Angiographic results of the cobalt chromium Vision and Mini-Vision stents

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BACKGROUND: Drug-eluting stents (DES) have been shown to reduce repeat revascularizations compared with their bare-metal stent (BMS) platforms. Modern BMS may be associated with better angiographic results compared with the older BMS platforms. In the Basel Stent Kosten Effektivitäts Trial (BASKET), target vessel revascularization after six months was nonsignificantly different between DES and BMS with clinical follow-up.

OBJECTIVES: To evaluate angiographic results of the cobalt chromium Vision and Mini-Vision stents (Abbott Vascular, USA).

METHODS: A total of 247 consecutive patients with 293 *de novo* lesions in native coronary arteries were treated with cobalt chromium Vision (n=184; stent diameter 2.75 mm to 4.0 mm) or Mini-Vision stents (n=109; stent diameter 2.0 mm to 2.5 mm), and scheduled for six months of angiographic follow-up. The primary end point was in-stent late loss after six months.

RESULTS: Acute coronary syndromes were present in 83.4% (n=206) of patients. The preinterventional reference diameter of Vision stents was 2.70 ± 0.34 mm and for Mini-Vision stents, it was 2.13 ± 0.27 mm ($P < 0.001$). Clinical and angiographic follow-up was 98.0% and 51.2%, respectively. In the Vision group, in-stent late loss was 0.64 ± 0.67 mm and the binary restenosis rate was 17.9%. In the Mini-Vision group, in-stent late loss was 0.82 ± 0.71 mm and the restenosis rate was 45.4%. No difference in occurrence of restenosis within the segments proximal or distal to the stent was observed. The restenotic pattern was predominantly focal with a short length of 7.9 ± 4.4 mm.

CONCLUSIONS: The use of the cobalt chromium Vision stent for the treatment of *de novo* lesions was associated with a low late loss and binary angiographic restenosis rate.

Key Words: Cobalt chromium; Late loss; Restenosis; Stents

Drug-eluting stents (DES) reduce the need for target lesion revascularization (TLR) compared with bare-metal stents (BMS) (1-3). Pivotal randomized trials that included routine angiographic follow-up demonstrated an advantage for DES. In patients undergoing angiographic follow-up, TLR rates are higher than in patients undergoing clinical follow-up (3,4). Although the Taxus (Boston Scientific Corporation, USA) stent was associated with a reduced rate of target vessel revascularization (TVR) in the subset of patients who underwent clinical follow-up compared with the BMS group (4), this did not occur with the Endeavor (Medtronic Inc, USA) stent (3). This can be explained by the higher late loss of the Endeavor compared with the Taxus stent.

BMS, such as cobalt chromium stents, may be superior to the older stent types used in the Taxus-IV (Express; Boston Scientific) (1), SIRIUS (Bx VELOCITY; Cordis Corporation, USA) (2) or Endeavor II (Driver; Medtronic Inc) (3) trials, reducing the shown advantage of first-generation DES. The Vision and Mini-Vision stents (Abbott Vascular, USA) are cobalt chromium stents with thin struts. In the Distinctly Assess Vision in Coronary Intervention (DaVinci) registry (5), 1186 patients were treated with Vision stents and clinically followed for nine months. The rate of target vessel failure, including death, myocardial infarction and TVR, was 9.2%. The Basel Stent Kosten

Les résultats angiographiques des endoprothèses de cobalt-chrome Vision et Mini-Vision

HISTORIQUE : Il est démontré que les endoprothèses à élution de médicament (EÉM) réduisent les revascularisations répétées par rapport aux endoprothèses à métal nu (EMN). Les EMN modernes peuvent s'associer à de meilleurs résultats angiographiques que les anciennes. Dans l'essai Basel Stent Kosten Effektivitäts (BASKET), la différence de revascularisation des vaisseaux cibles n'était pas significative entre les EÉM et les EMN au bout d'un suivi clinique de six mois.

OBJECTIFS : Évaluer les résultats angiographiques des endoprothèses de cobalt-chrome Vision et Mini-Vision (Abbott Vascular, États-Unis).

MÉTHODOLOGIE : Au total, 247 patients consécutifs ayant 293 lésions *de novo* dans des artères coronaires natives étaient traités au moyen d'endoprothèses de cobalt-chrome Vision (n=184; diamètre de l'endoprothèse : 2,75 mm à 4,0 mm) et Mini-Vision (n=109; diamètre de l'endoprothèse : 2,0 mm à 2,5 mm) et devaient profiter d'un suivi angiographique de six mois. Le point d'aboutissement primaire était une perte tardive de l'endoprothèse au bout de six mois.

RÉSULTATS : On remarquait des syndromes coronariens aigus chez 83,4 % (n=206) des patients. Le diamètre de référence préinterventionnel des endoprothèses Vision était de $2,70 \pm 0,34$ mm et des endoprothèses Mini-Vision, de $2,13 \pm 0,27$ mm ($P < 0,001$). Le suivi clinique et angiographique était de 98,0 % et de 51,2 %, respectivement. Au sein du groupe Vision, la perte tardive de l'endoprothèse était de $0,64 \pm 0,67$ mm et le taux de resténose binaire, de 17,9 %. Dans le groupe Mini-Vision, la perte tardive de l'endoprothèse était de $0,82 \pm 0,71$ mm et le taux de resténose binaire, de 45,4 %. On n'a observé aucune différence des occurrences de resténose dans les segments proximaux ou distaux de l'endoprothèse. Le motif de resténose était surtout focal, d'une courte longueur de $7,9 \pm 4,4$ mm.

CONCLUSIONS : L'utilisation d'endoprothèses de cobalt-chrome Vision pour le traitement de lésions *de novo* s'associait à un taux peu élevé de perte tardive et de resténose angiographique binaire.

Effektivitäts Trial (BASKET) (6) compared two DES (Taxus and Cypher [Cordis Corporation]) with a BMS. After six months, there was a statistically nonsignificant 3.2% absolute difference in clinically driven TVR between the DES and BMS group. The cobalt chromium Vision stent was used exclusively for the BMS group, providing good clinical results. Nevertheless, there is a lack of data on angiographic outcome of the Vision and Mini-Vision stents. Therefore, the objective of the present trial was to evaluate angiographic results of the cobalt chromium Vision and Mini-Vision stents.

METHODS

Study design

Consecutive patients with *de novo* lesions in native coronary arteries were treated with cobalt chromium Vision or Mini-Vision stents. Exclusion criteria comprised chronic total occlusion, saphenous vein graft, in-stent restenosis, left main stenosis and bifurcation lesion requiring stenting of the side and main branches. Furthermore, patients with contraindications to acetylsalicylic acid, clopidogrel or heparin were not included. After six months, angiographic and clinical follow-up was scheduled. The primary angiographic end point was in-stent late loss. The secondary angiographic end point was the in-segment late loss including the 5 mm segments proximal and distal to the stent. The

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Figure 1 Design of the cobalt chromium Vision (Abbott Vascular, USA) stent. Reproduced with permission from Abbott Vascular Deutschland GmbH. This illustration is an artwork. Copyright 2009 Abbott Laboratories. All rights reserved

secondary clinical end point was the incidence of TLR. The study received ethical approval and patients gave their written informed consent. Patients with hypertension were on antihypertensive drug treatment due to established arterial hypertension or, in cases of newly diagnosed arterial hypertension, had resting blood pressures higher than 140/90 mmHg. Patients with hyperlipidemia were on lipid-lowering drug therapy due to confirmed elevated lipid levels or a low-density lipoprotein cholesterol level that was higher than 2.5 mmol/L. Patients with diabetes were on antidiabetic drug therapy due to established diabetes mellitus; otherwise, diabetes mellitus was diagnosed if the fasting glucose level was higher than 7.0 mmol/L in two different samples. Patients with a history of smoking had smoked every week for at least one year at any time.

Percutaneous coronary intervention

Unfractionated heparin was administered to achieve an activated clotting time of longer than 250 s. The use of glycoprotein IIb/IIIa inhibitors was at the operator's discretion. A combined antiplatelet therapy consisting of 100 mg of acetylsalicylic acid and 75 mg of clopidogrel was prescribed daily for 12 months in patients with acute coronary syndromes, and for one month in all other patients. For stenting, the Vision and Mini-Vision stents were used. This L605 cobalt chromium stent has a strut thickness of 81 µm, consisting of a corrugated ring (Figure 1). Diameters of the Vision stents were 2.75 mm, 3.0 mm, 3.5 mm and 4.0 mm. Diameters of the Mini-Vision stents were 2.0 mm, 2.25 mm and 2.5 mm. Stents were available in 8 mm, 12 mm, 15 mm, 18 mm, 23 mm and 28 mm lengths. The Mini-Vision as well as the 2.75 mm and 3.0 mm Vision stents are identical, with a six-crown design. The strut width ranges from 76 µm for the link, 91 µm for the strut arm to 102 µm for the proximal ring. The 3.5 mm and 4.0 mm Vision stents consist of nine crowns with a strut width ranging from 76 µm for the link, 81 µm for the strut arm to 102 µm for the proximal ring. Stent size was chosen by visual estimation of the operator.

Quantitative coronary angiography

Coronary angiography of the culprit lesion before and after angioplasty and at follow-up was performed in the same projections after intra-coronary application of glycerol trinitrate. Angiographic measurements were performed with the CAAS QCA for Research 2.0 software (Pie Medical Imaging, The Netherlands). Quantitative coronary measurements were performed in the same two orthogonal views. Measurements were reported separately within the stent (in-stent segment), within 5 mm proximal to the stent, within 5 mm distal to the stent, and over the total segment. Restenosis was defined as diameter stenosis of more than 50% at follow-up angiography. Acute gain was calculated as the difference in minimal lumen diameter (MLD) before and after the procedure. Late loss was calculated as the difference

TABLE 1
Baseline clinical and angiographic characteristics

Characteristic	Total	Stent		P
		Vision	Mini-Vision	
Patients, n	247	158	89	
Age, years	64.7±11.9	63.8±12.2	66.2±11.2	0.13
Male sex, n (%)	182 (73.7)	118 (74.7)	64 (71.9)	0.63
Hypertension, n (%)	180 (72.9)	109 (69.0)	71 (79.8)	0.09
Hyperlipidemia, n (%)	228 (92.3)	146 (92.4)	82 (92.1)	0.6
History of smoking, n (%)	138 (55.9)	85 (53.8)	53 (59.6)	0.45
Diabetes mellitus, n (%)	68 (27.5)	40 (25.3)	28 (31.5)	0.32
Body mass index, kg/m ²	28.3±4.2	28.6±4.5	27.7±3.6	0.13
Cardiogenic shock, n (%)	19 (7.7)	15 (9.5)	4 (4.5)	0.09
Elective PCI, n (%)	41 (16.6)	24 (15.2)	17 (19.1)	
Acute coronary syndrome, n (%)	206 (83.4)	134 (84.8)	72 (80.9)	0.43
STEMI	103 (50.0)	77 (57.5)	26 (36.1)	
NSTEMI	73 (35.4)	41 (30.6)	32 (44.4)	
Unstable angina	30 (14.6)	16 (11.9)	14 (19.4)	
Number of diseased vessels	2.0±0.8	2.1±0.8	2.0±0.8	0.23

Data presented as mean ± SD unless otherwise specified. Vision and Mini-Vision stents (Abbott Vascular, USA). NSTEMI Non-ST elevation myocardial infarction; PCI Percutaneous coronary intervention; STEMI ST elevation myocardial infarction

between MLD postintervention and MLD at six months. The late loss index was calculated as the ratio of late loss to acute gain. Results for Vision stents and Mini-Vision stents were analyzed separately. The pattern of restenosis was classified according to Mehran et al (7).

Statistical analysis

Continuous variables are presented as mean ± SD. For comparison of continuous variables, the two-tailed *t* test was used. Discrete variables were expressed as counts and percentages compared by χ^2 analysis. Statistical significance was set at the 5% level. Data for the Vision and Mini-Vision stents are presented separately. This differentiation was made to provide angiographic data on the same stent type that the BASKET study (6) previously revealed good clinical results for. Statistics were calculated using Statistica release 6.1 (StatSoft Inc, USA).

RESULTS

Enrollment and baseline characteristics

During a 12-month study period, 247 patients with de novo lesions in native coronary arteries were included. Clinical characteristics, including risk profile, are detailed in Table 1. Acute coronary syndromes (ACS) were present in 206 (83.4%) patients. In the ACS population, ST elevation myocardial infarction (STEMI) was present in 103 (50.0%) patients, non-STEMI in 73 (35.4%) patients and unstable angina in 30 (14.6%) patients. ACS patients treated with Vision stents had significantly more frequent STEMI than patients treated with Mini-Vision stents ($P<0.035$; Table 1).

Procedural data and outcomes

A total of 293 lesions were treated. One hundred eighty-four lesions were treated with Vision and 109 were treated with Mini-Vision stents. Lesion characteristics are detailed in Table 2. Direct stenting was performed in 19 lesions treated with Mini-Vision stents and in 41 lesions treated with Vision stents. Approximately one-third of the lesions were total occlusions due to the high proportion of patients with ACS. The mean length of nonoccluded lesions was 10.2 mm. The mean inflation pressure was 16.4 atm and was significantly higher in lesions treated with Vision than in those treated with Mini-Vision stents. There was no difference in the number of inflations, balloon to artery ratio or postprocedural Thrombolysis In Myocardial Infarction (TIMI) flow (Table 2). The frequency of high-pressure postdilation with a noncompliant balloon was 37.3% in Vision and 41.2% in Mini-Vision stents. After stent implantation, the reference diameter, MLD and acute gain were higher

TABLE 2
Lesion characteristics

	Total (n=293)	Stent		P
		Vision (n=184)	Mini-Vision (n=109)	
Target vessel, n (%)				
LAD	117 (39.9)	66 (35.9)	51 (46.8)	<0.0014
CX	71 (24.2)	38 (20.7)	33 (30.3)	
RCA	105 (35.8)	80 (43.5)	25 (22.9)	
Number of stents	1.3±0.6	1.3±0.6	1.3±0.7	0.78
Minimal lumen diameter, mm	0.49±0.26	0.42±0.40	0.33±0.26	0.036
Stenosis, % of luminal diameter	84.7±13.2	84.8±13.8	84.5±12.1	0.85
Total occlusions, n (%)	94 (32.1)	62 (33.7)	32 (29.4)	0.44
Length of stenosis, mm	10.2±4.8	10.3±4.2	10.2±5.7	0.85
Bivalirudin, n (%)	7 (2.4)	5 (2.7)	2 (1.8)	0.63
TIMI 0 or 1 flow pre-PCI, n (%)	107 (36.5)	72 (39.1)	35 (32.1)	0.08
Number of inflations	2.9±1.9	2.9±2.0	2.9±1.7	0.76
Max inflation pressure, atm	16.4±2.8	16.9±2.7	15.6±2.7	<0.001
Max balloon diameter, mm	2.81±0.41	3.05±0.30	2.40±0.18	<0.001
Balloon to artery ratio	1.14±0.14	1.14±0.12	1.15±0.16	0.71

Data presented as mean ± SD unless otherwise specified. Vision and Mini-Vision stents (Abbott Vascular, USA). Maximum (max) balloon diameter is defined as the nominal diameter of the balloon. CX Circumflex artery; LAD Left anterior descending artery; PCI Percutaneous coronary intervention; RCA Right coronary artery; TIMI Thrombolysis In Myocardial Infarction

TABLE 3
Procedural results

	Total	Stent		P
		Vision	Mini-Vision	
Lesions, n	293	184	109	
TIMI 2 or 3 flow post-PCI, n (%)	292 (99.7)	184 (100)	108 (99.1)	0.23
Reference vessel diameter, mm	2.57±0.43	2.79±0.34	2.20±0.26	<0.001
Minimal luminal diameter, mm				
Total segment	2.17±0.43	2.36±0.38	1.84±0.30	<0.001
In-stent	2.41±0.41	2.61±0.34	2.08±0.27	<0.001
Stenosis, % of luminal diameter				
Total segment	13.4±8.3	12.9±7.8	14.4±9.0	0.14
In-stent	7.5±6.1	7.7±6.2	7.0±6.0	0.34
Acute gain, mm				
Total segment	1.78±0.51	1.94±0.51	1.52±0.39	<0.001
In-stent	2.03±0.49	2.19±0.50	1.75±0.34	<0.001

Data presented as mean ± SD unless otherwise specified. Vision and Mini-Vision stents (Abbott Vascular, USA). PCI Percutaneous coronary intervention; TIMI Thrombolysis In Myocardial Infarction

in the Vision group than in the Mini-Vision population (Table 3). Postprocedural diameter stenosis did not differ between groups.

Angiographic results

Angiographic follow-up with quantitative coronary analysis after a median of 189 days (range 51 to 359 days) was available in 150 lesions (51.2%) (Table 4). Clinical follow-up was obtained in 242 patients (98.0%). In the total study population, quantitative angiographic analysis within the stent revealed a diameter stenosis of 35.9% at follow-up with a late loss of 0.72 mm and a late loss index of 0.38. The late loss proximally and distally to the stent was 0.13 mm and 0.08 mm, respectively. In the total segment, diameter stenosis was 36.3%, with a late loss of 0.55 mm and a late loss index of 0.32 mm. In-stent late loss was higher in the Mini-Vision group (0.82 mm) than in the Vision group (0.64 mm), which was nonsignificantly different (Table 4).

The binary angiographic restenosis rate within the stent was 30.0% for the total study population, 17.9% for lesions treated with Vision

TABLE 4
Angiographic measures at six months

	Total	Stent		P
		Vision	Mini-Vision	
Lesions, n	150	84	66	
Number of stents	1.3±0.6	1.3±0.6	1.3±0.6	0.82
Length of stenosis, mm	10.3±5.7	10.3±4.9	10.2±6.7	0.94
Reference diameter, mm	2.47±0.41	2.71±0.35	2.16±0.27	<0.001
Minimal lumen diameter, mm				
Total segment	1.57±0.78	1.86±0.70	1.21±0.73	<0.001
Proximal segment	2.36±0.62	2.64±0.50	1.98±0.57	<0.001
In-stent segment	1.62±0.81	1.93±0.72	1.24±0.77	<0.001
Distal segment	2.10±0.49	2.31±0.44	1.81±0.40	<0.001
Stenosis, % of luminal diameter				
Total segment	36.3±29.1	29.5±24.9	45.0±31.9	<0.002
Proximal segment	10.7±15.5	8.7±9.2	13.5±20.9	0.069
In-stent segment	35.9±29.4	29.5±24.7	44.2±32.9	<0.003
Distal segment	9.7±11.5	9.4±9.9	10.1±13.5	0.72
Late loss, mm				
Total segment	0.55±0.67	0.47±0.63	0.65±0.71	0.097
Proximal segment	0.13±0.40	0.12±0.36	0.15±0.46	0.67
In-stent segment	0.72±0.69	0.64±0.67	0.82±0.71	0.11
Distal segment	0.08±0.38	0.08±0.39	0.08±0.37	0.99
Late loss index				
Total segment	0.32±0.42	0.23±0.34	0.43±0.48	<0.005
In-stent segment	0.38±0.38	0.29±0.31	0.49±0.42	<0.002

Data presented as mean ± SD unless otherwise specified. Vision and Mini-Vision stents (Abbott Vascular, USA)

TABLE 5
Characteristics of restenoses

	Total	Stent		P
		Vision	Mini-Vision	
Lesions, n	150	84	66	
Binary restenosis rate, n (%)				
Total segment	46 (30.7)	16 (19.1)	30 (45.5)	<0.001
Proximal segment	6 (4.0)	4 (4.8)	2 (3.0)	0.59
In-stent segment	45 (30.0)	15 (17.9)	30 (45.5)	<0.001
Distal segment	2 (1.3)	1 (1.2)	1 (1.5)	0.86
Length of restenotic lesions, mm*	7.9±4.4	7.4±5.3	8.2±3.9	0.58
Restenosis pattern, n (%)				
Focal	32 (69.6)	13 (81.3)	19 (63.3)	
Diffuse	5 (10.9)	1 (6.3)	4 (13.3)	0.61
Proliferative	1 (2.2)	0 (0.0)	1 (3.3)	
Total occlusion	8 (17.4)	2 (12.5)	6 (20.0)	

*Data presented as mean ± SD. Vision and Mini-Vision stents (Abbott Vascular, USA)

stents and 45.5% for stenosis treated with Mini-Vision stents (Table 5). No difference in the occurrence of restenosis within the segment proximal or distal to the stent was observed. The restenosis pattern was predominantly focal, with a short length of less than 10 mm. Repeat revascularizations were performed in 10 of 16 (62.5%) restenotic lesions in the Vision group and in 15 of 30 (50.0%) restenotic lesions in the Mini-Vision group.

Predilation was associated with a statistically nonsignificant higher restenosis rate for lesions treated with Vision (21.9% versus 10%; P=0.24) and Mini-Vision stents (47.3% versus 36.4%; P=0.51). The in-stent binary angiographic restenosis rate was 37.7% (20 of 53) in STEMI lesions and 24.7% (24 of 97) in non-STEMI lesions. Values for the total segment were 37.7% (20 of 53) and 25.8% (25 of 97), respectively. Late loss within the total segment was significantly higher in STEMI than in non-STEMI lesions (Table 6).

TABLE 6
Late loss in ST elevation myocardial infarction (STEMI)
compared with non-STEMI lesions

	Total	STEMI	Non-STEMI	P
Lesions, n	150	53	97	
Late loss, mm, mean $\pm$ SD				
Total segment	0.55 $\pm$ 0.67	0.70 $\pm$ 0.78	0.46 $\pm$ 0.59	0.039
Proximal segment	0.13 $\pm$ 0.40	0.17 $\pm$ 0.48	0.12 $\pm$ 0.36	0.46
In-stent segment	0.72 $\pm$ 0.69	0.86 $\pm$ 0.82	0.65 $\pm$ 0.60	0.08
Distal segment	0.08 $\pm$ 0.38	0.11 $\pm$ 0.45	0.06 $\pm$ 0.34	0.44

Clinical follow-up

Patients who underwent clinical follow-up were significantly older (67.8 $\pm$ 12.2 versus 62.2 $\pm$ 10.6 years; $P < 0.001$) and presented more often with cardiogenic shock (11.2% versus 4.0%; $P = 0.03$) than patients who underwent angiographic follow-up. All other parameters detailed in Tables 1 and 2 were not significantly different between groups. For the total population with clinical or angiographic follow-up ($n = 242$), cardiac mortality was 4.1% ($n = 10$), occurrence of myocardial infarction was 2.5% ($n = 6$) and reintervention in the target vessel remote from the target lesion was 4.9% ($n = 12$).

DISCUSSION

The cobalt chromium Vision stent was associated with good clinical results in the randomized BASKET trial (6). The present study expanded on this knowledge with angiographic data. In the BASKET trial, the TVR rate after six months was 7.8% with the Vision stent, which was an absolute difference of only 3.2% lower compared with the DES group treated with Taxus or Cypher stents. These good clinical data of the cobalt chromium BMS are supported by our angiographic results. The Vision stent was associated with a late loss of only 0.64 mm and a binary restenosis rate of 17.9% after six months.

In Intracoronary stenting and angiographic results: Strut thickness effect on restenosis outcome (ISAR-STEREO) trials 1 and 2, two BMS with different strut thicknesses were compared (8,9). The binary restenosis and TVR rates were significantly lower with the thin strut stent compared with the thick strut stent. Cobalt chromium allows for the construction of thinner struts without reduction in radial force compared with the majority of stainless steel stents. The same strut thickness of a cobalt chromium alloy stent is associated with a higher radial force than a stainless steel stent. Hence, stents consisting of a cobalt chromium alloy offer the advantages of a more flexible stent design because of thinner struts. The thinner struts may translate into a lower binary restenosis rate, leading to a clinical benefit compared with older stainless steel stent platforms.

Our results bolster the current discussion that the advantage of the present Food and Drug Administration (USA)-approved DES has been shown in comparison with old platforms. Indeed, the late loss of the Bx

VELOCITY stent (platform of the Cypher stent) was 1.00 $\pm$ 0.70 mm in SIRIUS (2). For the Express stent (platform of the Taxus-Express stent), late loss was 0.92 $\pm$ 0.58 mm in TAXUS-IV (1) and 0.90 $\pm$ 0.62 mm in TAXUS-V (10). For the Driver stent (platform of the Endeavor stent), late loss was even higher at 1.03 $\pm$ 0.58 mm in ENDEAVOR-II (3). All of these stents were associated with a higher late loss compared with the present analysis of the Vision stent, which showed an in-stent late loss of 0.65 $\pm$ 0.60 mm in non-STEMI lesions. These data support the hypothesis that modern BMS are associated with better angiographic and clinical results than the old DES platforms. In addition, this notion is supported by the results of the BASKET trial (6), with only a small difference in TVR in patients treated with DES compared with the Vision stent with clinical follow-up.

Furthermore, our study provides angiographic results of the Mini-Vision stent, which is available in 2.0 mm, 2.25 mm and 2.5 mm diameters. With a reference diameter of only 2.1 mm, the late loss of 0.82 mm and a binary restenosis rate of 46% were acceptable for a BMS. Nevertheless, especially in small vessels, DES have an advantage of a low late loss to obtain good clinical results. In the Intracoronary Drug-Eluting Stenting to Abrogate Restenosis in Small Arteries (ISAR-SMART 3) study (11), small vessels defined as having a reference diameter smaller than 2.8 mm were studied. In-stent late loss was 0.56 $\pm$ 0.59 mm for the Taxus stent and 0.25 $\pm$ 0.55 mm for the Cypher stent, clearly lower than the 0.82 mm with the Mini-Vision stent. The binary restenosis rate was 14.9% for the Taxus group and 8.0% for the Cypher population. In small vessels, a low late loss is favourable to obtain good results during clinical follow-up. In such lesions, the use of approved DES is preferred.

Limitations

The present study is a consecutive series and not a randomized trial. The limited angiographic follow-up rate may be explained by the patient characteristics, with a large number suffering from acute coronary syndromes including a patient subset with small reference diameters. Nevertheless, a lower angiographic follow-up rate shifts the results to patients with more complaints, possibly being associated with more restenoses. This would lead to a higher rather than a lower late loss, supporting our main study result and interpretation. Nevertheless, the high proportion of STEMI patients in the present study limits generalizability of the data because the restenosis rate and late loss differed between STEMI and non-STEMI lesions.

CONCLUSIONS

The use of the cobalt chromium Vision stent for treatment of de novo lesions was associated with a low late loss and binary angiographic restenosis rate.

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