


## AVM WIN Joint Meeting, Val d'Isère, 24.-29.04.2022

Morning session, 28.04.2022

### The ReSolv stent: Pre-clinical imaging and performance characteristics of a novel polymeric bioresorbable flow-diverter

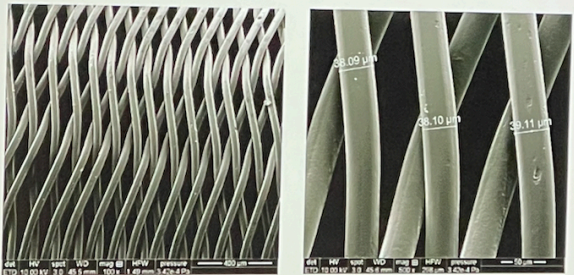
Wong J. (1), Mitha A. (1)

(1) University of Calgary, Calgary, Canada



### ABSORPTION STUDIES

In Vitro, Supraphysiologic Conditions, 130 days




FB stent absorbs by gradual reduction in strut diameter

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AVM 2022

AVM WIN JOINT MEETING  
24 TO 29 APRIL 2022  
Val d'Isère France



### LESS CLOT FORMATION

ISO Standard 10993-4

Sample type (N=3 for each)	% Thrombosis surface coverage
Positive control	100%
Negative control	0%
Medtronic Stent	3.6%
Fluid Biotech Stent	2.3%*

\*p=0.005, mixed effects linear regression

FB Stent is 35% less prone to clot formation than the leading commercial metal stent

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Data is very limited at this point and wasn't put into context of the current FD and absorbable stent technologies (Cardiology)

More information can be found here: <https://fluidbiomed.com>

## **Familial Multiple Cavernoma Syndrome**

**Sandya Sesahdri R. (1)**

(1) JSS, Mysore, India; Dupuytren's Hospital, Limoges CHU, France, Mysuru, INDIA

## **The Dyna Difference - About the Role of High Resolution Cone Beam CT Angiography**

**Raz E. (1), Nossek E. (1), Nelson P. (1), Shapiro M. (1)**

(1) NYU Langone Health, New York, United States

## **Current Status and Future Challenges for Robotically Performed Neurointervention**

**Crinnion W. (1), Jackson B. (1), Lynch J. (2), Bergeles C. (1), Hongbin L. (1), Rhode K. (1), Mendes Pereira V. (3), Booth T. (1,2)**

(1) King's College London, London, UNITED KINGDOM; (2) King's College Hospital NHS Foundation Trust, London, UNITED KINGDOM; (3) Toronto Western Hospital, Toronto, CANADA

Pictures available.

## **Aneurysm**

### **Antithrombotic therapies for neurointerventional surgery: a 2021 French comprehensive national survey**

**Caroff J. (1), Jeni Research Collaboration . (2)**

(1) Bicêtre Hospital, Le Kremlin-Bicêtre, France; (2) , , France

Very interesting survey about use of antiplatelet medication in France, published in JNIS:

<https://jnis.bmj.com/content/early/2022/03/27/neurintsurg-2021-018601>

Pictures available.

### **Safety and efficacy of antiplatelet regimens for stent assisted coiling; Direct IV preparation using Eptifibatide or Cangrelor (groups A & B) or conventional preparation with Ticagrelor (group C): A single center retrospective study**

**Gentric J. (1), Ognard J. (1), Cheddad El Aouni M. (1)**

(1) Brest University Hospital, Brest, France

Presentation along the same lines as the previous one, but with specific focus on the advantages/disadvantages of the different drugs and use protocols.

Pictures available.

### **Triple Therapy versus Dual Antiplatelet Therapy for Dolichoectatic Vertebrobasilar Fusiform Aneurysms Treated with Flow-Diverter**

**Monteiro A. (1), Monteiro A. (1), Hanel R. (2), Kan P. (8), Mohanty A. (7), Cortez G. (2), Rabinovich M. (3), Matouk C. (4), Sujjantararat N. (4), Ebersole K. (5), Fry L. (5), Natarajan S. (6), Owusu-Adjei B. (6), Ortega-Gutierrez S. (9), Vivanco-Suarez J. (9), Wakhloo A. (3), Levy E. (1)**

(1) University at Buffalo , Buffalo, United States; (2) Lysterly Neurosurgery and Baptist Health System, Jacksonville, United States; (3) Lahey Hospital and Medical Center, Burlington, United States; (4) Yale University School of Medicine, New Haven, United States; (5) University of Kansas Health Systems, Kansas City, United States; (6) University of Massachusetts Medical School , Worcester, United States; (7) Baylor College of Medicine, Houston, United States; (8) University of Texas Medical Branch, Galveston, United States; (9) University of Iowa Hospitals and Clinics, Iowa City, United States

Presentation given by Tufail Patankar.

### **Unusual ruptured pica aneurysm**

**Agid R. (1), Hendriks E. (1)**

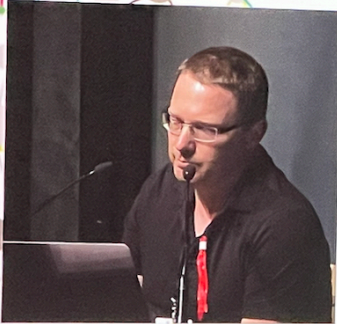
(1) Toronto Western Hospital, Toronto, Canada



## A pragmatic randomized trial on the management of unruptured intracranial aneurysms

Raymond J. (1)

(1) Centre Hospitalier de l'Université de Montréal, Montréal, Canada



### CAM hypothesis

For patients randomly allocated to at least 2 options, 1 of which is conservative management: active UIA treatment will reduce the 10-year combined neurologic morbidity and mortality (mRS score > 2) from 24% to 16%

961 patients will be needed

Randomization

10. Is the patient being considered for treatment? ☒ Yes ☐ No

11. What is the treatment method planned? ☐ a. Endovascular(E) ☐ b. Surgical (S) ☒ c. Either (E) or (S)

12. Is conservative management a reasonable alternative to treatment? ☒ Yes ☐ No

13. Randomized or assigned allocation **TOES-Treatment-Endovascular**

## Progress Report

CAM started in Feb 2020

3 active centers: CHUM Montreal  
University of Alberta, Edmonton  
Ospedale San Carlo Borromeo di Milano, Italy

655 patients: 327 observation registry  
23 endovascular registry  
2 surgical registry  
34 RCT: Surgery vs Endovascular  
269 RCT: Observation vs Treatment (Stratified)

**269+34 = 303 RCT patients so far**

10 year follow up will be necessary for these study patients. Concern: a lot will be lost to follow up.

## **The Contour device - Long term follow up, the Leeds experience.**

**Ktayan H. (1), Patankar T. (1)**

(1) Leeds General Infirmary NHS Trust, Leeds, United Kingdom

14 patients with ITT of which 11 were treated (catheterization difficulties in 3 patients) with FU data on 9 patients.

Contour and WEB can be used in different cases and can coexist (1 patient could not be treated with Contour, but was treated with WEB).

Pictures available.

## **The Contour Device, Besançon experience in 63 cases**

**Biondi A. (1), Charbonnier G. (1), Vitale G. (1), Reverberi L. (1), Primikiris P. (1)**

(1) Besançon University Hospital, Besançon, France

56 patients treated with 63 aneurysms, of which only 2 were ruptured and 8 were recurrences.

Pictures available.

## **Contour Device for Ruptured Aneurysms - Results from 18 Cases**

**Wodarg F. (1), Gaertner F. (1), Mahnke J. (1)**

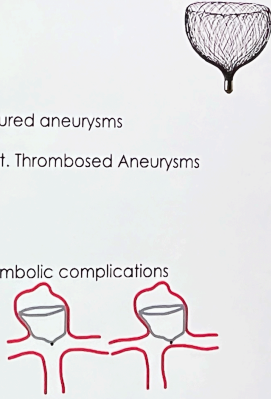
(1) University Hospital Kiel, Kiel, GERMANY

Experience from Kiel covering regular and “off label” (additional coiling) cases as well as ruptured cases.

### Conclusions


From this (small) experience:

- Contour can sufficiently close ruptured aneurysms
- Interesting option for complex / part. Thrombosed Aneurysms
  - (CoCoJaMBO)
- Acute Stenting can be avoided
- Relatively high number of thromboembolic complications
  - Medication? Patient selection?



### Open Questions

- Is CONTOUR as safe as WEB?
- Longterm Safety?
- Stent vs. Contour tip – what is more thrombogenic?
- Too many embolic events – better pat selection?
- Antiplatelet Strategy?
- What caused the rupture?
- And more....



Pictures available.



## CONTOUR vs. WEB, intervention times and learning curves

**Gärtner F. (1)**, Wodarg F. (1)

(1) UKSH Kiel, Kiel, Germany

The difference is not significant, but with a slight tendency for Contour, which might be due to the fact that WEB is around for a long time and experience with WEB was beneficial for the Contour cases.

Pictures available.

Contour discussion (4 presentations):

Patankar uses antiplatelets for his WEB and Contour procedures due to bad experience in the past. Both devices WEB and Contour work well and will both exist. When using intrasaccular devices, stenting can be avoided and if recurrences occur, a stent or FD can still be used in a following procedure.

One case of Contour deformation was reported from the UK, a rotation causing a thrombus formation was reported from Milano. Others have not seen this.

Rationale of use of coils was discussed. There is a study going on in Spain, where Contour can be used with or without coils. The question is, how good the immediate occlusion is and how well the patient is protected with just placing a Contour device.

## Afternoon session, 28.04.2022

### Nautilus intrasaccular bridging device: Animal and human experience

Monteiro A. (1,3), Sirakov S. (6), **Siddiqui A. (1,3)**, Mocco J. (4), Turk A. (5), Killer M. (2), Sakai N. (7), Almeida Perez R. (8), Diaz O. (9)

(1) Department of Neurosurgery - University at Buffalo, Buffalo, United States; (2) Paracelsus Medical University, Salzburg, Austria; (3) Gates Vascular Institute, Buffalo, United States; (4) Department of Neurosurgery - Mount Sinai, New York, United States; (5) Medical University of South Carolina, Charleston, United States; (6) UH St Ivan Rilski, Sofia, Bulgaria; (7) Kobe City Medical Center General Hospital, Kobe, Japan; (8) Nuevo Hospital Bocagrande, Cartagena, Colombia; (9) Houston Methodist Hospital, Houston, United States

Animal data as well as FIM was presented. Pictures available.

### CONCLUSIONS

- Safe in bifurcation and sidewall aneurysms in canine model
- No device-related adverse events
- No damage to the brain or sternal lymph nodes
- No device related thrombosis or any other complication
- Core-lab assessment showed high aneurysm occlusion rate after 29 and 90 days
- The histologic assessment showed healing process of the fundus and aneurysm neck

### **Nautilus intrasaccular neck bridging device – first experience**

**Kupcs K. (1,2)**

(1) Pauls Stradins Clinical University Hospital, Riga, Latvia; (2) Riga Stradins University, Riga, Latvia

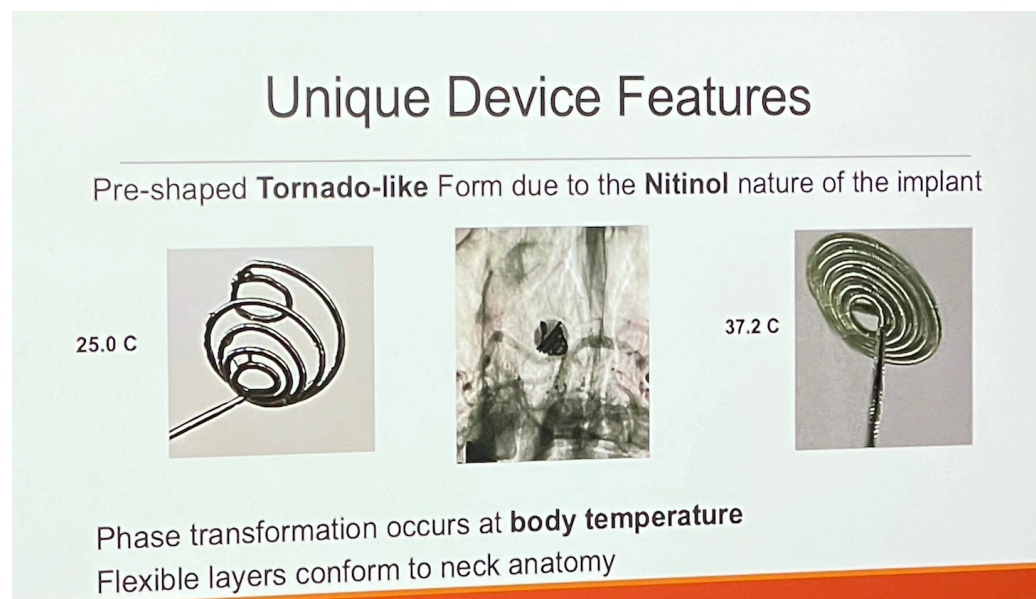
Device as a first “coil” or neck bridging device is placed, then normal coiling is performed. Pictures available.

### **Nautilus – new endosaccular frontier in wide necked aneurysms embolization**

**Sirakov S. (1)**

(1) UH St Ivan Rilski, Sofia, Bulgaria

Device becomes firmer upon contact with body temperature. Experience of 49 aneurysms are presented with up to 12 months FU. Oversizing of the device is done to anchor it and seal the neck.



Pictures available.

Discussion: can the device be moved during coiling? Not once it has become firm. Device is CE marked and currently in LMR.

### **The Trenza coils and Citadel (USA) / TREAT (Europe) studies**

**Cognard C. (1), Rai A. (2)**

(1) CHU Toulouse, Toulouse, France; (2) West Virginia University, Morgantown, Wv, United States

Intrasaccular coil-like device made from a ribbon. This device (1 or 2 Trenza) is then filled with coils.

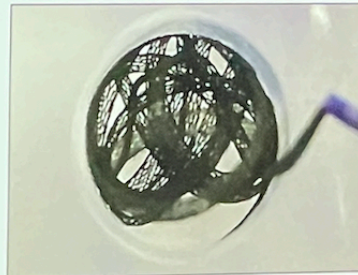
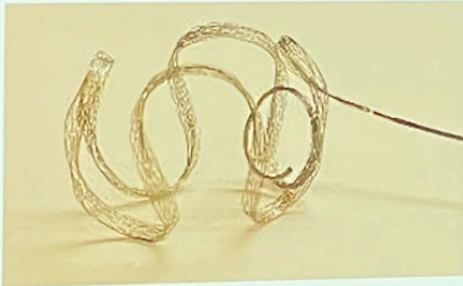


## Trenza™ Embolization Device

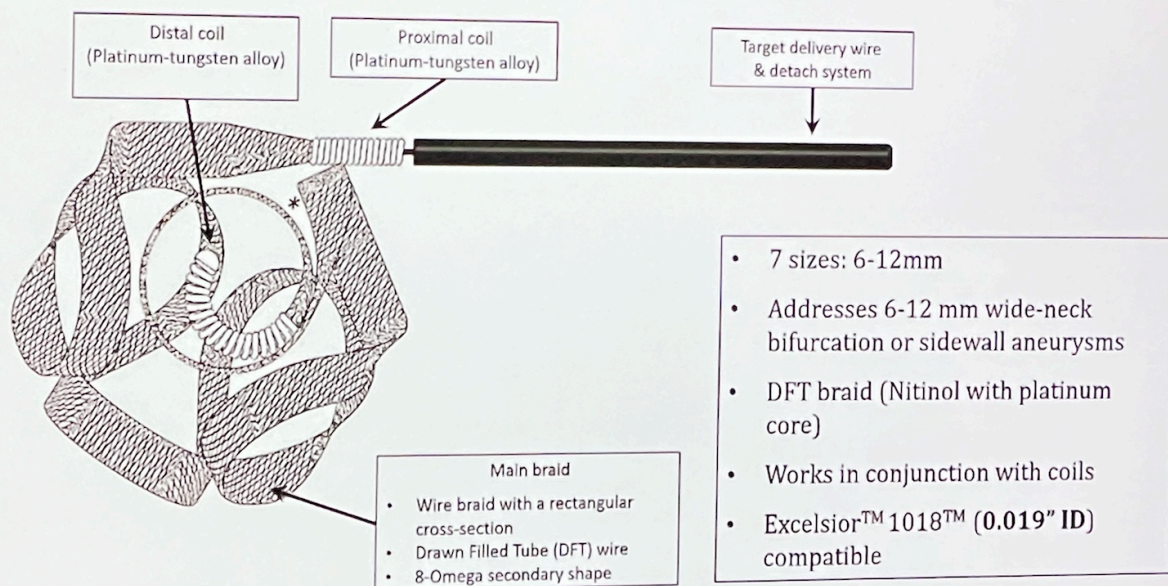
A new device developed internally by Stryker

A braided coil

A coils like Ribbon



## Trenza™ Embolization Device Technical Overview



Several cases were shown. Only wide-necked aneurysms are included in the study. Pictures available.

Do we need it? Looks like Medina (Dodi). No, it is a ribbon (Cognard)

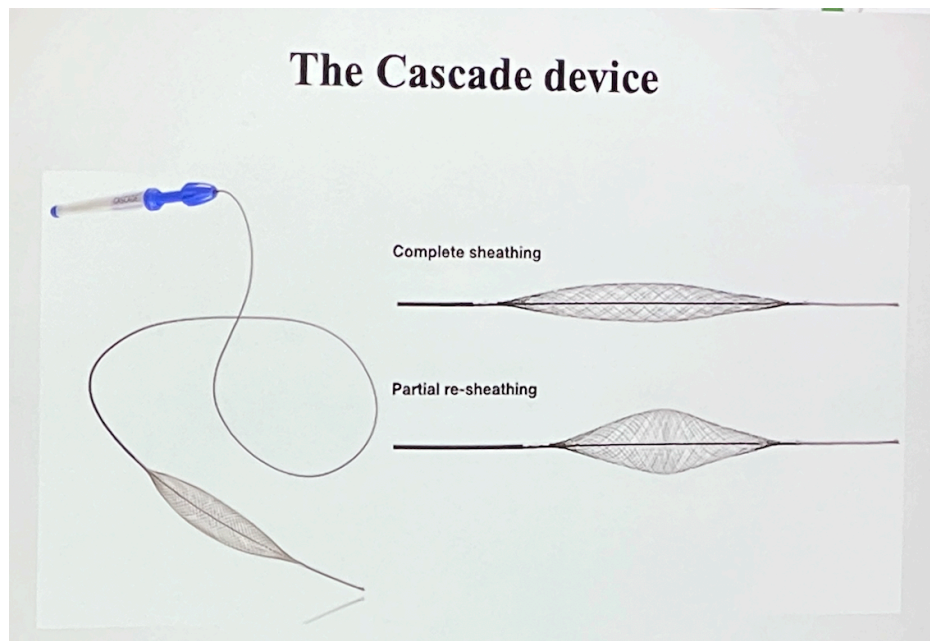
Device is sold as a coil (Patankar), but used as an FD, which could be a problem in some reimbursement systems.

### Cascade temporary bridging device – single center experience

**Sirakov A. (1)**, Sirakov S. (1)

(1) UH St Ivan Rilski, Sofia, Bulgaria

Device related vasospasm was reported in several cases in this series.



Discussion regarding Cascade and similar devices: you don't have the balloon protection in case of rupture.

Pictures available.

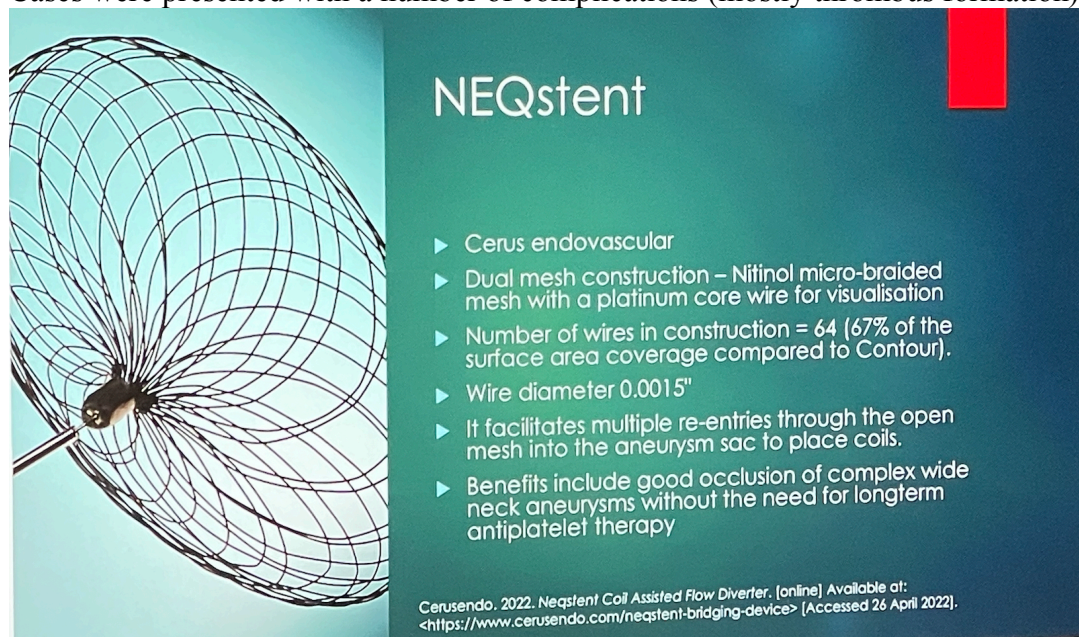
### **The Neqstent coil assisted intrasaccular flow diverter: immediate and 6 month angiographic results with our early clinical experience**

Islim F. (1), **Patankar T. (1)**, Dyde R. (3), Nagaraja S. (3), Sonwalkar H. (2)

(1) Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom; (2) Royal Preston Hospital, Preston, United Kingdom; (3) Sheffield teaching hospitals, Sheffield, United Kingdom

Price is lower than that of Contour and less thrombogenic.

Cases were presented with a number of complications (mostly thrombus formation).





# Conclusion

- ▶ Good safety profile
- ▶ Easy to use and with coils
- ▶ Early results are promising .
- ▶ 5/6 cases of complete occlusion at 6 month follow-up
- ▶ Correct sizing of the device is essential.
- ▶ 1 case of incompletely treated aneurysm due to small device. There is now a new 14mm Neqstent for larger aneurysms.
- ▶ Higher risk for thromboembolic events due to potential flow diversion at the neck and can benefit from the use of short term (4-8 weeks) antiplatelet treatment.
- ▶ Long term data is needed

How can you balance “pushing the envelope” with patient safety? Answer: in the British system, devices need to be approved by the hospital, so are pretty safe by the time they get through.

New devices should only be used in a randomized study environment (Raymond).

Pictures available.

## **All in one: a cross-device investigation for PreSize Neurovascular medical software**

**Patankar T. (1)**

(1) Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom

Software similar to Sim&Size.

## **New is always better than old. Or is it?**

**Boccardi D. (1)**

(1) Niguarda, Milano, Italy

Message from Dodi and others: don't take the PED Shield out of the market.

## **Treatment of intracranial bifurcation aneurysms using Woven EndoBridge (WEB) device: A comparative multicenter cohort study**

Adeeb N. (2), Dibas M. (3), Bengzon Diestro J. (4), Phan K. (3), Cuellar-Saenz H. (3), Sweid A. (6), Lay S. (5), Guenego A. (5), Aslan A. (2), Renieri L. (7), Sundararajan S. (8), Saliou G. (9), Möhlenbruch M. (10), Regenhardt R. (11), Vranic J. (11), Lylyk I. (12), Foreman P. (13), Vachhani J. (13), Župan?i? V. (14), Hafeez M. (15), Rutledge C. (11), Waqas M. (17), Tutino V. (17), Rabinov J. (11), Ren Y. (18), Schirmer C. (19), Piano M. (20), Kühn A. (21), Michelozzi C. (22), Elens S. (23), Starke R. (24), Hassan A. (25), Salehani A. (26), Brehm A. (27), Jones J. (26), Psychogios M. (28), Spears J. (4), Lubicz B. (23), Panni P. (22), Puri A. (21), Pero G. (20), **Griessenauer C. (1,19)**, Asadi H. (18), Siddiqui A. (17), Ducruet A. (16), Albuquerque F. (16), Du R. (3), Kan P. (15), Kalousek V. (14), Lylyk P. (12), Stapleton C. (11), Boddu S. (8), Knopman J. (8), Aziz-Sultan M. (3), Limbucci N. (7), Jabbour P. (6), Cognard C. (5), Patel A. (11), Dmytriw A. (11)

(1) Christian Doppler Klinik, Salzburg, Austria, Salzburg, Austria; (2) Louisiana State University, Shreveport, La, United States; (3) Brigham and Women's Hospital, Harvard Medical School, Boston, United States; (4) Department of Radiology, St. Michael's Hospital, University of Toronto, Toronto, Canada; (5) Centre Hospitalier de Toulouse, Hôpital Purpan, Toulouse, France; (6) Thomas Jefferson University, Philadelphia, United States; (7) Ospedale Careggi di Firenze, Florence, Italy; (8) New York Presbyterian Hospital, Weill Cornell School of Medicine, New York, United States; (9) Centre Hospitalier Vaudois de Lausanne, Lausanne, Switzerland; (10) Universitätsklinikum Heidelberg, Heidelberg, Germany; (11) Massachusetts General Hospital, Harvard University, Boston, United States; (12) Clínica La Sagrada Familia, Buenos Aires, Argentina; (13) Orlando Health

Neuroscience and Rehabilitation Institute, Orlando, United States; (14) Clinical Hospital Center 'Sisters of Mercy', Zagreb, Croatia; (15) UTMB and Baylor School of Medicine, Houston, United States; (16) Barrow Neurological Institute, Phoenix, United States; (17) State University of New York at Buffalo, Buffalo, United States; (18) Austin Health, Melbourne, Victoria, Australia; (19) Geisinger, Danville, United States; (20) Ospedale Niguarda Cà Granda, Milano, Italy; (21) UMass Memorial Hospital, Worcester, United States; (22) Ospedale San Raffaele, Milano, Italy; (23) Hôpital Universitaire Erasme, Bruxelles, Belgium; (24) University of Miami, Miami, United States; (25) Valley Baptist Neuroscience Institute, Harlington, United States; (26) University of Alabama at Birmingham, Birmingham, United States; (27) University Medical Center Hamburg-Eppendorf, Hamburg, Germany; (28) University Hospital Basel, Basel, Switzerland

## Conclusions

- First large cohort study to compare WEB aneurysm locations
- Not all bifurcation aneurysms are treated equally with WEB!
- Complex anatomy (ACOMM and MCA) may result in fewer occluded aneurysms and more complications
- Straight forward anatomy (basilar apex and ICAT) leads to higher rates of adequate occlusion and fewer complications
- Outcome differences were not statistically significant!

### Coated Flow Diverters: How to evaluate them?

**Pierot L. (1)**

(1) CHU Reims, Reims, France

### Biological optimization of flow-diverters - Impact of surface modification : The Cicaflow study

**Rouchaud A. (1,3),** Forestier G. (1,3), Cortese J. (2,3), Jeremy M. (1), Bardet-Coste S. (3), Perrin M. (3), Terro F. (3), Mounayer C. (1,3)

(1) Limoges University Hospital, Limoges, France; (2) Bicetre Hospital, Paris, France; (3) XLIM CNRS UMR 7252, Limoges, France

### HPC coated flow diverting stent embolisation: mid term follow up

**Keston P. (1,2)**

(1) NHS LOTHIAN, Edinburgh, United Kingdom; (2) University of Edinburgh, Edinburgh, United Kingdom

### The novel p64 Flow diverter with hydrophilic polymer coating (HPC) for treatment of unruptured intracranial aneurysms under single antiplatelet therapy: initial clinical experience and short term follow up from a single center

**Hellstern V. (1),** Aguilar Perez M. (1), Henkes E. (1), Cimpoca A. (1), Bäßner H. (1), Ganslandt O. (1), Henkes H. (1)

(1) Neurocenter, Clinic of Stuttgart, Stuttgart, Germany

Good discussion of these 4 presentations. Jean Raymond commented on COATING, that the design is unique and might set a new standard for evaluation of coated devices.

Videos of the presentations as well as the discussion are available.

### Initial clinical experience with the Derivo Heal device.

**Arat A. (1)**

(1) Hacettepe University, Ankara, TURKEY

Video available.