

AN INTERNATIONAL SURVEY OF ASYMPTOMATIC INCIDENTAL ANEURYSM MANAGEMENT: THE GAP BETWEEN ISUIA AND PRACTICE

Nabeel Al-Shafai MD; Michael Cusimano MD

Introduction

Asymptomatic aneurysm management changed in large part due to the findings printed in such publications as ISUIA I and II. The present and projected future trends in aneurysm management will have significant implications for patients and how we educate future cerebrovascular specialists.

Methods

Previous surveys in this field focus almost exclusively on postoperative outcomes while the focus of this study is the insights of experts into the different treatment methods and the decision-making processes. We present an up to date international survey with a focus on rupture risk factors, management trends and decisions for endovascular vs. open techniques. We then determine the implications of these trends to the practice of neurosurgeons. We summarize our findings from a panel of 231 experts across 5 continents from both academic and private practices, stratifying these experts according to geographic criteria and level of expertise.

Results

- 1) When to treat according to size and location:
- 4 mm: 47.6% for AcoA vs. 50.4% MCA choose to always treat these aneurysms by either clipping (27.2% AcoA vs. 40.1% MCA) or coiling (22.4% AcoA vs. 10.3% MCA).

 10 mm: Equally divided on the choice of endovascular treatment vs. clipping when it came to AcoA. Europe showed a clear bias in favor of choosing coiling as a method of treatment.
- 16 mm:
- There was a clear change in choosing clipping over coiling, even with the AcoA group.
- 2) How to treat using risk factors:

The presence of co morbidities and young age were the most important risk factors in choosing endovascular and open treatment techniques respectively.

Further details and data will be provided.

Conclusions

There is a significant discrepancy between the recommendations of the accepted papers and real world practice that is illustrated in graphs. When this is stratified geographically a significant difference in practice around the world is detected.

Learning Objectives

Find a common ground of approach for all well trained and highly experienced neurosurgeons in the decision-making paradigm and the implications of these trends to the practice of neurosurgeons.

References

- 1. Higashida R, Lahue B, Torbey M, et al. Treatment of Unruptured Intracranial Aneurysms: A Nationwide Assessment of Effectiveness. American Journal of Neuroradiology 2007; 28: 146-151.

 2. Baskaya K, Heros C, Tummala P. Contemporary Management of Incidental Intracranial Aneurysms. PubMed 2005; 18: 9.
- 3. Mitchell P, Kerr R, Mendelow D, et al. Could Late Rebleeding Overturn the Superiority of Cranial Aneurysm Coil Embolization over Clip Ligation Seen in the International Subarachnoid Aneurysm Trial? Journal of Neurosurgery 2008; 108:437-442.
- 4. Molyneux A, Kerr R, Stratton I, et al. International Subarachnoid Aneurysm Trial (ISAT) of Neurosurgical Clipping versus Endovascular Coiling in 2143 Patients with Ruptured Intracranial Aneurysms: A Randomized Trial. Lancet 2002: 360: 1267-1274.
- 2002; 360: 1267-1274.

 5. Molyneux J, Kerr S, Yu M, et al.
 International Subarachnoid Aneurysm
 Trial (ISAT) of Neurosurgical Clipping
 versus Endovascular Coiling in 2143
 Patients with Ruptured Intracranial
 Aneurysms: A Randomized Comparison of
 Effects on Survival, Dependency, Seizures,
 Rebleeding, Subgroups, and Aneurysm
 Occlusion.

Lancet 2005; 366: 809-817. 6. International Study of Unruptured Intracranial Aneurysms Investigators. Unruptured Intracranial Aneurysms: Risk of Rupture and Risks of Surgical Intervention. New England Journal of Medicine 1998; 339: 1725-1733. 7. Wiebers O, Whisnant P, Huston J 3rd, Meissner I, Brown D Jr, Piepgras G, Forbes S, Thielen K, Nichols D, O'Fallon M, Peacock J, Jaeger L, Kassell F, Kongable-Beckman L, Torner C. Unruptured Intracranial Aneurysms: Natural History, Clinical Outcome, and Risks of Surgical and Endovascular Treatment. Lancet 2003; 362: 103-110.

- 8. Campi A, Ramzi N, Molyneux J, et al. Retreatment of Ruptured Cerebral Aneurysms in Patients Randomized by Coiling or Clipping in the International Subarachnoid Aneurysm Trial (ISAT). Stroke 2007; 38: 1538-1544. 9. Raymond J, Guilbert F, Weill A, et al.
- 9. Raymond J, Guilbert F, Weill A, et al. Long-term Angiographic Recurrences after Selective Endovascular Treatment of Aneurysms with Detachable Coils. Stroke 2003; 34:1398-1403.
- 10. Sluzewski M, Jan van Rooij W, Beute, et al. Balloon-assisted Coil Embolization of Intracranial Aneurysms: Incidence, Complications, and Angiographic Results. Journal of Neurosurgery 2006; 105: 396-399.
- 11. Lanzino G, Fraser K, Kanaan Y, et al. Treatment of Ruptured Intracranial Aneurysms since the International Subarachnoid Aneurysm Trial: Practice Utilizing Clip Ligation and Coil Embolization as Individual or Complimentary Therapies. Journal of Neurosurgery 2006; 104: 344-350. 12. Wermer M. J. H, van der Schaaf I. C, Algra A, et al. Risk of Rupture of Unruptured Intracranial Aneurysms in Relation to Patient and Aneurysm Characteristics: An Updated Meta-Analysis. Stroke 2007; 38: 1404-1410. 13. van der Schaaf C, Brilstra H, Rinkel E, et al. Quality of Life, Anxiety, and Depression in Patients with an Intracranial
- Relation to Patient and Aneurysm
 Characteristics: An Updated Meta-Analysis.
 Stroke 2007; 38: 1404-1410.
 13. van der Schaaf C, Brilstra H, Rinkel E, et al. Quality of Life, Anxiety, and
 Depression in Patients with an Intracranial
 Aneurysms or Arteriovenous
 Malformation. Stroke 2002; 33:440-443.
 14. Murayama Y, Nein L, Duckwiler G, et al.
 Guglielmi Detachable Coil Embolizatoin of
 Cerebral Aneurysms: 11 Year Experience.
 Journal of Neurosurgery 2003; 98: 945-947.

Self-Expanding Stent for the Treatment of Intracranial Aneurysms. Journal of Neurosurgery 2005; 102: 235-41. 16. Nguyen N, Raymond J, Guilbert F, et al. Association of Endovascular Therapy of very Small Ruptured Aneurysms with Higher Rates of Procedure-Related Rupture. Journal of Neurosurgery 2008; 108: 1088-1092.

- 17. Lanzino G, Kallmes F. Endovascular Treatment of very Small Ruptured Intracranial Aneurysms (Editorial). Journal of Neurosurgery 2008; 108: 1088-1092.
 18. Bracard S, Abdel-Karim A, Thuiller L, et al. Endovascular Coil Occlusion of 152 Middle Cerebral Artery Aneurysms: Initial and Midterm Angiographic and Clinical Results. Journal of Neurosurgery 2010; 112: 703-708.
- 19. Lanzino G, Brinijikh W. Embolization of Middle Cerebral Artery Aneurysms: Ready for Prime Time? Journal of Neurosurgery 2010; 112: 701-702.
- 20. Raftopoulos C. Is Surgical Clipping Becoming Underused? Acta Neurochirurgica 2005; 147: 117-124. 21. Sade B, Mohr G. Critical Appraisal of the International Subarachnoid Aneurysm Trial (ISAT). Neurology India 2004; 52: 32-35.
- 22. Spears J, Jonas-Kimchi T, Gray B,
 Cusimano M, Noel de Tilly L, Moulton R,
 Muller P, Perrin R, Tucker W, Montanera
 W, and Marotta T. Current Trends in the
 Management of Ruptured Intracranial
 Aneurysms in Toronto following the
 International Subarachnoid Trial.
 Canadian Journal of Neurological Sciences
 2005; 32(Suppl.1):S7.
- 23. Lindsay W. The Impact of the International Subarachnoid Aneurysm Treatment Trial (ISAT) on Neurosurgical Practice. Acta Neurochirurgica 2003; 145: 97-99.
- 24. Kirkpatrick J, Kirollos W, Higgins N, Matta B. Lessons to be Learnt from the Subarachnoid Aneurysm Trial (ISAT). British Journal of Neurosurgery 2003; 17: 5 -7.
- 25. Maurice-Williams S, Lafuente J. Intercranial Aneurysm and its Future. Journal of the Royal Society of Medicine 2003; 96:540-543.
- 26. Kalfas H & Little R. Postoperative Hemorrhage: Survey of 4992 Intracranial Procedures. Neurosurgery 1988; 23: 343-374.

27. Servadei F, Murray D, Teasdale G, Dearden M, Iannotti F, Lapierre F, Maas R, Karimi A, Ohman J, Persson L, Stocchetti N, Trojanowski T, Unterberg A. Traumatic Subarachnoid Hemorrhage: Demographic and Clinical Study of 750 Patients from the European Brain Injury Consortium Survey of Head Injuries. Neurosurgery 2002; 50: 261-269.

28. Brilstra H, Rinkel E, van der Graaf Y, Sluzewski M, Groen J, Lo H, Tulleken F, Quality of Life after Treatment of Unruptured Intracranial Aneurysms by Neurosurgical Clipping or by Embolisation with Coils, Cerebrovascular Disease 2004; 17: 44-52.

29. Johnston C, Wilson B, Halbach V, Higashida T, Dowd F, McDermott W, Appelbury B, Farley L, Gress R. Endovascular and Surgical Treatment of Unruptured Cerebral Aneurysms: Comparison of Risks. Annals of Neurology 2000; 48: 11–19.

30. Andrew J Molyneux, Richard SC Kerr, Jacqueline Birks, Najib Ramzi, Julia Yarnold MA, Mary Sneade, Joan Rischmiller, for the ISAT collaborators. Risk of recurrent subarachnoid haemorrhage, death, or dependence and standardised mortality ratios after clipping or coiling of an intracranial aneurysm in the International Subarachnoid Aneurysm Trial (ISAT): long-term follow-up. The Lancet Neurology, Volume 8, Issue 5, Pages 427 - 433, May 2009

200 Monique H M Vlak, Ale Algra, Raya Brandenburg, Gabriël J E Rinkel Prevalence of unruptured intracranial aneurysms, with emphasis on sex, age, comorbidity, country, and time period: a systematic review and meta-analysis.

300 Joshua B. Bederson, Issam A. Awad,
David O. Wiebers, David Piepgras, E. Clarke
Haley, Jr, Thomas Brott, George
Hademenos, Douglas Chyatte, Robert
Rosenwasser and Cynthia Caroselli.
Recommendations for the Management of
Patients With Unruptured Intracranial
Aneurysms: A Statement for Healthcare
Professionals From the Stroke Council of the
American Heart Association Stroke 2000,
31:2742-2750

400. Bederson B, Awad A, Wiebers O,
Piepgras D, Haley Jr., Brott T, Hademenos
G, Chyatte D, Rosenwasser R, Caroselli C.
300 Recommendations for the Management
of Patients with Unruptured Intracranial