Fiber Optic RealShape (FORS) Technology
3D-Device Guidance in Practice

Tilo Kölbel, Joost van Herwaarden, Fiona Rohlffs, Giuseppe Panuccio

German Aortic Center Hamburg
University Heart Center Hamburg
University Hospital Eppendorf
Disclosures

- Consultant: Cook Medical, Philips, Getinge, Terumo Aortic, Arterica, Medyria
- Research-grants: Cook Medical, Philips, Terumo Aortic, Medtronic
- Travel-grants: Cook Medical, Getinge proctoring speaking-fees,
- Speaking fees: Cook Medical, Philips, Getinge
- Shares: Mokita-Medical, Arterica, Medyria, Siemens. Philips
- IP: Cook Medical, Terumo Aortic, Mokita Medical
- Royalties: Cook Medical, Terumo Aortic
Aortic Interventions
Times of Change

IT'S CALLED 'A BOOK'.
...NOT SURE WHERE THE BATTERIES GO.
Radiation Hazard Persists
A long time ago........

Thoracic Live X-Ray

Radiologists hands
and today.
1967: Introduction of Colour TV in Europe
1967: Introduction of Colour TV in Europe
2020: Introduction of FORS Technology
FORS Technology

- New Philips technology with CE-mark: two catheters and hydrophilic guidewire
- Embedded optical fiber enables real-time 3D visualization of the full shape of devices inside the body without the need for fluoroscopy
Devices currently available

<table>
<thead>
<tr>
<th>#</th>
<th>Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FORS guide wire</td>
</tr>
<tr>
<td>2</td>
<td>FORS Berenstein catheter</td>
</tr>
<tr>
<td>3</td>
<td>FORS Cobra catheter</td>
</tr>
</tbody>
</table>
Bench-Top Comparison Fluoroscopy vs. FORS

Cannulation time: 5:45 min
Fluoro time: 5:45 min

Cannulation time: 2:20 min
Fluoro time: 0 min
Case: Pseudoaneurysm Visceral Aorta

- 79y old Patient
- Previous TEVAR
Main-Body with Fluoro/VesselNavigator
Set-up in Hamburg
Left Renal with FORS Catheter and Wire

Catheter In Blue
Hydrophilic wire in Yellow
Right Renal with FORS Catheter and Wire

Catheter In Blue
Hydrophilic wire in Yellow
Right Renal with FORS Catheter and Wire

DSA as road map
SMA with FORS Catheter and Wire

Virtual Biplane helpful to avoid lateral projection with high radiation
SMA with FORS Catheter and Wire
Celiac with FORS Catheter and Wire

Optical fiber tolerates 180° bend from steerable sheath use in transfemoral BEVAR
SMA with FORS Catheter and Wire
Case: Pseudoaneurysm Visceral Aorta

Result: (Reference 2016)

Operating time: 201 min (305min)

Fluoroscopy time: 22,2 min (65min)

DAP: 6440 cGycm2 (18948cGycm2)

- DSA: 4370 cGycm2
- Fluoro: 2070 cGycm2

Reference: Rohlffs et al. 2020; Eur J Vasc Endovasc Surg, epub.
Conclusions

- FORS technology allows 3D navigation by visualizing catheters and guidewires in full shape 3D using laser light.
- High potential for reduction of radiation exposure and workflow improvement by intuitive virtual biplane visualization.
- Revolutionary new tools on the horizon to reduce radiation and facilitate complex endovascular procedures.
Welcome to Hamburg!

**AORTIC LIVE 6 | 2020**

**26–27 October 2020**
**Curio-Haus, Hamburg, Germany**

**6th Aortic Live Symposium**

Dept. of Vascular Medicine
University Heart & Vascular Center Hamburg

### Main topics

- Endovascular, hybrid, and open aortic surgery:
  - Aortic valve reconstruction
  - Ascending aorta
  - Aortic arch
  - Thoracoabdominal aorta
  - Aortoiliac disease

### Course directors

- **Tilo Kolbel**
  - Hamburg, Germany
- **Konstantinos Tsagakis**
  - Essen, Germany
- **Founding Director**
  - Heinz Jakob
  - Essen, Germany

### Co-directors

- **Joseph Bavaria**
  - Philadelphia, United States
- **Michael Borger**
  - Leipzig, Germany
- **Sebastian Debus**
  - Hamburg, Germany
- **Christian Detter**
  - Hamburg, Germany
- **Arjang Ruhrvar**
  - Essen, Germany
- **Stephan Haulon**
  - Paris, France
- **Gustavo Oderich**
  - Rochester, United States

---

**Get a taste of what awaits you: www.aortic-live.com**

---

**Congress organisation**

**Congo**

CongO GmbH, Ruffinistrasse 16,
80637 Munich, Germany
www.cong-o.com

**Phone:** +49.89.23 75 74 - 65
**Fax:** +49.89.23 75 74 - 70
**Home:** www.cong-o.com
Fiber Optic RealShape (FORS) Technology
3D-Device Guidance in Practice

Tilo Kölbel, Joost van Herwaarden, Fiona Rohlffs, Giuseppe Panuccio

German Aortic Center Hamburg
University Heart Center
University Hospital Eppendorf