24. Ulusal Kongresi
Göğüs Kalp Damar Anestezi ve Yoğun Bakım Derneği
3-6 MAYIS 2018 | RADISSON BLUE RESORT - ÇEŞME

Cerrah Gözüyle
Girişimsel Kardiyovasküler Yaklaşımlar

Dr. Emrah UĞUZ
Ankara Atatürk Eğitim ve Araştırma Hastanesi
KVC Kliniği

- Kalp Takımı
- Hibrid Oda
- TAVI
- T/EVAR (rAAA, TAAA, AAS)

?????

Kalp takımı
Aort takımı
PTE, PAH takımı
Vasküler takım
İnme takımı…

ESC European Society of Cardiology — European Heart Journal (2018) **39**, 763–816 doi:10.1093/eurheartj/ehx095 — ESC GUIDELINES

2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS)

ESC European Society of Cardiology — European Heart Journal (2017) **38**, 2739–2791 doi:10.1093/eurheartj/ehx391 — ESC/EACTS GUIDELINES

2017 ESC/EACTS Guidelines for the management of valvular heart disease

The Task Force for the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Nishimura, et al.
2017 AHA/ACC Focused Update on VHD

2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease

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

Developed in Collaboration With the American Association for Thoracic Surgery, American Society of Echocardiography, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

Kılavuzlarda Takım Olgusu

ESC/EACTS Guidelines

Table 5 Recommended requirements of a heart valve centre (modified from Chambers et al.[34])

Requirements
Multidisciplinary teams with competencies in valve replacement, aortic root surgery, mitral, tricuspid and aortic valve repair, as well as transcatheter aortic and mitral valve techniques including reoperations and reinterventions. The Heart Teams must meet on a regular basis and work with standard operating procedures.
Imaging, including 2D and stress echocardiographic techniques, perioperative TOE, cardiac CT, MRI, and positron emission tomography–CT.
Regular consultation with community, other hospitals, and extracardiac departments, and between non-invasive cardiologists and surgeons and interventional cardiologists.
Back-up services including other cardiologists, cardiac surgeons, intensive care and other medical specialties.
Data review: • Robust internal audit processes including mortality and complications, repair rates, durability of repair, and reoperation rate with a minimum of 1-year follow-up. • Results available for review internally and externally. • Participation in national or European quality databases.

12. Infective Endocarditis

12.2. Infective Endocarditis

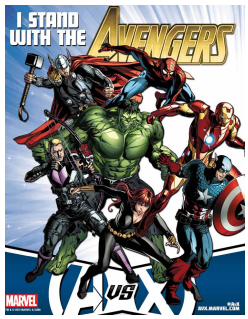
12.2.3. Intervention: Recommendations

Recommendations for IE Intervention		
COR	LOE	Recommendations
I	B	Decisions about timing of surgical intervention should be made by a multispecialty Heart Valve Team of cardiology, cardiothoracic surgery, and infectious disease specialists (255).

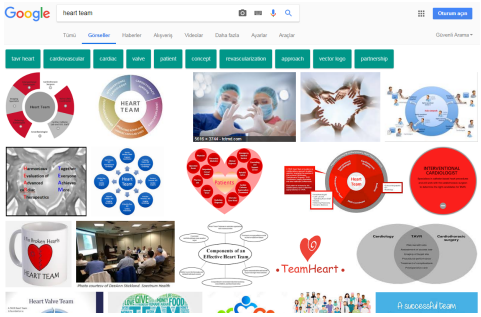
Nishimura, et al.
2017 AHA/ACC Focused Update on VHD

Recommendations for Choice of Intervention		
COR	LOE	Recommendations
I	C	For patients in whom TAVR or high-risk surgical AVR is being considered, a heart valve team consisting of an integrated, multidisciplinary group of healthcare professionals with expertise in VHD, cardiac imaging, interventional cardiology, cardiac anesthesia, and cardiac surgery should collaborate to provide optimal patient care.

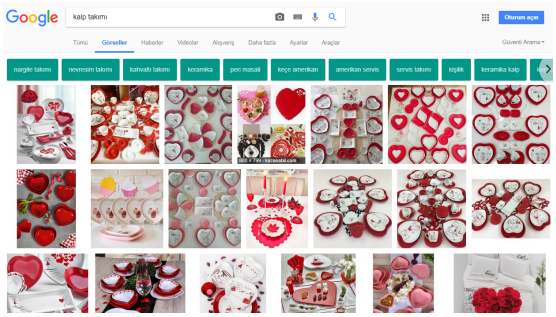
Takım olun !!!



HEART TEAM



KALP TAKIMI

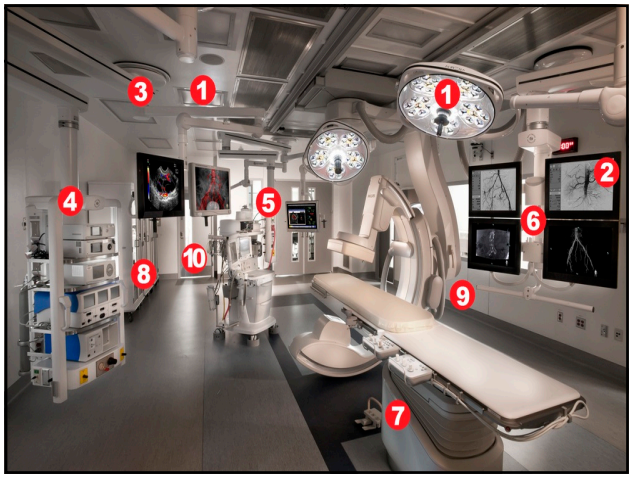


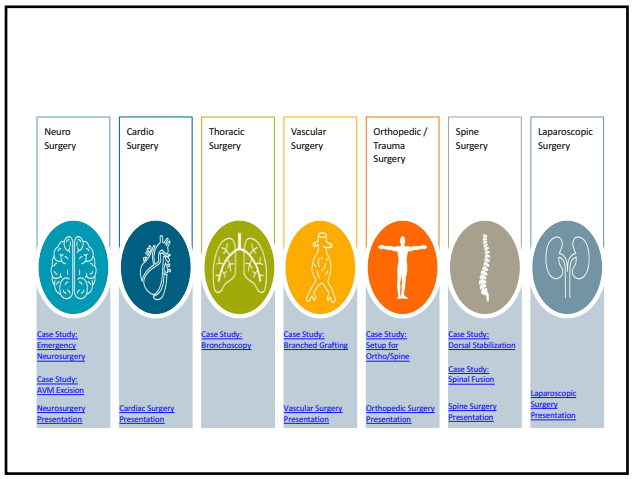
- Konvansiyonel cerrahi yöntemlerle Kalp ve Damar Cerrahisi uzmanı tarafından inoperable veya yüksek riskli olarak değerlendirilen semptomatik ciddi kalsifik aort kapak darlığı hastalarında ve ciddi aort yetmezliği olan hastalarda

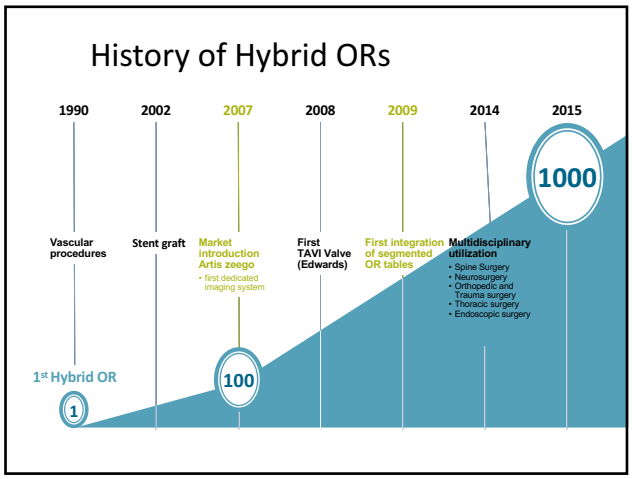
2 (iki) Kardiyoloji, 2 (iki) Kalp Damar Cerrahisi, 1 (bir) Anestezi Reanimasyon uzmanının

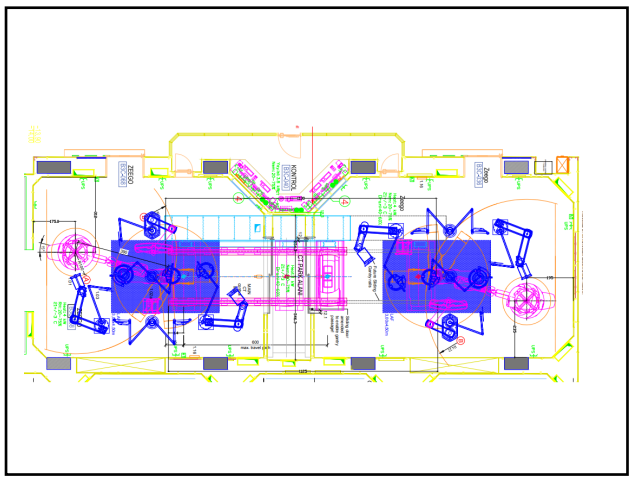
onayının bulunduğu **konsey** kararı ile bir yılda 2000 kardiyak girişimsel işlem (en az 300 tedavi amaçlı girişim) ve 250 açık kalp cerrahisi yapılan 3.basamak hastanelerde kullanılması halinde Kurumca bedeli karşılanır.

Hibrid Oda









Sağlık kampüsleri bir fırsat mı?

TAVİ

Hangi hastalara?

- İleri yaş, yüksek risk skoru
- Ciddi KOAH
- Siroz
- Toraksa radyoterapi
- Geçirilmiş CABG fonksiyonel greftler
- KPB kullanılmaması gereken malignensi
- Porselen aort
- Frailty

KV 1011 -1012

(1) Konvansiyonel cerrahi yöntemlerle Kalp ve Damar Cerrahisi uzmanı tarafından inoperable veya yüksek riskli olarak değerlendirilen semptomatik ciddi kalsifik aort kapak darlığı hastalarında ve ciddi aort yetmezliği olan hastalarda 2 (iki) Kardiyoloji, 2 (iki) Kalp Damar Cerrahisi, 1 (bir) Anestezi Reanimasyon uzmanının onayının bulunduğu konsey kararı ile bir yılda 2000 kardiyak girişimsel işlem (en az 300 tedavi amaçlı girişim) ve 250 açık kalp cerrahisi yapılan 3.basamak hastanelerde kullanılması halinde Kurumca bedeli karşılanır.

(2) STS skoru >=10 veya Logistic Euro Score>=20 olması, siroz, toraksa radyoterapi almış olma hikayesi, geçirilmiş koroner arter cerrahisi ve fonksiyonel koroner arter bypass greftleri olması, kardiyopulmoner baypasın kullanılmaması gereken malignensi durumları yüksek risk olarak kabul edilir.

(3) Yaşam beklentisi bir yıldan az olan hastalarda kullanılmaz.

(4) Yukarıda belirtilen şartların sağlanmadığı ve hastanın cerrahi tedaviyi reddettiği durumlarda kullanılan kapak ücretinin hasta tarafından karşılanması uygundur.

Frailty ? Futility?

İyi cerrahlar nasıl ameliyat edeceğini,
Daha iyi olanlar ne zaman edileceğini
En iyiler ise ne zaman edilmeyeceğini bilir.

- Katz indeksi (günlük yaşam aktiviteleri, banyo, tuvalet, kontinans, giyinme, hareket, beslenme)
- Albumin <3.5mg/dl
- Kavrama gücü (dinamometre, el sıkma)
- 5m yürüme testi <0.5m/sn
- Kilo kaybı >4.5kg/1y
- Tükenme, bitkinlik hissi

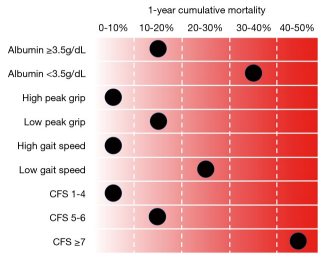
Clinical Frailty Scale

Detailed CFS criteria

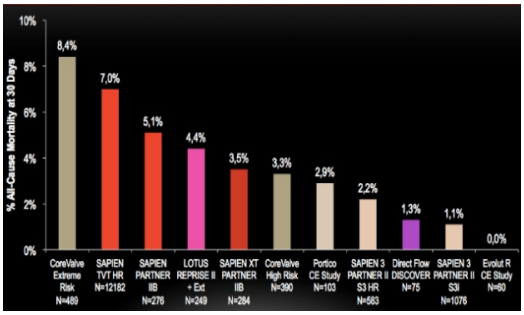
CFS	Severity	Definition
1	Very fit	People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age
2	Well	People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g., seasonally
3	Managing well	People whose medical problems are well controlled, but are not regularly active beyond routine walking
4	Vulnerable	While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day
5	Mildly frail	These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework
6	Moderately frail	People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing
7	Severely frail	Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~6 months)
8	Very severely frail	Completely dependent, approaching the end of life. Typically, they could not recover from a minor illness
9	Terminally ill	Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail

CFS, clinical frailty scale.

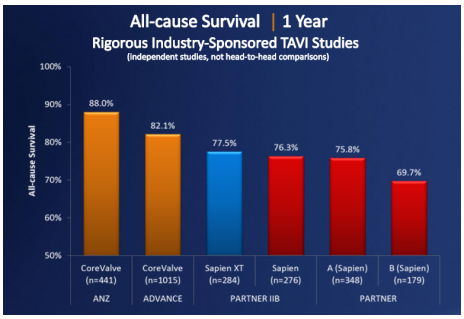
Fraility ? Futility? 1y sağkalım?



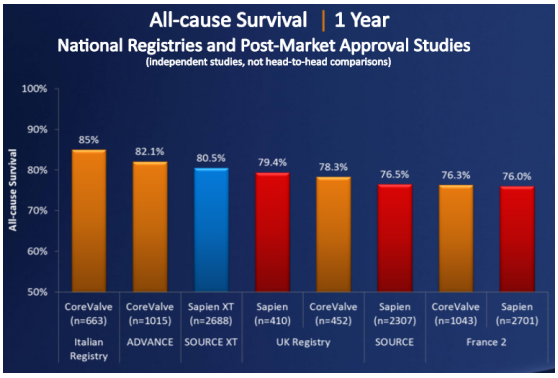
30 gün mortalite 0-8.4%



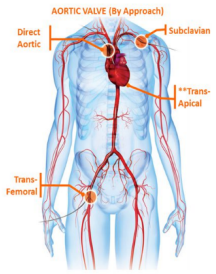
1y sağkalım 69.7-88%

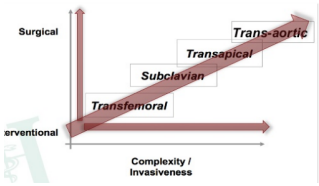


1y sağkalım 69.7-88%

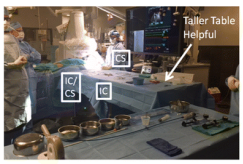


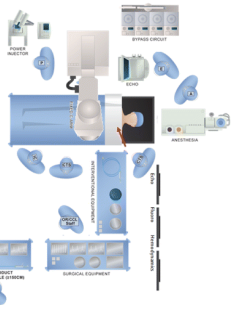
Nereden?



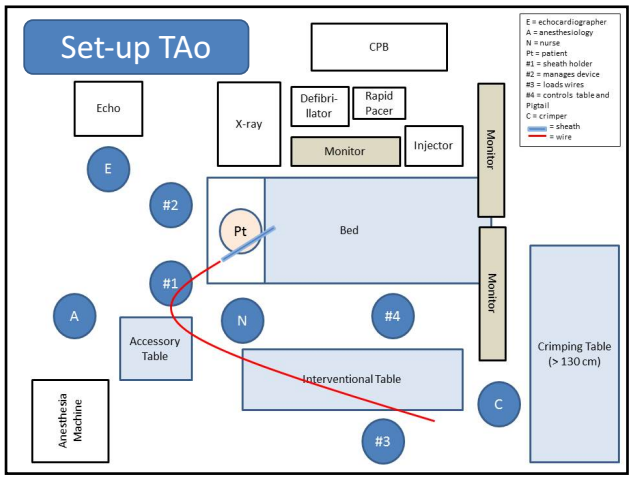


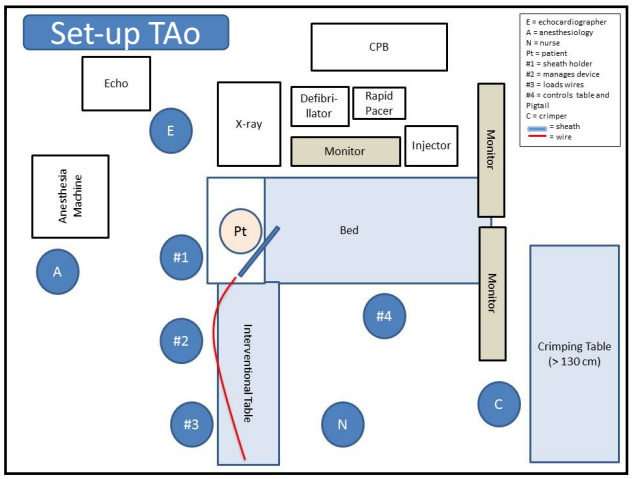
Set-up LSCA





Members of the Heart Team Present in the Procedure
IC: Interventional Cardiologist
CTS: Cardiothoracic Surgeon
A: Anesthesiologist
E: Echocardiographer
P: Perfusionist
DPL: Device Prep Lead
OR / CCL Staff: OR/Cath Lab Staff


Set-up TAo
CPB
Echo
X-ray
Defibri-llator
Rapid Pacer
Monitor
Injector
Monitor
E
#2
Pt
Bed
#1
Monitor
A
N
#4
Accessory Table
Interventional Table
Crimping Table (> 130 cm)
Anesthesia Machine
C
#3
E = echocardiographer
A = anesthesiology
N = nurse
Pt = patient
#1 = sheath holder
#2 = manages device
#3 = loads wires
#4 = controls table and Pigtail
C = crimper
= sheath
= wire


Set-up TAo
CPB
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Bed
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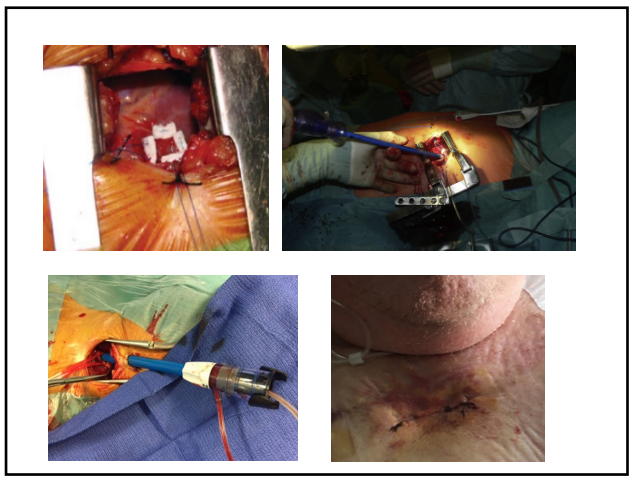
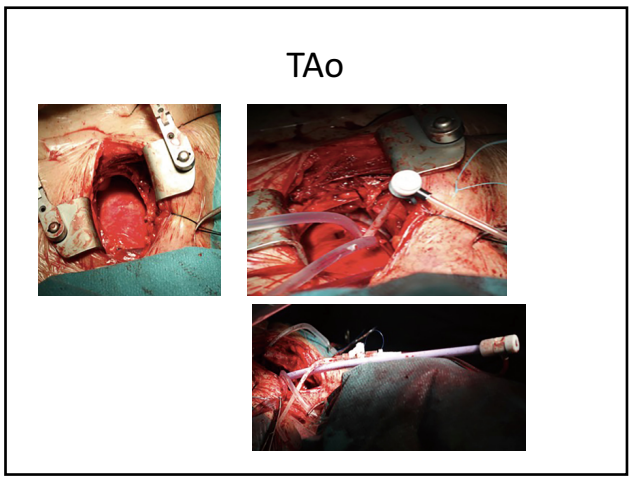
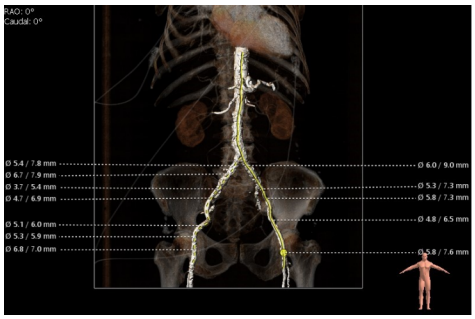
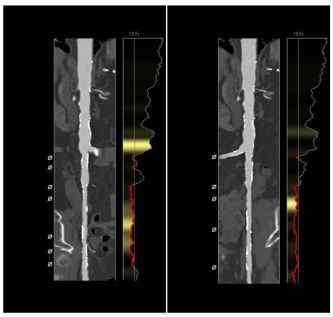



TAo

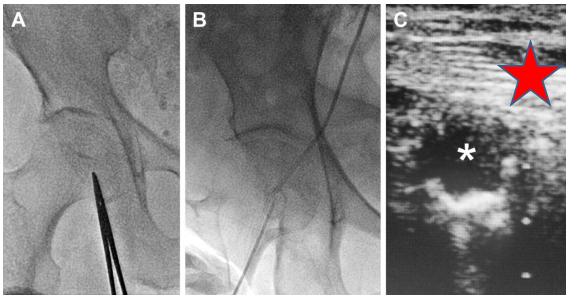
TrF


RAO: 0°
Caudal: 0°
Ø 5.4 / 7.8 mm
Ø 6.7 / 7.9 mm
Ø 3.7 / 5.4 mm
Ø 4.7 / 6.9 mm
Ø 5.1 / 6.0 mm
Ø 5.3 / 5.9 mm
Ø 6.8 / 7.0 mm
Ø 6.0 / 9.0 mm
Ø 5.3 / 7.3 mm
Ø 5.8 / 7.3 mm
Ø 4.8 / 6.5 mm
Ø 5.8 / 7.6 mm

TrF



TrF


A
B
C
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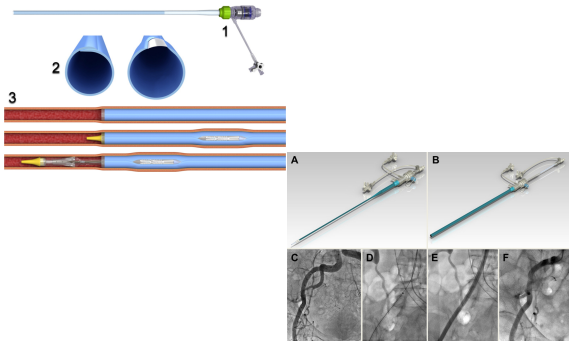
1
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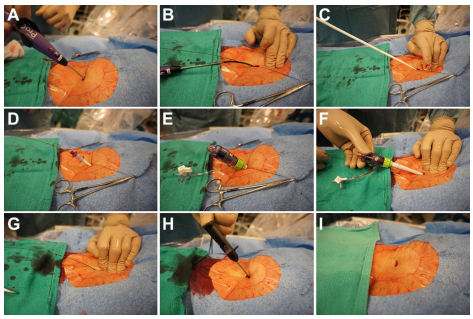
Proglide



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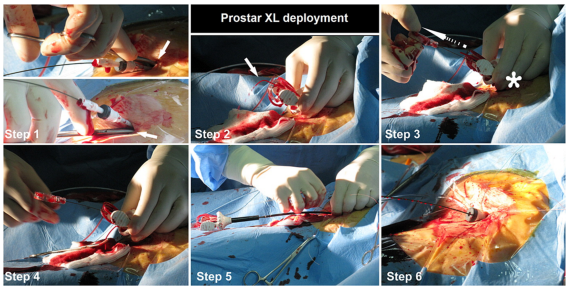
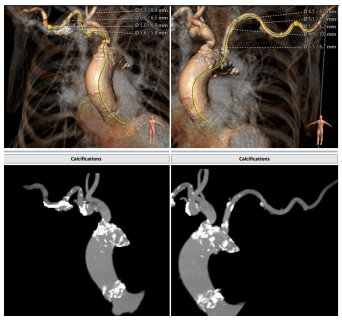
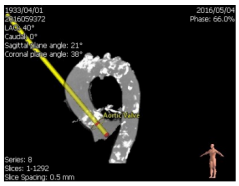
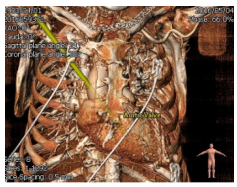


TAx



TAo

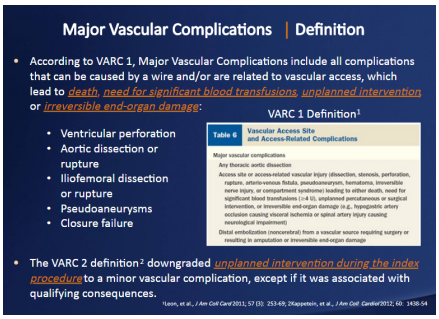




Komplikasyonlar

- **Vasküler komplikasyonlar**
- **Kanama**
- İnme
- PV kaçak
- AV blok
- Diğer (**koroner oklüzyon, kapak migrasyonu, embolizasyonu**, endokardit, **kök rüptürü**…)

Vasküler komplikasyonlar



VARC 2


Clinical Guidelines — Kappetein et al

Updated standardized endpoint definitions for transcatheter aortic valve implantation: The Valve Academic Research Consortium-2 consensus document*

A. Pieter Kappetein, Stuart J. Head, Philippe Généreux, Nicolo Piazza, Nicolas M. van Mieghem, Eugene H. Blackstone, Thomas G. Brott, David J. Cohen, Donald E. Cutlip, Gerrit-Anne van Es, Rebecca T. Hahn, Ajay J. Kirtane, Mitchell W. Krucoff, Susheel Kodali, Michael J. Mack, Roxana Mehran, Josep Rodés-Cabau, Pascal Vranckx, John G. Webb, Stephan Windecker, Patrick W. Serruys, and Martin B. Leon

Objectives: The aim of the current Valve Academic Research Consortium (VARC)-2 initiative was to revisit the selection and definitions of transcatheter aortic valve implantation (TAVI) clinical endpoints to make them more suitable to the present and future needs of clinical trials. In addition, this document is intended to expand the understanding of patient risk stratification and case selection.

Background: A recent study confirmed that VARC definitions have already been incorporated into clinical and research practice and represent a new standard for consistency in reporting clinical outcomes of patients with symptomatic severe aortic stenosis (AS) undergoing TAVI. However, as the clinical experience with this technology has matured and expanded, certain definitions have become unsuitable or ambiguous.

Methods and Results: Two in-person meetings (held in September 2011 in Washington, DC, and in February 2012 in Rotterdam, The Netherlands) involving VARC study group members, independent experts (including surgeons, interventional and noninterventional cardiologists, imaging specialists, neurologists, geriatric specialists, and clinical trialists), the US Food and Drug Administration (FDA), and industry representatives, provided much of the substantive discussion from which this VARC-2 consensus manuscript was derived. This document provides an overview of risk assessment and patient stratification that need to be considered for accurate patient inclusion in studies. Working groups were assigned to define the following clinical endpoints: mortality, stroke, myocardial infarction, bleeding complications, acute kidney injury, vascular complications, conduction disturbances and arrhythmias, and a miscellaneous category including relevant complications not previously categorized. Furthermore, comprehensive echocardiographic recommendations are provided for the evaluation of prosthetic valve (dys)function. Definitions for the quality of life assessments are also reported. These endpoints formed the basis for several recommended composite endpoints.

Conclusions: This VARC-2 document has provided further standardization of endpoint definitions for studies evaluating the use of TAVI, which will lead to improved comparability and interpretability of the study results, supplying an increasingly growing body of evidence with respect to TAVI and/or surgical aortic valve replacement. This initiative and document can furthermore be used as a model during current endeavors of applying definitions to other transcatheter valve therapies (for example, mitral valve repair). (J Thorac Cardiovasc Surg 2013;145:6-23)

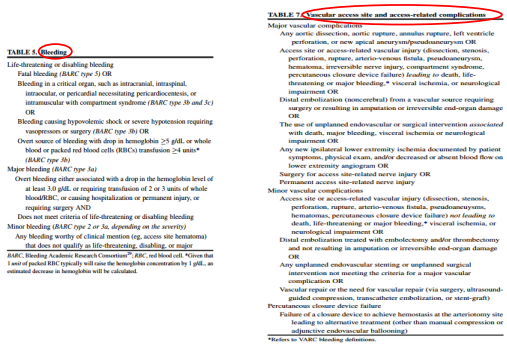


TABLE 5 Bleeding

Life-threatening or disabling bleeding
Fatal bleeding *(BARC type 5)* OR
Bleeding in a critical organ, such as intracranial, intraspinal, intraocular, or pericardial necessitating pericardiocentesis, or intramuscular with compartment syndrome *(BARC type 3b and 3c)* OR
Bleeding causing hypovolemic shock or severe hypotension requiring vasopressors or surgery *(BARC type 3b)* OR
Overt source of bleeding with drop in hemoglobin ≥5 g/dL or whole blood or packed red blood cells (RBCs) transfusion ≥4 units* *(BARC type 3b)*

Major bleeding *(BARC type 3a)*
Overt bleeding either associated with a drop in the hemoglobin level of at least 3.0 g/dL or requiring transfusion of 2 or 3 units of whole blood/RBC, or causing hospitalization or permanent injury, or requiring surgery AND
Does not meet criteria of life-threatening or disabling bleeding

Minor bleeding *(BARC type 2 or 3a, depending on the severity)*
Any bleeding worthy of clinical mention (eg, access site hematoma) that does not qualify as life-threatening, disabling, or major

BARC, Bleeding Academic Research Consortium[26]; *RBC*, red blood cell. *Given that 1 unit of packed RBC typically will raise the hemoglobin concentration by 1 g/dL, an estimated decrease in hemoglobin will be calculated.

TABLE 7 Vascular access site and access-related complications

Major vascular complications
Any aortic dissection, aortic rupture, annulus rupture, left ventricle perforation, or new apical aneurysm/pseudoaneurysm OR
Access site or access-related vascular injury (dissection, stenosis, perforation, rupture, arterio-venous fistula, pseudoaneurysm, hematoma, irreversible nerve injury, compartment syndrome, percutaneous closure device failure) *leading to* death, life-threatening or major bleeding,* visceral ischemia, or neurological impairment OR
Distal embolization (noncerebral) from a vascular source requiring surgery or resulting in amputation or irreversible end-organ damage OR
The use of unplanned endovascular or surgical intervention *associated* with death, major bleeding, visceral ischemia or neurological impairment OR
Any new ipsilateral lower extremity ischemia documented by patient symptoms, physical exam, and/or decreased or absent blood flow on lower extremity angiogram OR
Surgery for access site-related nerve injury OR
Permanent access site-related nerve injury

Minor vascular complications
Access site or access-related vascular injury (dissection, stenosis, perforation, rupture, arterio-venous fistula, pseudoaneurysms, hematomas, percutaneous closure device failure) *not leading to* death, life-threatening or major bleeding,* visceral ischemia, or neurological impairment OR
Distal embolization treated with embolectomy and/or thrombectomy and not resulting in amputation or irreversible end-organ damage OR
Any unplanned endovascular stenting or unplanned surgical intervention not meeting the criteria for a major vascular complication OR
Vascular repair or the need for vascular repair (via surgery, ultrasound-guided compression, transcatheter embolization, or stent-graft)

Percutaneous closure device failure
Failure of a closure device to achieve hemostasis at the arteriotomy site leading to alternative treatment (other than manual compression or adjunctive endovascular ballooning)

*Refers to VARC bleeding definitions.

Vasküler komplikasyon prediktörleri

Patient-Related Factors	Anatomical Factors	Procedural Factors (Device / Operator)
• Femoral artery calcium score[2,4] • Female gender[1]	• Sheath to femoral artery ratio (SFAR)[2] • Vessel tortuosity[4]	• Learning curve[2] • Complication management[3] • Percutaneous closure device failure[5] • Patient selection[3]

Predictability and Outcome of Vascular Complications after Transfemoral Transcatheter Aortic Valve Implantation

Emrah Uguz[1], Mecit Gokcimen[2], Sina Ali[3], Yakup Alsancak[3], Serdal Bastug[3], Haci Ahmet Kasapkara[3], Murat Canyigit[4], Mete Hıdıroglu[1], Erol Sener[1]

[1]*Department of Cardiovascular Surgery, Atatürk Training and Research Hospital, Ankara,* [2]*Department of Cardiovascular Surgery, Yozgat State Hospital, Yozgat, Departments of* [3]*Cardiology and* [4]*Radiology, Atatürk Training and Research Hospital, Ankara, Turkey*

Background and aim of the study: **Although the efficacy and safety of transfemoral transcatheter aortic valve implantation (TAVI) have been improved with new devices, careful patient selection is essential and awkward complications associated with the procedure persist. Despite a gradual reduction in the delivery system size and the development of access site arterial closure devices, vascular complications remain one of the main challenges of TAVI. The aim of this single-center study was to prospectively evaluate the incidence and predictors of vascular complications in transfemoral TAVI.**

Methods: **A total of 121 patients (mean age 77.98 ± 8.20 years) who underwent transfemoral TAVI between 2011 and 2014 at the authors' institution, using two different commercially available devices, was included in the study. Technical success, vascular complications, predictors of vascular complications and mortality were each assessed. Vascular complications were defined by the current Valve Academic Research Consortium-2 (VARC-2) criteria.**

Results: **The mean logistic EuroSCORE of the patients was 21.04 ± 7.51. An Edwards SAPIEN XT valve was used in 69.7% of cases, and a Medtronic CoreValve in 30.3%. Completely percutaneous transfemoral TAVI was successful in 81.6% of patients. Procedural and 30-day mortalities were 1.4% and 8.5%, respectively. Vascular complications occurred in 16.1% of patients (minor 10.4%, major 5.7%), and necessitated surgical repair in 25 cases (11.8%). Major vascular complications were predictive of 30-day mortality (58.3% versus 5.6% (p = 0.000). Predicted major vascular complications (by multivariate analysis) were female gender (hazard ratio (HR) 5.45; 95% confidence interval (CI) 0.91-32.5, p = 0.063), arterial calcification (HR 2.88; 95% CI 1.14-7.30, p = 0.025) and sheath to iliofemoral artery ratio (SIFAR) (HR 1.91, 95% CI 1.27-2.87, p = 0.001).**

Conclusion: **Although vascular preclosure devices have revolutionized transfemoral TAVI, and offer a simple but effective percutaneous procedure, vascular complications are still observed in a considerable number of patients. The major vascular complications were predictive of 30-day mortality, and included female gender, iliofemoral calcification and SIFAR. Further technological and procedural developments are required to reduce vascular complication rates and related mortality.**

The Journal of Heart Valve Disease 2016;25:173-181

Table I: Baseline clinical characteristics of the patients.

Parameter	Value/No. of patients
Age (years)*	77.98 ± 8.20
Female gender	129 (61.1)
Body mass index (kg/m²)*	24.74 ± 3.11
Diabetes	76 (36.0)
Hyperlipidemia	95 (45.0)
Hypertension	156 (73.9)
Smoking	10 (4.7(
NYHA class III/IV	174 (82.5)
Coronary artery disease	129 (61.1)
Previous MI	27 (12.8)
Previous PCI	70 (33.2)
Previous CABG	38 (18.0)
Peripheral vascular disease	54 (25.6)
Cerebrovascular disease	23 (10.9)
COPD	70 (33.2)
eGFR	
<60 ml/min	93 (44.1)
<30 ml/min	31 (14.7)
Logistic EuroSCORE (%)*	21.04 ± 7.51
LVEF (%)*	45.31 ± 10.34

*Values are mean ± SD,
Values in parentheses are percentages.
CABG: Coronary artery bypass grafting; COPD: Chronic obstructive pulmonary disease; eGFR: Estimated glomerular filtration rate; LVEF: Left ventricular ejection fraction; MI: Myocardial infarction; PCI: Percutaneous coronary intervention.

Table II: Procedural characteristics of the patients.

Parameter	Value/No. of patients
Prosthesis type	
SAPIEN XT	147 (69.7)
CoreValve	64 (30.3)
Prosthesis size (mm)	
23	91 (43.1)
26	72 (34.1)
29	43 (20.4)
31	5 (2.4)
General anesthesia	106 (50.2)
Closure technique	
Surgical	14 (6.6)
Perclose Proglide	60 (28.4)
Perclose Proglide + Prostar	5 (2.4)
Prostar	132 (62.6)
Sheath outer diameter (mm)	7.20 ± 0.24
6.7	26 (12.3)
7.2	109 (51.7)
7.3	64 (30.3)
7.5	4 (1.9)
8.0	8 (3.8)
Sheath size (Fr)	
16	26 (12.3)
18	173 (82.0)
19	4 (1.9)
20	8 (3.8)
IFMLD (mm)	7.20 ± 0.98
SIFAR	1.02 ± 0.12
Calcification score (0-3) ★	1.39 ± 0.66
0	5 (2.4)
1	135 (64.0)
2	55 (26.1)
3	16 (7.6)
Tortuosity score (0-3) ★	1.08 ± 0.76
0	37 (17.5)
1	138 (65.4)
2	19 (9.0)
3	17 (8.1)

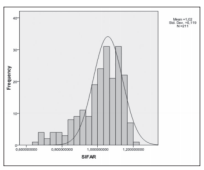
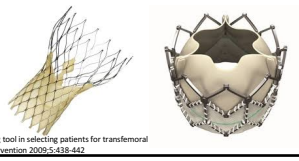


Figure 1: The distribution of sheath to iliofemoral artery ratio (SIFAR).

threshold SIFAR of 1.106876,
which predicted VARC major vascular complications



★ Eltchaninoff H, Kerkeni M, Zajarias A. Aorto-iliac angiography as a screening tool in selecting patients for transfemoral aortic valve implantation with the Edwards SAPIEN bioprosthesis. EuroIntervention 2009;5:438-442

Table III: Vascular complications.

Complication	No. of patients
Vascular complications	34 (16.1)
Minor	22 (10.4)
Major	12 (5.7)
Vascular complication site	
Aorta	3 (1.4)
Iliac artery	8 (3.8)
Femoral artery	23 (10.9)
Complication details	
Device failure (bleeding/occlusion/stenosis)	15 (7.1)
Access site hematoma	4 (1.9)
Pseudoaneurysm	3 (1.4)
Rupture	5 (2.4)
Dissection	4 (1.9)
Stenosis/Occlusion	3 (1.4)
Bleeding complications	26 (12.3)
Minor	18 (8.5)
Major	3 (1.4)
Life-threatening bleeding	5 (2.4)
Local infection	4 (1.9)
Vascular intervention	
Surgical repair	25 (11.8)
Stenting	3 (1.4)
Balloon angioplasty	3 (1.4)
Ultrasonography-guided compression	3 (1.4)
Need for surgical intervention (access or repair)	39 (18.4)

Values in parentheses are percentages.

- Tamamen perkütan TAVI %81.6
- Vasküler komplikasyonlar %16.1
- minor %10.4, **major %5.7**
- Cerrahi onarım %11.8

Mortalite %8,5

Table IV: Clinical outcome of the patients.

Parameter	Value
ICU stay (days)*	2.82 ± 5.10
Hospital stay (days)*	6.18 ± 6.37
30-day mortality (n)	18 (8.5) ★
Intraoperative mortality (n)	3 (1.4)

*Values are mean ± SD,
Values in parentheses are percentages.

Table V: Univariate and multivariate analysis of the clinical and procedural characteristics according to the incidence of VARC major vascular complications.

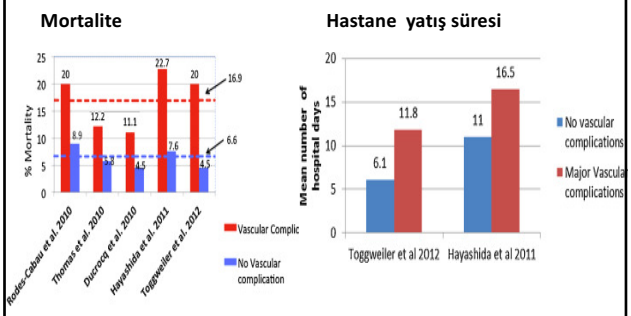
Parameter	Univariate p-value	Multivariate p-value	Odds ratio	95% CI
Clinical parameters				
Age (years)	0.980	-	-	-
★ Female gender	0.085*	0.063*	5.45	0.91-32.5
BMI (kg/m2)	0.347	-	-	-
Diabetes (%)	0.265	-	-	-
Dyslipidemia (%)	0.410	-	-	-
Hypertension (%)	0.365	-	-	-
Smoking (%)	0.505	-	-	-
NYHA class III/IV	0.472	-	-	-
Coronary artery disease (%)	0.256	-	-	-
Previous MI (%)	0.086	-	-	-
Previous PCI (%)	1.000	-	-	-
Previous CABG (%)	0.296	-	-	-
Peripheral vascular disease (%)	0.002*	0.584	-	-
Cerebrovascular disease (%)	0.654	-	-	-
COPD (%)	0.558	-	-	-
eGFR <60 ml/min	0.163	-	-	-
eGFR <30 ml/min	1.000	-	-	-
Logistic EuroSCORE (%)	0.147	-	-	-
LVEF (%)	0.294	-	-	-
Procedural				
Sheath outer diameter (mm)	0.680	-	-	-
Sheath size (Fr)	0.519	-	-	-
IFMLD (mm)	0.007	0.415	-	-
★★ SIFAR	0.000*	0.001**	1.91	1.27-2.87
★★ Calcification score (0-3)	0.000*	0.025**	2.88	1.14-7.30
Tortuosity score (0-3)	0.289	-	-	-
Prosthesis size (mm)	0.901	-	-	-
Prosthesis type	0.131	-	-	-
Experience	0.590	-	-	-

*Peripheral vascular disease, IFMLD predicted major vascular complications in the univariate analysis, but they were no longer significant for vascular complications after adjustment for other variables in the multivariate model.
**SIFAR, arterial calcification scores, and female gender were identified as independent predictors of VARC major vascular complications by multivariate analysis.
Abbreviations as Tables I and II.

- Mj vasküler komp. **30-d mortalite** göstergesi **(58.3% versus 5.6%** (p = 0.000)

  Vasküler komplikasyon RF (multivaryans analiz)
- **Kadın**
- **Arteriyel Kalsifikasyon**
- **SIFAR**

Vasküler komplikasyonlar



Sheath çapı

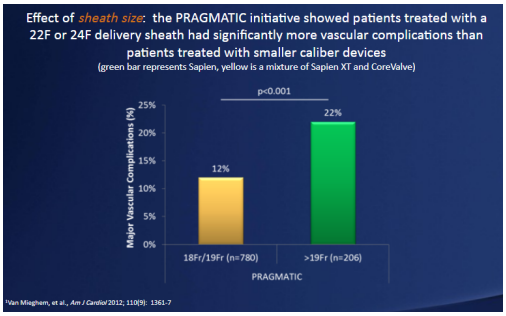
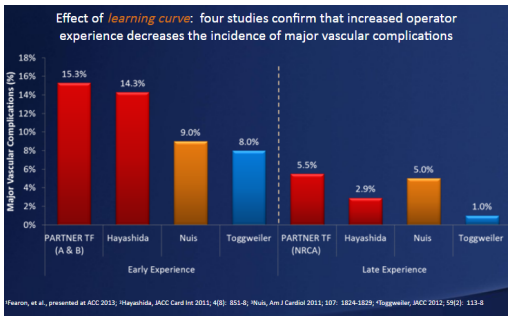


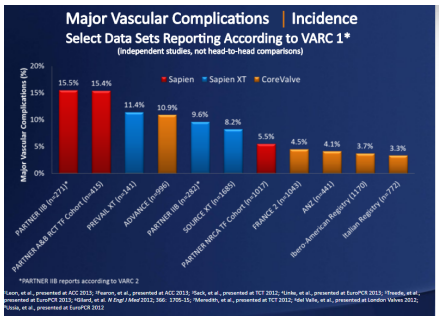
Table 1 Internal and External Diameter of Large Sheaths

Manufacturer	Sheath	Sheath Internal Diameter, F	Sheath External Diameter, mm
Edwards Lifesciences	RetroFlex 3 introducer sheath	22	8.4
		24	9.2
	NovaFlex introducer sheath	18	7.2*
		19	7.5
	Expandable Sheath	14	5.9*
		16	6.6*
		18	7.2*
		20	7.8*
Cook Medical	Check-Flo Introducer	18	7.2
St. Jude Medical	Ultimum	18	6.8
		20	7.6
		22	8.2
Onset Medical	SoloPath Balloon Expandable Transfemoral Introducer	19	7.3†
		20	7.7†
		21	8†
Gore Medical	DrySheath	16	6.2
		18	6.8
		20	7.5

Tecrübe



%3.3-15.5

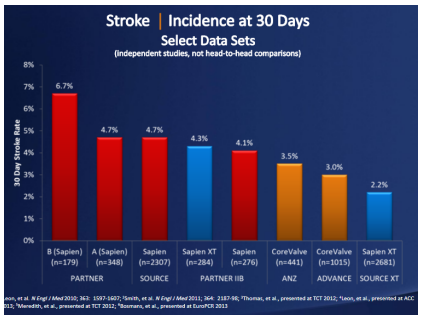


Nadir ama ölümcül !

The ADVANCE study shows that procedural complications are rare during CoreValve implants

Major Valve-Related Complications	
N=996	%
Annulus Rupture	0.0
Valve Embolization	0.2
Conversion to open AVR	0.1
Coronary Compromised	0.1

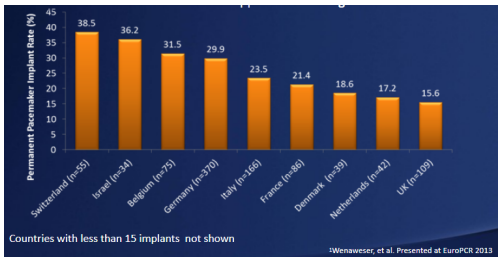
İnme 30d %2.2-6.7

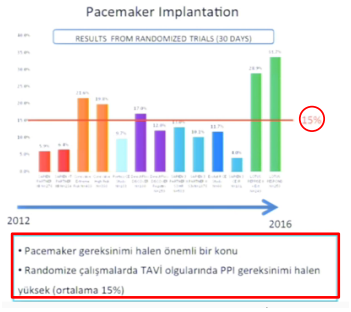


İnme prediktörleri

Early Stroke (within 30 days of TAVI)	Late Stroke (30 days to 1 year after TAVI)
• Female gender[1]	• History of CABG[1]
• Surgical cutdown for access[1]	• History of stroke[3,5]
• New onset atrial fibrillation[2]	• Coronary artery disease[3]
• Baseline aortic regurgitation 3+[2]	• Peripheral vascular disease[5]
• Smaller aortic valve area[3]	• Baseline NYHA class[3]
• COPD[4]	• Chronic atrial fibrillation[5]
• BMI <25 kg/m²[4]	
• Multiple implant attempts[4]	
• Valve dislodgement[5]	
• Balloon post-dilatation[5]	

Kalıcı pace implantasyon oranları %15.6-38.5





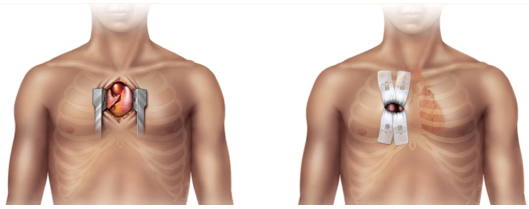
Kalıcı pace implantasyonu prediktörleri

Patient-Related Factors	Anatomical Factors	Procedural Factors (Device / Operator)
• **Right Bundle Branch Block (RBBB)** [2,3,4,5,7]	• Variations in location of LBBB exit point[1]	• **Implant Depth** [2,3,7]
• **Other pre-existing conduction disturbances** [3,4,8,9]	• Septum thickness[1,6]	• **Application of PPI guidelines** [10]
• Male gender[3]	• Thickness of the non-coronary cusp[1]	• **Learning Curve** [11]
• Age > 75 years[9]		• Balloon Aortic Valvuloplasty[8]
• Previous MI[3]		• Radial force of the prosthesis[3]

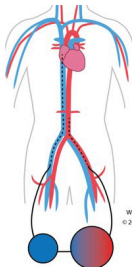
[1]Halhawi, et al. Am Heart J 2009; [2]Munoz-Garcia, et. al. JACC CV 2012; [3]Piazza et. al. EuroIntervention 2010; [4]De Carlo , et. al. Am Heart J 2012; [5]Calvi, et. al. JICE 2011; [6]Sato, et. al. Cath Card Intv 2012; [7]Fraccaroo, et. al. Am J Card 2011; [8]Khawaja, et. al. Circ 2011; [9]Schroeter et. al. EuroPACE 2011; [10]Wenaweser, et. al. presented at EuroPCR 2013; [11]Meredith, et. al. presented at TCT 2012

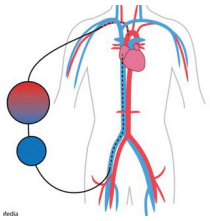
TAVI'nin alternatifi var mı?

Sağ minitorakotomi / Mini sternotomi



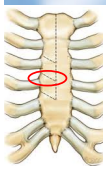
Kanülasyon nereden?

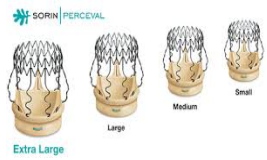


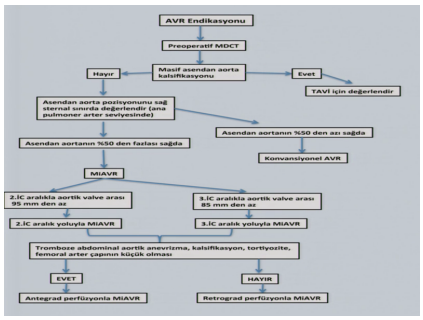


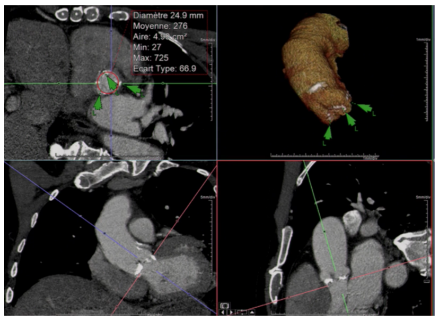
Mini-sternotomy

- 21-23 Fr V/Femoral
- 17-19 Fr A/Femoral
- TEE
- 3-4İKA
- Preop BTA

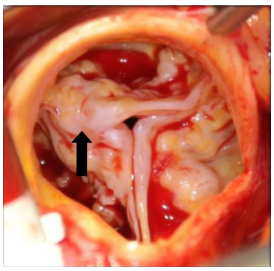


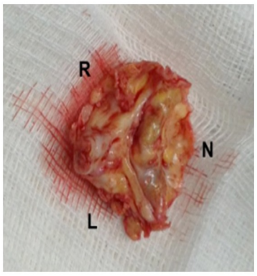




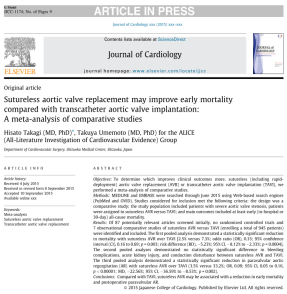


AVR'de ne fark var? (TAVI)





sAVR vs TAVI



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Journal of Cardiology xxx (2015) xxx–xxx

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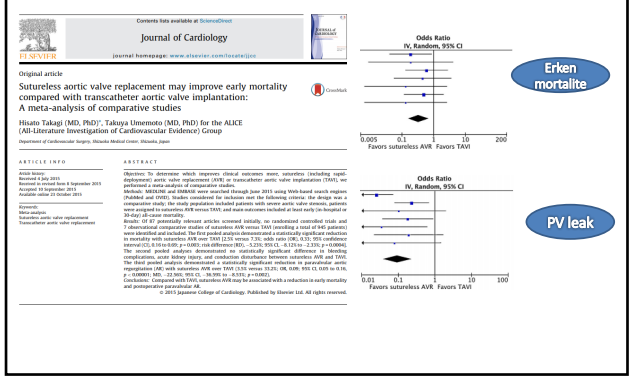
Original article

Sutureless aortic valve replacement may improve early mortality compared with transcatheter aortic valve implantation: A meta-analysis of comparative studies

Hisato Takagi (MD, PhD)*, Takuya Umemoto (MD, PhD) for the ALICE (All-Literature Investigation of Cardiovascular Evidence) Group

Department of Cardiovascular Surgery, Shizuoka Medical Center, Shizuoka, Japan

- Metaanaliz 945 hasta
- Erken mortalite 2.5% vs 7.3%,
- PV leak 3.5% vs 33.2%



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Sutureless aortic valve replacement may improve early mortality compared with transcatheter aortic valve implantation: A meta-analysis of comparative studies

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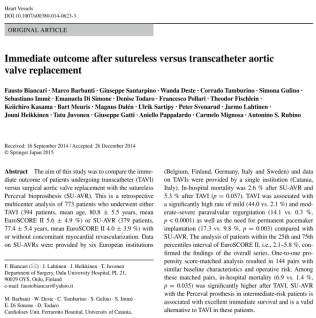
Erken mortalite

PV leak

sAVR vs TAVI



Heart Vessels
DOI 10.1007/s00380-014-0623-3

ORIGINAL ARTICLE

Immediate outcome after sutureless versus transcatheter aortic valve replacement

Fausto Biancari · Marco Barbanti · Giuseppe Santarpino · Wanda Deste · Corrado Tamburino · Simona Gulino · Sebastiano Immè · Emanuela Di Simone · Deaine Todaro · Francesco Pollari · Theodor Fischlein · Kelichiro Kasama · Bart Meuris · Magnus Dalén · Ulrik Sartipy · Peter Svenarud · Jarmo Lahtinen · Jouni Heikkinen · Tatu Juvonen · Giuseppe Gatti · Aniello Pappalardo · Carmelo Mignosa · Antonino S. Rubino

Received: 16 September 2014 / Accepted: 26 December 2014
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- Çok merkezli 773 hasta
- **Intermediate risk**
- Erken mortalite 2.6% vs 5.3%,
- hastane içi mortalite 1.4% vs 6.9%
- PV leak 0.3% vs 14.1%
- Pace 9.8% vs 17.3%

sAVR vs TAVI

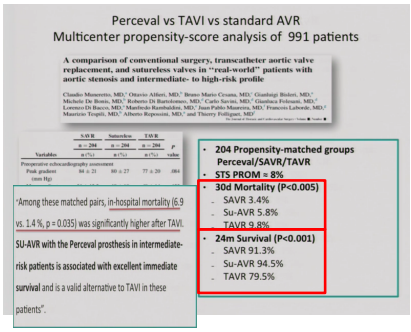
Clinical Outcome and Cost Analysis of Sutureless Versus Transcatheter Aortic Valve Implantation With Propensity Score Matching Analysis

Giuseppe Santarpino, MD[1*], Steffen Pfeiffer, MD[1], Jürgen Jessl, MD[1], Angelo Dell'Aquila, MD[1], Ferdinand Vogt, MD[1], Che von Wardenburg, MD[1], Johannes Schwab, MD[1], Joachim Sirch, MD[1], Matthias Puschinger, MD[1], and Theodor Fischlein, MD[1]

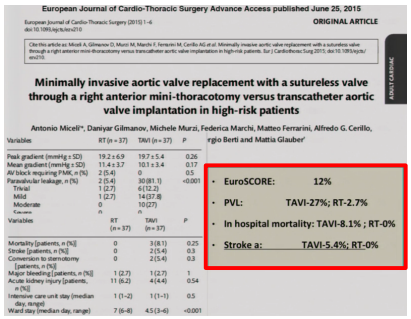
Surgical sutureless and interventional transcatheter aortic valve prostheses are nowadays extensively adopted in high-risk elderly patients. An explorative analysis was carried out to compare the clinical outcome and costs associated to these approaches. Since 2010, a total of 626 patients were distributed between transcatheter aortic valve implantation (TAVI; n = 364) and sutureless (n = 262) groups. Patients of both groups were not comparable for clinical and surgical characteristics, but many patients were in a "gray zone"; therefore, a retrospective propensity score analysis was possible and performed. For the matched pair samples, postoperative, follow-up clinical data, and costs data were obtained. In-hospital death occurred in 5 patients in sutureless group and 3 patients in TAVI group (p = 0.36). Blood transfusions were higher in sutureless group (2.1 ± 2.3 vs 0.4 ± 1.0 U), TAVI group had a shorter intensive care unit and hospital stay (2.2 ± 2.7 vs 3.2 ± 3.5 days, p = 0.037; 12 ± 6 vs 14 ± 6 days, p = 0.017). No differences in postoperative neurologic (p = 0.361), renal (p = 0.106), or respiratory (p = 0.391) complications were observed between groups. At follow-up (24.5 ± 13.8 months), 1 patient in sutureless group and 7 patients in TAVI group died (p = 0.052). Paravalvular leakage occurred more frequently in patients in TAVI group (35 [34%] vs 7 [6.9%]; p <0.001) with an impact on follow-up survival rate. The costs associated to the 2 procedures are similar when the cost of the device was excluded (p = 0.217). When included, the sutureless approach resulted a cost saving (€22,451 vs €33,877, p <0.001). In conclusion, the patients in the "gray zone" record a satisfying clinical outcome after sutureless surgery and TAVI. Patients in the sutureless group endure more hospital complications, but TAVI entails a higher follow-up mortality. On the costs aspects, TAVI technologies are more expensive, and it reflects on higher overall hospital costs. © 2015 Elsevier Inc. All rights reserved. (Am J Cardiol 2015;116:1737–1743)

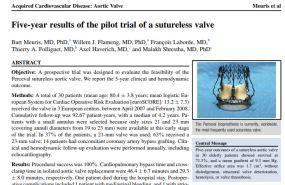
- 626 hasta
- Gri bölge hastalar
- **Mortalite, PV leak, maliyet sAVR'de daha düşük**

sAVR vs TAVI Int-High risk



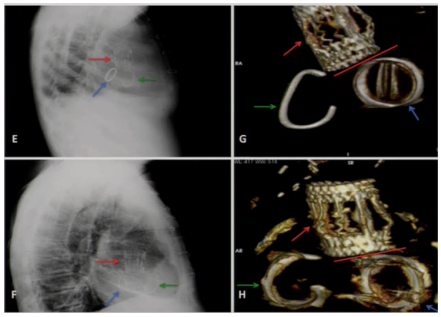
sAVR vs TAVI Intermed-High risk



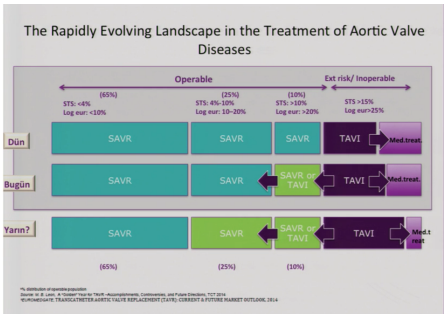


- Mean log Euroscore 13.2
- 5 yıl takip
- Prosedürel başarı %100
- **%3.3 pacemaker**, **SVO yok**
- Mean gradient 9.3 mm Hg
- Kapak dejenerasyonu, hemoliz, PV leak, thrombüs yok

sAVR+(MVR)+TP+CABG



Dün, Bugün, Yarın?



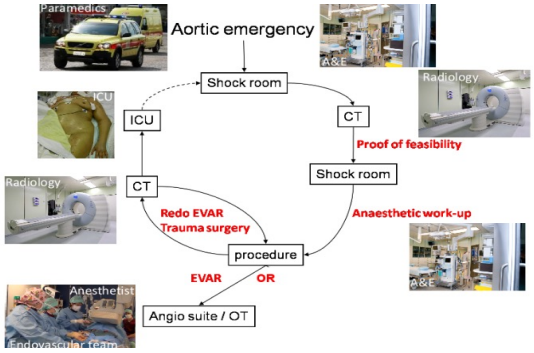
Sonuç olarak TAVİ'de…

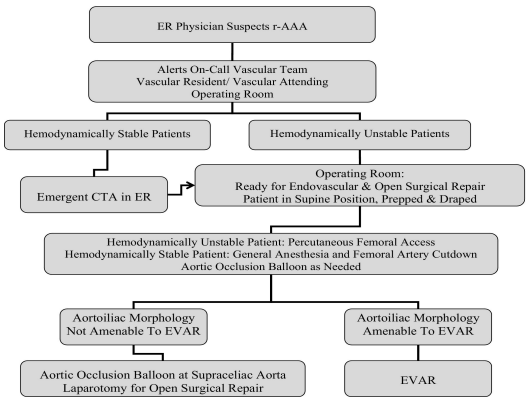
- **Vasküler komplikasyonlar** halen önemli sorun
- Mortaliteyle doğrudan ilişkili (30 gün)
- SIFAR, Kalsifikasyon, kadın RF
- Teknik / Cihaz / Tecrübe gelişmeler önemli
- **Preop değerlendirme en önemli aşama**
- **Alternatifler** göz önüne alınmalı
- Komplikasyonların çözümü konusunda (cerrahi/endovasküler) ön hazırlık
- **Transfemoral yapılmayan TAVİ'nin cerrahiye üstünlüğü yok**
- **PV leak, Pace ihtiyacı halen önemli sorun**

Takım olmak er ya da geç başarıyı getirir

Rüptüre AAA

Protokol (UHZ, AMC, UW)





Temel Prensipler

- Hastane personeli **eğitimi** (KVC, Acil, GR, Anest, Doktor, Hemşire, Teknik Personel)
- **Standart multidisipliner** yaklaşım
- **Erken** rAAA **tanı**sı (BTA), **tedavi** başlanması, **transfer**
- Sx → Ölüm (10h), Dx → Ölüm (2,5h)
- EVAR'dan en çok fayda gören hastalar **yüksek riskli hastalar** (şok, kadın, yaşlı, stabiil olmayan, hostil abdomen, kan transfüzyonu yapılamayacak)
- **Hardman index**'i yüksek (>2) hastalarda (>76y, Hb<9, MI+, bilinç -, krea>2.15mg/dl) EVAR

Temel Prensipler

- **Hipotansif hemostaz** (70-90 mm Hg SAP, 50-70mm Hg kısa süreler için tolere edilebilir, bilinç!)
- Kan basıncının yükselmesi → kanama, transfüzyon ihtiyacı, koagülopati
- Gereksiz sıvı replasmanı, kan transfüzyonundan kaçınılmalı

Temel Prensipler

- GA**, LA, LA+sed** ?
- GA → - sirkülatuar kollaps,
  +görüntü kalitesi, ek cerrahi işlem
- **Stok** (acil endoklemp kiti, endovasküler cihaz alternatifleri)
- **Endoklemp** (standart EVAR'dan temel fark) %19-27 ihtiyaç, supraçölyak, T12 üzeri, 2 balon??, uzun sheath en az 45 cm, brakial??
- Endovasküler + Cerrahi işlemler yapılabilmeli

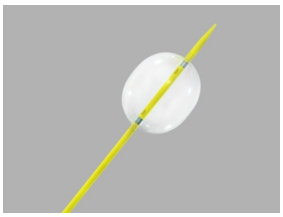
Acil Endoklemp Kiti

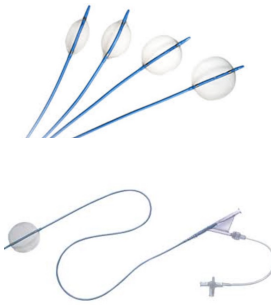
- Bistüri
- LA
- İğne
- SF
- Opak 100 ml
- Introducer sheath 6-7F 2 tane
- Tel (0.035/260 cm) J tip/glide
- Sert tel (Amplatz, Archer, Lunderquist, Back-up Meier) - 6cm floppy uç
- İşaretli pigtail 5Fr 65 cm
- Introducer **uzun sheath en az 12-14Fr 45 cm** (Cook)
- **Komplian balon** (Coda, Reliant, Equalizer)
- 20 cc enjektör 2 adet

Komplian balonlar

- Reliant (Medtronic)
  12Fr, 100 cm, 46 mm
- Coda (Cook)
  14Fr 100-120 cm, 32, 40 mm
- Equalizer (Boston Scientific)
  14-16 Fr, 65-110 cm, 20, 27, 33, 40 mm

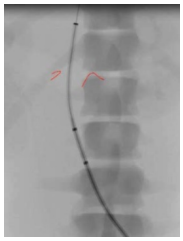
Komplian balonlar





Endoklemp

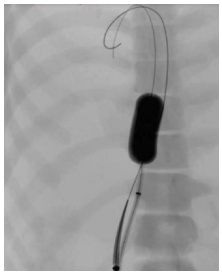
Uzun sheath (>45 cm)



Supraçölyak balon + ana gövde için kateterizasyon

İşlem

Endoklemp + Ana gövdenin ilerletilmesi

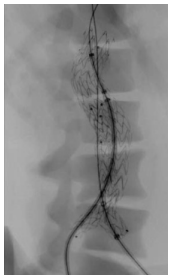


Parsiyel açılmış ana gövde

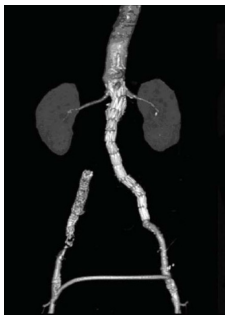
İşlem

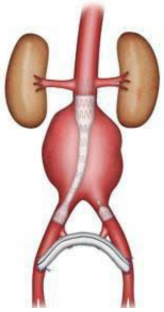
2. Balon

Kontralateral bacak

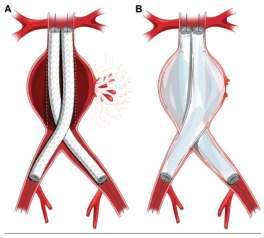


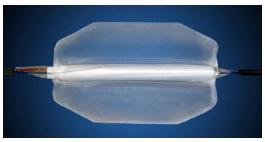
Hibrid Ao-uniilak + fem fem





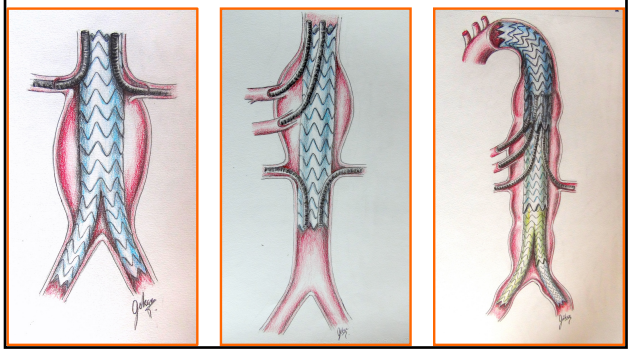
Nellix (Endologix) Endosealing





CHİMNEY /ŞNORKEL – PERİSKOP - SANDVİÇ TEKNİKLERİ

Dr. Gökçe ANNAÇ tarafından çizilmiştir



XC Endoklemp

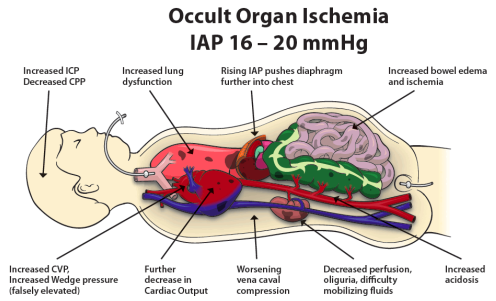
Klemp sırasında

- Uyar, BBl, NTG
- **MAP↑** %2 IR %5 SR %50 SC
- **Afterload ↑**
- **Miyokard O_2 ihtiyacı ↑**
- **CO ↓**
- **Miyokard iskemi riski**
- **Klemp distalinde perfüzyon bozukluğu**
- **Asidik metabolit birikimi**

Klemp sonrasında

- Almadan uyar, Preloadu arttır
- Anti HT ajanları azalt/kes
- Vazokonstriktörleri hazırla
- SVR, CO çok düşebilir
- Yer, süre önemli
- Almadan MAP %20-30 arttırmak iyi olabilir
- Asidoza hazırlıklı ol! (resp, metabolik tamponlama)

Abdominal kompartman sendromu



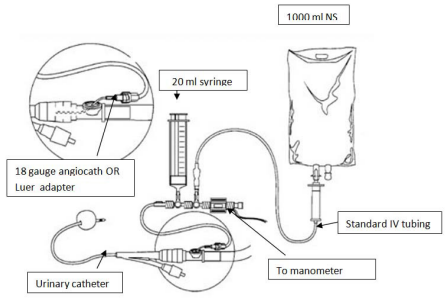
Abdominal kompartman sendromu

- Retroperitoneal hematom, lumbar ve İMA kanama, koagülopati, şoka sekonder permeabilite artışı ve ödem
- Akut, primer, x5 mortalite, %18-35 (%10-20 EVAR sonrası)
- IA Hipertansiyon
- RF: Endoklemp, masif transfüzyon, koagülopati
- BT: ön arka /trv çap >0.8, duvarlarda ödem, IVC kollaps
- AKS + %67, AKS - %10 mortalite

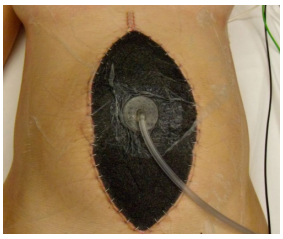
Abdominal kompartman sendromu

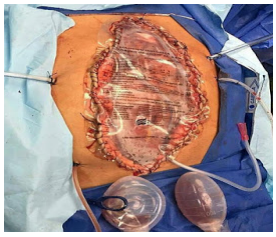
- IAP ölçümü !!!
- Grade I: 10-15 cm H_2O
- Grade II: 15-25 cm H_2O
- Grade III: 25-35 cm H_2O
- Grade IV, greater than 35 cm H_2O
- APP= MAP-IAP (mm Hg)
- **IAP>20, APP<60**, uç organ hasarı
- dekompresif laparotomi

IAP monitörizasyon



Vakum kontrol / Bogota bag





IMPROVE

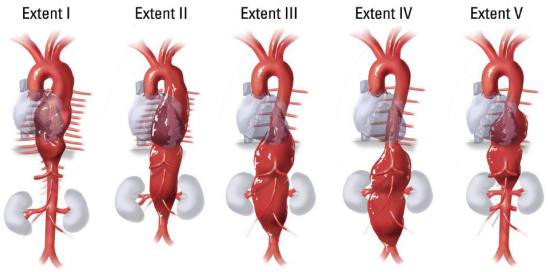
- 2014 BMJ, randomize çok merkezli
- 29 UK+CAN 613 hasta EVAR vs Cer 30 gün
- Hardman index>2, kadın EVAR
- **YB gün** 4.2 vs 6.3
- **Hastane gün** 9.8 vs 12.2
- **Eve taburculuk** %94 vs % 77
- Maliyet EVAR **1186£** daha az
- Mortalite %35.4 vs %37.4 (grup olarak EVAR /cer)
- Mortalite %25 vs %38 (EVAR sonrası/cer sonrası)

Dutch trial

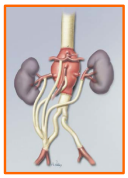
- 2013 Ann Surg randomize, çok merkezli
- 3 merkez
- 116 hasta
- Rupture konfirme olan ve EVAR uygunluğu açısından değerlendirilen hastalar
- Hemodinamik olarak stabil olmayan hastalar çıkarılmış (mortalite bu yüzden düşük)
- %21 vs %25

TAAA

Nörolojik komplikasyonlar, malperfüzyon, endoleak

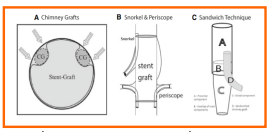


MODİFİYE ENDOVASKÜLER YAKLAŞIMLAR



HİBRİD TEDAVİ

DALLI ENDOGREFT



CHİMNEY /ŞNORKEL – PERİSKOP - SANDVİÇ TEKNİKLERİ

ÇOK KATMANLI STENT

Paralel greftler

Turk Gogus Kalp Dama 2016;24(2):289-296
doi: 10.5606/tgkdc.dergisi.2016.12082

***Original Article** / Özgün Makale*
***Mini Series** / Mini Seri*

Endovascular repair of type-V thoracoabdominal aortic aneurysms using parallel graft techniques

Paralel greft teknikleri kullanılarak tip-V torakoabdominal aort anevrizmalarının endovasküler tamiri

Murat Canyiğit,[1] Emrah Uğuz,[2] Mete Hıdıroğlu,[2] Tülin Gümüş,[3] Muhammet Fethi Sağlam,[2] Hüseyin Çetin,[1] Ali Çam,[1] Erol Şener[2]

Departments of [1]Radiology, [2]Cardiovascular Surgery and [3]Anaesthesiology and Reanimation, Ankara Atatürk Training and Research Hospital, Ankara, Turkey

Dallı greftler

Turk Gogus Kalp Dama 2015;23(3):561-565
doi: 10.5606/tgkdc.dergisi.2015.11301

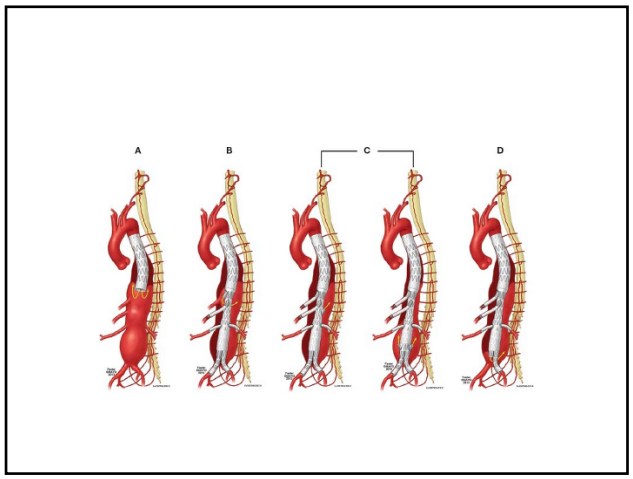
***Olgu Sunumu** / Case Report*

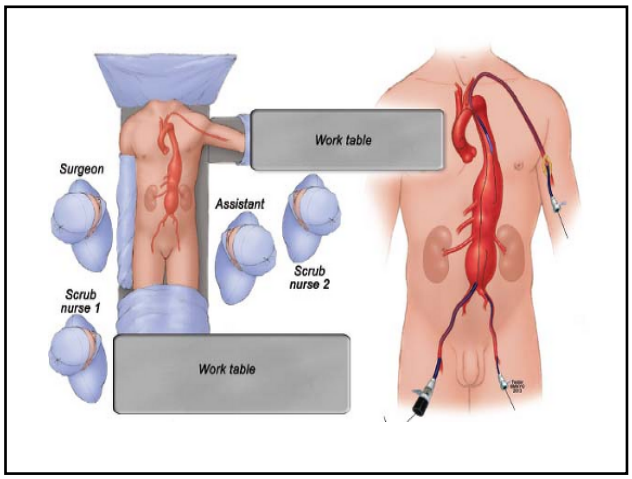
Pararenal aort anevrizmasında çok dallı stent-greft ile endovasküler aortik tamir: Türkiye'deki ilk başarılı deneyim

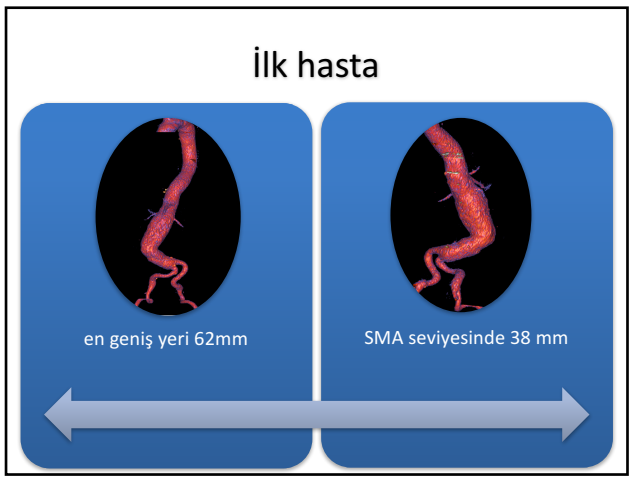
Endovascular aortic repair of pararenal aortic aneurysm with multibranched stent-graft: First successful experience in Turkey

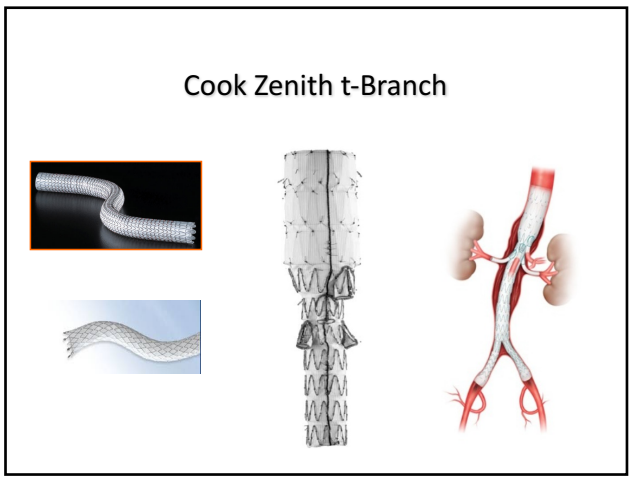
Murat Canyiğit,[1] Emrah Uğuz,[2] Mete Hıdıroğlu,[2] Erol Şener[2]

Atatürk Eğitim ve Araştırma Hastanesi, [1]Radyoloji Kliniği, [2]Kalp ve Damar Cerrahisi Kliniği, Ankara, Türkiye


A
B
C
D


Work table
Surgeon
Assistant
Scrub nurse 2
Scrub nurse 1
Work table


İlk hasta
en geniş yeri 62mm
SMA seviyesinde 38 mm


Cook Zenith t-Branch

Akut aortik sendrom

DIR
Diagn Interv Radiol 2016; 22:365–370
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INTERVENTIONAL RADIOLOGY
ORIGINAL ARTICLE

Treatment of acute thoracic aortic syndromes using endovascular techniques

Emrah Uğuz
Murat Canyiğit
Mete Hıdıroğlu
Erol Şener

PURPOSE
Acute thoracic aortic syndrome (ATAS) is a novel term to define emergency aortic conditions with common clinical features and challenges. Traditional management of ATAS includes surgical replacement of the aorta and is correlated with high perioperative mortality and morbidity. We aimed to evaluate our experience and outcomes in patients presenting with ATAS, managed by endovascular techniques.

METHODS
This cohort consisted of 31 consecutive patients (24 males; mean age, 57.5±13.81 years; range, 19–84 years) with acute thoracic aortic pathologies who underwent endovascular repair between January 2011 and January 2015. The study was designed as a retrospective analysis of prospectively maintained data.

RESULTS
Complicated acute type-B aortic dissection was the most common pathology (35.5%). All aortic stent-grafts (n=37) and dissection stents (n=9) were implanted with 100% procedural success. The overall in-hospital mortality was 9.7%. The mean follow-up duration of patients who were alive at 30 days was 25.9±11.49 months (3–53 months). So far, there have been no late deaths after 30 days.

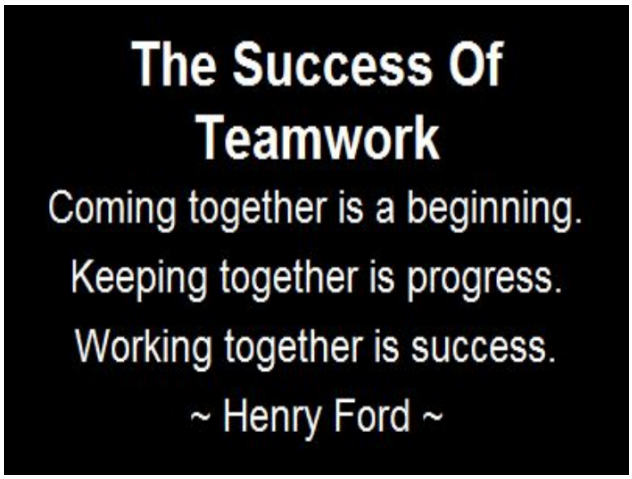
CONCLUSION
In the high-risk setting of ATAS, endovascular procedures come forward as novel therapeutic strategies with promising results. Endovascular repair of ATAS can be considered as a first-line treatment alternative under emergency conditions with encouraging results, particularly when conventional surgical repair cannot be implemented due to prohibitive comorbidities.

Mort 9.7%, hepsi hastane içi, geç dönem ölüm yok

Table 2. Aortic diseases

Aortic pathology	n (%)
Complicated acute type B aortic dissection	11 (35.5)
Symptomatic chronic aortic dissection	3 (9.7)
Symptomatic aortic aneurysm	2 (6.5)
Penetrating aortic ulcer	2 (6.5)
Intramural hematoma	4 (12.9)
Transection	8 (25.8)
Aortic pseudoaneurysm (acute aortic graft occlusion)	1 (3.2)

- **24 saat içinde işlem** 90.3%
- **CSF drenajı** (12 hasta) uzun segment kapama, LSCA kapanması, internal iliak arterlerin kapanması, AAA için EVAR + , 10ml/h,<10-12 mm Hg, SPP>70 mmHg,24-72h
- **LSCA** mutlaka inceleniyor kapanacak mı? **VA dominans?**
- **Diseksiyon stenti** (9hasta)
- **Karotid SCA bypass** 6 hasta
- **Hemotoraks boşaltılması**



Teşekkürler