Drug Eluting Stents: Update

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Disclosure

Speaker name:

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)

X I do not have any potential conflict of interest
Why Drug Eluting Stents (DES) ?

prevent restenosis
due to intimal hyperplasia
Why Drug Eluting Stents (DES)?

DEB better than POBA
Why Drug Eluting Stents (DES) ?

DEB better than POBA

“Leaving nothing behind” not always possible
Why Drug Eluting Stents (DES) ?

DEB better than POBA

“Leaving nothing behind” not always possible

Stent-indication → Recoil, Dissection
Why Drug Eluting Stents (DES)?

DEB better than POBA

“Leaving nothing behind” not always possible

Stent-indication $\rightarrow$ Recoil, Dissection

Transfer the effect from DEB to DES
Process of Intimal Hyperplasia

Trauma
Process of Intimal Hyperplasia

- Trauma
- Proliferation of smooth muscle cells
Process of Intimal Hyperplasia

1. Trauma
2. Proliferation of smooth muscle cells
3. Migration into the intima
Migration of Platelets to the place of injury
Migration of Platelets to the place of injury

Platelets release PDGF (platelet derived growth factor)

PDGF (Platelet Derived Growth Factor) promotes cell regeneration and the synthesis of collagen
Massive production of extra cellular matrix (Collagen / Elastic)
Massive production of extra cellular matrix (Collagen / Elastin)

Restenosis
What’s the effect of the applied drugs?

Prevent the growing of smooth muscle cells in the intima
What’s the effect of the applied drugs?

Prevent the growing of smooth muscle cells in the intima

**Paclitaxel**
blocks the Mitosis
What’s the effect of the applied drugs?

Prevent the growing of smooth muscle cells in the intima

**Paclitaxel**
blockes the Mitosis

**Sirolimus and everolimus**
Immunosuppressants, anti-proliferative
# Drug Eluting Stents

<table>
<thead>
<tr>
<th>DES</th>
<th>SFA</th>
<th>BTK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zilver PTX</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Eluvia</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Xience Prime BTK</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Cre8 BTK</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>BioMatrix Flex BTK</td>
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<td>x</td>
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<tr>
<td>Promus Premier</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Angiolite BTK</td>
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<td>x</td>
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</table>

All other BTK stents have no CE mark for this indication.
## Femoro-popliteal region

<table>
<thead>
<tr>
<th></th>
<th>Zilver PTX</th>
<th>Eluvia</th>
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<tbody>
<tr>
<td>Paclitaxel</td>
<td>x</td>
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<tr>
<td>Polymer</td>
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<tr>
<td>Release of drug</td>
<td>72 hours</td>
<td>Up to 360 days</td>
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<tr>
<td>CE-mark</td>
<td>2009</td>
<td>2016</td>
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<tr>
<td>Drug</td>
<td>Polymere</td>
<td>Material</td>
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<td>---------------</td>
<td>----------</td>
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</tr>
<tr>
<td>Xience Prime BTK</td>
<td>Everolimus</td>
<td>x</td>
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<tr>
<td>Cre8 BTK</td>
<td>Sirolimus + organic acid</td>
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<tr>
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<td>Biolimus A9</td>
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<tr>
<td>Promus Premier</td>
<td>Everolimus</td>
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<tr>
<td>Angiolite BTK</td>
<td>Sirolimus</td>
<td>x</td>
</tr>
</tbody>
</table>
Randomised Trials SFA

5-year Freedom from TLR
Provisional Zilver PTX vs. BMS

- Primary Patency
  - 72.4% Zilver PTX
  - 53.0% BMS

\( p = 0.03 \) log-rank
Randomised Trials SFA

5-year Freedom from TLR
Provisional Zilver PTX vs. BMS

Eminent
Eluvia vs BMS still enrolling
Randomised Trials SFA

Imperial-Trial
2:1 randomized (ELUVIA vs Zilver PTX)
Enrolment complete
1 year results in 2018
Randomized Trials BTK

ACHILLES

POBA vs CYPHER (DES)

Primary Endpoint
12M In-Segment Binary Restenosis by QA*

Intention to Treat (ITT): As Treated: * lesion-based analysis

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ITT (n)</th>
<th>n = 67</th>
<th>P</th>
<th>n = 74</th>
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<tbody>
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<td>n = 31</td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>ITT (n)</th>
<th>n = 75</th>
<th>P</th>
<th>n = 66</th>
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<tr>
<td>PTA</td>
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<td>n = 30</td>
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</table>

A. Schmidt
Randomized Trials BTK

DESTINY

DES vs BMS

Primary patency (angiographical at 12 months)

85.2% for DES (Xience V)

54.3% for BMS (Multilink Vision)

P<0.001

Bosiers et al. LINC 2011
Randomized Trials BTK

YUKON
DES vs BMS

The one-year primary patency rate for the drug-eluting stent was 80.6% versus 55.6% for the bare metal stent.
Conclusions

drug is better than no drug
Conclusions

drug is better than no drug
DES are better than BMS
Conclusions

drug is better than no drug
DES are better than BMS
open questions (SFA)

Is Zilver PTX better than BMS and DEB?
Cost effectiveness?
open questions (SFA)

Is Zilver PTX better than BMS and DEB?
Cost effectiveness?

No equivalent therapie for Eluvia

But what happens to the vessel wall due to long time exposure of paclitaxel?
open questions (SFA)

Is Zilver PTX better than BMS and DEB?
Cost effectiveness?

No equivalent therapie for Eluvia
But what happens to the vessel wall due to long time exposure of paclitaxel?

Eluvia better than Zilver PTX?
open questions (BTK)

What drug is the best for BTK (BTK vessels are not coronarys)
open questions (BTK)

What drug is the best for BTK
(BTK vessels are not coronarys)

Ballonexpanding or selfsexpanding
we have to wait for further randomized trials
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