

Treatment of erectile dysfunction: From pills to balloons and stents

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Disclosure

Speaker name:

Nicolas Diehm

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest



Clinical efficacy of PDE-5-I and Alprostadil



- No or suboptimal response in up to 50% of patients.
- Relevant side effects in up to 25% of patients.
- **If PDE-5-I or intracavernosal prostaglandins don't help, vascular problems are likely.**

Own experiences

Clinical Investigation

JOURNAL OF
ENDOVASCULAR
THERAPY

**Endovascular Therapy for Erectile
Dysfunction—Who Benefits Most? Insights
From a Single-Center Experience**

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- **Interdisciplinary setting** with urologists and internists / cardiologists.
- **All-comers** quality control investigation.
- 50 patients with 82 lesions treated with POBA (15.9%), DCB (26.8%), or DES (54.9%); 4/2016 – 10/2017.
- **Primary safety endpoint** was freedom from (MAE) at 30 days and at 3 months.
- **Primary feasibility endpoint:** incidence of a minimum clinically relevant improvement (MCID) of ≥ 4 in the IIEF-6 score at 12 months.

Clinical characteristics and comorbidities

Patients, n=50	
Age, yrs	59.6 ± 10.3
Smoking	39 (78)
Never	11 (22)
Former	19 (38)
Current	20 (40)
Diabetes mellitus	10 (20)
Hypertension	25 (50)
Hyperlipidemia	18 (36)
Coronary artery disease	11 (22)
Peripheral artery disease	6 (12)
Cerebrovascular disease	0 (0)
Neurological disease	1 (2)
Hypogonadism	3 (6)
History of prostate surgery	3 (6)
Chronic prostatitis	6 (12)
Alcoholism	0 (0)
Drug abuse	0 (0)
History of, or current dialysis	0 (0)
Baseline IIEF-15 score	31.3 ± 12.6
Ability to achieve penetration (Q3)	1.48 ± 1.25
Ability to maintain erection (Q4)	1.20 ± 1.05
Venous leakage	3 (6)
Baseline medication	35 (70)
Phosphodiesterase type 5 inhibitor	34 (68)
Prostaglandin, intracavernosal	5 (10)
Testosterone	1 (2)
Medication with impact on EF	15 (30)
β-Blockers	10 (20)
Psychotropic drugs	4 (8)
Thiazid diuretics	2 (4)

Multiple concomitant factors with impact on erection

EF, erectile function; IIEF-15, 15-Item International Index for Erectile Dysfunction; Q3, IIEF question 3; Q4, IIEF question 4.

^a Values are mean ± SD or n (%).

Procedural characteristics

Target lesion, n=82	
Internal iliac artery	12 (14.6)
Internal pudendal artery	60 (73.1)
Common penile artery	3 (3.7)
Dorsal penile artery	1 (1.2)
Cavernosal artery	5 (6.1)
Inferior gluteal artery	1 (1.2)
Arteries affected	
Left side only	27 (54.0)
Right side only	6 (12.0)
Bilateral	17 (34.0)
Arteries treated	
Left side only	30 (60.0)
Right side only	7 (14.0)
Bilateral	13 (26.0)
Lesion length, mm, n=75	11.9 ± 6.6
Total lesion length, mm	17.6 ± 13.3
RVD, mm, n=75	2.92 ± 1.48
Diameter stenosis, %, n=75	58.0 ± 6.5
MLD, mm, n=75	1.19 ± 0.63
PSV ^a , cm/sec, n=48	20.5 ± 10.9
EDV ^b , cm/sec, n=48	7.9 ± 5.4
Endovascular intervention	
Standard balloon angioplasty	13 (15.9)
Drug-eluting stent	45 (54.9)
Drug-coated balloon	22 (26.8)
No access	2 (2.4)

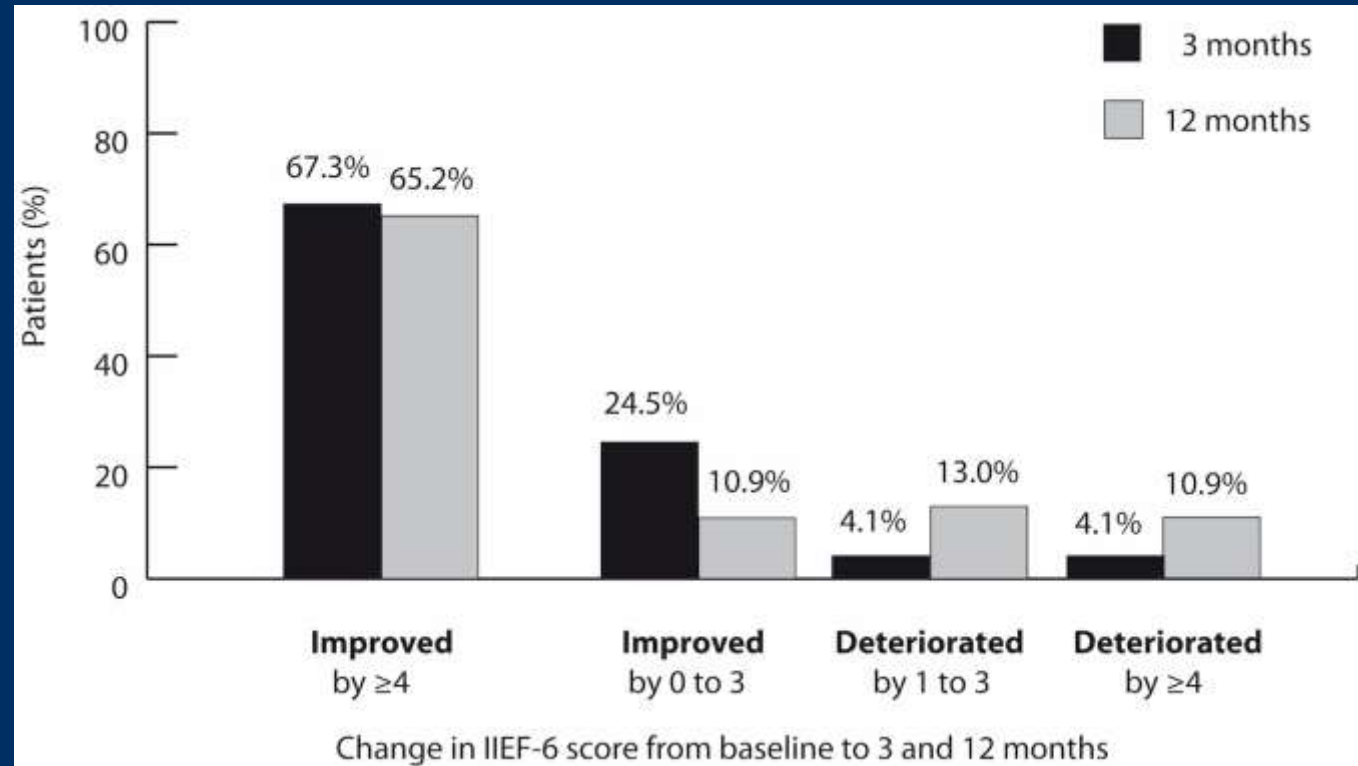
EDV, end diastolic velocity; PSV, peak systolic velocity; RVD, reference vessel diameter.

^aValues are mean ± SD or n (%).

^bPSV and EDV were averaged over right and left cavernosal arteries.

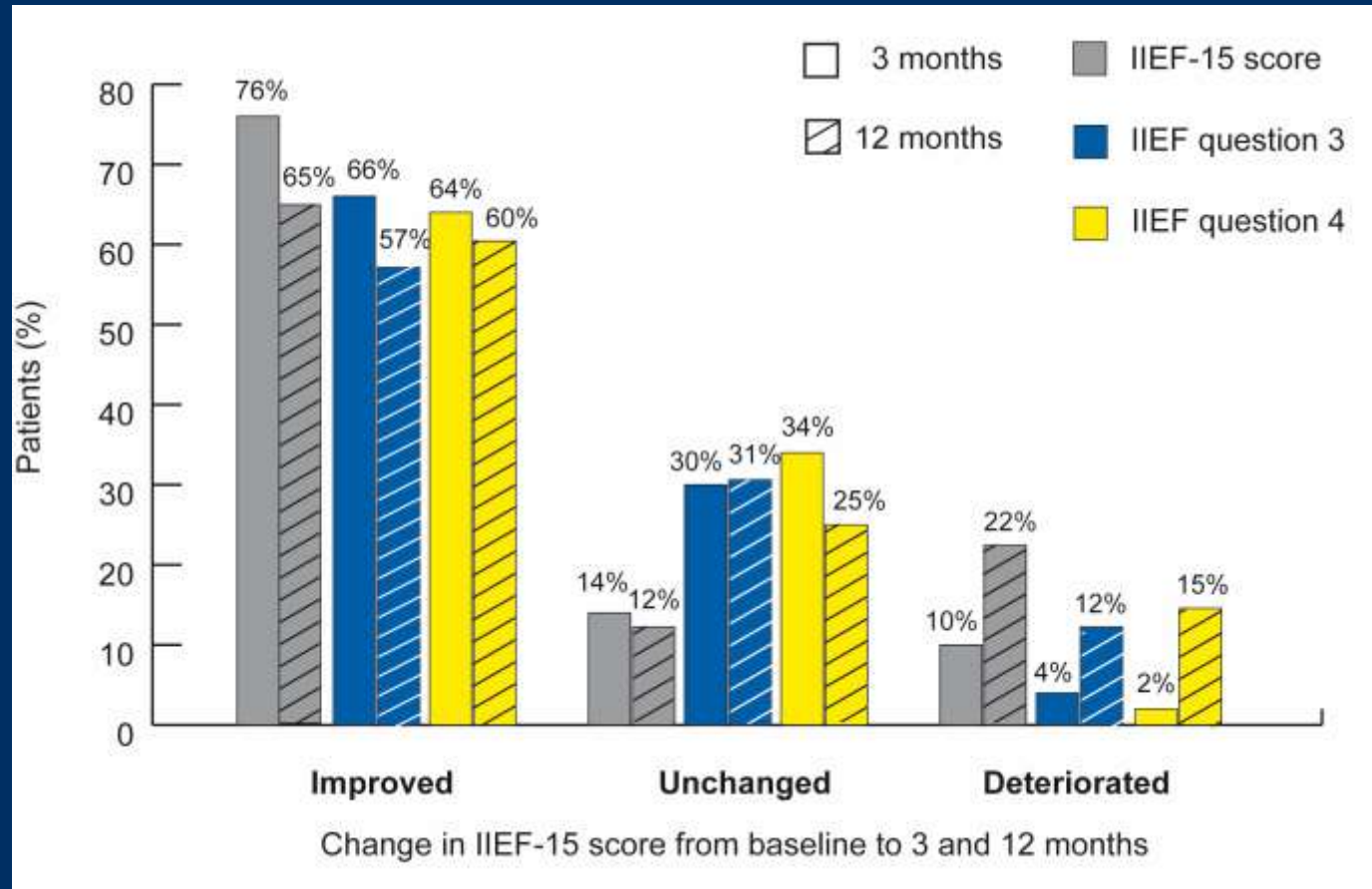
Coronary-type lesions
POBA, DES and DEB approach

Clinical Improvement



Minimal Clinical Improvement
(≥ 4 in the IIEF-6 score at 12 months)

Clinical Improvement



„Viagra Study Endpoints“ NEJM 1998

Restenosis of DES for ED

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ORIGINAL RESEARCH & REVIEWS

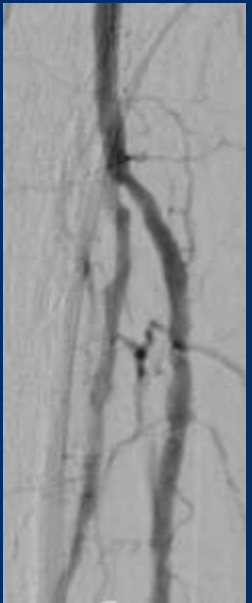
Endovascular Therapy for Arteriogenic Erectile Dysfunction With a Novel Sirolimus-Eluting Stent

Jan Schönhofen, MBBS,¹ Lorenz Räber, MD, PhD,² Jonas Knöchel, MD,¹ Hak Hong Keo, MD, PhD,¹ Christian Regli, MD,¹ Filip Kostal, MD,¹ Martin C. Schumacher, MD,³ Lisa Sammarchi, SN,¹ Markus Bechir, MD,⁴ and Nicolas Diehm, MD¹

- **Re-angiogram in 24 with 52 stented lesions at 9 months.**
- **Binary restenosis: 15.4%.**

PATHOPHYSIOLOGY OF SMALL CALIBER ARTERY RESTENOSIS

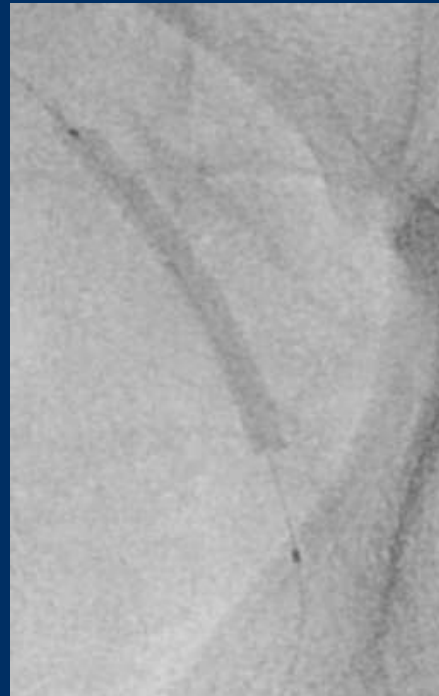
- is currently not fully understood.
- **Coronary trials: early recoil (10 minutes) with MLD reduction of 37.4% after POBA.**
- **BTK trial: early recoil (15 minutes) with MLD reduction of 29% after POBA.**



Recoil of ED-related arteries



Baseline



POBA 3/40

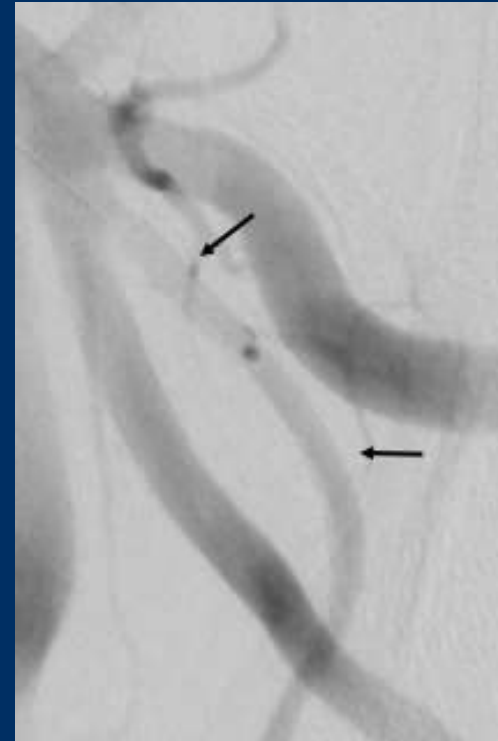


1 min

Recoil of ED-related arteries




10 min



DES

Early Recoil After Balloon Angioplasty of Erection-Related Arteries in Patients With Arteriogenic Erectile Dysfunction

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Nicolas Diehm, MD¹, Dai-Do Do, MD¹, Hak-Hong Keo, MD¹, Jana Boerlin, RN¹,
Christian Regli, MD¹, Martin Schumacher, MD², Pia M. Jungmann, MD³,
Lorenz Raeber, MD⁴, and Frederic Baumann, MD⁵

- 21 consecutive ED patients, 31 arterial lesions (pudendal n=27, penile n=4).
- Mean lesion length: 20.6 ± 13.9 mm
- Elastic recoil with $>10\%$ lumen compromise \rightarrow DEB
- Severe elastic recoil ($>30\%$) \rightarrow DES
- Elastic recoil was observed in all 31 (100%) lesions \rightarrow mean lumen compromise of 21.2%.
- **Severe ($>30\%$) recoil was observed in 14/31 (45%) arteries.**

Conclusions

- Endovascular therapy good treatment option in patients not responding to conservative ED treatment.
- Patients with best responses to revascularization need to be further defined in larger-scale studies.
- Best antirestenotic concept (thin arteries, young patients) needs to be evaluated.

