Biodegradable Polymer Drug-Eluting Stents Versus Durable Polymer Sirolimus-Eluting Stents in Patients Undergoing Percutaneous Coronary Intervention

A Pooled Analysis of Individual Patient Data from ISAR-TEST 3, ISAR-TEST 4, and LEADERS Randomized Trials at 4 Years

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Disclosures

Speaker's name: Dr. Robert A. Byrne

I do not have any potential conflict of interest

Introduction

- The efficacy of durable polymer drug-eluting stents (DES) is delivered at the expense of **delayed healing** of the stented segment and an excess of late stent thrombosis

- **Biodegradable polymer DES** aim to avoid this shortcoming and may potentially improve long-term clinical outcomes, with benefit expected to accrue over time

Introduction

- Detection of differences in the rates of rarely-occurring late adverse events require the **analysis of large patient numbers**

- First results from large-scale clinical trials with biodegradable polymer DES showed a reduction in stent thrombosis at long-term follow-up that was not statistically significant

Byrne et al. ISAR-TEST 4 JACC 2011, Stefanini et al. LEADERS Lancet 2011

Objective

- We sought to compare **long-term clinical outcomes in large numbers of patients** treated with:

biodegradable polymer drug-eluting stents

vs.

durable polymer sirolimus-eluting stents

Methods

- We pooled the 4-year outcome data from the **3 largest randomized clinical trials** comparing biodegradable polymer with durable polymer sirolimus-eluting DES

ISAR-TEST 3	Mehilli et al. EHJ 2008
ISAR-TEST 4	Byrne et al. EHJ 2009
LEADERS	Windecker et al. Lancet 2008

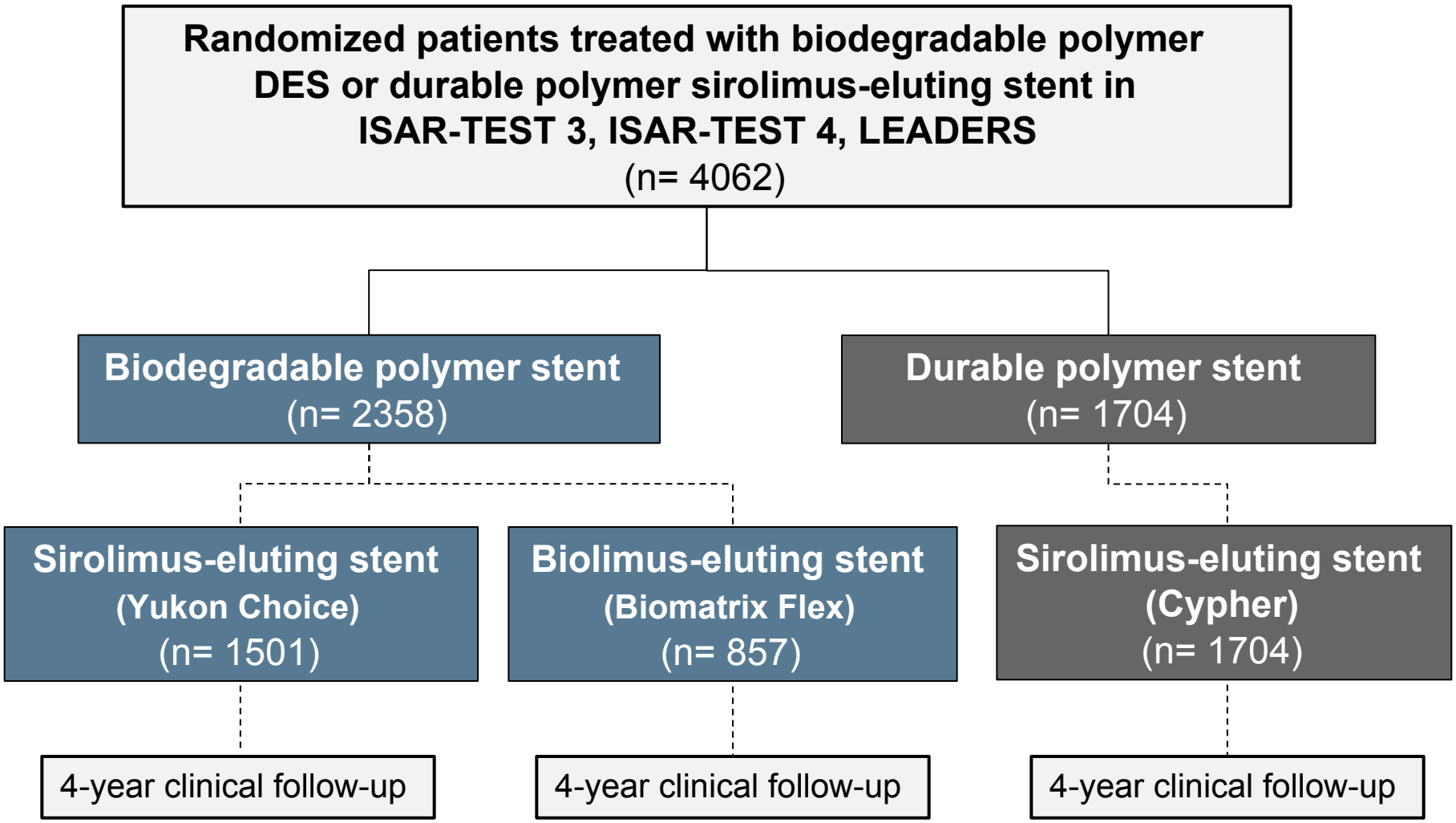
ClinicalTrials.gov: identifiers NCT0059867, NCT00389220, NCT00350454

Methods

Primary Safety Endpoint	**definite stent thrombosis**
Primary Efficacy Endpoint	clinically-indicated **target lesion revascularization**
Statistical methodology	random effects **individual patient data meta-analysis**

- Investigator-initiated, industry-independent

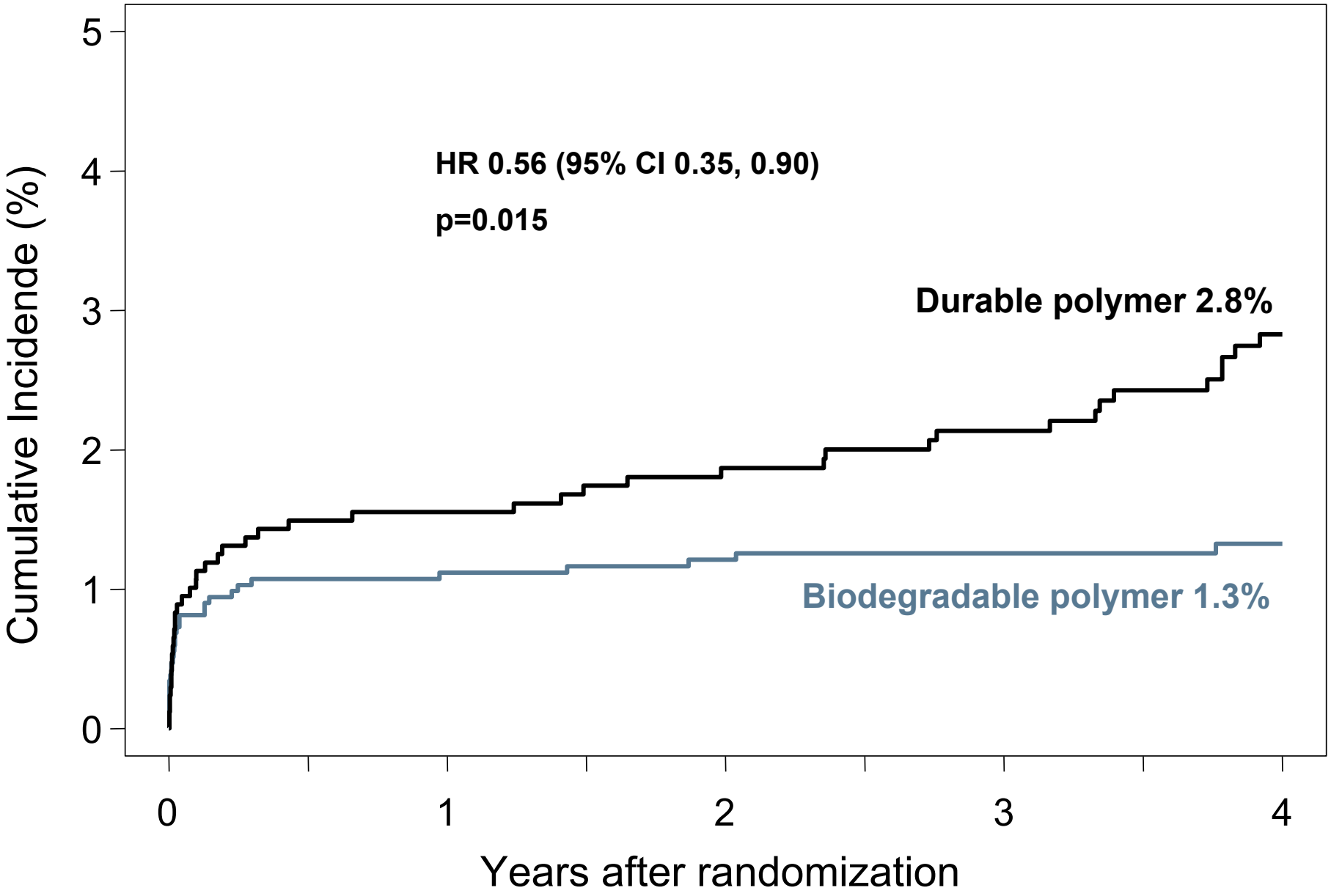
Study Flow


Randomized patients treated with biodegradable polymer DES or durable polymer sirolimus-eluting stent in ISAR-TEST 3, ISAR-TEST 4, LEADERS
(n= 4062)
Biodegradable polymer stent
(n= 2358)
Durable polymer stent
(n= 1704)
Sirolimus-eluting stent
(Yukon Choice)
(n= 1501)
Biolimus-eluting stent
(Biomatrix Flex)
(n= 857)
Sirolimus-eluting stent
(Cypher)
(n= 1704)
4-year clinical follow-up
4-year clinical follow-up
4-year clinical follow-up

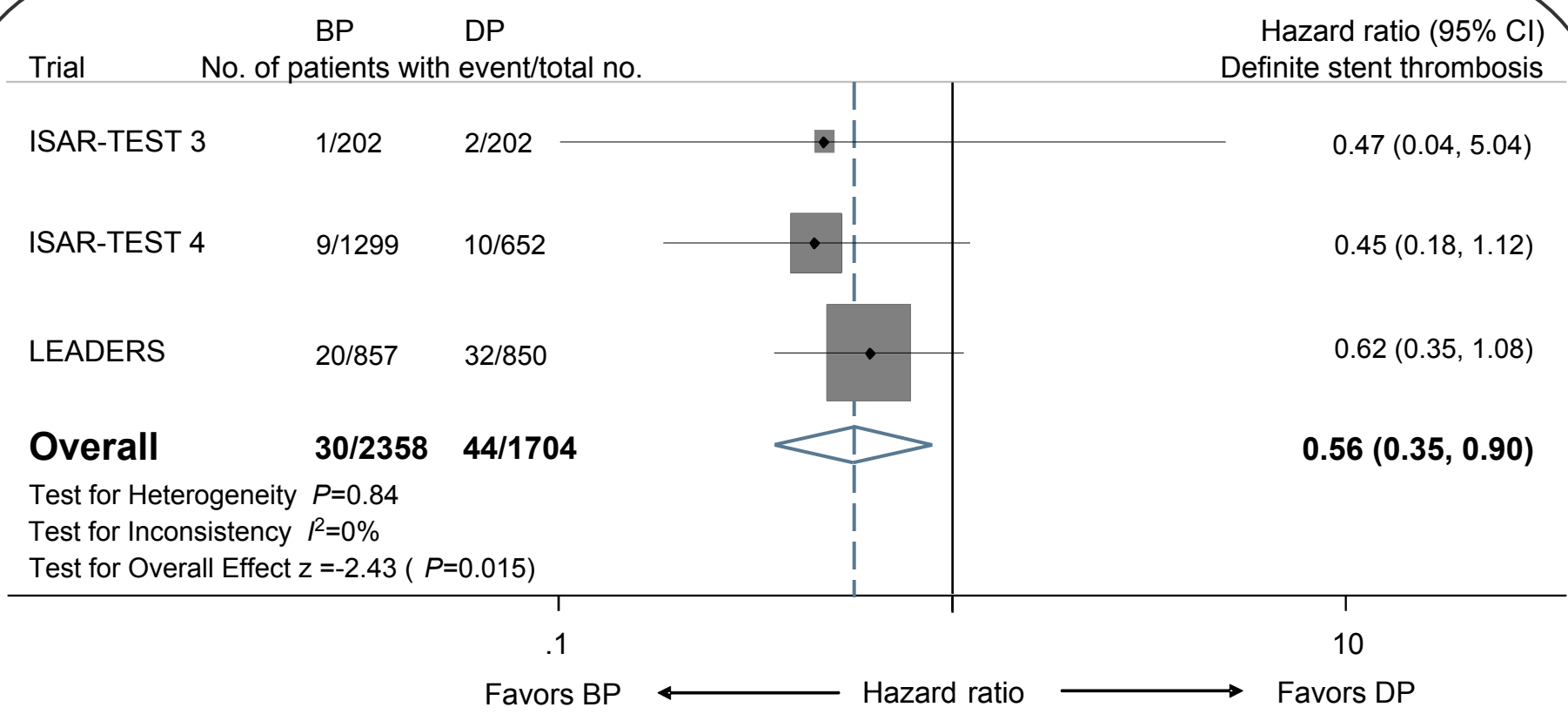
Trial Characteristics

Trials	ISAR-TEST 3	ISAR-TEST 4	LEADERS
Patients	605	2603	1707
Mean age	66.1 yrs	66.8 yrs	64.6 yrs
Diabetes	27%	29%	24%
Exclusion	LMS/Bypass/ Restenosis	LMS/Bypass/ Restenosis	None
Lesion/patients	1.2	1.3	1.5
Follow-Up	4 years	4 years	4 years

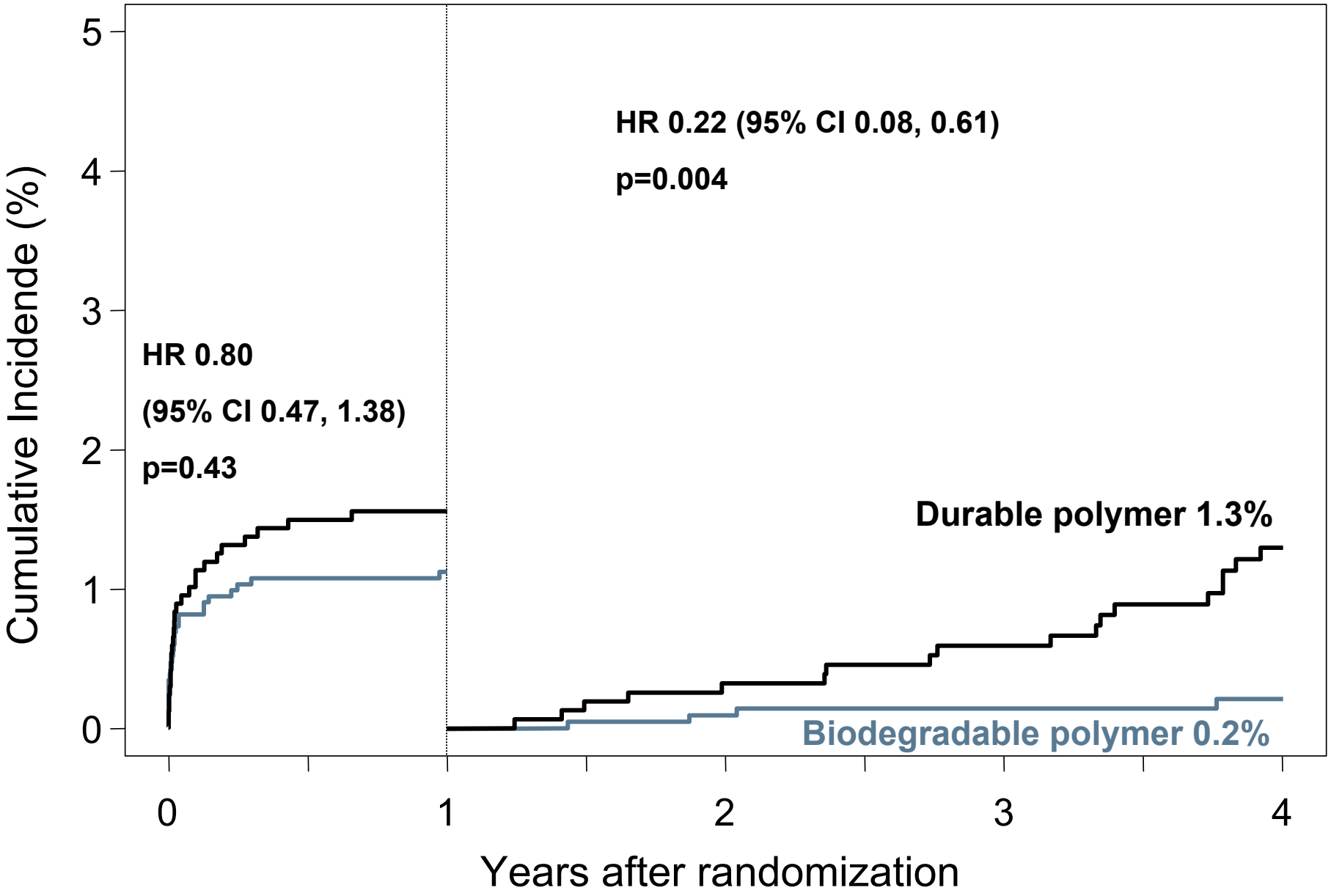
Definite Stent Thrombosis



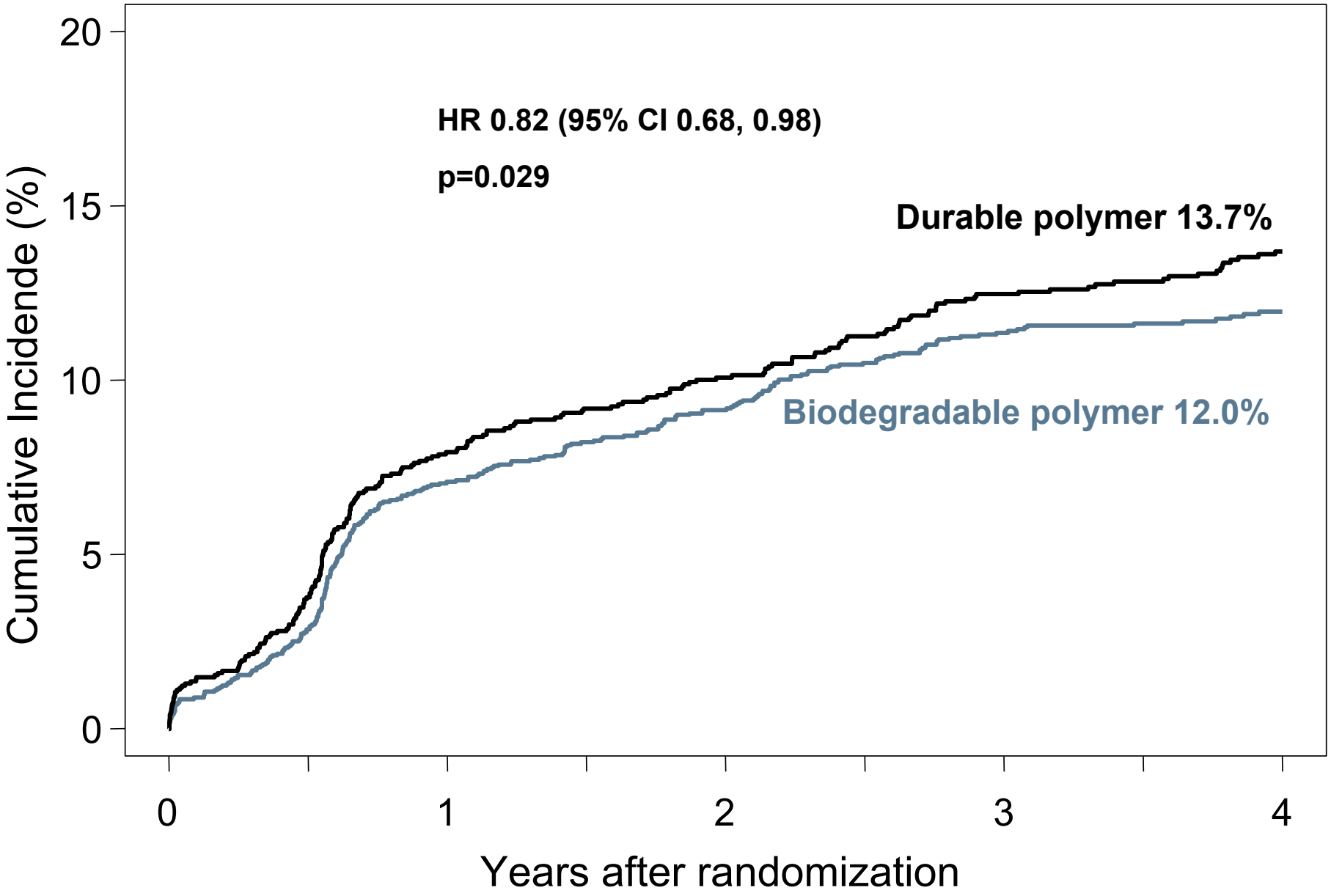
Definite Stent Thrombosis



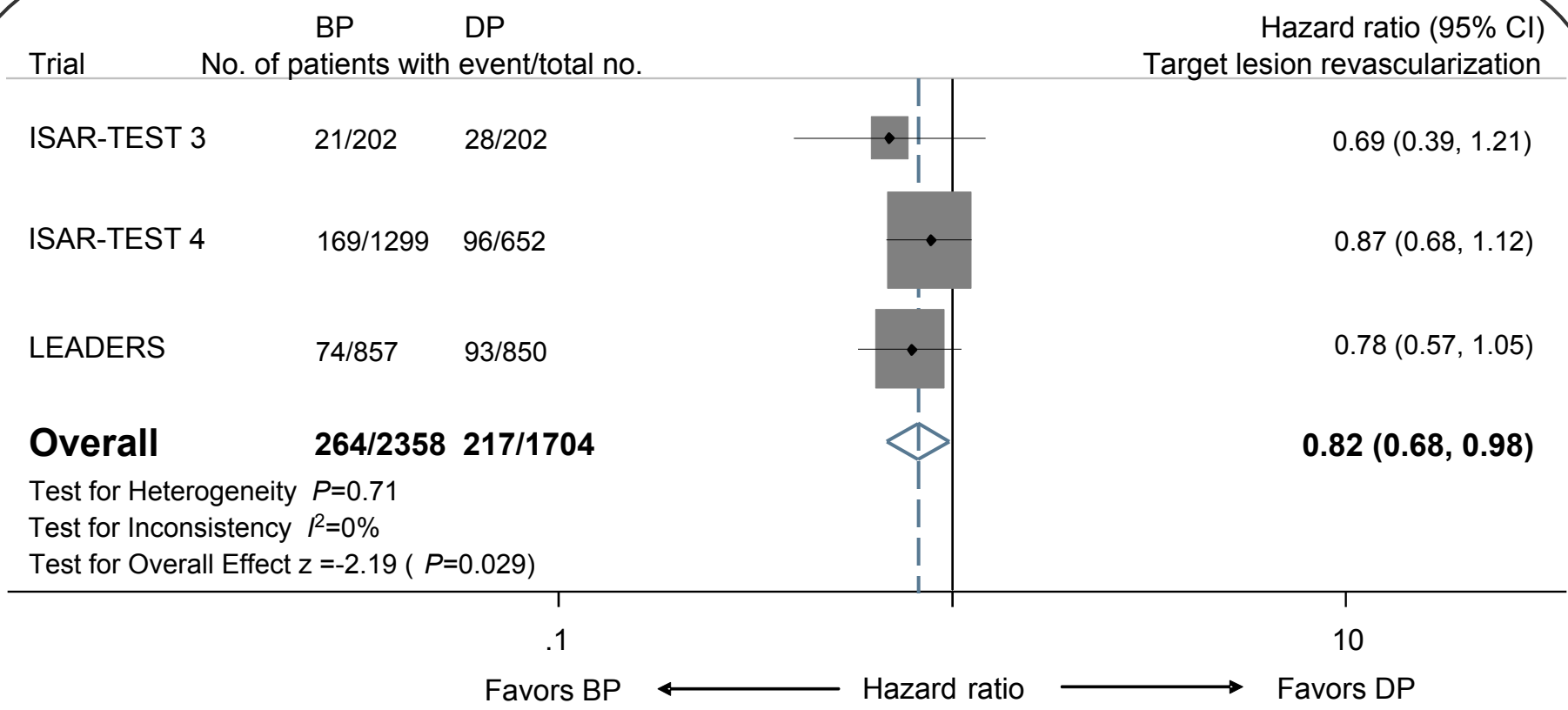
Definite Stent Thrombosis



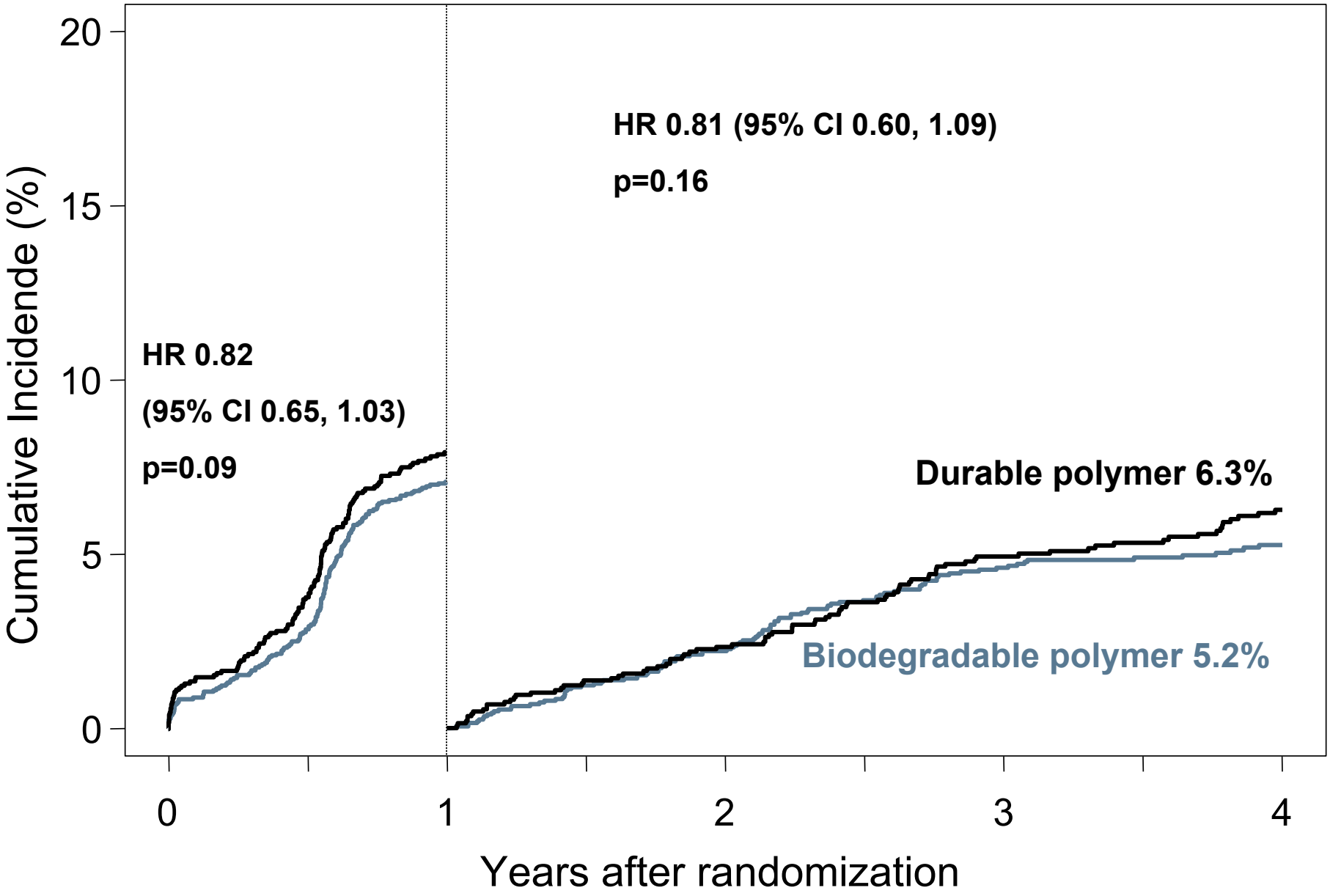
Target lesion revascularization



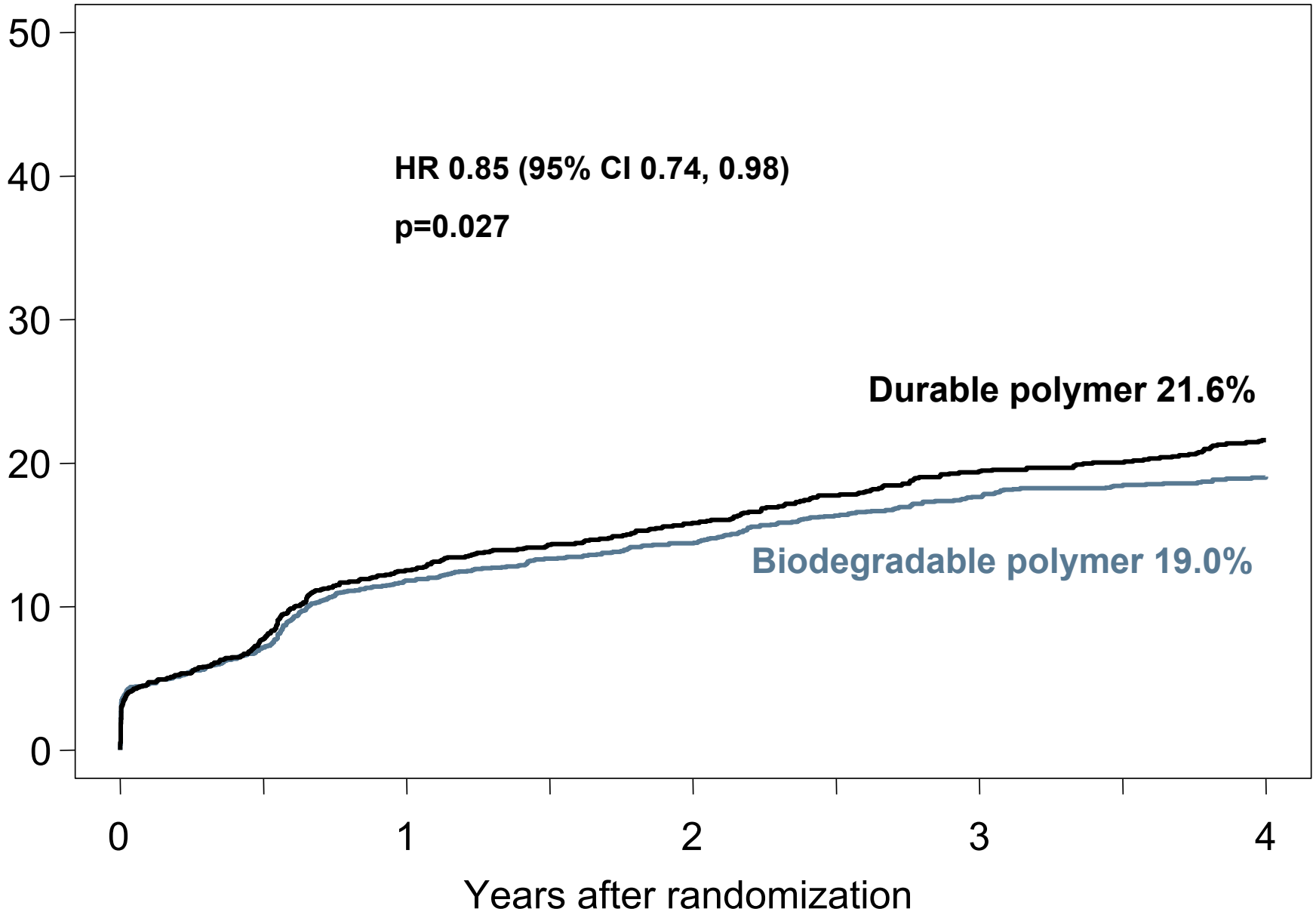
Target lesion revascularization



Target lesion revascularization



Cardiac Death/Myocardial Infarction/TLR



Conclusions

- Biodegradable polymer DES as compared to durable polymer SES demonstrate a **lower risk of definite stent thrombosis at 4 years**

- This differences driven by a statistically significant and likely clinically important **78% risk reduction in late stent thrombosis between 1 and 4 years**

- In addition **target lesion revascularization was significantly lower** at 4 years with biodegradable polymer DES

Conclusions

- These findings may represent **an important step in the proof-of-concept chain of investigation** for biodegradable polymer DES

- The enhanced late safety profile with biodegradable polymer DES may have implications regarding requirement for an **extended duration of dual antiplatelet therapy** following coronary stenting

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ACC FEATURED CLINICAL STUDY

Biodegradable polymer drug-eluting stents reduce the risk of stent thrombosis at 4 years in patients undergoing percutaneous coronary intervention: a pooled analysis of individual patient data from the ISAR-TEST 3, ISAR-TEST 4, and LEADERS randomized trials

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Aims The efficacy of durable polymer drug-eluting stents (DES) is delivered at the expense of delayed healing of the stented vessel. Biodegradable polymer DES aim to avoid this shortcoming and may potentially improve long-term clinical outcomes, with benefit expected to accrue over time. We sought to compare long-term outcomes in patients treated with biodegradable polymer DES vs. durable polymer sirolimus-eluting stents (SES).

Methods and results We pooled individual patient data from three large-scale multicentre randomized clinical trials (ISAR-TEST 3, ISAR-TEST 4, and LEADERS) comparing biodegradable polymer DES with durable polymer SES and assessed clinical outcomes during follow-up through 4 years. The efficacy endpoint of interest was target lesion revascularization and the safety endpoint of interest was definite stent thrombosis. Out of 4062 patients included in the present analysis, 2358 were randomly assigned to treatment with biodegradable polymer DES (sirolimus-eluting, $n = 1501$; biolimus-eluting,

http://eurheartj.oxfordjournals.org/cgi/content/full/ehs086