Bifurcation PCI with a hybrid strategy with drug eluting balloons versus a stepwise provisional two-stent strategy. A randomized controlled single-blinded multicentre trial and registry

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In this study we will compare a hybrid DEB strategy with a conventional bailout 2-stent strategy (TAP/T-stenting or Culotte) in patients with a bifurcation lesion with sub-optimal side-branch result. The primary endpoint will be the composite...

Ethical review	Approved WMO
Status	Recruitment started
Health condition type	Coronary artery disorders
Study type	Interventional research previously applied in human subjects

Summary

ID

NL-OMON56240

Source
ToetsingOnline

Brief title
Hybrid DEB study

Condition

- Coronary artery disorders

Synonym
Bifurcation lesions stenosis in coronary main- and sidebranch

Research involving
Human

Sponsors and support

Primary sponsor: Catharina Ziekenhuis
Source(s) of monetary or material Support: Davinci Medical B.V.

Intervention

- Other intervention

Keyword: Bifurcation lesion, DEB (drug eluting balloon), PCI (percutaneous coronary intervention)

Explanation

N.a.

Outcome measures

Primary outcome

To determine whether a hybrid approach with DEB is non-inferior to a two-stent
strategy with respect to the primary composite end point of all cause death,
periprocedural or spontaneous myocardial infarction, or target vessel
revascularization at the anticipated median follow-up of 2 years, with a
minimal follow-up of 1 year in each subject.

Secondary outcome

Clinical end points (measured at discharge, 12 months and at anticipated median
follow-up of 2 years)
• Procedural success, defined as successful stent delivery with:
o Final Core Lab defined Thrombolysis in Myocardial Infarction (TIMI) flow of
III.
o Angiographic residual diameter stenosis (DS) <=30% after PCI with DES in MV or
SB and <30% after PCI with DEB in the SB.
o Absence of in-hospital major adverse cardiac and cerebrovascular events
(MACCE, consisting of all-cause death, spontaneous myocardial infarction (MI),
target vessel revascularization (TVR), stroke).
• Target vessel failure (TVF, consisting of cardiac death, target vessel
spontaneous MI, and TVR).
• Major adverse cardiac events (MACE, consisting of all-cause death,
spontaneous MI, and repeat revascularization).
• Individual components of MACE and TVF.

Safety endpoints during index hospitalization
• Incidence of periprocedural MI:
o Type 4a (4th universal def).

• Major intraprocedural complications including type C-F dissections,
perforations, slow flow or no reflow(< TIMI III), thrombus and major side
branch occlusion (>2mm).
• Probable and definite stent thrombosis
• Major bleeding BARC type 2-5

Procedural and economical endpoints during index procedure
• Contrast volume
• Radiation exposure
• Procedural time (time from first to last procedural angiography image)
• Total costs per patient stratified to treatment group
• Cost-effectiveness analysis

Optional Intracoronary imaging endpoints (OCT) and Intravascular Ultrasound
(IVUS) if available
• Percentage of stent expansion in proximal and distal Main Branch (MB) and
Side-Branch (SB)
• Final minimal lumen and stent area (MLA/MSA) post stenting in the proximal
and distal MB and SB
• Incidence and quantification of dissections in the proximal and distal MB and
SB

Angiographic endpoints (Core Lab Assessed):
Pre-procedural assesment
• MB and SB Lesion length, diameter percentage of stenosis (DS), reference
vessel diameter
• moderate to severe coronary calcium
• Bifurcation angle
• Trombus
Final assesment post-stenting after final balloon dilatation
• Final in-stent and in-segment DS residual stenosis post-stenting in the MB
and SB
• Final in-stent and in-segment minimal lumen diameter (MLD) in the MB and SB
• Final in-stent and in-segment acute gain in the MB and SB</p>

Study description

Background summary

The optimal treatment of coronary bifurcation lesions is complex and remains subject of current research. There is ongoing debate about the optimal strategy for complex bifurcations with upfront two-stent strategy (Double kiss double crush technique) or provisional one-stent strategy with bailout stenting (TAP/T-stenting or Culotte) of the side-branch.(1-5) Current guidelines

generally advise provisional approach with optional upfront two-stent strategy in highly complex bifurcations.(6-7) However, a two-stent strategy carries technical difficulties and is associated with increased procedure duration and costs.

Beside improvement of techniques, outcome of bifurcation lesions have been significantly improved due to the introduction of drug-eluting stents (DES). DES have dramatically reduced the incidence of restenosis, in particular in complex lesions and small vessel diameters. After the revolution of drug-eluting stents, an emerging device that can optimize outcome in bifurcation lesions are drug-eluting balloons (DEB).(10) DEB are conventional semi-compliant angioplasty balloons covered with an anti-proliferative drug, which is released into the vessel wall during inflation of the balloon. These DEB have been widely tested for treating neo-intima proliferation after stent implantation (in stent restenosis) or de novo lesions.(10-11) Several pilot studies have also successfully investigated a hybrid approach with use of drug-eluting balloons in addition to the provisional one-stent strategy.(8-9) This hybrid approach has shown to be safe and feasible, however no large trials have been performed comparing this with current 2-stent bifurcation strategies.

Study objective

In this study we will compare a hybrid DEB strategy with a conventional bailout 2-stent strategy (TAP/T-stenting or Culotte) in patients with a bifurcation lesion with sub-optimal side-branch result. The primary endpoint will be the composite endpoint of death, reinfarction, or target vessel revascularization after two year follow-up. If the Hybrid PCI technique leads to a non-inferior outcome of the primary endpoint as compared with the conventional two-stent strategy, it will lend support to the use of this treatment strategy as part of the standard approach in patients with bifurcation lesions. This wil lead to shorter procedure time and thereby less exposure to radiation and contrast and lower costs. Also there is less chance of in stent thrombosis and restenosis.

Study design

Investigator initiated, randomized controlled, single blinded, multicenter study

Intervention

Patients in the hybride DEB group will get treatment with DEB in the side branch. Patients in de two-stent group will get a second stent (DES) in the side branch.

Study burden and risks

There is a risk of complications related to coronary angiography, regardless of the treatment (DEB or two-stent). Possible risk associated with DEB are linked to the use of the balloon catheter during the procedure:
• Coronary spasm
• Coronary dissection or perforation
• (distal) thrombo-embolism
• Restenosis or the side branch

These risks are low and can also happen if a patients is not participating in this studie.
There is also the risk of the Hybrid DEB technique being inferior to the two-stent strategy, with a higher risk of restenosis. On the other hand there is one stent less implanted in the Hybrid DEB group, so lower change of in-stent thrombosis.

Contacts

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Trial sites

Trial sites in the Netherlands

Medisch Centrum Leeuwarden (MCL)
Target size: 40

OLVG
Target size: 45

Meander Medisch Centrum

Target size: 40

Catharina-ziekenhuis
Target size: 200

Rijnstate
Target size: 40

Jeroen Bosch Ziekenhuis
Target size: 30

St. Antonius Ziekenhuis
Target size: 40

Elisabeth-Tweesteden ziekenhuis
Target size: 35

VieCuri Medisch Centrum
Target size: 40

Haaglanden Medisch Centrum (HMC)
Target size: 30

Maasstad Ziekenhuis
Target size: 80

Albert Schweitzer Ziekenhuis
Target size: 40

HagaZiekenhuis
Target size: 40

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

- > 18 years
- Significant de novo bifurcation lesion (main branch and side branch at least 2.5mm, one or more lesions >= 70% stenosis, side branch lesion >= 50% stenosis or in case of intermediate stenosis FFR <= 0.80, iFR <=0.89)
- Stable coronary artery disease or stabilized acute coronary syndrome
- Patient is an acceptable candidate for treatment with a drug eluting stent

- Patient is willing and able to cooperate with study procedures and required follow up visits
- Patient or legal representative had been informed of the nature of the studie and agrees to its provisions and has provided an EC approved written informed consent including data privacy authorization.

Exclusion criteria

- < 18 years
- Unstable clinical condition and/or need for emergency revascularization, including cardiogenic shock
- Previous PCI with stent implantation in the target lesions
- Known comorbidity with a life expectation of <2 year
- Active bleeding requiring medical attentions
- Pregnancy
- Unable to provide consent for any other reason
- Participation in another stent or drug trial
- Known hypersensitivity or allergy for asprin, clopidogrel, ticagrelor, prasugrel, cobalt, chromium, sirolimus, to excipients with phospholid or related orgnis

Study design

Design

Study phase:	N/A
Study type:	Interventional research previously applied in human subjects
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)
Control:	Other type of control
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment started
Start date (anticipated):	21-03-2023
Enrollment:	700

Duration:	24 months (per patient)
Type:	Actual

Medical products/devices used

Product type:	N.a.

IPD sharing statement

Plan to share IPD: Undecided

Plan description
N.a.

Ethics review

Approved WMO Date:	20-01-2023
Application type:	First submission
Review commission:	MEC-U: Medical Research Ethics Committees United (Nieuwegein)
Approved WMO Date:	02-06-2023
Application type:	Amendment
Review commission:	MEC-U: Medical Research Ethics Committees United (Nieuwegein)
Approved WMO Date:	27-07-2023
Application type:	Amendment
Review commission:	MEC-U: Medical Research Ethics Committees United (Nieuwegein)
Approved WMO Date:	07-12-2023
Application type:	Amendment
Review commission:	MEC-U: Medical Research Ethics Committees United (Nieuwegein)
Approved WMO Date:	14-05-2024
Application type:	Amendment
Review commission:	MEC-U: Medical Research Ethics Committees United

	(Nieuwegein)
Approved WMO Date:	20-02-2025
Application type:	Amendment
Review commission:	MEC-U
Approved WMO Date:	24-04-2025
Application type:	Amendment
Review commission:	MEC-U

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
ClinicalTrials.gov	NCT05731687
CCMO	NL82146.100.22
Research portal	NL-004954