



Listing of Publications & Oral Presentations/Posters

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PUBLICATIONS LISTING

1. **Healing Response in Elastase-Induced Rabbit Aneurysms After Embolization With a New Platinum Coil System (*AJNR Am J of Neuroradiol* 23:1137-1144, August 2002)**

N. Fujiwara and D. Kallmes
University of Virginia, Charlottesville, VA

Conclusion: The new coil system evaluated in this study tracked, deployed, and detached in a predictable manner. Densely packed aneurysms in rabbits demonstrate reproducible histologic evolution that include early fibrin coverage, delayed coverage by spindle cells, delayed resorption of intra-aneurysmal thrombus, and occasional coil compaction.

2. **New Expandable Hydrogel-Platinum Coil Hybrid Device for Aneurysm Embolization (*AJNR Am J of Neuroradiol* 23:1580-1588, October 2002)**

D. Kallmes and N. Fujiwara
University of Virginia, Charlottesville, VA

Conclusion: The new hydrogel-platinum coil hybrid device is easily tracked, deployed, repositioned, and detached through standard microcatheters without the use of non-aqueous solvents. High rates of delayed, progressive occlusion were seen.

3. **Aneurysm Packing with HydroCoil Embolic System versus Platinum Coils: Initial Clinical Experience (*AJNR Am J of Neuroradiol* 25:60-62, January 2004)**

H. Cloft and D. Kallmes
Mayo Clinic, Rochester, MN

Conclusion: HES allows substantially improved packing of the aneurysm lumen relative to standard platinum coils (72% vs. 32% $P= .0001$) Able to significantly improve aneurysm packing even in cases in which only a single HES was used.

4. **Transvenous Occlusion of a Dural Cavernous Sinus Fistula Using a New Expandable Hydrogel-Platinum Coil (HydroCoil®) (*Interventional Neuroradiology*, 10: 151-154, 2004)**

H. Morsi, G. Benndorf, R. Klucznik, M. Mawad
The Methodist Hospital, Baylor College of Medicine, Houston, TX

Conclusion: Report of successful combined use of HydroCoil and bare platinum coils for transvenous complete occlusion of dural cavernous sinus fistula. Controlled volume expansion after deployment of HydroCoils offers potential benefits in treatment of dural arteriovenous fistulas in other locations or in parent vessel occlusions for giant or complex aneurysms.

5. **Percutaneous Coil Embolization of a Large, congenital Coronary-Pulmonary Fistula using Hydrophilic-Coated Detachable Platinum Coils (*Herz* 29:218-9, 2004)**

C. Naber, A. Doefler, S. Churzidze, D. Böse, A. Schmermund, and R. Erbel
Klinik für Kardiologie, Westdeutsches Herzzentrum Essen, Neuroradiologie, Institut für Diagnostische und Interventionelle Radiologie, Universitätsklinikum Essen.

Conclusion: (German with English Translation) After placement of two electrolytically detachable platinum coils, two additional HydroCoil were used to successfully placed. This resulted in a complete occlusion of the AV shunt.

6. **The Use of HydroCoil for Parent Artery Occlusion (*AJNR* 25:1490-1410, September 2004)**

D. Kallmes and H. Cloft
Mayo Clinic, Rochester, MN

Conclusion: This case series demonstrates that the HES can be used to achieve occlusion, even in short segments of vessel. In the case of a vertebral PAO, device placement within vessel segments as short as 6mm could achieve occlusion. Typically, a single platinum coil and two HES devices were needed for vessel occlusion. It remains possible that a single HES device could have achieved occlusion, but we chose to rapidly place at least two HES devices before performing control angiography to maximize attenuation of HES packing.

7. **Endovascular treatment of intracranial aneurysms: comparative evaluation in terminal bifurcation aneurysm model in dogs (*J Neurosurg* 101:996-1003, 2004)**

Y. Yoshino, Y. Niimi, J. Song, M. Silane, A. Berenstein
Beth Israel Hyman-Newman Institute for Neurology and Neurosurgery, Roosevelt Hospital, New York, NY

Conclusions: The experimental canine bifurcation aneurysm model overcomes the limitations of side-wall aneurysm models. In this model, HydroCoils resulted in significantly denser coil packing, less follow-up coil compaction, and thicker neointimal tissue at the neck of the lesion. HydroCoils also appeared more thrombogenic at the aneurysm neck-parent artery interface.

8. **Hydrogel-Coated Coils for the Treatment of Cerebral Aneurysms: Preliminary Results (*Neurosurgery Focus* V. 18, No. 2, February 2005)**

A. Arthur, S. Wilson, S. Dixit, J. Barr
Baptist Memorial Hospital, Memphis, TN

Conclusions: The HydroCoils were implanted with few complications. On angiographic follow up, a clearly defined radiolucent separation of the coils from the parent artery was noted in many of the aneurysms treated. The authors have not previously observed angiographic ally demonstrated lucencies separating the coils from the parent artery. This frequent, but not consistent, appearance on follow-up angiograms obtained in the study indicates that HydroCoils support significant neointimal formation across the neck of the treated aneurysms. The preliminary results indicate that HydroCoils can be used safely and effectively to treat aneurysms and that these devices may allow for improved aneurysm filling.

9. **Changes in the Intraaneurysmal Pressure Due to HydroCoil Embolization (*AJNR Am J Neuroradiol* 26:904-907, April 2005)**

G. Cantón, D. Levy, and J. Lasheras

Conclusions: Packing the aneurysm with hydrogel-coated coils at a density up to 93% did not increase the intraaneurysmal fluid pressure.

10. **Chemical Meningitis After Cerebral Aneurysm Treatment Using Two Second Generation Aneurysm Coils: Report Two Cases (*Neurosurgery* 55:E1222-E1227, 2004)**

P. Meyers, S. Lavine, B. Fitzsimmons, C. Commichau, A. Parra, S. Mayer, R. Solomon, E. Connolly, Jr.

Conclusions: The con-current use of HydroCoil and Matrix coils systems in large aneurysms may cause an exuberant inflammatory response with both local and systemic manifestations. More information to understand better the interaction of HydroCoil and Matrix is needed.

11. **Determination of Filling Volumes in HydroCoil-treated Aneurysms by Using Three-Dimensional Computerized Tomography Angiography (*Neurosurg Focus* 18 (2):E5, 2005)**

E. Deshaies, S. Bagla, C. Agner, A. Boulous

Conclusions: Three-dimensional CT angiography is a novel and accurate way of determining aneurysm volume and calculating percentage aneurysm filling volumes. Using this method, we have demonstrated a significantly better aneurysm filling volume in small and large lesions treated with HydroCoils compared with bare platinum coils. Nevertheless, giant aneurysms continue to be a challenge even for HydroCoils, because of coil compaction. Furthermore, we did not find a direct correlation between angiographically confirmed occlusion and volume packing; however, preliminary data indicate a possible role in preventing recurrences with higher filling volumes identified in this series. Further evolution of coil technology is required to improve our ability to treat the neck of the aneurysm with endovascular techniques.

12. **Treatment Options for Wide-Necked Intracranial Aneurysms Using a self-Expandable Hydrophilic Coil and a Self-Expandable Stent Combination (*AJNR Am J Neuroradiol* 26:1237-1240, May 2005)**

J. Brisman, J. Song, Y. Niimi, A. Berenstein

Conclusions: The combination of intracranial stents with HydroCoil may be an improved method of treating certain broad-based aneurysms.

13. **Angiographic and Histologic Analysis of Experimental Aneurysms Embolized with Platinum Coils, Matrix, and HydroCoil (*AJNR Am J Neuroradiol* 26:1757-63, August 2005)**

Yong Hong Ding, Daying Dai, Debra A. Lewis, Harry J. Cloft, and David F. Kallmes

Conclusions: In the rabbit model, the use of HydroCoil results in improved long-term occlusion rates compared with Matrix and platinum coils. The Matrix group showed an increase in inflammation and coil compaction compared with HydroCoil and platinum coils.

14. HydroCoil for Endovascular Aneurysm Occlusion (HEAL) Study: Peri-procedural Results (*AJNR Am J Neuroradiol 27:289-292, Feb 2006*)

H. Cloft (for the HEAL Investigators)

Conclusions: Mean packing attenuation was higher with HES. The initial occlusion success and complication rate when HES is used to treat cerebral aneurysms is not significantly different from platinum coils. Follow-up angiography is currently being collected and will be evaluated to determine if use of the HES reduces the rate of aneurysm recurrence.

15. Transarterial Coil Embolization of the Venous Component of Aggressive Type 4 Dural Arteriovenous Fistulas (*AJNR Am J Neuroradiol 27:750-52, Apr 2006*)

K. Layton, M. Nelson, F. Kallmes

Conclusions: This case report demonstrates the feasibility of performing coil embolization of the venous outlet of dAVFs from a transarterial approach, which may offer advantages over other endovascular approaches.

16. Embolization of Intracranial Aneurysms with Hydrogel-Coated Coils Versus Inert Platinum Coils: Effects on Packing Density, Coil Length and Quantity, Procedure Performance, Cost, Length of Hospital Stay, and Durability of Therapy (*Stroke. 2006; 37: 1443-1450*)

R. Gaba, S. Ansari, S. Sinha Roy, F. Marden, M. Viana, T. Malisch

Conclusions: HydroCoil embolization achieves greater packing density with decreased coil length. Initial durability data favors HydroCoils, with lower recurrence and retreatment rates.

17. Treatment of Cerebral Aneurysms with Hydrogel-Coated Platinum Coils (HydroCoil): Early Single-Center Experience (*AJNR Am J Neuroradiol 27:1834-40, Oct 2006*)

A. Berenstein, J. Song, Y. Niimi, K. Namba, N.S. Heran, J.L. Brisman, M.C. Nahoum, M. Madrid, D.J. Langer, M.J. Kupersmith

Conclusions: The overall safety profile of HydroCoils appears acceptable. Preliminary midterm observations suggest less coil compaction/aneurysm recanalization in large aneurysms. However, HydroCoil-related delayed hydrocephalus is a concern.

18. Use of a Hydrogel-Coated Self-Expandable Coil to Salvage a Failed Transcatheter Embolization of a Mesenteric Hemorrhage (*Cardiovasc Intervent Radiol 29:1121-24, May 2006*)

J. Bui, D. West, R. Pai, C. Owens

Conclusions: The unique characteristics of the HydroCoil allowed safe and precise positioning of the coil and, within minutes, complete occlusion of the mesenteric artery resistant to more conventional embolic agents.

19. Transvenous Treatment of Cranial Dural Arteriovenous Fistulas with Hydrogel Coated Coils (*Interventional Neuroradiology 12: 319-326, 2006*)

P. Klurfan, T. Gunnarsson, I. Shelef, K. TerBrugge, R. Willinsky

Conclusions: Hydrogel coated platinum coils can be used effectively and safely to treat cranial DAVFs through a transvenous approach. The volume expansion of these coils has potentially a significant advantage over bare platinum coils give the large venous spaces that need to be filled, and may help reduce procedure time and radiation exposure.

20. HydroCoil for Endovascular Aneurysm Occlusion (HEAL) Study: 3-6 Month Angiographic Follow-Up Results (*AJNR 28:152-54, Jan 2007*)

H. Cloft, for the HEAL Investigators

Conclusions: Although the overall recurrence rates for small and large aneurysms in HEAL were no lower than published rates for aneurysms treated with platinum coils, patients treated in HEAL had reduced recurrence rate when greater than 75% of the coil length was HES and when the final coil was HES.

21. HydroCoil as an adjuvant to bare platinum coil treatment of 100 cerebral aneurysms (*Neuroradiology 49:139-48, Feb 2007*)

N. Fanning, Z Berentei, P. Brennan, J. Thornton

Conclusions: HydroCoils can be deployed with a similar complication rate to bare platinum coils; they result in improved aneurysm filling; intermediate follow-up angio showed fewer major recurrences.

22. A prospective single-center analysis of the safety and efficacy of the HydroCoil embolization system of the treatment of intracranial aneurysms (*J Neurosurg 106:226-233, Feb 2007*)

E. Deshaies, M. Adamo, A. Boulos

Conclusions: HydroCoil embolization system is safe and provides excellent 1-year occlusion of small (≤ 7 mm) and large (8-15mm) aneurysms with initial RR)C Type 1 and Types 2 and 3 with stasis of contrast material at the time of embolization. Very large and giant aneurysms were not a successfully occluded.

23. Treatment of Intracranial Aneurysms with Hydrogel Coated Expandable Coils (*Can. J. of Neurol. Sci. 34:38-46, Feb 2007*)

T. Gunnarsson, P. Klurfan, K. terBrugge, R. Willinsky

Conclusions: Hydrocoils can be used effectively to treat cerebral aneurysms. The volume expansion allows for much greater packing which may result in better long-term

results. The recanalization rate is low, but limited. The complication rate is similar to larger current series using bare platinum coils.

24. Aseptic Meningitis after Embolization of Cerebral Aneurysm Using Hydrogel-Coated Coils: Report of Three Cases (*AJNR* 28:511-12, Mar 2007)

S. Im, M. Han, B. Kwon, C. Jung, J. Kim, D. Han

Conclusions: Aseptic meningitis is one of the important complications related to hydrogel-coated coils that should be recognized; more information based on the posttreatment surveillance after used of hydrogel-coated coils is required.

25. Acute Ruptured Intracranial Aneurysm Packing with HydroCoil Embolic System: Initial Clinical Experience (*The Neuroradiology Journal* 20: 000-000, 2007)

P. Ya, X. Jing-Gang, Y. Yi-Lin, W. Sui-Nuan

Conclusions: The HydroCoil Embolic System may reduce recurrences of aneurysm by allowing for increased packing density compared with platinum coils based on initial experience in treatment of 31 patients with acute ruptured cerebral aneurysms.

26. Packing efficacy of HydroCoil Embolic System: In vitro study using ruptured aneurysm model (*Neurosurg Rev* 30:127-130, 2007)

K. Watanabe, K. Sugiu, K. Tokunaga, W. Sasahara, S. Ono, I. Date

Conclusions: The HydroCoil could result in a higher initial occlusion rate of silicone model. Expanded hydrogel possibly sealed the ruptured point directly. Changes in the size of aneurysms were not detected, from which the risk of over-expansion seemed extremely low.

ORAL PRESENTATION & POSTER LISTING

1. **Angiographic and Histologic Evaluation of an Expandable Hydrogel Material for Aneurysm Embolization (presented at ASNR 2000)**

Kallmes, D., Fujiwara, N., and Marx, W.
University of Virginia, Charlottesville, VA

Conclusion: A new, expandable hydrogel material successfully occluded model aneurysms in rabbits. The material is biocompatible and fosters growth of cells across the necks of embolized aneurysms.

2. **Embolization of Experimental Porcine Aneurysms with a Combination Platinum Coils and Hydrogel Material (presented at ASNR 2000)**

Ciceri, E., Dickerson, J. Klucznik, R., Moret, J., and Mawad, M.
The Methodist Hospital/Baylor College of Medicine, Houston, TX and *Foundation Rothschild, Paris, France*

Conclusion: The addition of an expansile material such as hydrogel to the current platinum devices may play a very useful role in the endovascular treatment of aneurysms. Specifically, the expansile material may obviate the need for complete filling of the aneurysm with platinum coils and may prevent recanalization in the long term.

3. **Experimental Hydrogel Coil Embolization of Bifurcation Aneurysms in a Canine Model (presented at Val D'Isere 2002)**

Aagaard, B., Strother, C., and Rappe, A.
University of Wisconsin, Madison, WI

Conclusion: Complete embolization of canine aneurysms using experimental complex and hydrogel coils is feasible and promoted partial or complete neointima formation at the aneurysm neck.

4. **Evaluation of a Hydrogel/Platinum Coil Hybrid Device and Platinum Coils in Sidewall Aneurysms in Canines (presented at ASNR 2002)**

Nesbitt, G., Tien, R., and Barnwell, S.
Oregon Health Sciences University, Portland, OR

Conclusion: Preparation, tracking, deployment, and detachment were predictable for hydrogel-coated and conventional platinum coils. The treatment durability of aneurysms embolized with the hydrogel-coil system was statistically significant higher ($p=0.002$) than those treated with platinum coils. Aneurysms treated with the hydrogel-coil system organized at a higher rate than those treated with platinum coils.

5. **New Expandable Hydrogel/Platinum Coil Hybrid Device for Aneurysm Embolization (presented at ASNR 2002)**

Kallmes, D. and Fujiwara, N.

University of Virginia, Charlottesville, VA

Conclusion: The new hydrogel/platinum coil hybrid device is easily tracked, deployed, repositioned, and detached through standard microcatheters without the use of non-aqueous solvents. High rates of delayed, progressive occlusion were seen.

6. Evaluation of a New Platinum Coil System in Experimental, Sidewall Aneurysms (presented at ASNR 2002)

Nesbitt, G., Tien, R., and Barnwell, S.
Oregon Health Sciences University, Portland, OR

Conclusion: The MCS platinum coils tracked, deployed, repositioned, and detached in experimental aneurysms comparably to the GDC's. The durability of the treatments was statistically equivalent. Histological analyses showed similar host responses.

7. Embolization of Wide-Necked Aneurysms Using a New, Detachable Complex Platinum Coil (presented at ASNR 2002)

Soma, S., Fujiwara, N., and Kallmes, D.
University of Virginia, Charlottesville, VA

Conclusion: This new, detachable complex platinum coil demonstrates great promise in embolizing wide-necked aneurysms with minimal risk for untoward parent artery compromise and without the need for balloon assist procedures. Initial placement of this new coil incorporated greater than 90% of the aneurysm cavity in a large majority of our wide-necked aneurysms.

8. Healing Response in Elastase-Induced Rabbit Aneurysms After Embolization With a New Platinum Coil System (presented at ASNR 2002)

Kallmes, D. and Fujiwara, N.
University of Virginia, Charlottesville, VA

Conclusion: The new coil system evaluated in this study tracked, deployed, and detached in a predictable manner. Densely packed aneurysms in rabbits demonstrate reproducible histologic evolution that include early fibrin coverage, delayed coverage by spindle cells, delayed resorption of intra-aneurysmal thrombus, and occasional coil compaction.

9. Experimental Study of Aneurysm Endovascular Treatment with Hydrogel-coated Coils (presented at ASNR 2002)

Moret, J., *et al.*
Foundation Rothschild, Paris, France

Conclusion: The use of coils coated with expansile hydrogel resulted in high packing densities of aneurysms. Because the HydroCoils, while in contact with blood in the aneurysm sac expand from .012 to .035 inch, fewer coils are needed to obtain circulatory exclusion of aneurysms than regular platinum coils. Aneurysm occlusion with the hydrogel-coated coils is stable at least in a pig model.

10. Experimental Complex Platinum and Hydrogel Coil Embolization of Bifurcation Aneurysms in a Canine Model (presented at ASNR 2002)

Aagaard, B., Strother, C., and Rappe, A.
University of Wisconsin, Madison, WI

Conclusion: Complete embolization of canine aneurysms using experimental complex and hydrogel coils is feasible and promoted partial or complete neointima formation at the aneurysm neck.

11. In Vitro and In Vivo Characterization of a Hydrogel-Based Aneurysm Embolization System (presented at Society for Biomaterials 2002)

Cruise, G., Strother, C., Kallmes, D., Aagaard, B., and Fujiwara, N.
MicroVention, University of Wisconsin, Madison, and University of Virginia

Conclusion: The combination of the biocompatibility and mechanical properties of the HES device shows promise for improving the endovascular treatment of intracranial aneurysms.

12. HydroCoils Embolization in Experimental Canine Models in update of Phase 2-3 (presented at Val d'Isere 2003)

Aagaard, B., Strother C., Reppert, M., Consigny, D.
University of Wisconsin, Madison, WI

13. Healing Response in HydroCoil treated Rabbit Aneurysms an Immunohistochemical Study (presented at Val d'Isere 2003)

Kallmes, D., Fujiwara, N.
University of Virginia, Charlottesville, VA

14. Effect of GDC Coils Versus HydroCoils on Pressure and Flow in the Aneurysm (presented at Val d'Isere 2003)

Sorteberg, A., Bakke S., Strother C.
National University Hospital Rikshospitalet, Oslo, Norway

15. On the Efficacy and Safety of the HydroGel Coils (presented at Val d'Isere 2003)

Gyula, G.

16. Treatment of Aneurysms with HydroCoils: Experience about 19 Cases (8 Months) (Presented at Val d'Isere 2003)

Moret, J.
Fondation Rothschild, Paris, France

17. Beth Israel in Experience with HydroCoil (presented at Val d'Isere 2003)

Berenstein, A.
The Hyman Newman Institute of Neurology and Neurosurgery Beth Israel NY, and the Center for Endovascular Surgery, New York, NY

18. Effect of Hydrogel Coated Coil System on Cerebral Aneurysm Flow Dynamics (presented at SIR 2003, Salt Lake City, UT and CNS 2003, Denver, CO)

Levy, D.
Kaiser Hospital, San Diego, CA

Conclusion: The velocity field measurements demonstrate that flow within the aneurysm can be significantly arrested by the use of HydroCoils without substantially disrupting the flow within parent artery

19. Larger hydrogel coil embolization volumes result in more stable aneurysm occlusion in the canine bifurcation aneurysm model (presented at ASNR 2003)

Aagaard, B, Strother, C., Rappe, A., Consigny, D.
University of Wisconsin, Madison, WI

Conclusion: Use of HydroCoils for embolization allowed for increased volumetric filling compared with GDC and was associated with a trend for less coil compaction. Use of HydroCoils was also associated with a trend for less need for aneurysm re-treatment

20. Healing of Experimental Aneurysms Embolized with the HydroCoil Embolization System (presented at ASNR 2003)

Kallmes, D., Cloft, H.
Mayo Clinic, Rochester, MN

Conclusion: The healing of experimental aneurysms embolized with the HydroCoil™ Embolization System was rapid in experimental aneurysms. At two weeks, organization of the contents of the aneurysm was underway. By six weeks, a fibrous neointima sealed the neck of the aneurysms and clefts of organized thrombus were present between the hydrogel pieces. Collagen was present in the fibrous tissue traversing the neck as well as in the organized thrombus in the aneurysm sac.

21. Guglielmi Detachable Coils vs. Expanding Hydrogel Coils: Effect on Intraaneurysmal Pressure and Flow (presented at ASNR 2003)

Sorteberg, A., Bakke, A., Strother, C.
National University Hospital Rikshospitalet, Oslo, Norway and U. of WI, Madison, WI

Conclusion: HES coils appear to be superior to GDC coils in obtaining flow stagnation within the aneurysm without causing local increases in pressure.

22. HydroCoil Clinical Update Symposium (presented at ASNR 2003)

Cloft, H.: "Heal Study Update"
Lylyk, P.: "ENERI HES Clinical Experience"

Dion, J.: "Emory University Hospital HES Clinical Experience"

23. Volumetric Percentage Occlusion in Aneurysms Treated with HydroCoil Embolization (presented at WFITN 2003, Recife, Brazil)

Malisch, T; Roy, SS; Marden, F; Charbel, F
Division of Neuroendovascular Surgery, University of Illinois Medical Center at Chicago

24. Expandable Hydrogel-Platinum Coils (presented at WFITN 2003, Recife, Brazil)

Lylyk, P; Ferrario, A; Miranda, C; Villasante, F; Dorozuck, G; Pabón, B
ENERI, CMB-FLENI, Ciudad Autonoma de Buenos Aires, Argentina

25. One Year Experience with HydroCoil for Treatment of Cerebral Aneurysms (about 29 cases) (presented at WFITN 2003, Recife, Brazil)

Moret, J; Piotin, M; Mounayer, C; Spelle, L
Fondation Rothschild, Paris France

26. Angiographic and Histological Correlation in a Large Canine Bifurcation Aneurysm (presented at WFITN 2003, Recife, Brazil)

Berenstein, A; Niimi, Y; Yoshino, Y; Kohyama, S; Setton, A; Jayaramen, T; Silane, M
The Hyman Newman Institute of Neurology and Neurosurgery Beth Israel NY, and the Center for Endovascular Surgery, New York, NY

27. Embolization with HydroCoils: Preliminary Experience in 18 Cases (presented at WFITN 2003, Recife, Brazil)

Chapot, R; Maurice, JPS; Merland, JJ; Houdart, E
Department of Interventional Neuroradiology, Lariboisiere Hospital

28. Treatment of Intracranial aneurysm with HydroCoil: A single Center Experience (presented at WFITN 2003, Recife, Brazil)

Shownkeen, HN(1,2), Origitano, TC(1)
*(1)Department of Neurological Surgery, (2)Department of Radiology
Loyola University Medical Center, Maywood, Illinois*

29. Are There More Complications Due to the Swelling of the Hydrogel-Coils for Aneurysm Treatment? (presented at WFITN 2003, Recife, Brazil)

Wanke, I; Doerfler, A; Egelhof, T; Sandalcioglu, E; Forsting, M
Department of Neuroradiology and Neurosurgery, University Hospital of Essen, Germany

Conclusion: Initial results in aneurysm treatment with hydrogel coils are very promising: Technical feasible even in small aneurysms and high occlusion rates. Larger series and long-term observations are necessary to reveal if there is a real benefit over bare coils.

30. Treatment of Intracranial Aneurysms Utilizing the HydroCoil Embolization System (HES) (presented at WFITN 2003, Recife, Brazil)

Sanders, W(1,2); Kasmierczak, C(2)
1. William Beaumont Hospital, Royal Oak, Michigan
2. Henry Ford Hospital, Detroit, Michigan

31. Embolization of Intracerebral Aneurysms with HydroCoils: Initial Clinical Experience (presented at WFITN 2003, Recife, Brazil)

Moreno, A; Muñoz, F; Taboas, J; Fernández, M
Interventional Neuroradiology, POVISA Medical Center, Spain

Conclusion: Our initial clinical experience with HydroCoils has been very positive, as well as the different teams who have used them. However we must be prudent in valuing the results and await their confirmation in the short and long-term follow-up.

32. Utilization of Expandable Hydrogel-Platinum Coil (HydroCoil) in Interventional Neuroradiology (presented at WFITN 2003, Recife, Brazil)

Goyanna, A; Zuniga, F; Barbosa, L; Frudit, ME; Puglia Jr., P; Caldas, JGMP
Interventional Neuroradiology, Hospital das Clinicas from the University of Sao Paulo – USP, Brazil

33. HydroCoil Clinical Update Symposium (presented at ASITN 2004)

Cloft, H.: "HEAL Study Update"
Brisman, J.: "Beth Israel HES Clinical Experience and Preclinical Animal Study"
Dion, J.: "Emory HES Clinical Experience"
Malisch, T.: "U of Illinois HES Clinical Experience"
Boulos, A.: "Albany Medical Ctr. HES Clinical Experience"

34. Follow up in Patients Treated with HydroCoils (presented at ASITN 2004)

Shownkeen, H.N., Anderson D.E., Origitano T.C.
*Department of Neurological Surgery, Department of Radiology
Loyola University Medical Center, Maywood, IL*

Conclusion: Using HydroCoils is a viable, relatively safe treatment option for intracranial aneurysms and may decrease the rate of recanalization in cerebral aneurysms including those with wide necks.

35. Mid-Term Follow Up of Intracranial Aneurysms Treated With Expandable Hydrogel-Platinum Coils (Hydrogel Embolic System.) (presented at ASITN 2004)

Pedro L.MD; Ferrario, A. MD; Miranda, C. MD; Doroschuck,G. MD; Pabon, B. MD
Buenos Aires, Argentina

Conclusion: HES coils demonstrate to be very useful in the treatment of intracranial aneurysm, in terms of safety, feasibility, and stability promoting a greater fraction of

volumetric filling intra-aneurysmal and organized thrombus formation resulting in adequate mid-term occlusion rates. Long-term follow-up and additional clinical experience is necessary to assess the role of this approach in comparison with regular platinum coils.

36. Volumetric Percentage Occlusion of Aneurysms Treated with Hydrogel-Coated Coils versus Inert Platinum Coils (presented at ASITN 2004)

Malisch, T. MD; Roy, S. MD; Gaba, R. MD; Fitch, M. BS; Cxharbel, F. MD
Chicago, IL

Conclusion: In this intent-to-treat series, 35 patients with 39 aneurysms ranging in size from <5mm to >20 mm were safely and effectively treated with expandable hydrogel-coated platinum coils (HES). Embolization with HydroCoils provided a statistically significant, nearly three-fold denser packing compared to a matched, historical control group of inert platinum coils. Follow-up angiographic data is currently being collected to assess if this translates to more durable occlusion.

37. HydroCoil-Assisted Revision after Balloon Reconstruction: A Novel Approach to Direct Carotid-Cavernous Fistula Repair

Marden, F. MD, Malisch, T. MD, Roy, S. MD

Conclusion: As endovascular treatment for direct CCF continue to evolve, techniques for revision will likely follow. We describe a novel method using expandable hydrogel-coated platinum coils to revise a failed balloon reconstruction in which the balloon had migrated within the cavernous sinus away from the rest in the carotid wall. This new technique to buttress the balloon back into desired position proved to be effective, safe, and durable.

38. Endosaccular Obliteration of Intracranial Aneurysms Using Hydrogel-Coated Self-Expandable Coils; Early Experience from a Single Center (presented at ASITN 2004)

Brisman, J. MD; Berenstein, A. MD; Niimi, Y., Setton, A. MD
New York, NY

39. Hydrogel-Coated Platinum Coils are Safe, Effective, and Cheaper Than Bare Platinum Coils for Endosaccular Cerebral Aneurysm Embolization (presented at AANS 2004)

Deshaies, E. MD; Boulos, A. MD
Albany Medical Center, Albany, NY

Conclusion: HydroCoils have a low incidence of complications and provide durable occlusion of small and large aneurysms. HydroCoils also require less coil length and are cheaper than BPC. A multicenter trial is needed to look at long-term angiographic occlusion, cost savings, and complications of HydroCoils.

40. Buenos Aires Experience in the Treatment of Intracranial Aneurysms with Hydrogel-Platinum Coils (presented at ASNR 2004)

Lylyk P., Miranda C, Ferrario A., Villasant F.
ENERI, Buenos Aires, Argentina

Conclusion: In our experience, HES shows to be safe, feasible and the hydrogel expanded in a predictable way until 20 min. Percentage of occlusion was excellent in group A with not dense packing. More trials and long-term follow-up are needed.

41. Angiographic Follow-Up 3-6 months in Patients Treated with HydroCoils (a New Self-Expanding Coated Coil) (presented at ASNR 2004)

Shownkeen, H. Origitano, T. Anderson, D. Craig, E. Hall, M.
Loyola University Medical Center, Maywood, IL

Conclusion: The use of HydroCoils in the treatment of intracranial aneurysms is a viable treatment and may decrease the rate of recanalization in cerebral aneurysms including those with wide necks. Complications are low after an initial learning curve.

42. Expandable Hydrogel-Platinum Coils; Indications, Technical Problems, and Complications in the Treatment of Cerebral Aneurysms (presented at ASNR 2004)

Fanning, N. Brennan, P, Thornton, J.
Beaumont Hospital, Dublin, Ireland

Conclusion: While HydroCoil devices appear a very promising adjuvant to platinum coils in treatment of cerebral aneurysms, a number of technical difficulties still need to be overcome in its development. The precise role for this coil, whether used alone or in combination with standard coils, is evolving. Longer follow-up and further development is required.

43. Endovascular Retrieval of Errant Platinum Coils during Treatment of Cerebral Aneurysms Using a Foreign Body Retrieval Device (presented at ASNR 2004)

Tong, F.C. Cawley, C.M. Abruzzo, T.A., Dion, J.E.
Emory University School of Medicine, Atlanta, GA

44. HydroCoil Embolization Results in Progressive Aneurysm Occlusion and a Trend to Postembolization Aneurysm Shrinkage in Large and Giant Cerebral Bifurcation Aneurysms (presented at ASNR 2004)

Aagaard-Kienitz, B. Niemann, D. Rappe, A. Consigny, D.
University of Wisconsin, Madison, WI

Conclusion: Use of HydroCoils for embolization allowed for progressive aneurysm occlusion in large and giant cerebral aneurysms and also was associated with a trend of aneurysm shrinkage in the 6-month post treatment cases.

45. HydroCoil for Endovascular Aneurysm Occlusion (The HEAL registry): An Update (presented at ASNR 2004)

Cloft, H.J.
Mayo Clinic, Rochester, MN

Conclusion: High packing densities are achieved with HydroCoil therapy, which may lead to a reduced aneurysm recurrence rate. The HEAL registry is currently collecting data regarding recurrence rates. Preliminary analysis of the HEAL registry data indicates that the safety and initial success of HydroCoil therapy of cerebral aneurysms are comparable to results with platinum coils.

46. Prospective Evaluation of CT Angiography to Render a Volume Embolization Ratio in Endovascular Treatment of Intracranial Aneurysms (presented at ASNR 2004)

Boulos, A., Bala, S. Deshaies, E.M. Belden, C.
Albany Medical Center, Albany, NY

Conclusion: The novel use of CTA to determine volume allowed for more precise determination of volume embolization ratios regarding a new embolic material. These ratios may well provide meaningful data regarding recanalization. As the mean embolic ratio was significantly higher than 32% in all but one case, this may portend well for the ability to prevent recanalization using this embolic material. Indeed in all cases that the volume embolization ratio was greater than 40%, stable follow-up digital subtraction angiography is being depicted.

47. Comparison of HydroCoil Embolization System, Platinum Coils, and Matrix in the Embolization of Experimental Aneurysms in Rabbits (presented at ASNR 2004)

Kallmes, D. F. Ding, Y.
Mayo Clinic, Rochester, MN

Conclusion: Immediate angiographic occlusion is similar among platinum, Matrix, and HydroCoil devices. Volumetric occlusion is improved using HydroCoil as compared to other devices. Compared to platinum, HydroCoil results in improved long-term occlusion rates. Additional data regarding long-term performance of Matrix devices in the rabbit model will be presented, along with histologic analysis of all three devices.

48. Hemorrhagic Foreign Body Granulomas Following Stent-Assisted Aneurysm Embolization (presented at ASNR 2004)

Tong, F.C. Abruzzo, T.A. Cawley, C.M. Dion, J.E.
Emory University School of Medicine, Atlanta, GA

Conclusion: This patient demonstrated clinical and imaging findings of cerebral emboli resulting in the formation of foreign body granulomas that are likely the cause of her delayed intraparenchymal hemorrhage. These granulomas demonstrate the presence of cotton givers and cellulose matching the foreign body ejected from the microcatheters during video analysis, which was confirmed by Fourier, transforms infrared spectroscopy. Further study into the etiology of these foreign body fibers is necessary so that the source can be identified and eliminated.

49. Non-Aneurysm lesions treated with Hydrogel Platinum Coils (presented at SILAN 2004)

L. Haass, A. Ferrario, C. Miranda, R. Romero, P. Angelani, F. Fillasante, P. Lylyk
Clinica Medica Belgrano (ENERI & FLENI)

Conclusion: Study included 17 patients total (11 W, 6 M); age between 2 months and 74 years. All patients included were diagnosed for brain vascular lesions other than aneurysms. Hydrogel coils self-expanding property constitutes a promising tool in the treatment of complex vascular lesions, reducing significantly the time of the procedure.

50. Giant Aneurysm On The Persistent Trigeminal Artery (PTA) Endovascular Treatment With Hydrocoil And Stent (presented at SILAN 2004)

Batista Alves de Souza Filho*, Michel Eli Frudit**, Atos Alves de Sousa*

(*Serviço de Neurocirurgia da Santa Casa de Belo Horizonte - Faculdade de Ciências Médicas de Minas Gerais (Neurosurgery Service of Santa Casa in Belo Horizonte – School of Medical Sciences - Minas Gerais - Brazil) **Universidade Federal de São Paulo - Escola Paulista de Medicina (Federal University of São Paulo – Paulistan School of Medicine)

Conclusion: Aneurysm on the persistent trigeminal artery is a rare pathology, difficult to treat with surgery. The use of coils with stents has proved to be a safe and probably efficient option. Still, it is necessary to perform a long-term research for more definitive conclusions.

51. Post Traumatic Diploic Arteriovenous Fistula With Intracranial Venous Drainage (presented at SILAN 2004)

Michel E. Frudit – José GMP Caldas – Antenor T. Sá Jr., Leandro A. Barbosa, Sérgio F. Zuniga, Maurício Jory, Paulo Puglia Jr., Guilherme Abrão

(Instituto de Radiologia do Hospital das Clínicas da FMUSP e Centro de Intervenção Neurovascular do Hospital São Luiz – Itaim (Radiology Institute – Hospital das Clínicas – (Medicine School at University of Sao Paulo) and Neurovascular Intervention Center at São Luiz Hospital – Itaim – Brazil)

Conclusion: The intraosseus access has proved to be efficient in the occlusion of diploic fistula and has showed the potentiality of combining the neurosurgical and endovascular methods to treat this rare pathology.

52. Long-term follow up of brain aneurysms treated with Hydrogel Platinum Coils (presented at SILAN 2004)

L. Haas, F. Villasante, C. Miranda, A. Ferrario, E. Scrivano, R. Romero, P. Lylyk
ENERI, Clinica Adventista Belgrano & FLENI

Conclusion: The study demonstrated the safety and efficacy of Hydrogel Platinum Coils. Hydrogel Platinum coils showed incremental total occlusion with low re-canalization rate in long-term follow up.

53. HydroCoil Experience (presented at SILAN 2004)

D. Lopez
Chicago Institute of Neurosurgery & Neuroresearch

Conclusion: Faster detachment, coils have variable stiffness due to softening technique, possibly use less coils to embolized aneurysm, and a decrease in recurrence rates.

54. HydroCoil Embolic System – Buenos Aires Experience (presented at SILAN 2004)

A. Ferrario
ENERI

Conclusion: Increased durability of treatment. Stable platform for healing. Mechanical stabilization of coil mass. Reduced re-canalization and compaction. Longer follow up confirmed coil basket and no more gel expanded than the first minutes. Good basket of Complex coils is needed in wide neck aneurysms. Coils behavior is easy to predict passed 20 minutes. Cause no variation on aneurysm size or shape. Increase filling and healing of aneurysm sac.

55. HydroCoil Symposium – Compilation of Single Center Experiences (presented at SILAN 2004)

D. Lopes, A Ferrario, J. Freitas, J. Guilherme M. P. Caldas, M. Zenteno, B. Pessoa Vale, L. Lopez-Ibor

56. Embolization of Intracranial Aneurysm with Hydrogel-Coated Coils versus Inert Platinum Coils: Effects on Packing Density, Coil Length and Quantity, Procedure Performance, and Cost (presented at AANS/CNS & ASITN 2005)

R. Gaba, S. Ansari, S. Sinha Roy, F. Marden, M. Viana, F. Charbel, S. Amin-Hanjani, T. Malisch
Chicago, IL

Conclusion: Hydrogel-coated coil embolization achieves greater aneurysm packing density with decreased total length of coil, but with higher costs in this series. Long-term follow-up is being collected to determine whether better packing improves durability and justifies additional cost.

57. Comparative Evaluation of GDCs, HydroCoils, and Matrix Coils in a Terminal Bifurcation Canine Aneurysm Model (presented at AANS/CNS & ASITN 2005)

Y. Niimi, Y. Yoshino, J. Song, S. Kohyama; M. Silane, A. Berenstein
New York, NY
Tokyo, Japan

Conclusion: In this model, Hydrocoils resulted in significantly denser coil packing, less follow-up coil compaction, and thicker neck neointimal tissue than Matrix coils or GDCs. However, Hydrocoils appeared more thrombogenic at the aneurysm neck-parent artery interface.

58. One-Year Follow-up Data for a Prospective Single-Center Analysis of the Safety and Effectiveness of Hydrogel-Coated Platinum Coils in the Treatment of Cerebral Aneurysms (presented at AANS/CNS & ASITN 2005)

E. Deshales, C Agner, M. Adamo, S. Bagla, J. Popp, A. Boulos
Albany, NY

Conclusion: Hydrocoils have a low incidence of complications, provide durable occlusion of small and large aneurysms, but are more likely to cause headaches and cranial nerve deficits from delayed coil swelling in large and giant aneurysms. Hydrocoils provide excellent immediate and long-term occlusion, require less coil length, demonstrate less coil compaction, and are cheaper than expected for BPC.

59. HydroCoil Symposium –Complications and Histology Review, Single Center Experiences & HEAL 1 and HEAL 2 Registry Update (presented at AANS/CNS & ASITN 2005)

D. Lopes, K. terBrugge, L. Brennecke, J. Barr, J. Dion, A. Boulos, H. Cloft

60. Delayed Blindness After HydroCoil Embolization of Paraclinoid Aneurysms (presented at AANS/CNS & ASITN 2005)

E. Cunningham, P. Rasmussen
Cleveland, OH

Conclusion: While we lack definitive evidence that the complications were directly related to the use of the hydrogel coated HydroCoil, the association cannot be excluded. Based on these two cases, we recommend judicious use of expanding coils in aneurysms adjacent to exquisitely sensitive structures, such as the optic apparatus.

61. Endovascular Obliteration of Wide-Necked Intracranial Aneurysms Using a Self-Expandable Stent and Self-Expandable Hydrophilic Coil Combination (presented at AANS/CNS & ASITN 2005)

Y. Niimi, J. Brisman, J. Song, A. Berenstein
New York, NY

Conclusion: We document the first clinical use of a combined new intracranially navigable stent and expandable coils in the successful treatment of wide-necked brain aneurysms. Stent-assisted endosaccular treatment of intracranial aneurysms with this new generation of coils may prove superior to other techniques for treating such difficult aneurysms.

62. Endovascular Embolization of the Left Atrial Appendage using Hydrogel Based Devices (presented at 30th Annual Meeting for the Society for Biomaterials)

J. Blackshear, D. Kallmes, T. Ding, D. Dai, D. Lewis, M. Constant, G. Cruise
Memphis, TN.

Conclusion: The device design is suitable for the embolization of the LAA. Endovascular embolization of the LAA is feasible using tools currently available. The coil mass was stable in the LAA of a normal pacing heart over 12 weeks. Histological evaluation of fibrous tissue in the clefts between the hydrogel.

63. A Histological Comparison of Preclinical and Clinical Aneurysms Embolized with HydroCoils (presented at 30th Annual Meeting for the Society for Biomaterials)

G. Cruise, J. Cloft, D. Kallmes

Memphis, TN.

Conclusion: In all three models, Hydrocoil-treated experimental aneurysms have statistically higher histological scores than platinum coil-treated aneurysms at early timepoints, indicating increased rate of organization. Inflammation elicited by the treatments was minimal and highly concordant between experimental and clinical aneurysms. Hydrocoil and platinum coil-treated experimental aneurysms organized at a slower rate compared to clinical aneurysms. The rabbit elastase model exhibited the highest degree of concordance compared to clinical aneurysms.

64. Carotid Cavernous Fistula: Classification & Approach (presented at Simi 2005)

P. Lylyk, J. Villa
Buenos Aires, Argentina

Conclusion: First option of treatment of CCF is the endovascular technique to completely occlude the fistula, while maintaining the flow in the internal carotid artery. The development of new embolization material available to medical professionals together with a better knowledge of the vascular anatomy open to improved clinical results.

65. Brain Aneurysms in Adults (presented at Simi 2005)

P. Lylyk, J. Villa
Buenos Aires, Argentina

Conclusion: There is no magic formula for treating all brain aneurysms. It is important to know all the different treatment options available today; understand their advantages and disadvantages. The future is promising. The continuous development of the technique and materials allowed a more extensive indication of use of the endovascular therapy.

66. Initial Two Year Experience using Hydrogel Coated Coils in the Treatment of Cerebral Aneurysms (presented at 2005 Southern Neurosurgical Society Annual Meeting)

A. Arthur, J. Barr, S. Dixit
Memphis, TN

Conclusion: Hydrocoils were successfully used with few complications. We have not previously observed angiographically demonstrated lucencies separating the coils from the parent artery. This frequent, but not consistent, appearance on follow-up angiography suggests that Hydrocoils support significant neointimal formation across the neck of the treated aneurysms.

67. Experimental Study of the Hydrocoil in Large Size, Wide Neck and Haemodynamically Stressed Canine Bifurcation Aneurysm Model (presented at 2005 ASNR)

Y. Yoshino
Toronto, Canada

68. Healing and Inflammation in Experimental and Clinical Aneurysms (presented at 2005 ASNR Evening Symposium)

R. Virmani
Toronto, Canada

Conclusion: Early observations at 2 and 6 weeks in a model of internal carotid artery aneurysm in the rabbit suggest that HydroCoil behave similar to Platinum coil except granulation tissue and neoangiogenesis is greater in Platinum coil but neck endothelialization is similar. Coil prolapse into the main lumen of the artery should be avoided as should incomplete filling of the aneurysm. Early observations in man show thrombosis and inflammatory infiltrate around coils. No significant differences were observed between HydroCoil and Platinum coil.

69. HydroCoil Embolization System Post Procedure Complications (presented at 2005 ASNR Evening Symposium)

C. Wallace, R. Willinsky, K. terBrugge
Toronto, Canada

Conclusion: The impact of hydro coil obliteration of a large patent or partially thrombosed intracranial aneurysm may be the induction of a biological response of the suddenly isolated thrombus and/or the wall of the aneurysm resulting in peri-aneurysmal changes and or CSF changes and/or weakening of the aneurysm wall. Endovascular management of large and giant size patent and partially thrombosed intracranial aneurysms with hydroCoils should include full imaging assessment (including contrast enhanced MRI imaging) prior to and at routine intervals after treatment has been performed. Physician awareness and proper documentation of possible adverse effects may lead to improved understanding of aneurysmal pathophysiology and result in improved risk management strategies.

70. HELPS - HydroCoil Endovascular Aneurysm Occlusion & Packaging Study - An On-going Study (presented at 2005 ASNR Evening Symposium)

P. White
Toronto, Canada

71. Aneurysms Treated with Hydrocoils for Intracranial Aneurysms from 3 Centers (presented at 2005 ASNR)

H. Shownkeen, A Boulous, N. Fanning, P. Brennan, J. Thornton
Toronto, Canada

Conclusion: HydroCoils can be deployed safely in aneurysms, including wide necked aneurysms. Combined series of 219 aneurysms with 127 follow-ups, median 9 months. 16/127 (12.6%) regrowth rate. 4.7% retreatment rate. Procedural complications 21/219 (9.6%). 5.9% overall clinical complication rate.

72. HydroCoil Occlusion of Aneurysms: Cost Analysis and Latest Angiographic Results in Initial Fifty Aneurysms (presented at the 2005 ASITN Practicum)

T. Malisch, S. Roy

Toronto, Canada

Conclusion: This series achieved 80% angiographic follow-up, mean follow-up = 12 months. 15% regrowth / coil compaction rate in entire HydroCoil series. 8% regrowth/coil compaction rate after first five (“learning curve”) patients. 26% regrowth/coil compaction rate in size and shape-matched historical platinum coil series. 10% retreatment rate in entire HydroCoil series. 8% retreatment rate after first five (“learning curve”) patients. 15% retreatment rate in size and shape-matched historical platinum coil series. The use of platinum coils as neck finishing coils in half the patients appears to have increased the number of coils used (and coil costs) but does not appear to improve durability.

73. Pathophysiologic Considerations on HydroCoil®- and Platinum Coil-Occluded Retrieved Human Cerebral Aneurysms (presented at the 2005 ASITN Practicum)

H. Plenk, M. Killer, B. Richling
Toronto, Canada

Conclusion: HydroCoils and bare platinum coils are not toxic and are provoking thrombus formation, when delivered in aneurysms. HydroCoils and bare platinum coils DO NOT adversely affect the natural inflammatory reaction, leading to fibrinolysis and thrombus organization. The abnormal amount and composition of the coagulum, particularly in larger aneurysms, can lead to inconsistent and long delayed fibrinolysis and thrombus organization. Bare platinum coils elicit more Macrophages and Foreign Body Giant Cells (FBGCs) than HydroCoils. Neointima formation is well established at 26 days, and complete coverage of the orifice with a new vessel wall may be completed at 40 days post embolization.

74. 219 Aneurysms Treated With Hydrocoils For Intracranial Aneurysms From 3 Centers (presented at the 2005 ASITN Practicum)

A. Boulous, J. Thornton, P. Brennan, N. Fanning, H. shownkeen
Toronto, Canada

Conclusion: Hydrocoils can be deployed safely in aneurysms including wide neck aneurysms. Our combined series of 219 aneurysms with 127 f/u’s demonstrate a regrowth /coil compaction/ recanalization rate of 14.2 %/retreatment rate of 4.7% – small (0/19;0%) none retreated, medium (4/66;6.1%) none retreated, large (8/27;29.6%) 2 retreated, very large (0/13;0%) 3 retreated, giant (0/2;0%) 1 retreated. Mean f/u – 9 months. Overall clinical complication rate of 5.9%.

75. Hydrocoil Experience in the Treatment of Direct and Dural Fistulae (presented at 2005 ASITN Practicum)

M. Jensen
Toronto, Canada

Conclusion: Extensive experience was gained with hydrocoils in this series. Hydrocoil is an effective embolization agent for both dural and direct fistulae. No obvious conclusions in terms of length/volume needed for occlusion. Study hampered by the lack of available stock and rapid change in technology. Need further study to determine cost effectiveness when compared to bare or fibered platinum.

76. Histologic Comparison of HydroCoil Embolization System of Embolization of Aneurysms Rabbits, Canines and Humans (presented at 2005 ASNR)

D. Kallmes, H Cloft, G. Gruise
Toronto, Canada

Conclusion: In all three experimental aneurysm models, healing generally was completed at 4 weeks postprocedure, with stable or progressive occlusion, thin or thick neck coverings, and mostly organized to completely organized sacs. The tissue response did not change in the time course evaluated in this study, 10-13 weeks. Rabbit and human aneurysms were similar at 2 weeks postprocedure. At 4 weeks, experimental aneurysms tended toward greater healing than the human aneurysms. Inflammation was equivalent, and minimal, in the experimental and human aneurysms. The development of experimental aneurysms that heal in a slower, more clinically relevant manner would improve the development of new aneurysm treatment therapies.

77. Initial Experience with HydroCoil 10 System for Endovascular Aneurysm Treatment (Poster presented at 2005 ASNR)

P. White, L. Horribine, P. Keston, R. Sellar
Toronto, Canada

Conclusion: The Hydrocoil 10 system extends the use of Hydrogel-coated coils to most aneurysms including small, acutely ruptured aneurysms. Few technical complications were experienced with HES 10 coils. High packing density and angiographic results achieved are encouraging but a randomized controlled trial is required to definitively confirm the value of Hydrocoils.

78. DURABLE Study - Durable Results in Aneurysms with Better Long-term Efficacy (poster presented at MicroVention Symposium at 2005 WFITN)

H. Shownkeen, A. Boulos, P. Brennan, J. Thornton
Venice, Italy

Conclusion: HydroCoils can be deployed safely in aneurysms, including wide necked aneurysms. Combined series of 240 aneurysms with 170 follow-ups, mean 8.7 months. 19/170 (11.2%) regrowth/recurrence rate. 3.5% retreatment rate. Procedural complications 21/240 (8.8%). 5.1% overall clinical complication rate.

79. Initial Intracranial Aneurysm Neck Occlusion is a Better Predictor of Long-term Aneurysm Recurrence than Filling Volumes in HydroCoil Embolized Aneurysms (poster presented at Congress of Neurological Surgeons 55th Annual Meeting)

E. Deshaies, M. Adamo, S. Bagla, C. Agner, D. Yavagal, A. Boulos
Boston, MA

80. Embolization with Hydrocoils: Filling Rate and One-Year Angiographic Follow-up in 70 Patients (poster presented at Congress of Neurological Surgeons 55th Annual Meeting)

A. Narata, R. Chapot, A. Maubon, C. Duminy, J. Moreau
Boston, MA

81. Follow-Up of Coiled Aneurysms by MRA- Comparison of Different Coiltypes in Terms of Artifacts (presented at 2005 WFITN)

M. McCoy, M. Killer, F. Weymeyr, F. Klausner, M. Grobovschek,
Venice, Italy

Conclusions: MRA is a good standardized non invasive method for follow up of coiled aneurysms, but it is important to know which kind of coils were used, in order to allow an accurate interpretation of the artifacts.

82. Treatment of Cerebral Aneurysms with Hydrogel-Coated Platinum Coils (Hydrocoil): Early Results of the First 100 Consecutive Patients (presented at 2005 WFITN)

A. Berenstein, J.K. Song, Y. Niimi, K. Namba, J. Brisman, N.Heran, M. Nahoum, M. Madrid, M. Kupersmith
Venice, Italy

Conclusions: Hydrocoils are a major advance in the treatment of cerebral aneurysms. Despite limitations in early follow-up, Hydrocoils resulted in less coil compaction/aneurysm recanalization than that reported for GDC Platinum coils. Longer follow-up is needed, however. A randomized controlled clinical trial comparing GDC and Hydrocoil is warranted.

83. Initial experience with Hydrocoil 10 System for Endovascular Aneurysm Treatment (presented at 2005 WFITN).

P. White, L. Horribine, P. Keston, R. Sellar
Venice, Italy

Conclusions: The Hydrocoil 10 system extends the use of hydrogel-coated coils to most aneurysms including small, acutely ruptured aneurysms. Few technical complications were experienced with HES 10 coils. High packing density and angiographic results achieved are encouraging but a randomized controlled trial is required to definitively confirm the value of hydrocoils.

84. Angiographic, Clinical and Histopathological Assessment of Hydrocoil – Embolized Human Aneurysms (presented at 2005 WFITN)

M. Killer, H. Plenk, M. McCoy, M. Grobovschek, F. Weymeyr, G. Ladurner, B. Richling
Venice, Italy

Conclusions: Hydrogel-coated coils represent a significant improvement of the aneurysm coil occlusion paradigm. As opposed to other reported coil modifications, Hydrocoils work by expanding during the treatment session to fill spaces between coils and obliterate the aneurysm. This thrombus stabilization and healing can occur better, and recanalization seems to be minimized.

85. Use of Hydrocoil Expandable Coils in Treatment of Cerebral Aneurysms. A Prospective Stud with Follow-up (presented at 2005 WFITN)

M. Musacchio, S. Sani, A. Badruddin, D. Lopes
Venice, Italy

Conclusions: Preliminary results reported here suggest that Hydrocoil expandable coils are safe and carry a morbidity profile comparable to previously reported endovascular coiling procedures. Long-term efficacy of Hydrocoil will be elucidated when larger series of patients with longer follow-ups are studied.

86. Preliminary Experience in the Treatment of Intracranial Aneurysms with Hydrocoils (presented at 2005 WFITN)

R. Blanc, P. Thomas, P. Brugieres, A. Gaston
Venice, Italy

Conclusions: The use of Hydrocoil appears safe, but owing to the physical properties of the material, difficulties of delivery can be encountered. Early angiographic control shows good stability of the treatment but longer follow-up are needed.

87. Treatment of Intracranial Aneurysms with Hydrogel Coated Expandable Coils: Preliminary Experience in 20 Patients (presented at 2005 WFITN)

T. Gunnarsson, P. Kurflan, R. Willinsky, K. terBrugge
Venice, Italy

Conclusions: In our limited experience, Hydrogel coated coils can be used to successively occlude aneurysms of various sizes with no recanalization seen on short term follow up. The volume expansion of the coils allows for much greater packing than described for bare platinum coils. This could potentially lead to more stable long term results, especially in patients with large and giant aneurysms.

88. Ruptured Intracranial Aneurysms Endovascular Occlusion by Solely Hydrocoils. Single Centre Experience as a Work-in-Progress (presented at 2005 WFITN)

R. Marina, L. Quilici
Venice, Italy

89. Follow-up after Embolization with Hydrocoils in 100 Aneurysms (presented at 2005 WFITN)

R. Chapot, A. Narata, A. Rogopoulos, A. El Serwi, A. Maubon
Venice, Italy

Conclusion: Embolization with Hydrocoils enables to achieve an important filling rate and an occlusion that seems to be more stable than with platinum coils.

90. Wall Enhancement and Edema after Endovascular Coiling of Cerebral Aneurysms: A Comparison Using Platinum, Matrix and Hydrocoil (presented at 2005 WFITN)

R. Willinsky, R. Farb, S. Lee, K. terBrugge
Venice, Italy

Conclusions: Asymptomatic wall enhancement can be seen after coiling with platinum, Hydrocoil or Matrix. It is more common with Hydrocoil. In a number of patients treated with Hydrocoil, asymptomatic peri-aneurysmal edema was found on early imaging. Wall enhancement and peri-lesional edema was more frequent in larger aneurysms that are well packed. The significance of wall enhancement and edema in terms of efficacy of treatment is not yet determined.

91. Comparison of a Current Hydraulic and a New Thermal Detachment System for Coils in Experimental Aneurysms (poster presented at 2005 WFITN)

M. Killer, H. Plenk, A. Lametschwantner, B. Minnich, B. Richling
Venice, Italy

Conclusion: In experimental, bifurcation aneurysms in rabbits, the procedural, angiographic, and histological outcomes were equivalent using the hydraulic and thermal detachment system is not achieved at the expense of performance.

92. HELPS Trial: Presentation of Blinded Data and an Update on Progress (presented at 2006 ABC/WIN Conference)

P. White
Val d'Isere, France

93. Hydrocoils – The Celtic Collaboration (presented at 2006 ABC/WIN Conference)

P. Keston
Val d'Isere, France

94. Do Hydrocoils Allow Partial and Targeted Coiling of Aneurysms? (presented at 2006 ABC/WIN Conference)

R. Chapot
Val d'Isere, France

95. Durable Results in Aneurysms with Better Long Term Efficacy: 248 Aneurysms Treated with Hydrocoils (presented at 2006 ABC/WIN Conference)

J. Dion, H. Shownkeen, A. Boulos, P. Brennan, J. Thornton
Val d'Isere, France

96. Treatment of 179 Aneurysms with Hydrocoils at Emory. Independent Review (presented at 2006 ABC/WIN Conference)

P. Klurfan, T. Gunnarsson, F. Tong, C. Cawley, J. Dion
Val d'Isere, France

97. HydroCoils for the Treatment of Cerebral Aneurysms: Experience with 110 Cases (presented at 2006 AANS/CNS & ASITN Meeting)

A. Arthur, S. Wilson, J. Barr

Conclusions: HydroCoils can be safely and effectively used to treat aneurysms and that the usage of HydroCoils may allow for improved aneurysm filling.

98. Treatment of Cerebral Aneurysm with Hydrogel-Coated Platinum Coils (HydroCoil): Early Results of the First 100 Consecutive Patients (presented at 2006 AANS/CNS & ASITN Meeting)

A. Berenstein, J. Song, Y. Niimi, K. Namba, N. Heran, J. Brisman, M. Madrid, M. Hahoum, M. Kupersmith

Conclusions: HydroCoils are a major advance in the treatment of cerebral aneurysms. Despite limitations, in early follow-up, HydroCoils resulted in less coil compaction/aneurysm recanalization than that reported for GDC platinum coils. Longer follow-up is needed.

99. Coiling of Large Cerebral Aneurysms with HydroCoil: Early Results from a Single Institution (Poster presented at 2006 AANS/CNS & ASITN Meeting)

K. Namba, J. Song, Y. Niimi, N. Heran, M. Kupersmith, A. Berenstein

Conclusions: Use of over 60% HydroCoil in large aneurysms shows a trend toward complete occlusion and less recanalization. Our preliminary results suggest that HydroCoil may be an improvement over GDC in the coiling of larger aneurysms.

100. Aneurysm Treatment with Hydrogel Coated Expandable Coils (Poster presented at 2006 AANS/CNS & ASITN Meeting)

T. Gunnarsson, P. Klurfan, K. terBrugge, R. Willinsky

Conclusions: HydroCoils can be used effectively to treat intracranial aneurysms. The volume expansion allows for much greater packing than bare platinum coils which may result in better long term results. The complication rate is similar to larger current series using bare platinum coils.

101. Transvenous Treatment of Cranial Dural Arteriovenous Fistulas with Hydrogel Coated Expandable Coils (Poster presented at 2006 AANS/CNS & ASITN Meeting)

P. Klurfan, T. Gunnarsson, K. terBrugge, R. Willinsky

Conclusions: HydroCoils can be used effectively and safely to treat intracranial DAVFs transvenously. The volume expansion of these coils may have significant advantage over bare platinum coils and may decrease the procedure time and radiation dose to the patient.

102. HydroCoil Clinical Outcomes and Follow-up (presented at 2006 AANS/CNS & ASITN MicroVention Symposium)

J. Barr

103. DURABLE Registry Update (presented at 2006 AANS/CNS & ASITN MicroVention Symposium)

A. Boulos

104. HydroCoil Clinical Follow-up with Adjudication (presented at 2006 AANS/CNS & ASITN MicroVention Symposium)

J. Dion

105. HEAL and HEAL II Registry Updates (presented at 2006 AANS/CNS & ASITN MicroVention Symposium)

H. Cloft

106. A Prospective Multi-Center Study of the Effectiveness of the HydroCoil Embolic System to Treat Intracranial Aneurysms (presented at 2006 AANS Meeting)

A. Boulos, H. Shownkeen, J. Thornton, E. Deshaies, P. Brennan, N. Fanning

107. The Use of Hydrogel Detachable Coils in the Treatment of Pulmonary Fistulas (presented at 2006 SIR Meeting)

A. Setton, C. Greben, E. Gandras, D. Axelrod, H. Charles

Conclusions: HydroCoils can be a helpful tool in achieving complete focal occlusion of pulmonary fistulazation in combination with platinum detachable coils.

108. HydroCoil Embolization of Dural Carotid Cavernous Fistulas (presented at 2006 ASNR Meeting)

W. Zenzen, A. Evans, S. Boutin, K. Daly, M. Jensen

Conclusions: The volume expansion afforded with HydroCoils may allow for more complete closure of fistula using fewer coils.

109. Follow-up after Embolization with HydroCoils in 100 Aneurysms (presented at 2006 ASNR Meeting)

R. Chapot, A. Narata, A. Rogopoulos, A. Maubon

Conclusions: Embolization with HydroCoils enables a filling rate and occlusion that seems to be more stable than with platinum coils.

110. Endovascular Treatment of 179 Intracranial Aneurysms with Hydrogel-Coated Expandable Coils (presented at 2006 ASNR Meeting)

T. Gunnarsson, P. Klurfan, F. Tong, M. Cawley, J. Dion

Conclusions: In this series of relatively large aneurysms, the immediate and follow-up treatment results compare favorably to series using bare platinum coils with similar or lower complication rates.

111. Treatment of Direct Fistulas with the HydroCoil Embolization System (Poster presented at 2006 ASNR Meeting)

W. Zenzen, A. Evans, S. Boutin, K. Daly, M. Jensen

Conclusions: The volume expansion afforded with HydroCoils may allow for more complete closure of fistula using fewer coils.

112. Transvenous Treatment of Cranial Dural Arteriovenous Fistulas with Hydrogel-Coated Expandable Coils: Techniques, Clinical, and Radiologic Outcome in Seven Consecutive Cases (Poster presented at 2006 ASNR Meeting)

P. Klurfan, T. Gunnarsson, I. Shelef, K. terBrugge, R. Willinsky

Conclusions: HydroCoils can be used effectively and safely to treat intracranial DAVFs tranvenously. The use of HydroCoils may decrease the procedure time and radiation dose to the patient.

113. Tips & Tricks of HydroCoil Utilization in Aneurysm & Patient Management (Presented at 2006 ASITN Practicum)

J. Dion, R. Klucznik, R. Chapot

114. Treatment of 200 Aneurysms at Emory Hospital: An Independent Review (Presented at 2006 SILAN Meeting)

F. Tong

115. HydroCoil Utilization: Tips and Tricks (Presented at 2006 SILAN Meeting)

J. Modenese de Freitas

116. Long-term Follow-up of Aneurysms Treated with HydroCoil (Presented at 2006 SILAN Meeting)

P. Lylyk

117. Experimental Evaluation of a New Hydrogel Coil (Poster presented at 2006 ASITN Course & Workshop)

M. Killer, M. Hauser, T. McCoy, L. Ritter, H. Plenk, Jr., G. Ladurner

Conclusions: HydroCoil Hypersoft HES2 Coils angiographic and histological performance is comparable to the HydroCoil 10 System, but due to the softer polymer, the delivery performance is improved.

118. Comparison of a New Complex Coil to Other 3D-Coils in an Animal Model (Poster presented at 2006 ASITN Course & Workshop)

M. Killer, R. Agic, T. Hauser, P. Wolfsgruber, G. Ladurner

Conclusions: The study shows that the new framing coil may offer superior performance, especially in wide neck aneurysms and further evaluation in a clinical setting will give us the real meaning of these improvements.

119. Comparison of a New Complex Coil to Other 3D-Coils in an Animal Model (MicroVention Symposium conducted at 2006 ASITN Course & Workshop)

Symposium Presenters:

M. Killer – Cytokine and Growth Factor Expression in CSF and Serum in Patients with Hydrocephalus-Clinical

G. Cruise - Cytokine and Growth Factor Expression in CSF and Serum in Patients with Hydrocephalus-Biochemical Analysis

J. Barr – Large and Giant Aneurysm Registry

120. Endovascular treatment of bifurcation aneurysms with Hydrocoils: follow-up results up to 3 years (presented at MicroVention Symposium conducted at 2006 AAIFTN Meeting)

S. Cekirge

Conclusions: In 35 bifurcation aneurysms followed up, aneurysm recanalization developed in 4 patients for a recurrence rate of 11.4% (1 small, 2 large, 1 giant aneurysm that was also partially thrombosed)

121. Embolization with HydroCoils-Single Center Experience (presented at MicroVention Symposium conducted at 2006 AAIFTN Meeting)

R. Chapot

Conclusions: HydroCoil provides: a high degree of aneurysmal filling; no handling related problems, but it is stiffer (use balloon and undersize coil); a significant improvement in stability of coiling (no coil compaction, no cast of coil dislocation)

122. Dural Fistula Treated with HydroCoil at Toronto-Western (presented at MicroVention Symposium conducted at 2006 LINC Course)

K. terBrugge

Conclusions: HydroCoils can be used effectively and safely to treat cranial DAVFs using the transvenous approach; the volume expansion of these coils has potentially a significant advantage over bare platinum coils given the large venous spaces that need to be filled

123. Bifurcating Aneurysms Treated with HydroCoil (presented at MicroVention Symposium conducted at 2006 LINC Course)

S. Cekirge

Conclusions: In 35 bifurcation aneurysms followed up, aneurysm recanalization developed in 4 patients for a recurrence rate of 11.4% (1 small, 2 large, 1 giant aneurysm that was also partially thrombosed)

124. Aneurysm Treatments with HydroCoil at St.Lukes-Roosevelt (presented at MicroVention Symposium conducted at 2006 LINC Course)

A. Berenstein

Conclusions: HydroCoil is a major advancement in the Tx cerebral aneurysms with no recanalization in small aneurysms despite neck anatomy; HydroCoil is the first modified platinum coil that decreases coil compaction and may further improve results with neck protection maneuvers or devices; larger number of cases, longer-term follow up and other single center and multicenter experience are necessary for validation