University Heart Center Hamburg

GERMAN AORTIC CENTER HAMBURG

Do we need Dual antiplatelet after F/BEVAR?

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Conflicts

* No conflict of interest

Questions

- Do you prescribe DAPT or SAPT after f/bEVAR?
- Do you think that the evidence on the antiplatelet therapy after f/bEVAR is enough to support your decision?

Guidelines

CLINICAL PRACTICE GUIDELINE DOCUMENT

Editor's Choice — European Society for Vascular Surgery (ESVS) 2023 Clinical Practice Guidelines on Antithrombotic Therapy for Vascular Diseases

↑ Cardiovascular events after AAA repair
- ✓ 2.5% higher risk for MI
- ✓ 2.9% higher risk for stroke

Aspirin improve long term survival
- ✓ ↓ Cardiovascular events

Recommendation 46			
Patients undergoing endovascular or open abdominal aortic aneurysm repair should be considered for aspirin (75 – 100 mg) following repair to reduce the risk of secondary cardiovascular events.			
Class	**Level**	**References**	**ToE**
IIa	**B**	Wong *et al.* (2022)[35]	

No evidence to suggest superiority or inferiority of any other antithrombotic therapy following AAA repair, including complex procedures

Guidelines

CLINICAL PRACTICE GUIDELINE DOCUMENT

Editor's Choice – European Society for Vascular Surgery (ESVS) 2024 Clinical Practice Guidelines on the Management of Abdominal Aorto-Iliac Artery Aneurysms☆

Recommendation 40 — Changed

Patients undergoing elective open or endovascular abdominal aortic aneurysm rep… of established mono… (e.g., clopidogrel) d…

Class	Leve…
IIa	B

Recommendation 132 — New

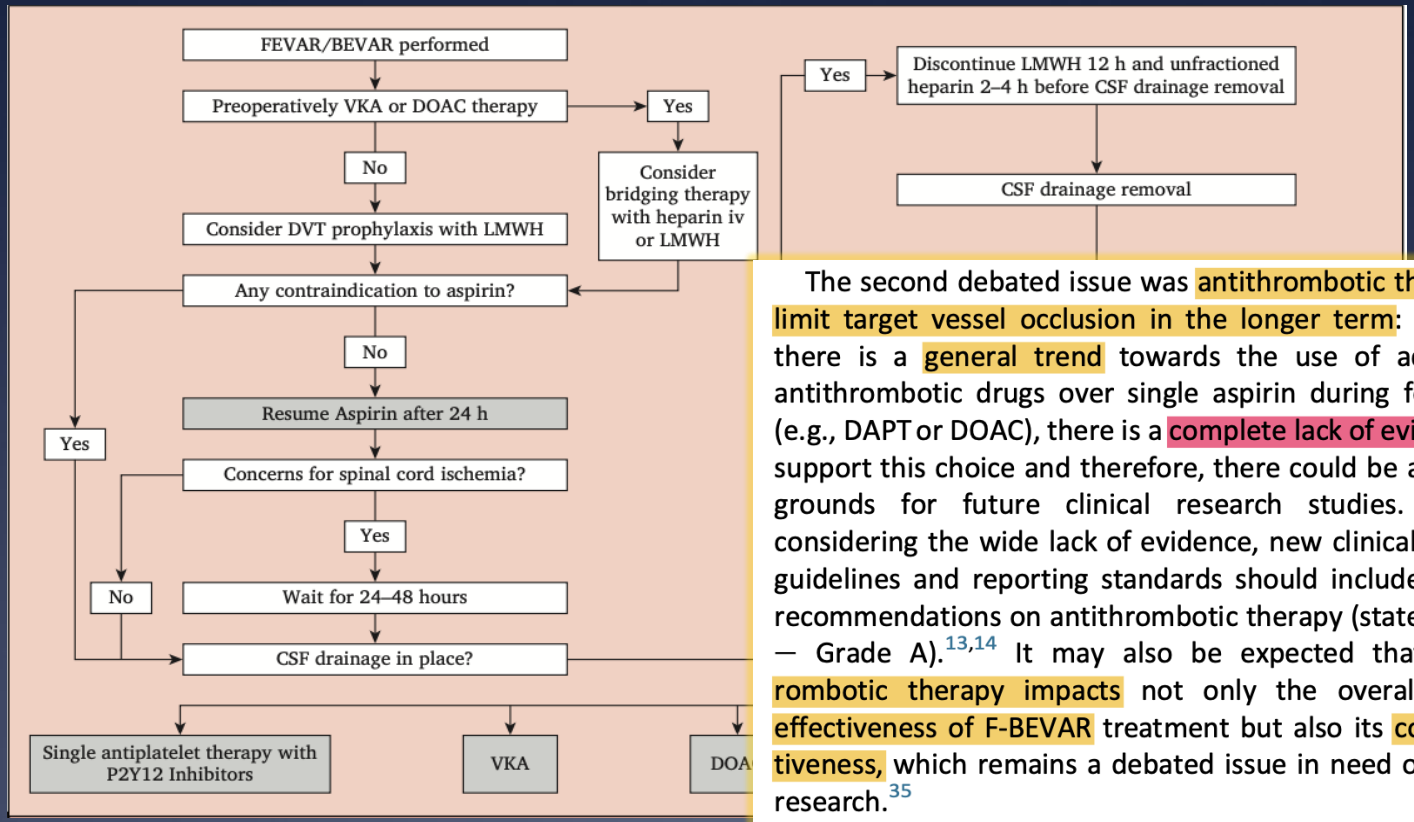
Patients deemed at risk of bridging stent patency failure after endovascular treatment for complex abdominal aortic aneurysm may be considered for dual antiplatelet therapy in the early post-operative period.

Class	Level	References
IIb	C	Consensus

…ew

Class	Level	References
III	C	Consensus

Introduction



The second debated issue was antithrombotic therapy to limit target vessel occlusion in the longer term: although there is a general trend towards the use of adjunctive antithrombotic drugs over single aspirin during follow up (e.g., DAPT or DOAC), there is a complete lack of evidence to support this choice and therefore, there could be attractive grounds for future clinical research studies. Overall, considering the wide lack of evidence, new clinical practice guidelines and reporting standards should include specific recommendations on antithrombotic therapy (statement 44 — Grade A).[13,14] It may also be expected that antithrombotic therapy impacts not only the overall clinical effectiveness of F-BEVAR treatment but also its cost effectiveness, which remains a debated issue in need of further research.[35]

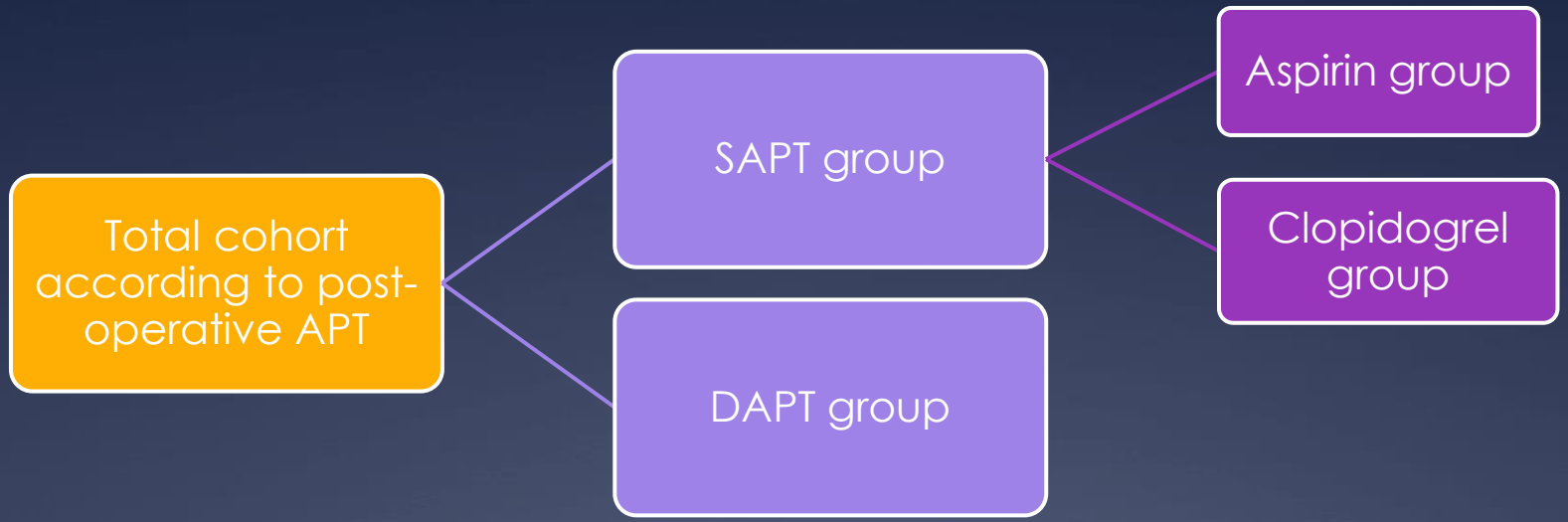
D'Oria M, et al. Editor's Choice - PRINciples of optimal antithrombotiC therapy and coagulation managEment during elective fenestrated and branched EndovaScular aortic repairS (PRINCE²SS): An International Expert Based Delphi Consensus Study. Eur J Vasc Endovasc Surg. 2022.

Methods

- ✓ Multicenter retrospective analysis
- ✓ f/bEVAR (Cook Medical)
- ✓ Non-ruptured aneurysms
- ✓ January 2018 to December 2022

N	Aortic centers	Contribution
1	German Aortic Center, Department of Vascular Medicine, University Heart & Vascular Center, Universitätsklinikum Eppendorf	246
2	Service de Chirurgie Vasculaire, Centre de l'Aorte, Centre Hospitalier Universitaire (CHU) Lille	237
3	Department of Vascular Surgery, Ludwig-Maximillian University Hospital	158
4	Aortic Center, Hôpital Marie Lannelongue, Groupe Hospitalier Paris Saint Joseph, Université Paris Saclay	149
5	Department of Vascular Surgery, University of Bologna, Policlinico Sant' Orsola Malpighi, Istituto di Cura a Carattere Scientifico (IRCCS)	124
6	Vascular Center, Department of Thoracic Surgery and Vascular Diseases, Skåne University Hospital	114
7	Department of Surgery, Division of Vascular Surgery and Surgical Research Laboratories, Medical University of Vienna, Vienna General Hospital	83
8	Section of Vascular Surgery, Department of Surgical Sciences, Uppsala University	62
9	Vascular Surgery Department, University Hospital of Larissa, Faculty of Medicine, University of Thessaly	53
10	Department of Vascular Surgery, School of Cardiovascular Medicine and Sciences, King's College London	45
11	Klinik für Gefäßchirurgie und Endovaskuläre Chirurgie, Universitätsklinikum Heidelberg	44
12	Department of Radiology, Leiden University Medical Center	43
13	Division of Vascular Surgery, Department of Clinical and Experimental Sciences, University of Brescia School of Medicine, ASST Spedali Civili of Brescia	36
14	Department of Vascular Surgery, St. Olav's Hospital, Trondheim University Hospital	26
15	Department of Vascular Surgery, Medical University Innsbruck	10

Methods



Duration of APT for 1-6 months post

Outcomes

Primary outcomes

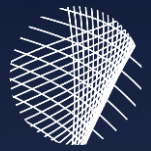
- ✓ 30-day mortality
- ✓ Cardiovascular ischemic events
- ✓ Major ISTH hemorrhagic events

Secondary outcomes

✓Survival

✓TV patency

✓Freedom from endoleak



Patient cohort

1 430 patients

SAPT: 955 vs. DAPT: 475 patients

- ✓ ASA III-IV

  SAPT: 91.6% vs. DAPT: 91.1%, p=.76

Multivariate analysis

Sex (OR 1.5, 95% CI 1.1-2.0, p=.01)

COPD (OR 1.9, 95% CI 1.2-2.4, p<.001)

Variable	SAPT	DAPT	p
Age (years)	72.1±8.3	71.6±7.8	.64
Males	80.1	84.6	.04
Tobacco use	68.6	75.9	.004
Hypertension	87.7	85.9	.32
Dyslipidemia	51.4	68	<.001
CAD	37.7	42.7	.07
MI	15.2	20.2	.03
CABG	9.6	9.6	.99
PCI	17.8	21.3	.14
CHF	11.3	7.6	.03
COPD	23.9	38.0	<.001
CKD	26.0	24.9	.65
Stroke	11.3	11.8	.79
PAD	18.2	18.5	.89
Prior aortic repair	32.7	24.8	.002
TAAA	34.7	39.2	.09
Symptomatic AA	8.0	6.7	.41
BEVAR	57.0	62.9	.03
FEVAR	37.8	31.5	.02

Primary 30-day outcomes

Variable	SAPT (955 patients)	DAPT (475 patients)	p
CV ischemic events	11.9	8.2	.037
Myocardial infarction	1.6	2.1	.47
Ischemic stroke	1.9	0.8	.13
-Major stroke	0.4	0.2	.53
Acute mesenteric ischemia	1.9	0.2	.009
-Need for bowel resection	1.0	0.2	.09
Acute limb ischemia	2.7	0.6	.008
Spinal cord ischemia	5.8	5.5	.83
-Grade 3	1.8	1.3	.46

Multivariate analysis

Patients under DAPT at lower risk for:

Acute mesenteric ischemia (0.25 OR, 0.08-0.83 95% CI, p=.02)

Lower limb ischemia (0.12 OR, 0.02-0.93 95% CI, p=.04)

Primary 30-day outcomes

Variable	SAPT (955 patients)	DAPT (475 patients)	p
ISTH defined major hemorrhagic events	7.5	6.3	.397
Intracranial hemorrhage	0.8	0.2	.16
Gastrointestinal bleeding	0.7	0.4	.48
Retroperitoneal bleeding	1.8	1.1	.29
Access hematoma needing reintervention	2.4	3.6	.21
Access hematoma conservatively treated	6.0	2.2	.003

Endoleak & TV patency at 30 days

No difference for any type of endoleak

SAPT: 37.6% vs. DAPT: 39.1%, p=.61

Type I: SAPT: 4.0% vs. DAPT: 2.9% (p=.12)

Type II: SAPT 25.3% vs. DAPT: 29.2% (p=.17)

Type III: SAPT: 5.6% vs. DAPT: 6.5% (p=.76)

No difference in TV patency
SAPT: 97.2% vs DAPT: 97.2%, p=.94

Aspirin vs. Clopidogrel

Aspirin group (864 cases) vs. Clopidogrel group (91 cases)

30-day main outcomes

- ✓ **Mortality:** Aspirin: 2.0% vs. Clopidogrel: 3.3%, p=.40
- ✓ **CV ischemic events:** Aspirin: 11.8% vs. Clopidogrel; 13.2%, p=.70
- ✓ **ISTH major hemorrhagic events:** Aspirin: 7.5% vs Clopidogrel: 7.7%, p=.95

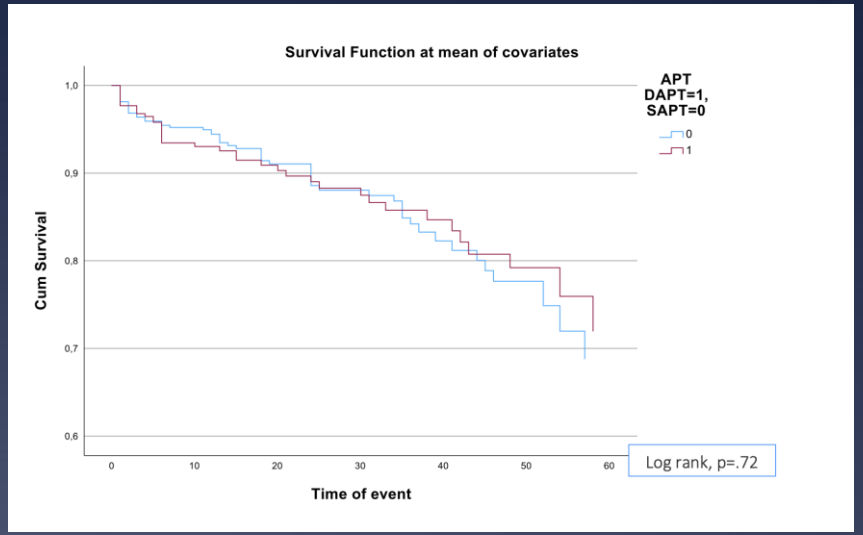
Follow-up outcomes

SAPT: 540 patients vs. DAPT: 391 patients

Follow-up: 21.8±2.9 months

At 36 months of follow-up:

- ✓ Survival (log rank, p=.71)
  - ✓ SAPT: 84.3%, SE 2.1% vs. DAPT: 85.2%, SE 2.6%
- ✓ Freedom from endoleak (log rank, p=.04)
  - ✓ SAPT: 79.4%, SE 2.4% vs DAPT: 73.7%, SE 3.1%



Cox-regression analysis

Sex (HR 1.0, 95% CI 0.66-1.6, p=.91)

COPD (HR 0.9, 95% CI 0.6-1.6, p=.79)

Follow-up outcomes

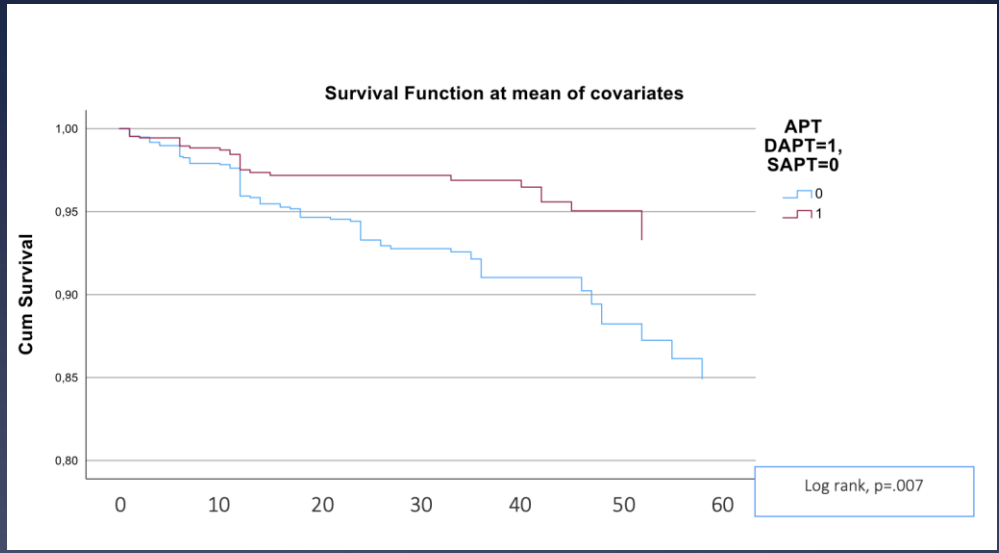
Significant difference at 36 months

Log-rank, p=.007

- **TV patency at 36 months**
  - SAPT: 93.4%, SE 0.7%

vs.

  - DAPT: 96.6%, SE 0.7%



Cox-regression analysis

COPD (HR 1.05, 95% CI 0.69-1.61, p=.79)

Sex (HR 1.1, 95% CI 0.74-1.76, p=.55)

Aortic dissection (HR 1.2, 95% CI 0.78-2.0, p=.36)

TAAA (HR 0.98, 95% CI 0.66-1.5, p=.94)

Follow-up outcomes

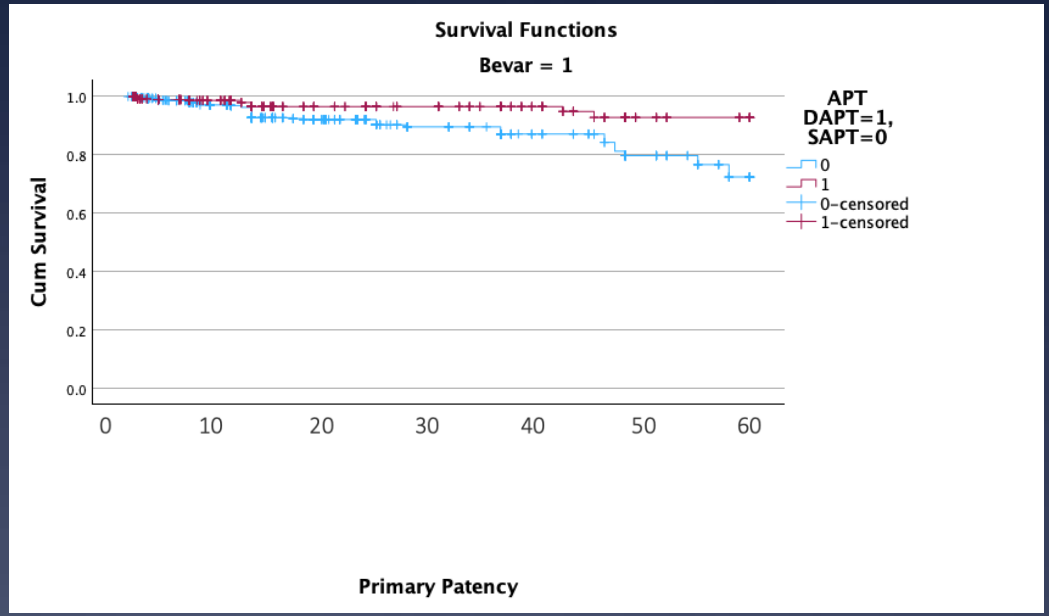
<u>Significant difference at 36 months within BEVAR</u>

Log-rank, p<.001

- **TV patency at 36 months**
  - SAPT: 87.2%, SE 2.1%

  vs.

  - DAPT: 94.9%, SE 1.9%



<u>Cox-regression analysis</u>

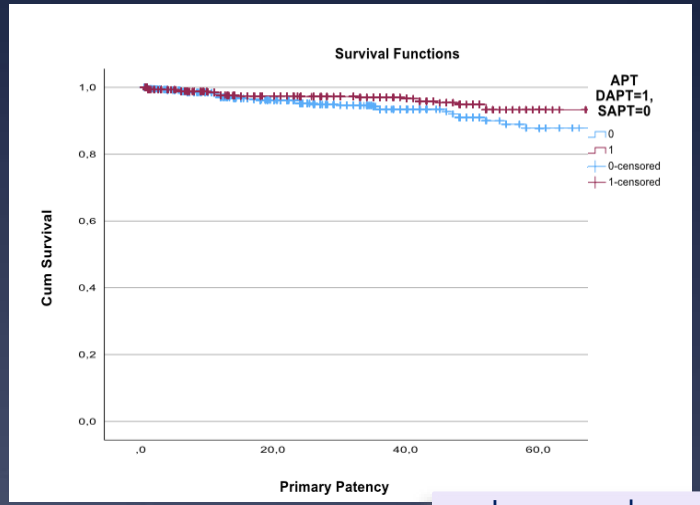
BEVAR predictor for worse TV patency
(BEVAR: HR 2.03, 95% CI 1.36-3.03, p<.001)

3-6 months APT duration

SAPT: 540 patients vs. DAPT: 196 patients

No difference at 36 months

- ✓ Survival (log rank, p=.19)
  - ✓ SAPT: 84.3%, SE 2.3% vs. DAPT: 82.8%, SE 2.9%
- ✓ Freedom from endoleak (log rank, p=.91)
  - ✓ SAPT: 79.6%, SE: 2.4% vs. DAPT: 81.3%, SE: 3.4%



Log rank, p=.005

TV patency at 36 months

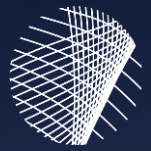
SAPT: 93.4% (SE 0.7%) vs. DAPT: 97.4%, SE 0.7%

Follow-up outcomes overview

12-month outcomes within patients with at least 1 month of SAPT vs. DAPT	SAPT (955 patients)	DAPT (475 patients)	P (log-rank)
Survival	93.2%	92.5%	.72
Freedom from endoleak	88.1%	81.5%	.04
TV patency	97.0%	97.7%	.007
12-month outcomes within patients with 3 to 6 months of SAPT vs. DAPT	**SAPT (540 patients)**	**DAPT (196 patients)**	**P (log-rank)**
Survival	93.2%	94.8%	.19
Freedom from endoleak	88.1%	88.0%	.91
TV patency	97.0%	97.7%	.005

Summary

- DAPT better in terms of cardiovascular ischemic events after F/BEVAR
- Similar major ISTH hemorrhagic event rates
- Patients may benefit from DAPT in terms of TV patency
  - Especially, those treated with BEVAR



Thank you