

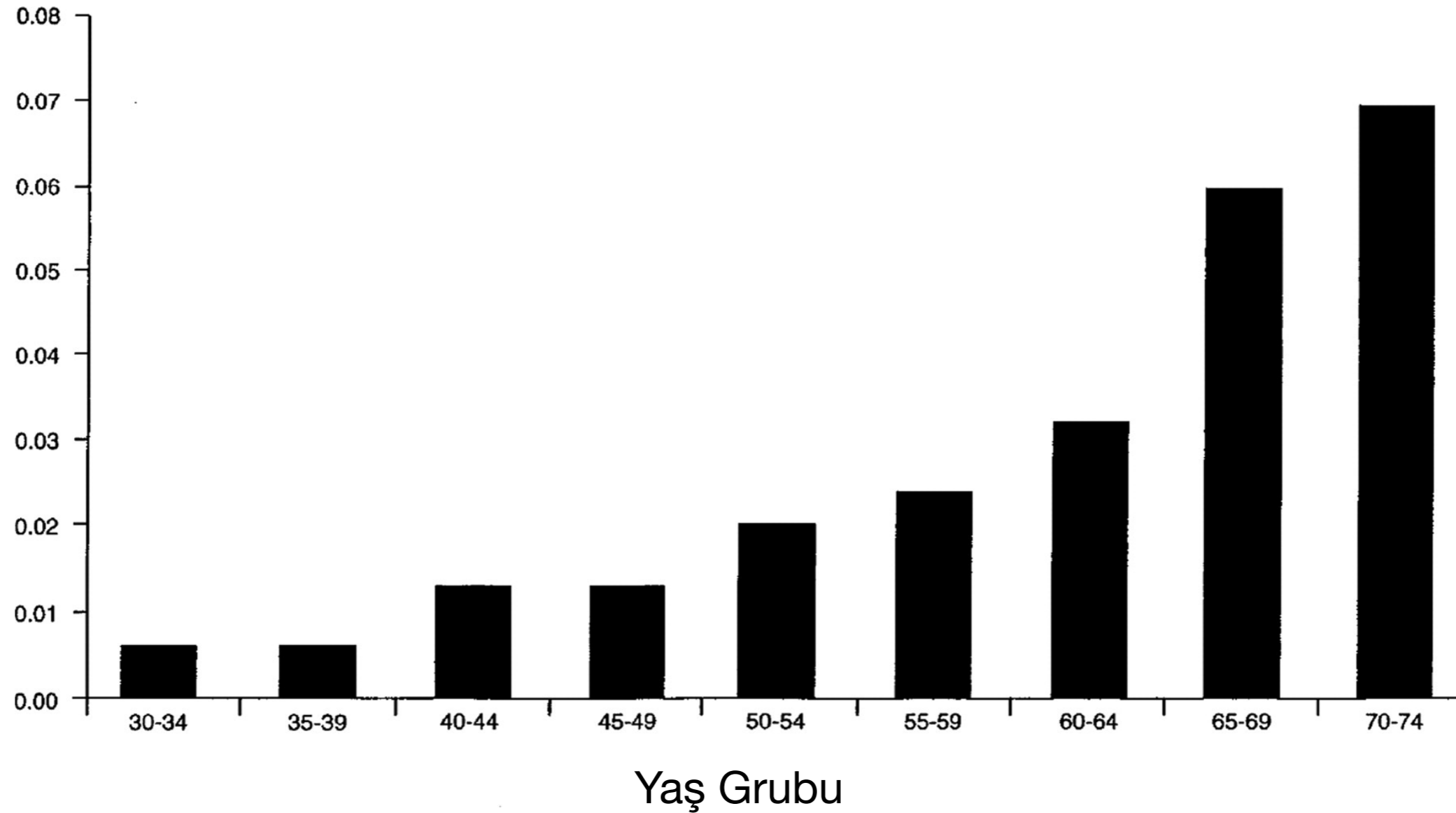
# Preoperatif Deęerlendirme ve Access Tercihii

**Dr. Birkan Akbulut**

Antalya Eęitim ve Arařtırma Hastanesi



# Hasta Grubu



# Tanı

- Fizik muayene
  - Nabız muayenesi
  - Her iki koldan TA ölçümü
- Ankle - Brachial Index ölçümü
- Doppler ultrasonografi\*
- Komorbid hastalıklar

\*White CJ, Grey WA. *Endovascular Therapies for Peripheral Arterial Disease. Circulation. 2007;116:2203-2215*

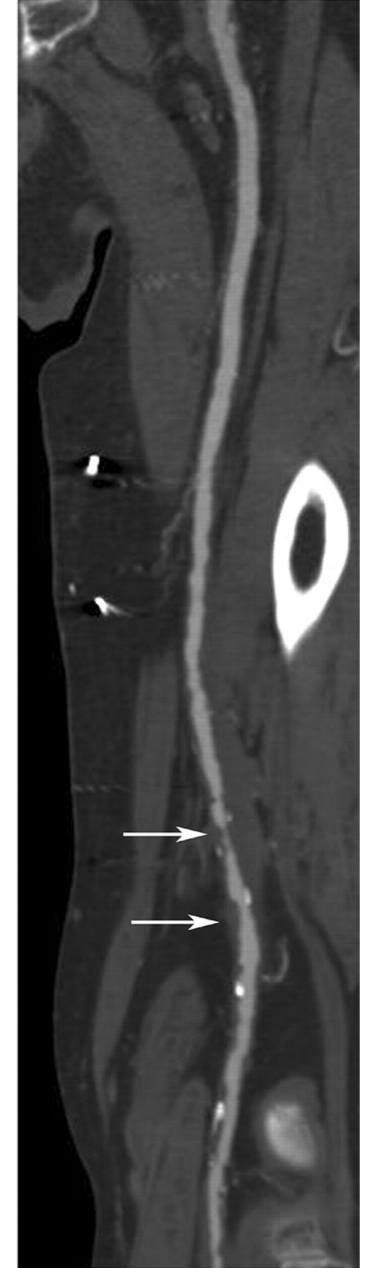
# Tanı

- Non-invaziv anjiyografi
  - BT-Anjio
  - MR-Anjio

Vasküler anatomi mükemmel şekilde ortaya konulur

3D görüntüleme mümkün (bifurkasyon lezyonlarını, egzantrik plakları ve overlapleri daha iyi gösterir\*)

SFA'nın BT-A görüntüsü



# Tanı

## İnvaziv anjiografi

- 2 boyutlu bir luminogramdır
- 3 boyutlu rekonstrüksiyon ve kesitsel görüntüleme mümkün değil
- AAA'da yanıtıcı olabilmektedir
- Stenoz üzerinde basınç gradiyenti ölçmek mümkün
- Tek başına komplikasyon kaynağı olabilmektedir (çoğu kateter kaynaklı)\*

\*Balduf LM, Langsfeld M, Marek JM, Tullis MJ, Kasirajan K, Matteson B. Complication rates of diagnostic angiography performed by vascular surgeons. *Vasc Endovascular Surg.* 2002; **36**: 439–445

# Tedavi Endikasyonları

- Konzervatif tedaviye cevap vermeyen yaşam kısıtlayıcı intermittent claudicatio
- Kritik bacak iskemisi
- Akut bacak iskemisi

# Tedavi Endikasyonları

## Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II)

From the Society for Vascular Surgery

Endovascular management of iliac artery occlusions: extending treatment to TransAtlantic

Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II)  
SOCIETY FOR VASCULAR SURGERY® DOCUMENT

Christopher D.  
Sean P. Lyden,  
Kenneth Ouriel

Nehler, K.A. Harris, and F.G.R. Fowkes on behalf of  
Denver, Colorado

2011 ACCF/AHA Focused update of the  
guideline for the management of patients with  
peripheral arterial disease  
AHA/ACC GUIDELINE

## 2016 AHA/ACC Guideline on the Management of Patients With Lower Extremity Peripheral Artery Disease: Executive Summary

Report of the American College of Cardiology/American Heart Association  
Force on Clinical Practice Guidelines

Received: 5 May 2017 | Accepted: 5 May 2017  
DOI: 10.1002/ccd.27141

PERIPHERAL VASCULAR DISEASE  
Core Curriculum

SCAI appropriate use criteria for peripheral arterial interventions: An update

Andrew J. Klein, MD, FSCAI<sup>1</sup> | Michael R. Jaff, DO, FSCAI<sup>2</sup> |  
Bruce H. Gray, DO, FSCAI<sup>3</sup> | Herbert D. Aronow, MD, MPH, FSCAI<sup>4</sup> |  
Robert M. Bersin, MD, MPH, FSCAI<sup>5</sup> | Larry J. Diaz-Sandoval, MD, FSCAI<sup>6</sup> |  
Robert S. Dieter, MD, RVT, FSCAI<sup>7</sup> | Douglas E. Drachman, MD, FSCAI<sup>8</sup> |  
Dmitriy N. Feldman, MD, FSCAI<sup>9</sup> | Osvaldo S. Gigliotti, MD, FSCAI<sup>10</sup> |  
Kamal Gupta, MD, FSCAI<sup>11</sup> | Sahil A. Parikh, MD, FSCAI<sup>12</sup> |  
Duane S. Pinto, MD, MPH, FSCAI<sup>13</sup> | Mehdi H. Shishehbor, DO, MPH, PhD, FSCAI<sup>14</sup> |  
Christopher J. White, MD, MSCAI<sup>15</sup>

WILEY

# Tedavi Endikasyonları

Gelişen teknoloji ile

- Lezyon uzunluğu
- Lezyon karakteri (stenoz, okklüzyon)

gibi özelliklerin önemi endovasküler cerrahi endikasyonu bakımından giderek azalıyor gibi gözükmemektedir.



# Tedavi Endikasyonları

Açık cerrahi endikasyonları

- Common femoral arter bölgesi
- Popliteal arter bölgesi

Kalça veya diz ekstansiyon / fleksiyonuna bağlı gerilme, torsiyon ve bası nedeniyle stent kırılmaları mümkün.

# Tedavi Endikasyonları

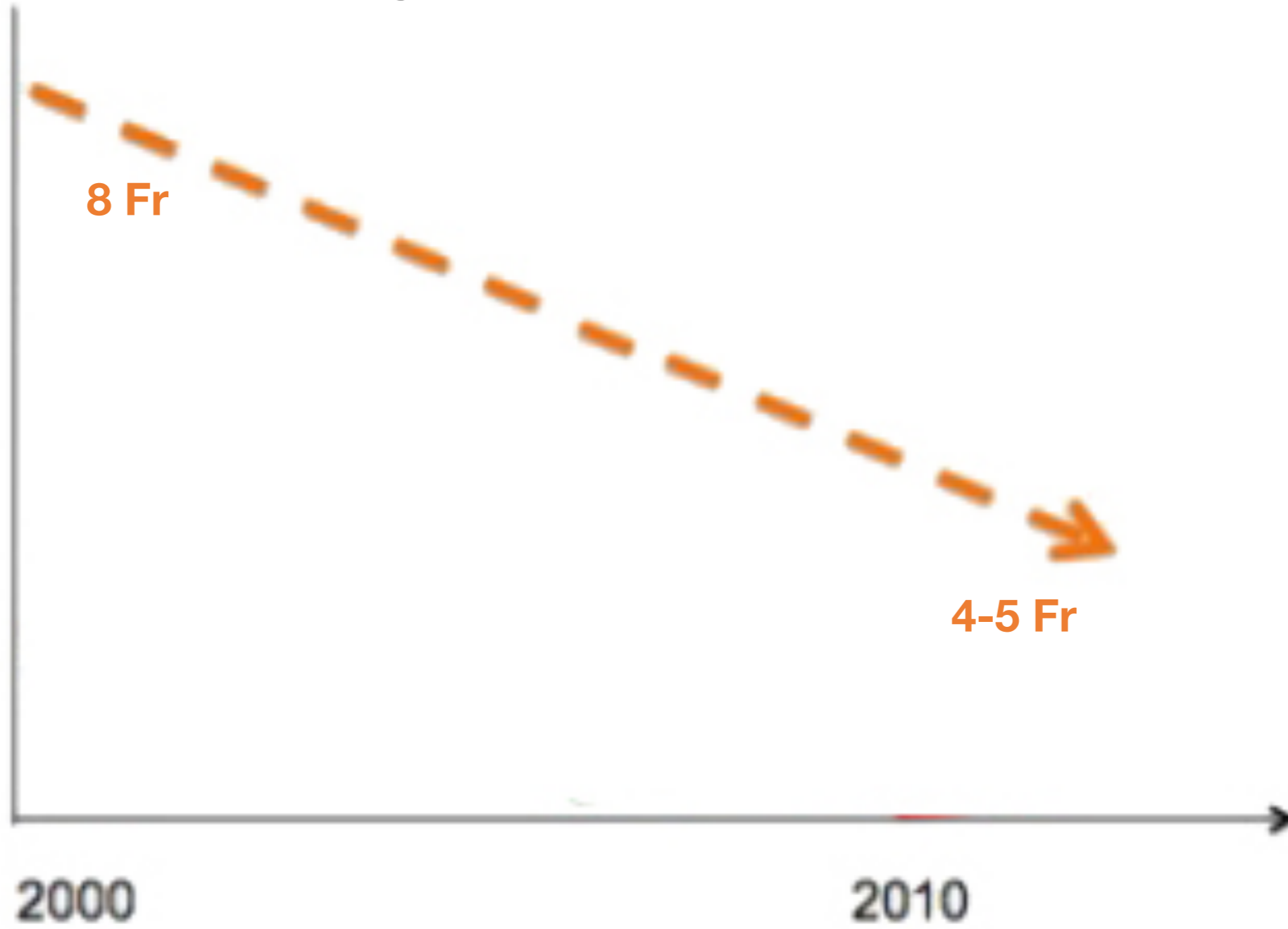
Son yıllarda Common femoral arter ve Popliteal arter hastalarında bile balon anjioplasti ve stentleme ile 12 aylık takipte kabul edilebilir sonuçlar alındığı bildirilmiştir.\*

Kaldı ki, ilaçlı balon ve atarektomi teknikleri ile stentsiz endovasküler tedavi seçenekleri de mümkündür.\*\*

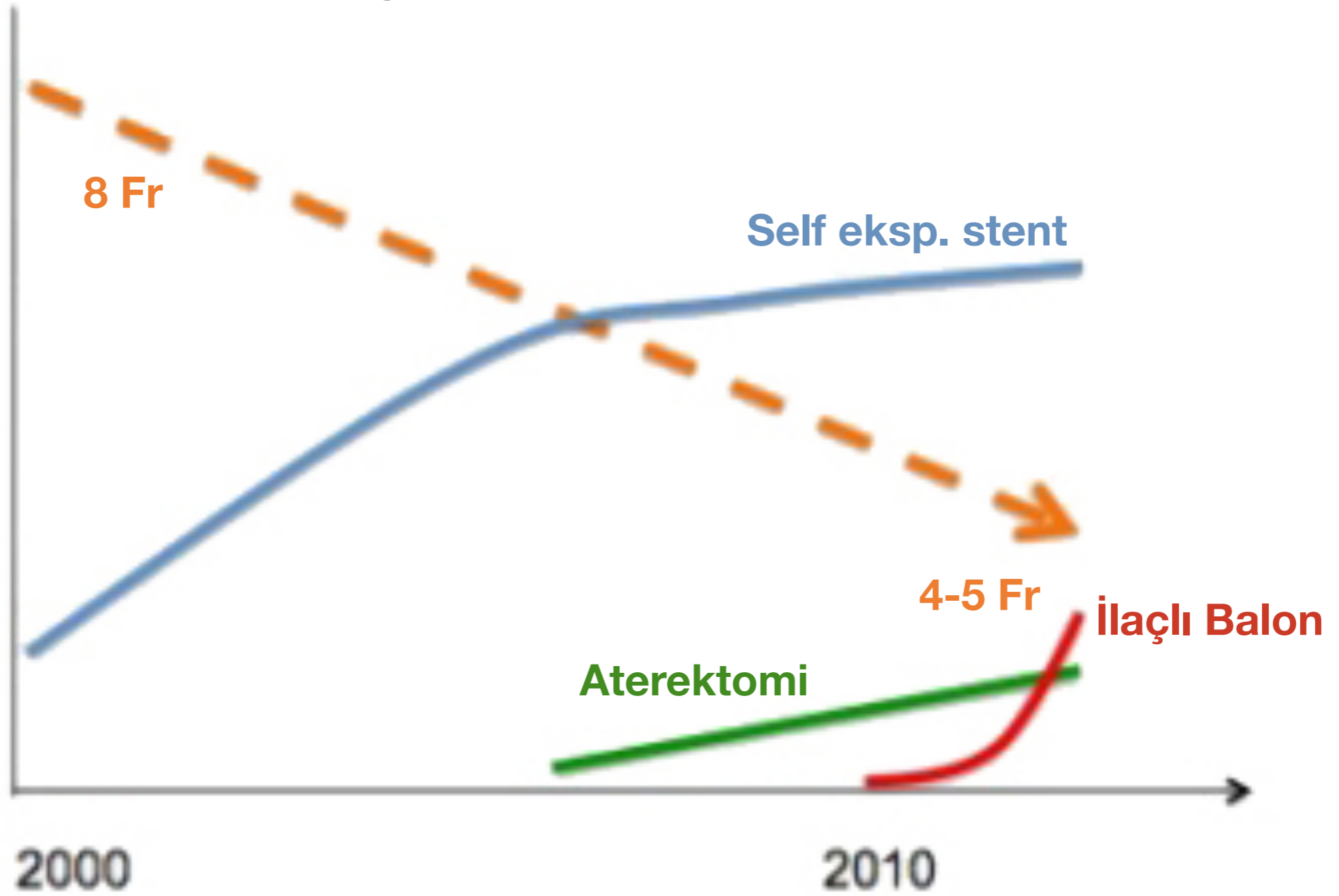
\*Bonvini RF, Rastan A, Sixt S, Noory E, Schwarz T, Frank U, Roffi M, Dorsaz PA, Schwarzwälder U, Bürgelin K, Macharzina R, Zeller T. Endovascular treatment of common femoral artery disease: medium-term outcomes of 360 consecutive procedures. J Am Coll Cardiol. 2011; 58:792– 798

\*\*Scheinert D, Duda S, Zeller T, Krankenberg H, Ricke J, Bosiers M, Tepe G, Naisbitt S, Rosenfield K. The LEVANT I (Lutonix paclitaxel-coated balloon for the prevention of femoropopliteal restenosis) trial for femo-ropopliteal revascularization: first-in-human randomized trial of low- dose drug-coated balloon versus uncoated balloon angioplasty. JACC Cardiovasc Interv. 2014; 7:10

# Gelişen Teknoloji



# Gelişen Teknoloji



# Endovasküler İşlem Sayıları

From the New England Society for Vascular Surgery

## National trends in lower extremity bypass surgery, endovascular interventions, and major amputations

Philip P. Goodney, MD, MS,<sup>a,b,c</sup> Adam W. Beck, MD,<sup>a</sup> Jan Nagle, MS, RPh,<sup>d</sup> H. Gilbert Welch, MD, MPH,<sup>b,c</sup> and Robert M. Zwolak, MD, PhD,<sup>a</sup> Lebanon and Hanover, NH; White River Junction, VT; and Chicago, Ill

**Introduction:** Advances in endovascular interventions have expanded the options available for the invasive treatment of lower extremity peripheral arterial disease (PAD). Whether endovascular interventions substitute for conventional surgery or are simply additive has not been investigated, and their effect on amputation rates is unknown.

**Methods:** We sought to analyze trends in lower extremity endovascular interventions (angioplasty and atherectomy) between 1996 and 2006. We used 100% samples of Medicare Part B claims to calculate annual procedure rates of lower extremity bypass surgery, endovascular interventions (angioplasty and atherectomy), and major amputation between 1996 and 2006. Using physician specialty identifiers, we also examined trends in the specialty performing the primary procedure. Results: Between 1996 and 2006, the rate of major lower extremity amputation declined significantly (2.2-2.8) a threefold (from 138 to 455 per 100,000; RR = 3.30; 95% CI: 2.9-3.7) while bypass surgery interventions increased 126 per 100,000 (RR = 0.58; 95% CI: 0.5-0.7). The increase in endovascular interventions consisted of 126 per 100,000 (from 135 to 118 per 100,000; RR = 43.12; 95% CI: 34.8-52.0). While radioangioplasty among endovascular surgery was increased by almost threefold, while the bypass surgery rate decreased by half. Conclusion: Endovascular surgery is now performed more commonly than bypass surgery for PAD treatment. Balloon angioplasty among endovascular surgery was increased by almost threefold, while the bypass surgery rate decreased by half.

**Conclusion:** Endovascular surgery is now performed more commonly than bypass surgery for PAD treatment. Balloon angioplasty among endovascular surgery was increased by almost threefold, while the bypass surgery rate decreased by half.

**Key Words:** Trends, Peripheral arterial disease, Endovascular surgery, Bypass surgery, Amputation

**Lower extremity peripheral arterial disease (PAD) affects over 8 million Americans, with significant associated morbidity and mortality.<sup>1-5</sup> Until recently, the treatment of these patients primarily consisted of peripheral arterial bypass surgery, such as femoral-popliteal or percutaneous catheter-based technology have made endovascular interventions (removal of intra-arterial plaque using catheter-based devices) a commonly utilized alternative.<sup>3,6</sup> In fact, many physicians now advocate an "endovascular first" strategy.<sup>7-9</sup>**

**This change has occurred in the setting of limited and often conflicting evidence. For example, in the early 1990s, population-based data from Maryland led many vascular surgeons to argue that effective, and instead resulted in increased rates of major lower extremity amputation.<sup>10</sup> In fact, many physicians now advocate an "endovascular first" strategy.<sup>7-9</sup>**

**From the Section of Vascular Surgery,<sup>a</sup> Dartmouth-Hitchcock Medical Center, the VA Outcomes Group,<sup>b</sup> and the Dartmouth Institute for Health Policy and Clinical Practice,<sup>c</sup> Dartmouth Medical School; and ILM Data, Inc.<sup>d</sup>**

**Competition of interest: none.**

**Presented at the New England Society for Vascular Surgery, October 3-5, 2008.**

**Reprint requests: Philip P. Goodney, MD, Section of Vascular Surgery, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03765 (e-mail: philip.goodney@hitchcock.org).**

**0741-5214/\$36.00**

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**doi:10.1016/j.jvs.2009.01.035**

**54**

## ASTR

### National trends for the treatment of peripheral arterial disease in Korea between 1996 and 2006

Youn Young Park, Jin Hyun Joh<sup>1</sup>, Sang-Ah Han<sup>1</sup>, Sang-Ho Lee<sup>2</sup>, and Hyeon-Gook Kim<sup>3</sup>

<sup>1</sup>Department of Surgery, Graduate School, Kyung Hee University, Seoul, Korea; <sup>2</sup>Department of Vascular Surgery, Kyung Hee University School of Medicine, Seoul, Korea; <sup>3</sup>Kyung Hee University School of Medicine, Seoul, Korea

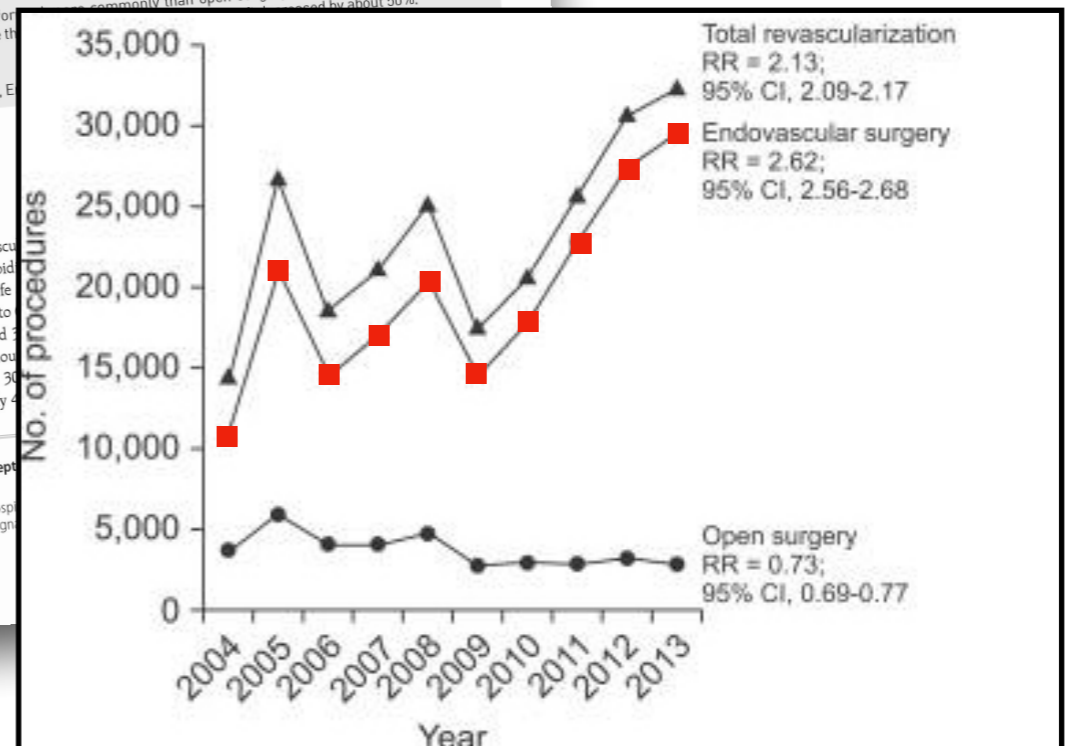
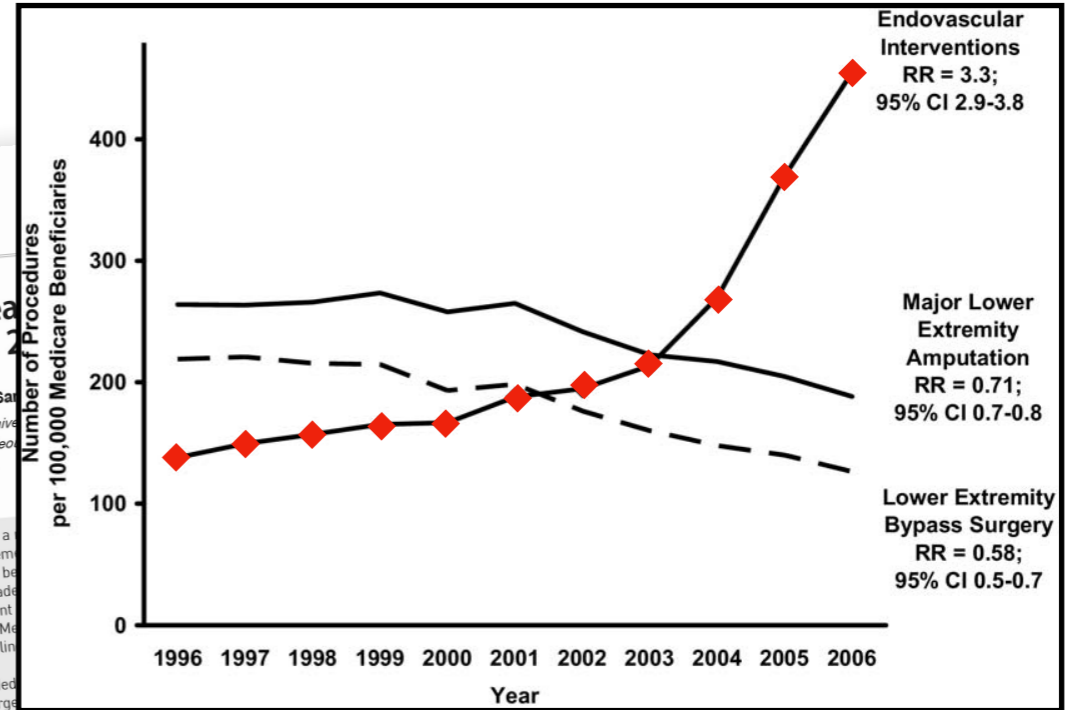
**Purpose:** Peripheral arterial disease (PAD) has been a major cause of morbidity and mortality in Western countries. In Korea, limited data have been reported on the management of PAD. The purpose of this study was to evaluate the national trends in the treatment of PAD in Korea between 1996 and 2006. **Methods:** Health Insurance Review and Assessment (HIRA) data were analyzed to determine the trends in endovascular surgery, bypass surgery, and major lower extremity amputation in the lower extremity. A linear regression analysis was performed. **Results:** The rate of open surgery per 100,000 Medicare beneficiaries increased from 1.5 in 1996 to 6.0 in 2006. At the same time, endovascular surgery per 100,000 Medicare beneficiaries increased from 135 to 455 per 100,000 Medicare beneficiaries. Balloon angioplasty among endovascular surgery was increased by almost threefold, while the bypass surgery rate decreased by half. **Conclusion:** Endovascular surgery is now performed more commonly than bypass surgery for PAD treatment. Balloon angioplasty increased by almost threefold, while the bypass surgery rate decreased by half.

### INTRODUCTION

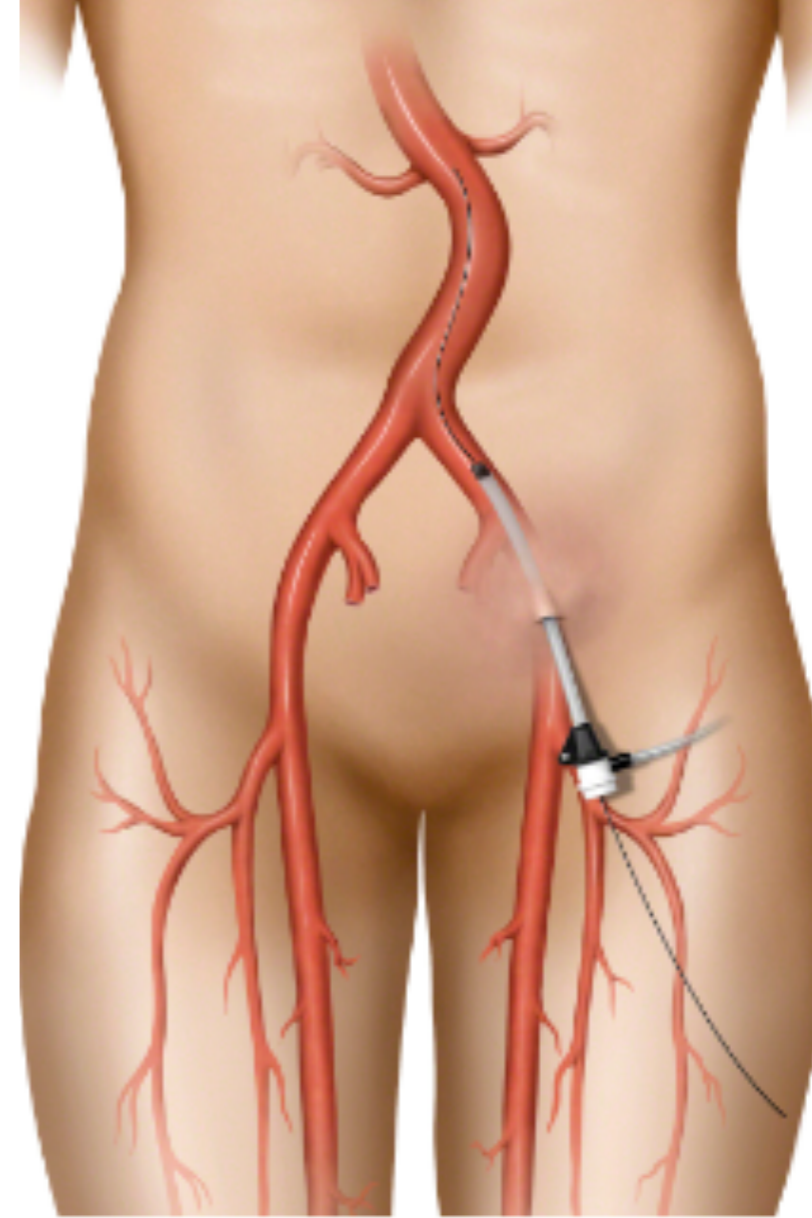
Peripheral arterial disease (PAD), a common vascular disease, carries an increased risk of cardiovascular morbidity and mortality [1]. It can lead to a decreased quality of life and major limb loss [2]. Patients with PAD are at up to a 30% increased risk of death from coronary heart disease and a 20% increased risk of all-cause mortality than patients without PAD [3]. Generally, at one year of PAD, 30% of patients are expected to undergo amputation, with only 40% remaining limb salvageable.

Received March 31, 2015, Revised June 7, 2015, Accepted July 14, 2015.

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E-mail: jhjoh@khu.ac.kr



Endovasküler Girişim  
**Vasküler Akse**  
ile başlar.\*



# Dođru Akses

- Daha az radyasyona maruziyet (hasta, ekip)
- Daha iyi kateter ve tel kontrolü
- İşlem başarısı

# Prensipier

- Akses noktası hastanın ihtiyacına göre belirlenmelidir
- Ponksiyon yeri lezyona yeterli uzaklıkta olmalıdır
- Ponksiyon yapılacak arter palpe edilmelidir (yumuşak, sert, nabzın karakteri)
- Anatomik belirteçlere dikkat edilmelidir
- Floroskopi veya USG altında yapılması tercih edilir



# Prensipier

Girişim arteri...

- Patent olmalıdır (nabız alınması şart değildir)
- Kemik üzerinde ve yüzeysel yerleşimli olmalıdır
- Üzerindeki cilt sağlıklı olmalıdır
- Lezyona mümkün olduğunca yakın olmalıdır

# Access Seçenekleri

- Femoral arter
  - Antegrad
  - Retrograd
- Popliteal arter
- Radial arter
- Brakial arter

# Access Seçenekleri

- Femoral arter

- Antegrad
- Retrograd

- Popliteal arter

- Radial arter

- Brakial arter

Bir lezyon için birden fazla seçenek mümkün

- Uygulanacak tedavi yöntemi
- Tecrübe / Eğitim - Kişisel tercih
- Teknik ölçüler
  - Kateter şaft uzunluğu
  - Sheath kalınlığı

# Kateterler

**PERIPHERAL PLAQUE EXCISION SYSTEM**

**Aterektomi kateteri**

**LX-M**  
LARGE VESSEL XTENDED TIP with MEC™ TECHNOLOGY

Vessel Range: **3.5 mm - 7.0 mm**

Tip Length: **9 cm**

Max. Profile: **0.105" (2.7 mm)**

Effective Length: **104 cm**

Max. Guidewire: **0.014" (0.36 mm)**

**Recommended Sheath Size: 8 F**

Contents: **1 Catheter**

DEFIBRILLATOR PROOF Type CF Equipment

Only to be used with SilverHawk Catalog No. 02550 (packaged separately)

Authorized representative in the European community: Covidien Ireland Limited, IDA Business & Technology Park, Tullamore

**Stent**

Self-expanding Peripheral Stent with Entrust™ Delivery System

5 mm Ø, 60 mm ↔, 120 cm →

.035" 5F OTW

3.5 - 4.5 mm

Lumen Diameter / Diamètre de la lumière / Lumen-durchmesser / Diámetro del lumen / Diámetro del lumen / Lumen diameter / Lumendiameter / Διάμετρος αυλού / Lumenátmérő / Диаметр просвета / Średnica światła / Lumen Çapı / Lumendiameter / 管腔直径

REF: EVX35-05-060-120

LOT: A551140

Use-by date: 2020-11-03

150 cm

60 mm

120 cm

60 mm

5 mm Ø

Manufacturer: ev3 Inc., 4600 Nathan Lane North, Plymouth, MN 55442-2920, USA

Authorized Representative in the European Community: Covidien Ireland Limited, IDA Business & Technology Park, Tullamore.

**PTFE kaplı stent**

Advanta V12

85336 8mm x 38mm x 120cm

246397112 (01)00650862853360

85336 8mm x 38mm x 120cm

246397112 (01)00650862853360

7 Fr (2.3 mm)

Nominal Pressure: 8 atm (811 kPa)

Rated Burst Pressure: 12 atm (1216 kPa)

STENT SIZING TABLE

Balloon Diameter (mm)	Stent Length (mm)	Post Nominal Pressure 8 ATM (811 kPa)		Post Rated Burst Pressure 12 ATM (1216 kPa)	
		OD	Length	OD	Length
5	16	4.9	15.9	5.2	15.6
5	22	4.9	21.3	5.2	21.0
5	38	5.1	37.2	5.3	37.7
5	59	5.0	58.6	5.3	60.0
6	16	5.7	15.7	6.2	15.1
6	22	5.8	20.8	6.2	20.2
6	38	6.0	36.6	6.3	37.0
6	59	6.0	57.8	6.3	58.7
7	16	6.9	15.0	7.3	14.2
7	22	6.9	20.1	7.3	19.4
7	38	6.9	35.8	7.3	35.7
7	59	7.0	57.1	7.3	57.5
8	38	8.1	34.7	8.5	34.7
8	59	8.0	56.0	8.4	56.5
9	38	8.9	33.7	9.3	32.7
9	59	8.9	54.6	9.3	54.0
10	38	10.0	30.8	10.4	30.9
10	59	9.9	53.3	10.3	52.5

LS009032 © 2013 Atrium, V12 and Advanta are Trademarks of Atrium Medical Corporation

# Sheath

**6F** (2.0mm)

**Tek Kullanimlik Intraducer Set**  
Introducer Kit

11cm  
45cm  
0.038" (0.97mm) 18G (1.25mm)  
7cm

**STERILE EO** Etilen Oksit ile Steril Edilmiştir  
1 UNIT

**Dikkat**  
Paket Acik yada zarar görmüş ise kullanılmaz  
Kullanma Kılavuzunu Okuyunuz  
Hiçbir Yolda Kullanılmaz

**REF** FS061138 **EXP** 2020-03-14  
**LOT** 201703027

6 936733 775998

**LEPU MEDICAL TECHNOLOGY (BEIJING) CO., LTD.**  
No.37 Chaoqian Road, Changping District, Beijing 102200, P.R. China  
Tel: +86-10-80120666 Fax: +86-10-80120600

**EC REP** Lepu Medical(Europe) Cooperatief U.A.  
De Marne 118, 8701 MC Bolsward, The Netherlands  
Tel.: +31-515-573399 Fax: +31-515-760020

Türkiye Tek Yetkili Temsilcisi / Turkey Representative  
**LEPU MEDİKAL SANAYİ VE TİC. A.Ş.**  
Bati Sitesi Mah. Gersan San.Sit. 2308 Sokak No: 90 Batıkent/ ANKARA  
Tel: +90-312-2562606 Fax: +90-312-2573757 CE-İK-100.2 Rev.03

**7F** (2.33mm)

**Tek Kullanimlik Intraducer Set**  
Introducer Kit

11cm  
45cm  
0.038" (0.97mm)

**STERILE EO** Etilen Oksit ile Steril Edilmiştir  
1 UNIT

**Dikkat**  
Paket Acik yada zarar görmüş ise kullanılmaz  
Kullanma Kılavuzunu Okuyunuz  
Hiçbir Yolda Kullanılmaz

**REF** FS071138 **EXP** 2020-03-21  
**LOT** 201703033

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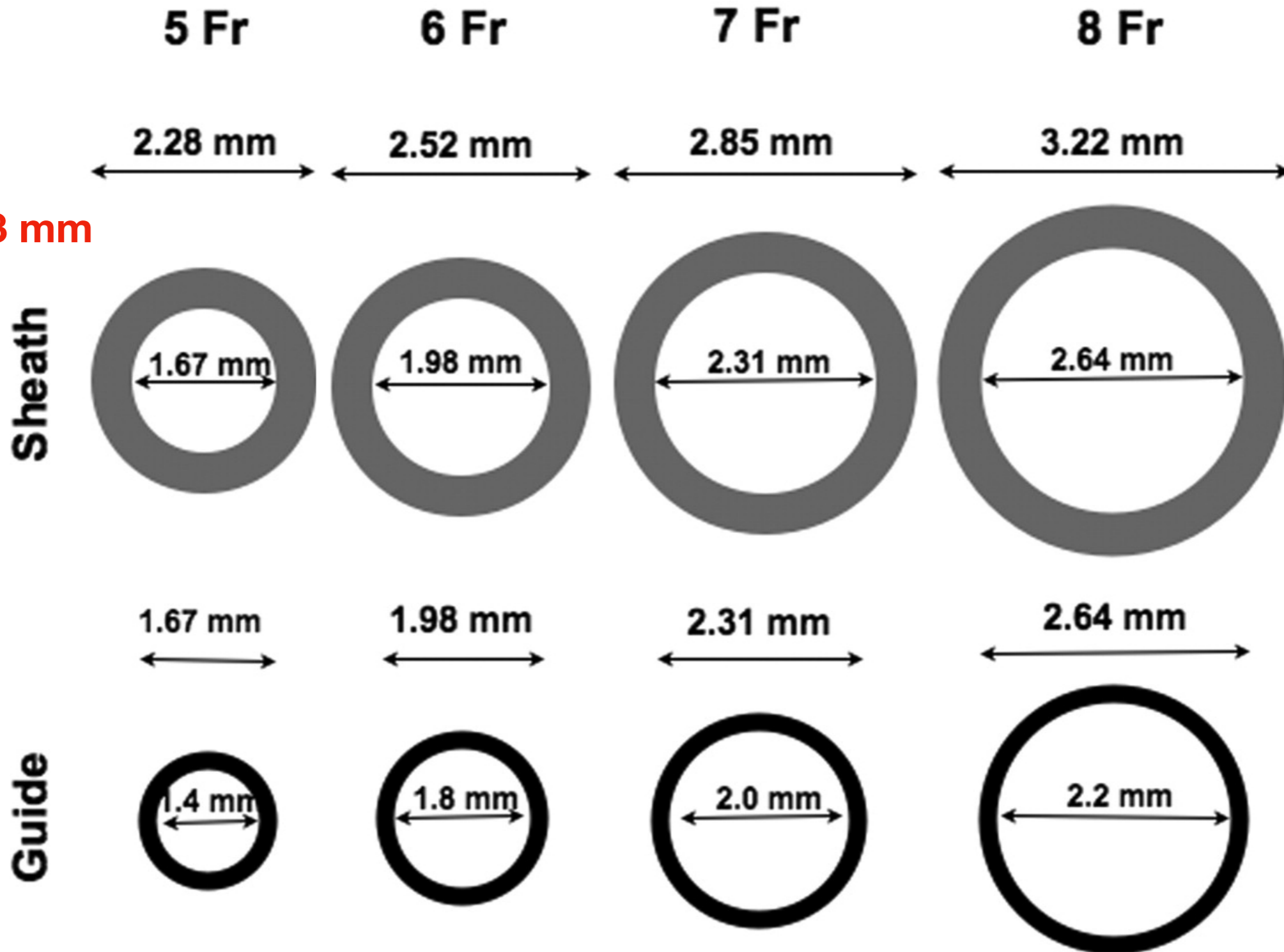
**LEPU MEDICAL TECHNOLOGY (BEIJING) CO., LTD.**  
No.37 Chaoqian Road, Changping District, Beijing 102200, P.R. China  
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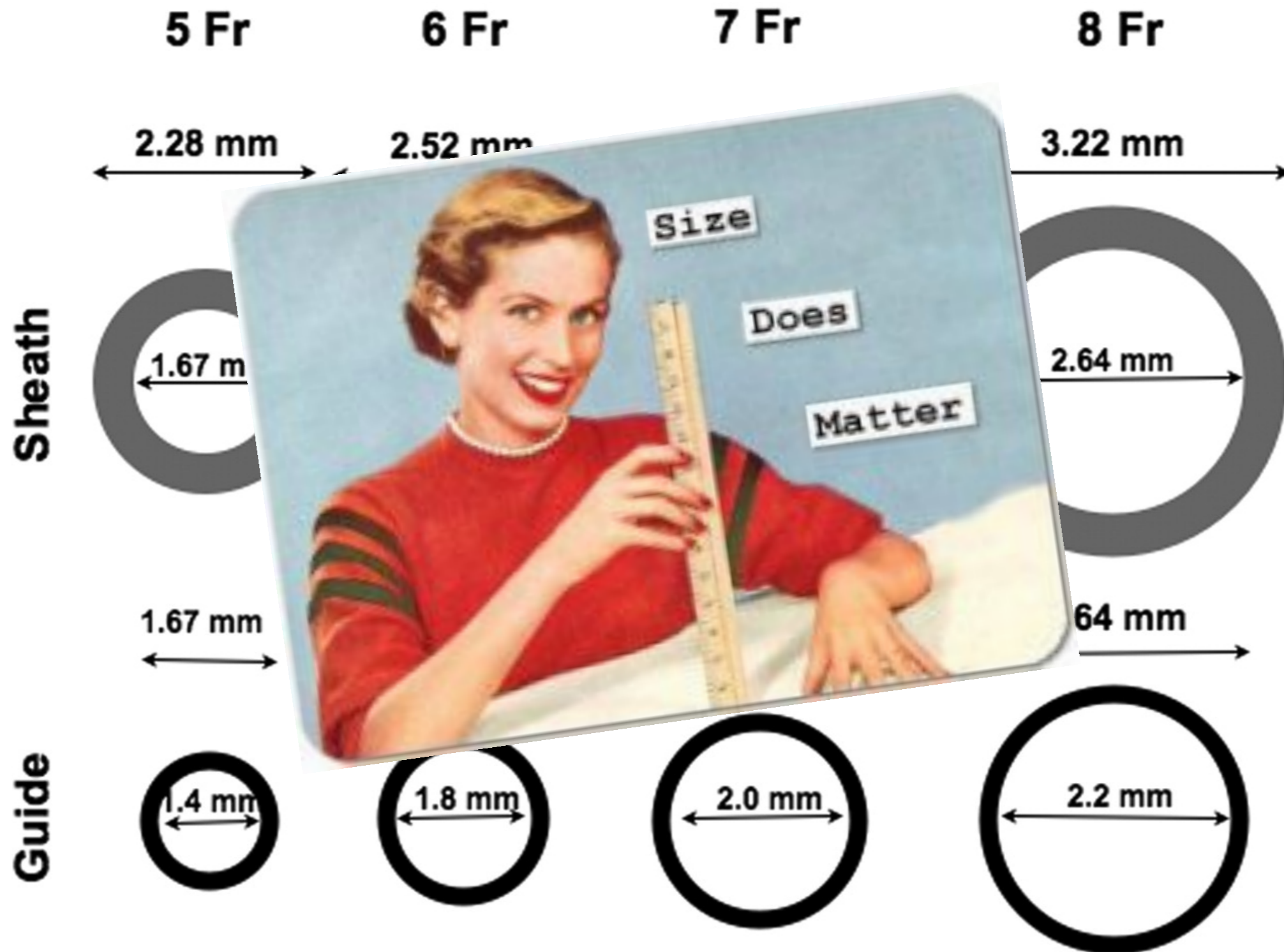
Türkiye Tek Yetkili Temsilcisi / Turkey Representative  
**LEPU MEDİKAL SANAYİ VE TİC. A.Ş.**  
Bati Sitesi Mah. Gersan San.Sit. 2308 Sokak No: 90 Batıkent/ ANKARA  
Tel: +90-312-2562606 Fax: +90-312-2573757

# Sheath

1 Fr = 0,33 mm

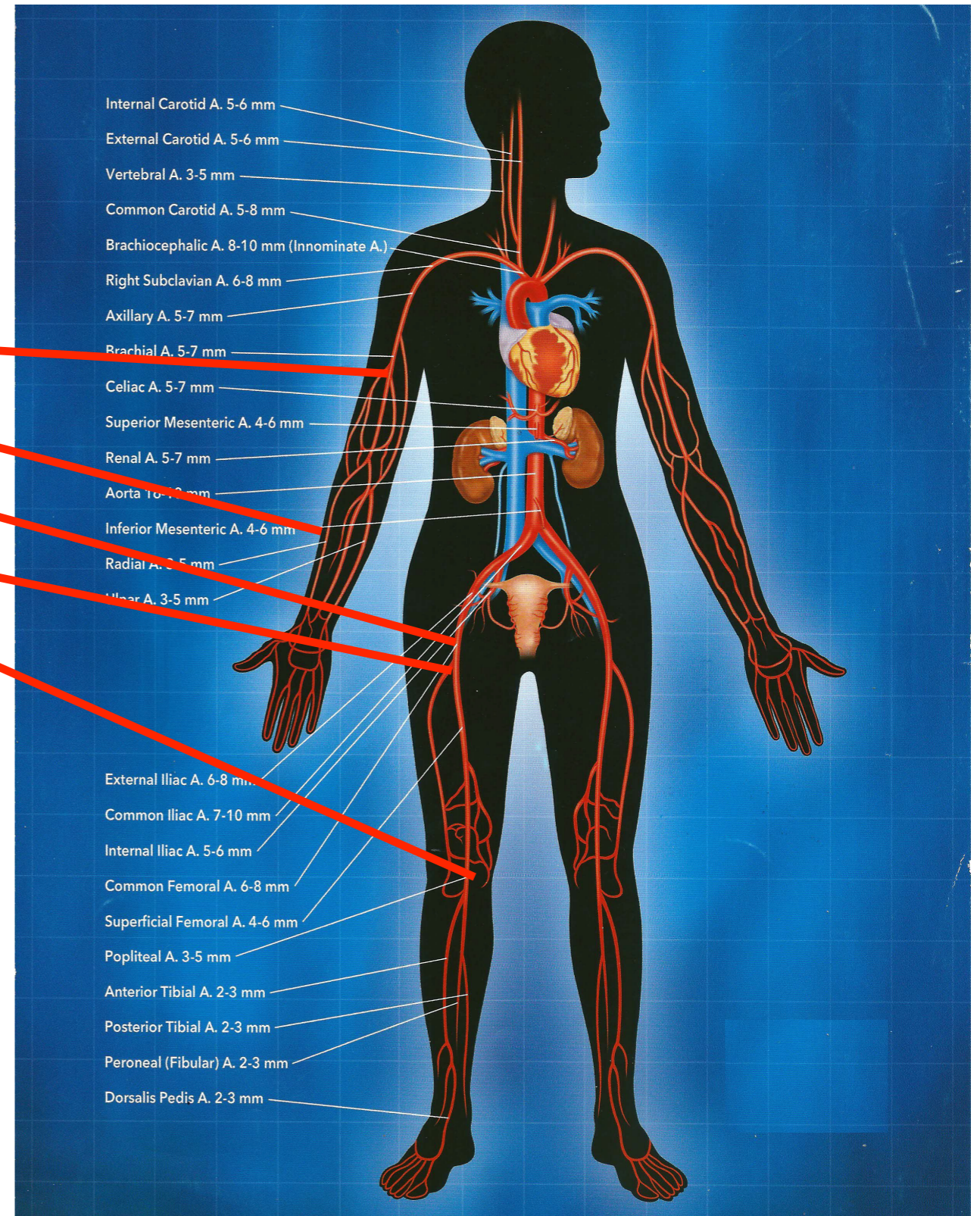


# Sheath



# Normal Anatomi

Brakial arter: 5-7 mm  
Radial arter: 3-5 mm  
Comm. Femoral arter: 6-8 mm  
Süperf. Femoral arter: 4-6 mm  
Popliteal arter: 3-5 mm





# Normal Anatomi

**Radial arter - Karotis a.**  
60-75 cm

**Radial arter - Subklavian a.**  
50-70 cm

**Radial arter - Renal a.**  
80-100 cm

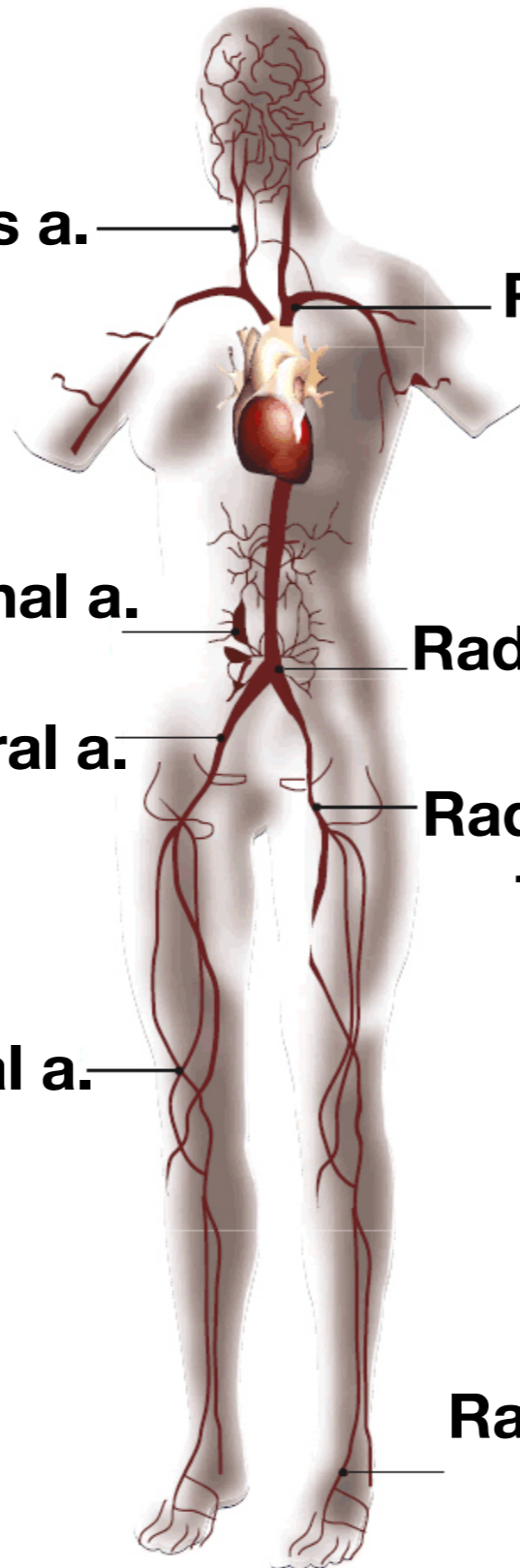
**Radial arter - Common iliak a.**  
105-125 cm

**Radial arter - Common femoral a.**  
120-150 cm

**Radial arter - SFA**  
130-170 cm

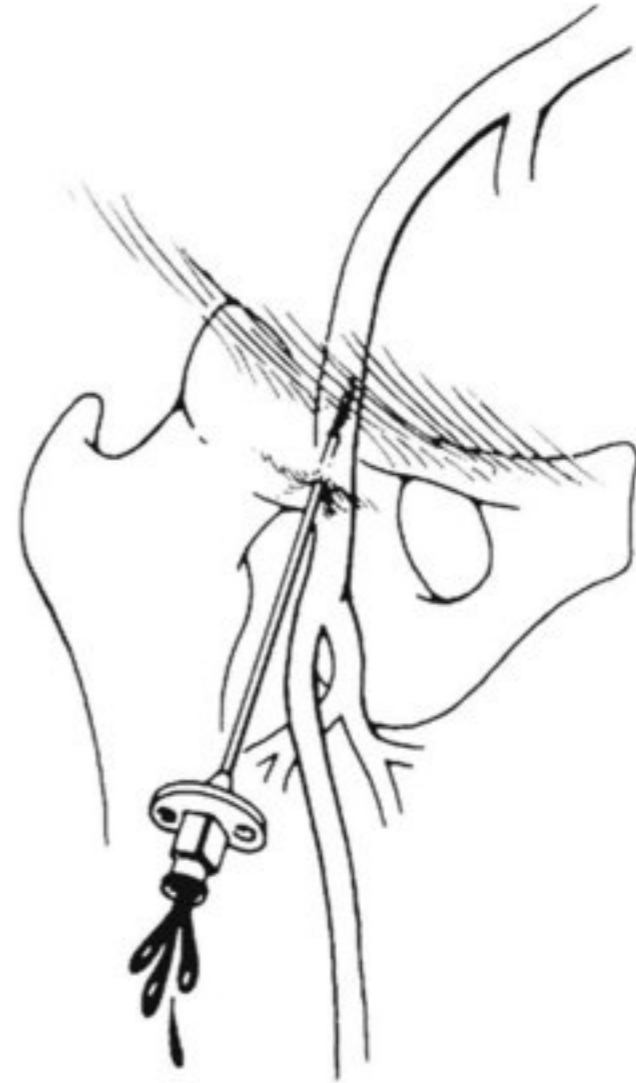
**Radial arter - Popliteal a.**  
150-180 cm

**Radial arter - Ayak**  
200-250 cm



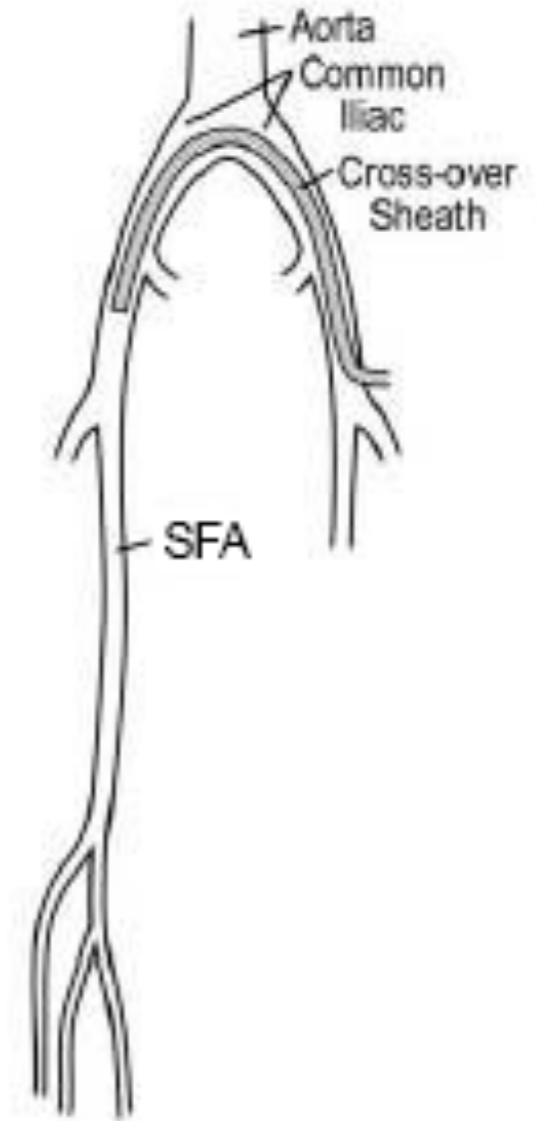
# Retrograd Femoral Akses

- En sık tercih edilen
  - Güvenli
  - Birçok işlemi mümkün kılmaktadır
- Hedef damarlar: distal aorta, ipsilateral CIA, proks-mid EIA
- Distal EIA lezyonlarında elverişli değil



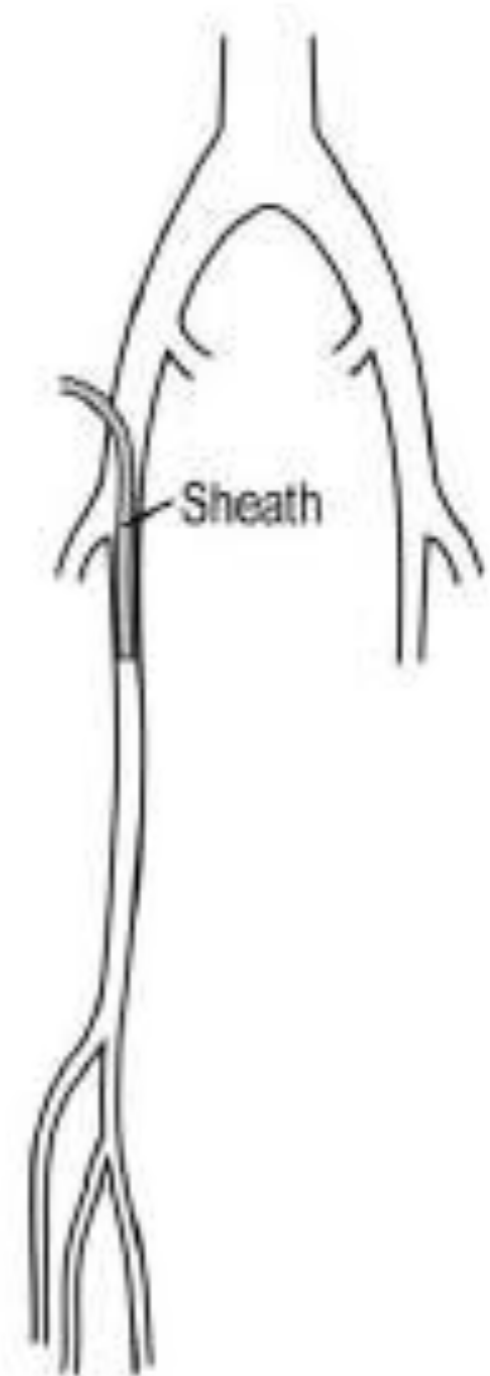
# Femoral Crossover

- Hedef damarlar: Kontrlateral İİA'den kontrlateral dizaltı damarlara kadar
- Antegrad femoral yaklaşıma göre kanama riski daha düşük
- Özellikle common femoral arter ve ostial SFA lezyonlarında iyi bir yaklaşımdır



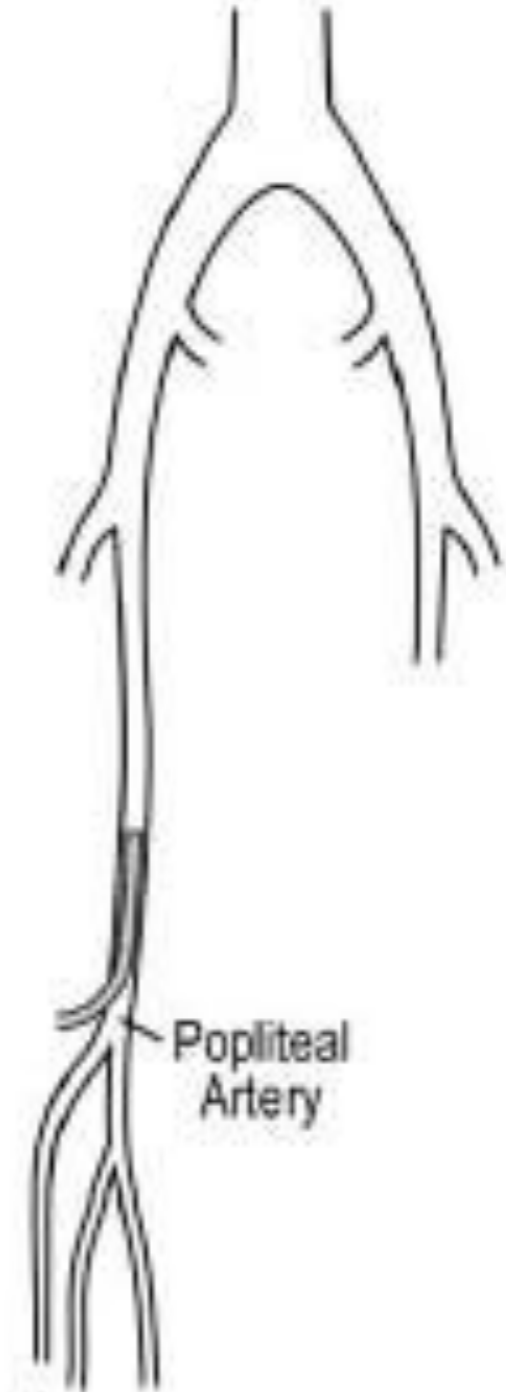
# Antegrad Femoral Akses

- Hedef damarlar: İpsilateral non-ostial SFA, popliteal arter, dizaltı damarlar
- İnfrainguinal ve özellikle dizaltı işlemlerde tel ve kateter kontrolü artabilir
- Obez hastalarda uygulama zorluğu
- Derin femoral arter kanülasyonu
- Yüksek komplikasyon oranları



# Retrograd Popliteal Akses

- Hedef damarlar: Distal SFA'nın proksimalinde olan tüm ipsilateral damarlar
- Kateter ve tel kontrolü iyi
- SFA okklüzyonunu yukarıdan geçmek mümkün olmadıysa iyi bir alternatif
- Yüksek vasküler komplikasyon oranı
- Sinir hasarı riski yüksek



# Retrograd Dorsalis Pedis-Tibialis

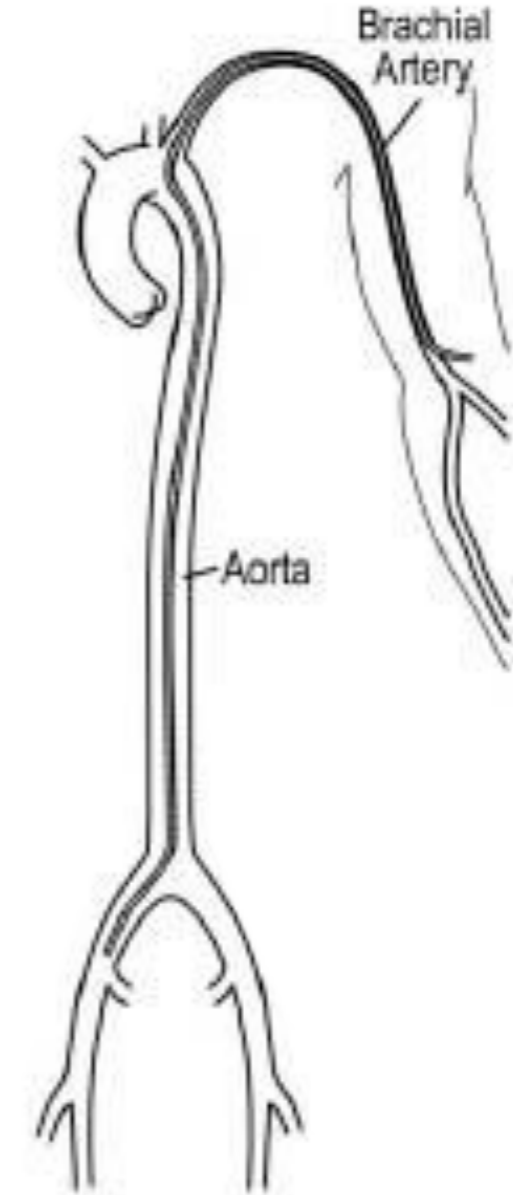
- Yukarıdan geçiş sağlanamadıysa denenebilir
- İyi tecrübe gerektirir

# Radial Akses

- Hedef damarlar: Aorta, proksimal iliak arterler
- En düşük vasküler komplikasyon oranı
- 6 Fr sheath ile kısıtlı
- Alt ekstremitte hedef damarlarına uzak

# Brakial Akses

- Hedef damarlar: Aorta, iliak damarlar
- Radial artere göre daha büyük sheath kullanılabilir
- Komplikasyon oranı radial artere göre daha yüksek





# Aksiller Akse

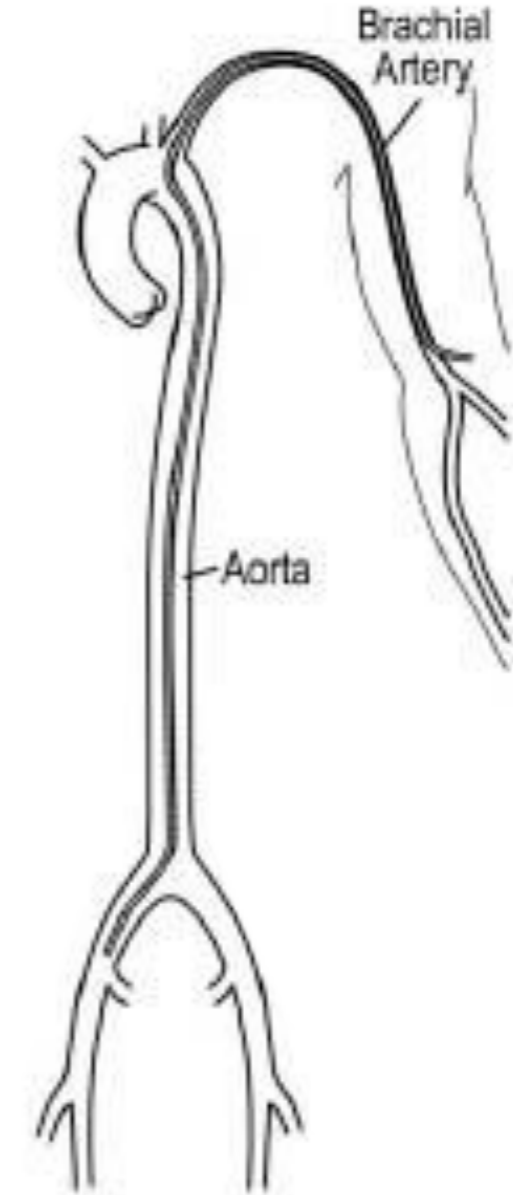
- Hedef damarlar: Aorta, iliak damarlar, proks-mid femoral arter
- Vasküler komplikasyon oranı yüksek
- Brakial pleksus hasarı açısından riskli

# Çoklu Akses

- Bilateral retrograd femoral akses:
  - Femoral crossover ile ipsilateral damarlar ve kontrilateral EİA ve distaline işlem yaptıktan sonra kontrilateral proksimal CİA'de lezyon varsa
  - Bilateral ostial CİA lezyonunda kissing anjioplasti için eşzamanlı iki taraflı retrograd femoral akses

# Çoklu Akkses

- Total okklüzyonda lezyonu hem antegrad hem retrograd geçebilmek için eşzamanlı brakial/radial giriş gerekebilir



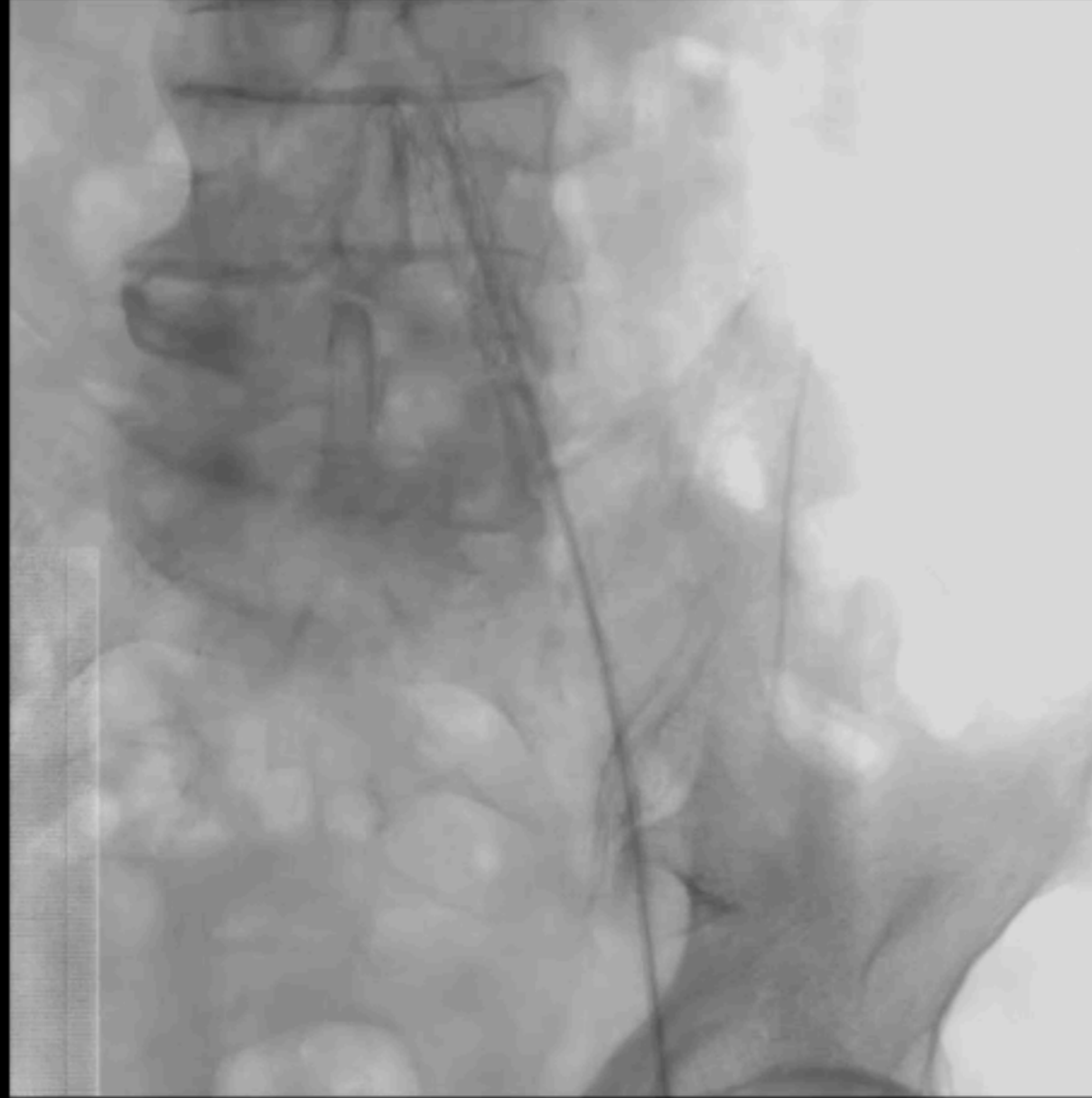
# Kontrilateral Geçiş



# Kontrlatateral Geçiř

Im: 1/42

Se: 1



ASKIN\_OMER

20187056314

01.01.1942 F

ANTALYA EGITIM ARASTIRMA HASTANESI

1111

Abdomen

PT\_NAME: OMER\_ASHIN

BIRTH\_DATE: 01/01/1942

SEX: F

EXL\_DESC: Peritonal

EXL\_DATE: 31/05/2018

EXL\_HOUR: 14:51:29

RUN: 0

IM: 0

WL: 128 WW: 256 [D]

31.05.2018 14:51:29

# Kontrilateral Geçiş

Im: 1/74

Se: 1



ASKIN\_OMER

20187056314

01.01.1942 F

ANTALYA EGITIM ARASTIRMA HASTANESI

1111

Abdomen

PT\_NAME: OMER\_ASHIN

BIRTH\_DATE: 01/01/1942

SEX: F

EXL\_DESC: Peritonal

EXL\_DATE: 31/05/2018

EXL\_HOUR: 14:51:29

RUN: 11

IM: 0

WL: 128 WW: 256 [D]

31.05.2018 14:51:29

# Kontrilateral Geçiş

Im: 1/191

Se: 1



ASKIN\_OMER

20187056314

01.01.1942 F

ANTALYA EGITIM ARASTIRMA HASTANESI

1111

Abdomen

PT\_NAME: OMER\_ASHIN

BIRTH\_DATE: 01/01/1942

SEX: F

EXL\_DESC: Peritonal

EXL\_DATE: 31/05/2018

EXL\_HOUR: 14:51:29

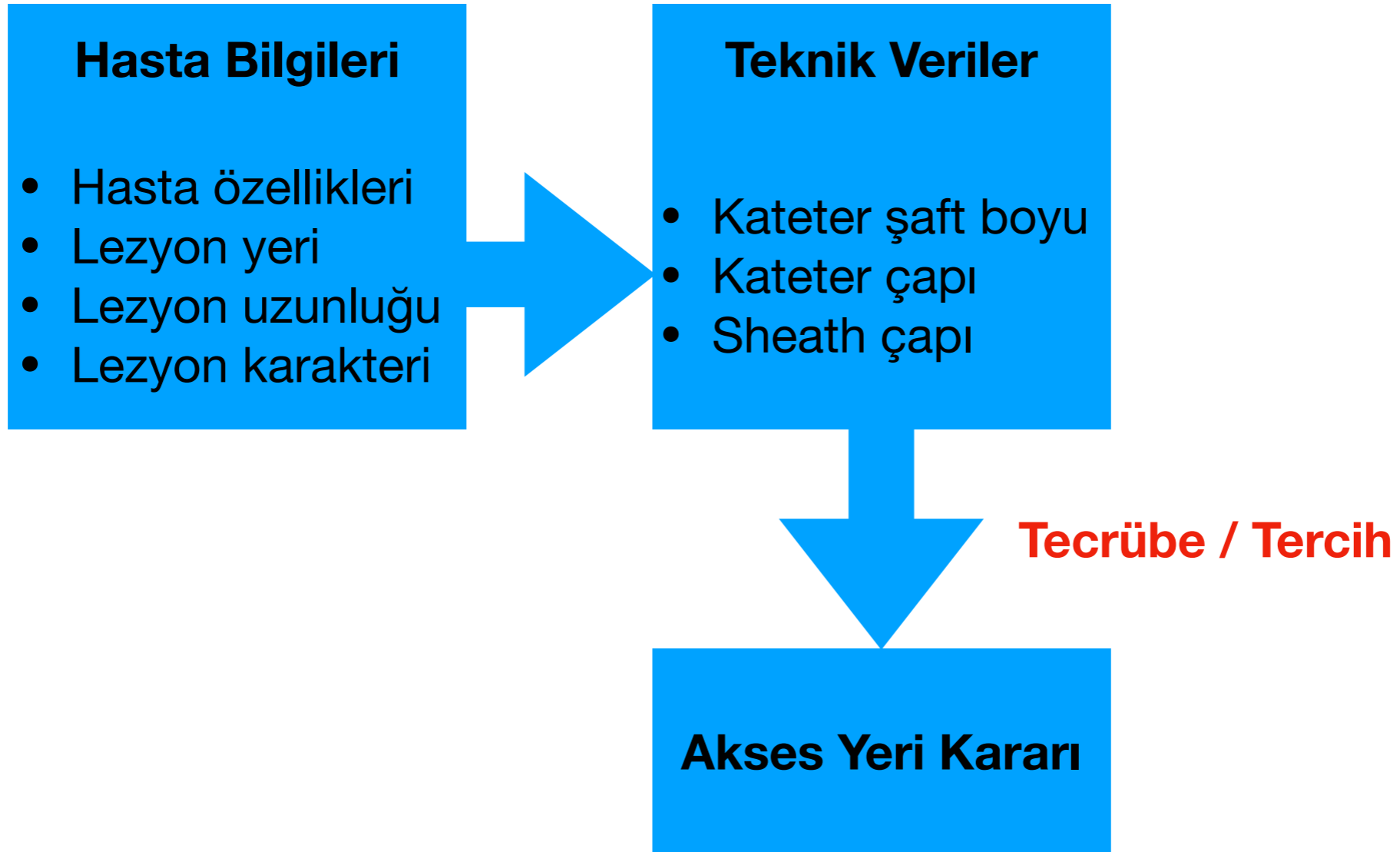
RUN: 18

IM: 0

WL: 128 WW: 256 [D]

31.05.2018 14:51:29

# Endovasküler Kararı





**Teşekkür ederim...**

