shahmoradian, Bahram Mousavizadeh, Vahid Javanmard, Amir Ghobadi, Hajar Ghobadi, and Gholam Reza Ranaei</small></p>	<p><b>27/30 successful, no complications.</b> 3x discontinued: vascular tortuosity</p>

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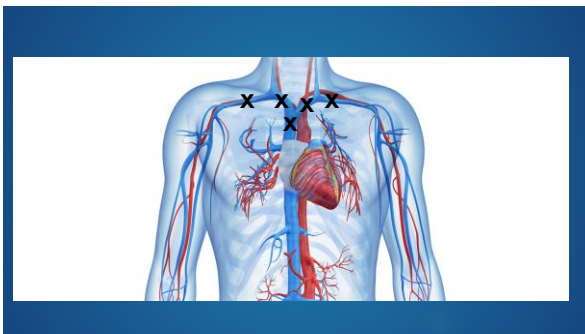
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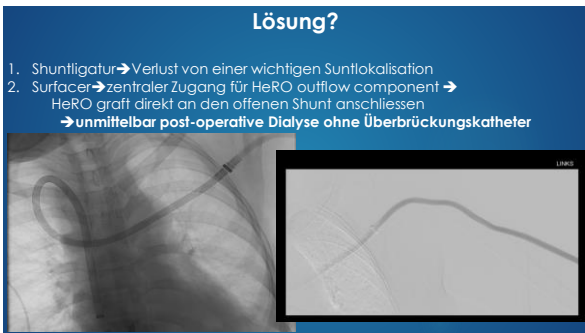
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### Letztes Dia

Es gibt eine Reihe von neuen Devices, die durch

optimierte Verwendung von Kathetern,

Reduktion der Katheterraten,

Ermöglichung von Shunts bei sonst Katheter-abhängigen PatientInnen

zusätzliche interventionelle Shuntmöglichkeiten

Verbesserung von (chirurgischen) Shunt-Outcomes,

den best-möglichen Erhalt der Gefäße unserer PatientInnen ermöglichen -

**als Teil einer multidisziplinären Gesamtstrategie.**

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