

# 3<sup>rd</sup>

## MENA - SINO

**Narrow the Gap Between Rich  
and Poor Stroke Care System**



In collaboration with

**ESS (Egyptian Society of Stroke)  
CNS (Cairo Neurology Specialist)**

**ESNS (Egyptian Society of Neurological Surgeons)  
ESON (Egyptian Society of Neuroradiology)**

Endorsed by

- ESO (European stroke organization)
- SVIN (Society of Vascular and Interventional Neurology)
- SNIS ( Society of Neurointerventional Surgery )
- AAFITN (Asian Australian Federation of Interventional and Therapeutic Neuroradiology)
- AFAN (African Academy of Neurology)
- SANS ( Saudi Association of Neurological Surgery)
- SNCCC ( Saudi Neurocritical Care Chapter)

Honorary President

Saher Hashem  
Farouk Talaat

Mamdouh Salama  
Ashraf Ghobashy

Ahmed Sami  
Fathy Afifi

Presidents of the Conference

Khaled Sobh

Mohamed Alaa

Secretary of conference

Farouk Hassan

Mena Sino President


Ossama Yassin Mansour

21<sup>st</sup>-22<sup>nd</sup> June 2018

Intercontinental Cairo Semiramis Hotel

[www.mena-sino.org](http://www.mena-sino.org)

[meeting@mena-sino.com](mailto:meeting@mena-sino.com)

 Mena-Sino in Egypt

Congress App: <https://snappy.appypie.com/html5/menasino2018>



# Welcome Message

It is great pleasure to welcome you to the 3rd Meeting of MENA-SINO , organized by the Middle East North Africa Stroke & interventional neurotherapies organization, the most significant stroke and neurovascular event in Africa and the Middle East. Egyptian Neurointerventionalists and stroke specialists are honored to be affiliated to this respected society which had been founded in 2013, and Since that time, the MENA-SINO is playing an active role in the progress of Stroke and neurointerventional practice on local, regional, continental and international levels.

We are truly fortune to have this meeting done in collaboration with the Egyptian society of stroke (ESS) and the African Academy of neurology (AAN). The scientific program is outstanding, with high standard courses, distinguished speakers from all over the world, and highly educational and fascinating presentations.

Between the dream and reality, I strongly believe that these sessions and courses will guide our young neurointerventionalists and stroke specialists , expanding their intellects, strengthening their technical skills, introducing them to a new era with a brighter future.

Cairo had always been the melting point of different cultures, and will now offer the chance for all neurovascular specialists from different countries to get together. With great respect to our remarkable history extending among thousands of years, and historical places attracting people from all over the world, our city presents a modern surrounding with its educational institutes, developing infrastructure, national and international shopping possibilities.

The 2018 meeting takes place at the Intercontinental Citystars Hotel, located in the spark of the city, with an amazing panoramic view over the beautiful turquoise Nile River, few steps from the Egyptian Museum, Tahrir Square and Down Town.

My best wishes to all our guests to have a pleasant stay in this beautiful historical city, and to all of you to have a memorable gathering and a successful great event.



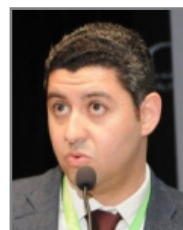
**Ossama Mansour**  
*Ossama Mansour*  
President of the MENA-SINO



**Mohamed Alaa**  
*Mohamed Alaa*  
Chairman of  
3rd MENA-SINO Congress



**Khaled Sobh**  
*Khaled Sobh*  
Chairman of  
3rd MENA-SINO Congress



**Farouk Hassan**  
*Farouk Hassan*  
Secretary of  
3rd MENA-SINO Congress

## Honorary Presidents

Saher Hashem



Mamdouh Salama



Ahmed Sami



Farouk Talaat



Ashraf Ghobashy



Fathy Afifi



## Presidents of the Conference

Khaled Sobh

Mohamed Alaa

## Secretary of the Conference

Farouk Hassan

## Mena Sino President

Ossama Yassin Mansour

## Scientific Board

Abeer Bekhit  
Adel Elhuzzini  
Adnan Siddique  
Ahmed Abdel Bar  
Ahmed El Nemr  
Ahmed Hegazy  
Ahmed Sobri  
Ahmed Sultan  
Ali Rabae  
Anchalee Churojana  
Ayman Ismail  
Azza Ghali  
Bassem Henery  
Dileep Yavagal  
Farid Eladham  
Farouk Hassan  
Fathi Afifi  
Foad Abd-Allah  
Hany Fekry  
Hany Zaki El Deen  
Hazem Abdel Khalik

Hossam Egila  
Islam El Malky  
Islam Eldesoky  
Khaled Sobh  
Luigi Manfre  
Maher Saqur  
Mahmoud Abd El-Moety  
Mahmoud Galal  
Mahmoud Mostafa  
Mohab Mohamed  
Mohamed Abdel Aal  
Mohamed Alaa  
Mohamed E Isherbini  
Mohamed Ghorbani  
Mohamed Kassem  
Mohamed Khaled  
Mohamed Khalil  
Mohamed Nabil  
Mohamed Shadad  
Mohamed Zaiton  
Momen Al Maamon

Mostafa Nabeeh  
Nabil El Agouz  
Rashad Hamdy  
Sam Zaidat  
Sameh Fathy  
Sameh Saleh  
Sayed El Zayat  
Shady Mashhor  
Sherif Hashim  
Tamer El Serafi  
Tamer Hassan  
Tamer Ibrahim  
Tarek Gamal  
Tarek Meneci  
Tarek Sinan  
Umair Rashid  
Wael El Shawaf  
Walid Khalef  
Wesam Fathy

## Guest Speakers



Prof. Hans Henkes  
(Germany)



Prof. Anchalee Churojana  
(Thailand)



Prof. Adnan Siddiqui  
(USA)



Prof. Dileep Yavagal  
(USA)



Prof. Nader Souror  
(France)



Prof. Kharal Ghulam Abbas  
(USA)



Prof. Syed Zaidi  
(USA)



Prof. Raul Nogueira  
(USA)



Prof. Shigeru Miyachi  
(Japan)



Mr. Dhirenkumar Patel  
(UK)



Prof. Umair Rashid  
(Pakistan)



Prof. Marc Ribo  
(Spain)



Prof. Tufail Patankar  
(UK)



Prof. Hossam Al-Jehani  
(KSA)



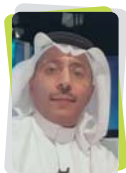
Prof. Ashfaq Shuaib  
(Canada)



Prof. Mohammed Ghorbani  
(Iran)



Prof. Ahmed Muda  
(Malaysia)



Prof. Ali Alkhatami  
(KSA)





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## Session 1



Cleopatra Room

08:30 - 09:50 am

## Chairpersons

Prof. Ashraf Abdo

Prof. Ismail Ramadan

Prof. Anchalee Churonjana

Prof. Abdel Nasser Mourad

Prof. Tamer Hassan

- 8:30-8:40 am Prof. Umair Rashid Pakistan  
Techniques in Aneurysm Treatment :Embolization of intracranial Aneurysms without assisting technique ,how far can we go and why
- 8:40-8:55 am Prof. Tamer Hassan Egypt  
Aneurysms between Clipping and Coiling in low Economic Countries
- 8:55-9:10 am Prof. Foad Abd-Allah Egypt  
MENA Stroke Burden
- 9:10-9:25 am Prof. Sameh Saed Egypt  
Constructed stroke services & Thrombolysis in MENA region
- 9:25-9:40 am Prof. Ali Khathami KSA  
Stroke Certification training in MENA region could be possible or not and how?
- 9:40-9:45 am Discussion
- 9:45-9:50 am Break



## Session 2



Cleopatra Room

09:50 – 11:10 am

### Chairpersons

Prof. Fathy Afifi  
 Prof. Abdel Halim Tantawy  
 Prof. Ayman Ezz Eldeen  
 Prof. Moustafa Mahmoud  
 Prof. Ahmed Elserwi

- 9:50-10:05 am **Prof. Farouk Hassan** **Egypt**  
 Recent and ongoing trails for Acute Ischemic Stroke Management
- 10:05-10:15 am **Prof. Azza Ghali** **Egypt**  
 Penumbra as the target for hyper acute Stroke treatment what is in the literature
- 10:15-10:25 am **Prof. Ismail Ramadan** **Egypt**  
 PFO Closure in cryptogenic stroke ; should become routine for secondary prevention (PRO)
- 10:25-10:35 am **Prof. Amr Elfatary** **Egypt**  
 PFO Closure in cryptogenic stroke ; should become routine for secondary prevention (CONS)
- 10:35-10:50 am **Prof. Fathy Afifi** **Egypt**  
 Neuroimmunology of Stroke what we should know
- 10:50-11:05 am **Prof. Hazem Maarouf** **Egypt**  
 Resumption of oral anticoagulations after ICH ; Who , When and How
- 11:05-11:10 am **Discussion**

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## Session 3



Cleopatra Room

11:10 – 12:35 pm

## Chairpersons

Prof. Ali Khatami  
 Prof. Rashad Hamdy  
 Prof. Sahar Nasr  
 Prof. Umair Rashid  
 Prof. Ali Soliman

- 11:10-11:25 am Prof. Marco Ribo Spain  
 Comprehensive stroke pathways. Different scenarios too complete or create the cycle of stroke chains
- 11:25-11:40 am Prof. Ashfaq Shuaib Canada  
 Prehospital and ER phase, how we could make things faster in chaos
- 11:40-11:50 am Prof. Ahmed Subrai Muda Malaysia  
 Neuroimaging predictors in AVM , pre-intra-hemorrhagic ictus
- 11:50-12:05 pm Prof. Ramy Edward Egypt  
 State of the Art imaging for diagnosis & treatment of Acute ischemic stroke
- 12:05-12:15 pm Prof. Mohamed Ghobrani Iran  
 Do we need to follow clipped aneurysms angiographically?
- 12:15-12:30 pm Prof. Ashfaq Shuaib Canada  
 Remote Ischemic preconditioning-collateral pathway , the old theory could be a new target for Neuroprotection in acute ischemic stroke.
- 12:30-12:35 pm Discussion



## Session 4

  
Cleopatra Room

12:35 – 01:25 pm

### Chairpersons

Prof. Alaa Fakhr  
Prof. Mohamed Moustafa  
Prof. Adel Hassanin  
Prof. Magdy Eidaous  
Prof. Ossama Mansour

12:35-1:00 pm    Prof. Hans Henkes    Germany  
Recorded Cases From Stuttgart, Germany

1:00-1:20 pm    Prof. Hans Henkes    Germany  
Why Thrombectomy Fails Sometimes

1:20-1:25 pm    Discussion



## Opening Ceremony

1:25-2:00 pm

### Chairpersons

Prof. Ahmed Deif  
Prof. Nadia Hafez  
Prof. Omar Elserify  
Prof. Ismael Montasser  
Prof. Ahmed ElNmr

Lunch MENA SINO Research Symposium  
AOP1,AOP2,AOP3,AOP4,AOP5

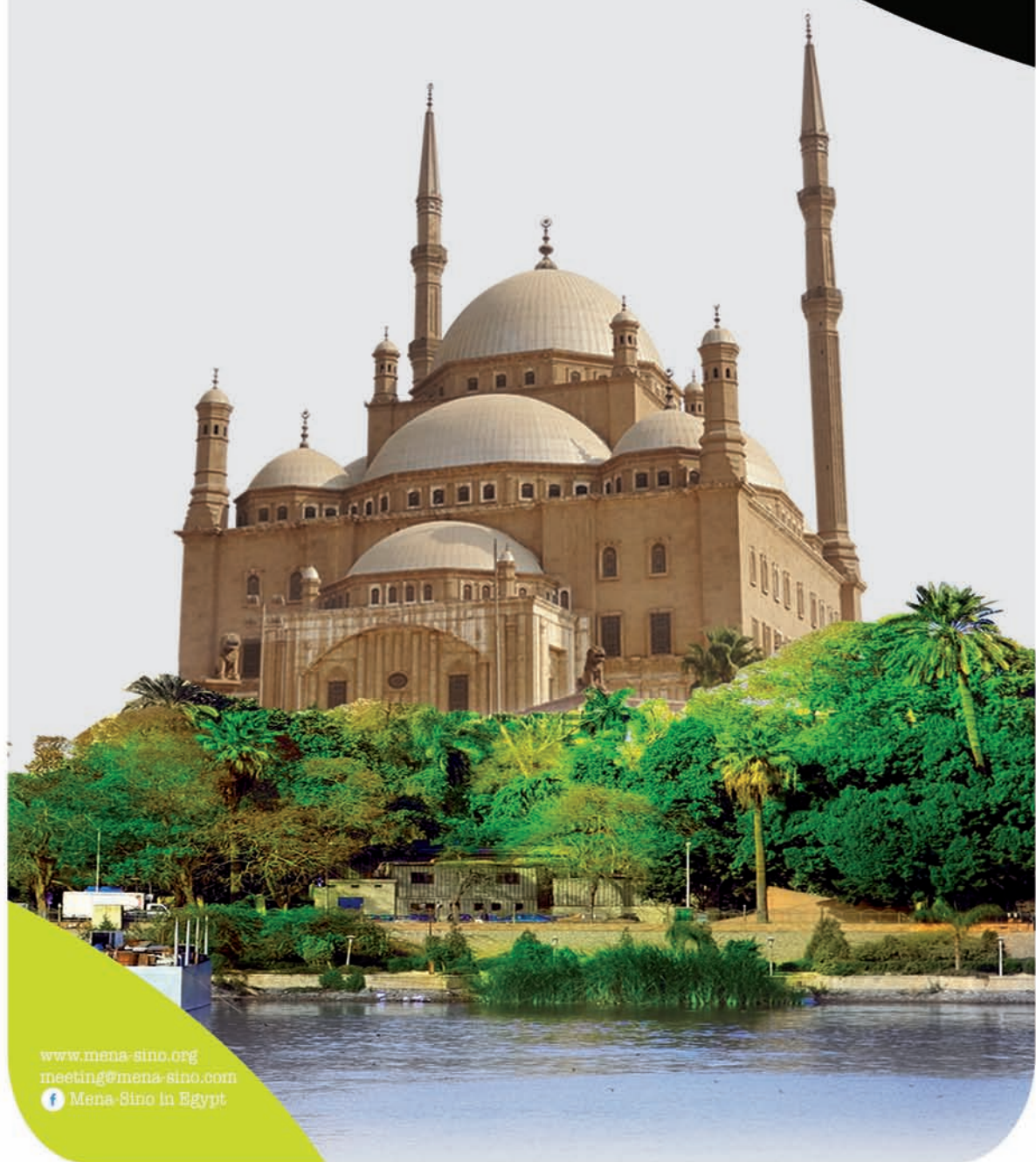
2:00-2:30 pm

Accepted Poster Refer to Posters Area

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## Session 5



Cleopatra Room

02:30 - 03:30 pm

### Chairpersons

Prof. Mamdouh Salama  
 Prof. Ahmed Sami  
 Prof. Ashraf Ghobashe  
 Prof. Farouk Talat  
 Prof. Tufail Patankar

- |              |   |
|--------------|---|
| 2:30-2:40 pm | <p>Prof. Tufail Patankar      UK</p> <p>Blister &amp; Dissecting Aneurysm treatment :Endovascular approaches and strategies</p>   |
| 2:40-2:50 pm | <p>Prof. Tufail Patankar      UK</p> <p>STENT RETRIEVAL for AIS treatment is enough</p>   |
| 2:50-3:00 pm | <p>Prof. Marc Ribo      Spain</p> <p>ADAPT in AIS treatment is enough</p>   |
| 3:00-3:10 pm | <p>Dr. Mohamed Nabil      Egypt</p> <p>Aspiration only Technique versus Stent retrievers as a first line<br/>                         Thrombectomy in acute ischemic stroke :Initial experience at the University of Zurich</p> |
| 3:10-3:20 pm | <p>Prof. Nader Sorour      France</p> <p>Should patients with suspicion of LVO be transferred to CSC bypassing next PCS , PRO</p>   |



3:20-3:30 pm

Prof. Ali Khatami

KSA

Should patients with suspicion of LVO be transferred to CSC bypassing next PCS . CON

Discussion



## Session 6



Cleopatra Room

03:30 – 04:45 pm

### Chairpersons

Prof. Saher Hashem

Prof. Marc Ribo

Prof. Nabil Elagouz

Prof. Raul Nogueira

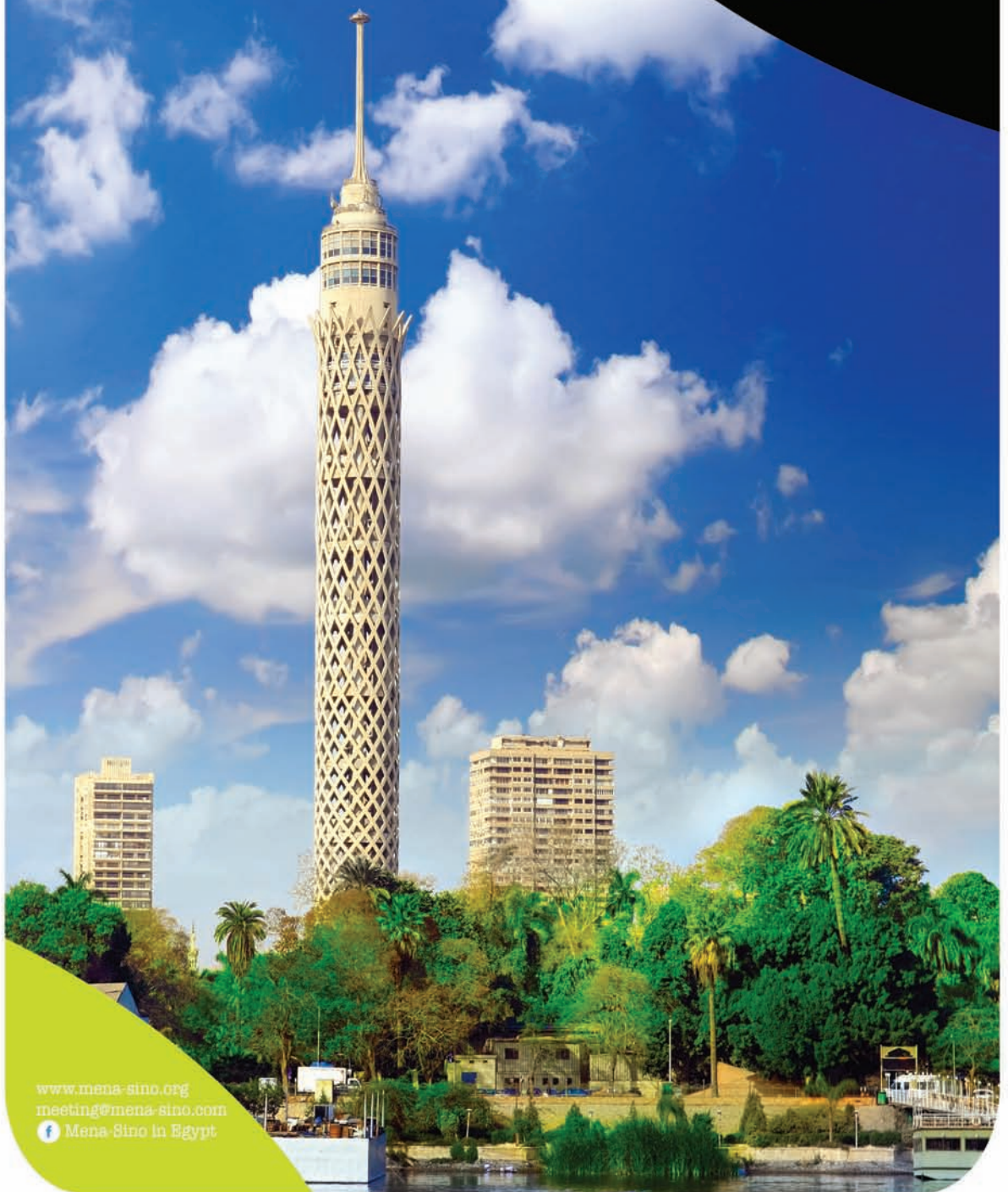
Prof. Ashfaq Shuaib

- |              |                       |       |  |
|--------------|-----------------------|-------|--|
| 3:30-3:55 pm | Prof. Raul Nogueira   | USA   | Recorded Cases from Emory MA, USA  |
| 3:55-4:10 pm | Prof. Raul Nogueira   | USA   | Acute stroke patients are heterogeneous spectrum from fast to slow progressors , New evidence from trials. |
| 4:10-4:20 pm | Prof. Hosam El-Jehani | KSA   | SAH & IVH critical care, what physician wants?   |
| 4:20-4:30 pm | Prof. Mohamed Alaa    | Egypt | MoyaMoya : epidemiology, diagnosis,& treatment from MENA prospective                                       |
| 4:30-4:40 pm | Prof. Ahmed Naser     | Egypt | Intracranial pressure management in critical care of stroke patients                                       |
| 4:40-4:45 pm | Discussion            |       |  |

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## Session 7



Cleopatra Room

04:45 – 06:35 pm

### Chairpersons

Prof. Shigeru Miyachi  
 Prof. Mohamed Hamdy  
 Prof. Shora Yossef  
 Prof. Dileep Raghavendra Yavagal  
 Prof. Hoda Tamon

- |              |   |
|--------------|---|
| 4:45-5:00 pm | <p><b>Prof. Shigeru Miyachi</b>    Japan</p> <p>Endovascular therapy for idiopathic intracranial hypertension when and how?</p>                                   |
| 5:00-5:10 pm | <p><b>Prof. Mohamed Hamdy</b>    Egypt</p> <p>How to identify which patients with asymptomatic carotid stenosis could benefit from endarterectomy or stenting</p> |
| 5:15-5:30 pm | <p><b>Prof. Ashraf Abdo</b>    Egypt</p> <p>Reversible cerebral vasoconstriction syndrome common or uncommon presentation</p>                                     |
| 5:30-5:45 pm | <p><b>Prof. Marc Ribo</b>    Spain</p> <p>Tools that could help rapid triage ( eg prehospital scales)</p>   |
| 5:45-6:00 pm | <p><b>Prof. Shora Yossef</b>    Egypt</p> <p>Approach to Pediatric patient with ischemic stroke</p>   |

- 6:00-6:15 PM     Dr.Raghda Zaitoun ,  
Dr. Maha Zakariya Ramadan  
The Many Faces of Pediatric Stroke
- 6:15-6:30 pm     Prof. Dileep Raghavendra Yavagal     USA  
Mechanical thrombectomy in childhood stroke why is not that easy to be like adults
- 6:30-6:35 pm     Discussion





## Session 8



Cleopatra Room

06:35 – 08:30 pm

### Chairpersons

Prof. Nabil Kitchener  
 Prof. Ehab Shaker  
 Prof. Hassan Gad  
 Prof. Ahmed Hegazy  
 Prof. Ramez Reda

6:35-6:45 pm    Prof. Nabil Kitchener    Egypt  
 Intracranial atherosclerosis , problem magnitude in MENA

6:45-6:55 pm    Prof. Ramez Reda    Egypt  
 Intracranial atherosclerosis , Best Medical treatment is enough

6:55-7:05 pm    Prof. Wessam Fathi    Egypt  
 Intracranial atherosclerosis , EVT when & how

7:05-7:10 pm    Prof. Umair Rhashid    Egypt  
 Recorded Cases from Lahore General Hospital Pakistan

7:10--7:15 pm    Discussion

### Nefertiti Room

4:30-8:00    Pain and Minimally Invasive spine Interventions Workshop

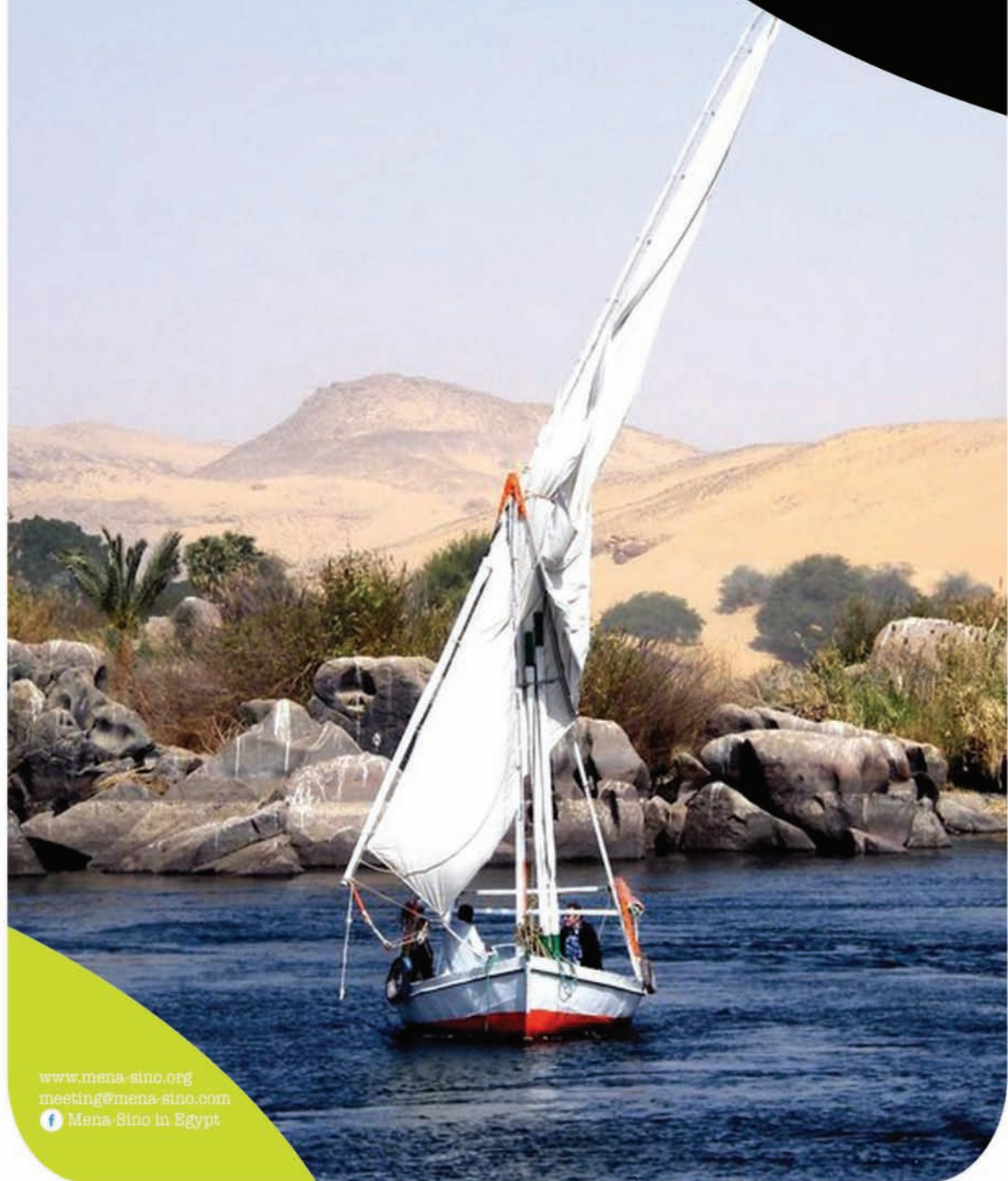
### Cleopatra Room

7:30-8:30    Diploma Exam Part 1

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## Session 9



Cleopatra Room

09:00 – 10:15 am

### Chairpersons

Prof. Azza Ghali  
 Prof. Ayman Nassef  
 Prof. Khaled Sobh  
 Prof. Foad Abd-Allah  
 Prof. Farouk Hassan

- 9:00-9:20 am Prof. Shigeru Miyachi Japan  
 Recorded cases from Neuroendovascular Therapy Center, Aichi Medical University
- 9:20-9:30 am Prof. Shigeru Miyachi Japan  
 Cerebral Dural fistula : Practical classification & best treatment approach
- 9:30-9:40 am Prof. Anchalee Churonjana Thailand  
 Dural AUF: how to avoid complications
- 9:40-9:50 am Dr. Islam Eldesoky, Egypt  
 Dural AUF ; embolizing via venous arterial route which & when
- 9:50-10:00 am Prof. Khaled Sobh, Egypt  
 CCF : Classification and best approach of treatment
- 10:00-10:10 am Prof. Wassim Hamed, Egypt  
 Spinal Cord AUMs systematic Review
- 10:10-10:15 am Discussion



## Session 10



Cleopatra Room

10:05 – 11:35 am

## Chairpersons

Prof. Khaled Elbahy

Prof. Anchalee Churonjana

Prof. Hans Henkes

Prof. Amr Salem

Prof. Tamer Hassan

10:15-10:25 am Prof. Hans Henkes Germany

Flow diversion for complex aneurysms treatment, anterior vs posterior circulation ones

10:25-10:35 am Prof. Mohamed Khaled Egypt

Lessons from ARUBA and DAY practice , the difference between VR &amp; RL ( virtual reality and real life )

10:35-10:45 am Prof. Farouk Hassan Egypt

Pressure Cooker Technique :New Era for AVM and Dural Fistula Embolization

10:45-10:55 am Prof. Khaled Sobh Egypt

Endovascular approach in AVM will be curative for most AVM cases

10:55-11:05 AM Prof. Ahmed Hegazy Egypt

Neurosurgery will be considered the standard treatment for most AVM cases

11:05-11:15 am Prof. Talaat Hassan Egypt

Vessel Wall Imaging

- 11:15-11:25 am Prof. Syed Zaidi USA  
Clot imaging in stroke patient ready for clinical use and its implication on Device industry
- 11:25-11:35 am Prof. Mohamed Shadad Egypt  
Transarterial Embolization of Brain Hypervascular Tumours
- 11:35-11:40 pm Discussion
- 11:40-12:45 pm Prayer and Break



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## Session 11



Cleopatra Room

12:45 – 02:00 pm

### Chairpersons

Prof. Naser ElGhandour  
 Prof. Hazem Maarouf  
 Prof. Hosam El-Jehani  
 Prof. Mohamed Alaa  
 Prof. Kharal Ghulam Abbas

- |               |                           |          |   |
|---------------|---------------------------|----------|---|
| 12:45-1:05 pm | Prof. Anchalee Churonjana | Thailand | Cases from Siriraj Hospital , Mahidol University , Bangkok , Thailand                       |
| 1:05-1:15 pm  | Prof. Hosam El-Jehani     | KSA      | Small unruptured aneurysms, risk of treatment, results of GREAT trial.                      |
| 1:15-1:25 pm  | Prof. Mohamed Alaa        | Egypt    | Giant Anterior Circulation aneurysms , Endovascular choices :Risk and outcome. Poor Vs Rich |
| 1:25-1:35 pm  | Prof. Tamer Hassan        | Egypt    | Blister & dissecting aneurysm :the role of Surgery PROS                                     |
| 1:35-1:45 pm  | Prof. Ali Khathami        | KSA      | Vasospasm, how to expect, how to treat  |
| 1:45-1:55 pm  | Dr. Mohamed Zaiton        | Egypt    | Side Branch aneurysm, EUT , Strategies of treatment   |
| 1:55-2:00 pm  | Discussion                |          |   |

3rd Mena - Sino Poor Vs Rich



## Session 12

  
Cleopatra Room

02:00 – 02:45 pm

Industrial Symposium and Lunch

### Moderator

Prof. Ossama Mansour

### Chairpersons

Prof. Raul Noguera

Prof. Dileep Raghavendra Yavagal

Prof. Marc Ribo

Prof. Mohamed Alaa

Prof. Farouk Hassan



## Session 13

SINO Research Symposium



Cleopatra Room

02:30 – 02:50 pm

### Chairpersons

Prof. Tarek Menice

Prof. Gareeb Fawi

Prof. Mahmoud AbdElmoaty

Prof. Kamel Hewedy

Maj.Gen. Dr. Ossama Zein

Maj.Gen.Dr. Wael Elshawaf

AOP6,AOP7,AOP8,AOP9



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## Session 14



Cleopatra Room

02:50 - 03:30 pm

### Chairpersons

Prof. Mahmoud Haroun  
Prof. Anchalee Churonjana  
Prof. Ahmed Sorbi Muda  
Prof. Syed Zaidi  
Prof. Mahmoud Moustafa

2:50-3:15 pm    Prof. Adnan Siddiqui    USA  
Recorded Cases From Buffalo New York

3:15-3:25 pm    Prof. Adnan Siddiqui    USA  
Paradigm for treatment of Giant & complex bifurcation aneurysms using  
New devices

3:25-3:30 pm    Discussion



## Session 15

  
Cleopatra Room

03:30 – 04:00 pm

### Chairpersons

Prof. Kamel Hewedy  
Prof. Sayed El-Zayat  
Prof. Nabil Elagoz  
Prof. Ayman Ismail  
Prof. Wael Fadel

3:30-3:45 pm    Prof. Ehab Shaker    Egypt  
Antithrombotic drugs approach post stroke , current guidelines and odd situations

3:45-4:00 pm    Prof. Eman Khedr    Egypt  
TMS in Stroke management , the Egyptian Experience

Break



## Session 16



Cleopatra Room

04:00 – 08:00 pm

### Chairpersons

Prof. Anwer ElEtrebi  
 Prof. Farouk Talaat  
 Prof. Dileep Raghavendra Yavagal  
 Prof. Huda Massoud  
 Prof. Tarek El Raghy  
 Prof. Ossama Mansour

- 4:00-4:20 pm    **Prof. Marc Ribo**    **Spain**  
 Recorded cases from Stroke Unit. Department of Neurology; Neurologist.  
 Hospital Vall d'Hebron. Barcelona
- 4:20-4:35 pm    **Prof. Dileep Yavagal**    **USA**  
 MT 2020 global campaign to accelerate stroke thrombectomy access.
- 4:35-4:50 pm    **Prof. Kharal Ghulam Abbas**    **USA**  
 Global LVO burden and barriers to MT access
- 4:50-5:05 pm    **Prof. Ossama Mansour**    **Egypt**  
 What are the obstacles that decrease the number of MT in MENA-region .  
 Onsite overview
- 5:05-5:20 pm    **Prof. Syed Zaidi**    **USA**  
 MT 2020 App how could technology support stroke Practice in the  
 world
- 5:20-5:30 pm    **Discussion**

5:30-5:45 pm Prof.Mohamed Alaa,  
Prof. Tamer Hassan ,  
Prof.Mohamed Ghobrani  
Discussion & recorded cases from  
Egypt & Iran

Cleopatra Room

5:45-8:00 Neuro-critical Care Workshop

Nefertiti Room

5:45-8:00 Neuro-Endovascular Hemodynamics Workshop

Cleopatra Room

8:00-9:00 Diploma Exam Part 2

## Pre-congress Workshop

### Technician Workshop

19th of June

Institute of Diabetes and Endocrinology Cath. Lab

### Basic Endovascular Workshop

20th of June

Institute of Diabetes and Endocrinology Cath.Lab

### Advanced Endovascular Hands On Workshop

20th of June

Institute of Diabetes and Endocrinology Cath.Lab

## Post-congress Workshop

### Hands On Cadaveric Pain and Minimally

### Invasive Spine Workshop

23rd of June

Alazhar University Morgue

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# Accepted Oral Presentations



## AOP 1

## EVENT ABSTRACT

## Mobile Real-time Tracking of Acute Stroke Patients and Instant, Secure Inter-team Communication - The EgyptianStrokeNetwork mobile App

ossama y. Mansour<sup>1</sup>, aser gomaa<sup>1</sup>, abdul rahman m. Saad<sup>1</sup> and mohammed anwar<sup>1</sup>

<sup>1</sup> Neurology Department Stroke and interventional neurology center, Alexandria University, Egypt

### Purpose

The primary correlate to survival and preservation of neurologic function in patients suffering from an acute ischemic stroke is time from symptom onset to initiation of therapy and reperfusion. Communication and coordination among members of the stroke team are essential to maximizing efficiency and subsequently early reperfusion. In this work, we aim to describe our preliminary experience using the Join mobile application as a means to improve interdisciplinary team communication and efficiency.

### Materials and Methods

We describe our pilot experience with the initiation of the EgyptianStrokeNetwork mobile application between Jan. 2017 and March 2018. With this application, a mobile beacon is transported with the patient on the ambulance. Transportation milestone timestamps and geographic coordinates are transmitted to the treating facility and instantly communicated to all treatment team members. The transport team / patient can be tracked en route to the treating facility.

Additionally, RACE scale based interactive forum to predict LVO stroke is included which is of Arabic Interface to facilitate its use by paramedical and patients relative personal is included.

### Results

During our pilot study, 42 patients were triaged and managed using the EgyptianStrokeNetwork application. Automated time-stamping of critical events, geographic tracking of patient transport and summary documents were obtained for all patients. Treatment team members had an overall favorable impression of the Join application and recommended its continued use. 15 cases were LVO and Reporting for LVO stroke was effective with sensitivity of (75%, 10 cases) of actually LVO which was confirmed later on. while 28 cases were driven to nearest ready center with notification onset to door mean time 46+/-12 min. Cases triaged by app had shorter intrahospital workflow time with average mean time reduction of 28+/-14 min.

### Conclusion

The EgyptianStrokeNetwork application is one of several components of a multi-institutional, interdisciplinary effort to improve the treatment of patients with acute ischemic stroke. The ability of the treatment team to track patient transport and communicate with the transporting team may improve reperfusion time and, therefore, improve neurologic outcomes.

**Keywords:** Mobile smartphone application, Acute ischemic stroke management, Acute ischemic stroke workflow, Egyptian experience

## Acknowledgements

On behave of Alexandria university stroke team

Farouk M. Talaat, Ahmed Deif, Nadia Haez, Aymen Ezeldeen , Mohamed Foad, Abdelfatah Elkersh, Asherf abdo, Ismail Ramdan , Sameh saed, hazem marouf, mohamed hamdy, (Neurology departement )

Tamer hassen, Nadeem abdelrahman , Ahmed sultan, tamer ibrahim (neurosurgery department)

Tamer abdalla , amero abdalla , mohamed megahed , mohamed abdelalleam ( neurocritical department)

## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Keywords:** smartphone app, stroke organization, Triage, Large vessel occlusion, acute stroke treatment, EgyptiannStrokeNetwork

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** Stroke Unit Organization

**Citation:** Mansour oy, goma a, Saad am and anwar m. Mobile Real-time Tracking of Acute Stroke Patients and Instant, Secure Inter-team Communication – The EgyptianStrokeNetwork mobile App. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

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## AOP 2

## ODD LOOKING AVM BRAIN □HOW WE TREAT

Umair Rashid<sup>1\*</sup><sup>1</sup> Lahore General Hospital, Pakistan

**Objective:** Endovascular embolization of brain arteriovenous malformations (AVMs) is widely utilized, often used in conjunction with micro □and/or radiosurgery. To report the clinical experience by using a new liquid embolic agent (Squid) or glue for embolization of Odd looking brain AVMs.

**Materials and Methods:** This study was conducted from June 2015 to December 2017 at the Department of Neuroradiology, Punjab Institute of Neurosciences/Lahore General Hospital, Lahore. A total of 50 patients with AVM at Infra and Supratentorially including deep seated AVMs were treated of both genders. Clinical presentation seizures 09 patients with hemorrhage 35 patients and 06 with motor weakness. The procedures were performed under biplane Artis ZEE DSA Siemens.

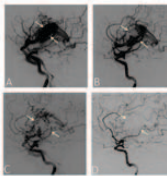
**Results:** Out of 50 patients, there were 20 males and 30 female patients. Their age ranged from 14 - 45 years. The maximum numbers of patients were in their early twenties. In hemorrhagic AVMs, the rupture point when recognized is endovascularly occluded, while the complete cure of the AVM is postponed after the expected clinical improvement.

In our study targeted, complete or partially embolization or modified embolization was done in these patients, 60 to 85% size reduction was achieved with no significant complication.

**Conclusion:**

Embolization of Odd Looking AVM varies case to case particularly where the access of nidus is not possible. Our experience favours selection of the embolizing material Squid 18 or glue both remain feasible, safe penetration with easy accessibility and embolization of different compartments of AVM, particularly for deep seated.

**Figure 1**



## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Keywords:** AVM Embolization, AVM, Endovascular, Onyx, Squid

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** Ruptured Aneurysm treatment

**Citation:** Rashid U. ODD LOOKING AVM BRAIN – HOW WE TREAT. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

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## AOP 3

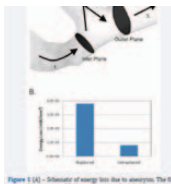
## Predicting aneurysm rupture and treatment outcomes by geometric and computational flow dynamics

Sherif Rashad<sup>1\*</sup>

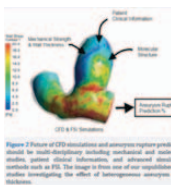
<sup>1</sup> Tohoku University, Japan

Brain aneurysms have a prevalence of 3-5% in the general population; their rupture has high morbidity and mortality rates and a very high dependence rate among survivors. However, 50-80% of aneurysms do not rupture during an individual life time. This is a particularly significant dilemma since treating unruptured aneurysms by itself possesses a significant morbidity and mortality, given the fact that these cases usually are asymptomatic. Herein I will present our recent work regarding basilar tip aneurysms rupture risk, and how understanding the relationship between geometry and hemodynamics can help us identify predictors that can correlate with future rupture risk of brain aneurysms. In this work, we focused on the bifurcation angle of basilar tip aneurysm, as a predictor of rupture and a strong influencer on aneurysm hemodynamics. I will also show how the same factors that were able to predict aneurysm rupture were also used to predict the recurrence rates of basilar tip aneurysms following endovascular coiling.

**Figure 1**



**Figure 2**



## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Keywords:** Brain Aneurysms, Unruptured aneurysms, Treatment outcomes, endovascular coiling, CFD Simulation

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** Raptured Aneurysm treatment

**Citation:** Rashad S. Predicting aneurysm rupture and treatment outcomes by geometric and computational flow dynamics. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO)*.

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## AOP 4

## EVENT ABSTRACT

## Angiographic Geometric changes of the lumen Arterial Wall after Intracranial Stenting of Cerebral Aneurysm and its Clinical and Radiological correlation

Mohamed S. Hashem<sup>1, 2\*</sup> and Osama Y. Mansour<sup>2</sup>

<sup>1</sup> Neurology Department, Faculty of Medicine, Cairo University, Egypt

<sup>2</sup> Neurology, Faculty of Medicine, Alexandria University, Egypt

### Abstract

#### Objective:

The aim of the present study is to assess the angiographic geometric changes after intracranial stenting of cerebral aneurysm and its clinical and radiological relations.

#### Patients and methods:

This retrospective study is a combined work of Faculty of Medicine, Cairo University and Faculty of Medicine, Alexandria University. The study was conducted on 40 patients (23 females and 17 males) with 49 cerebral aneurysms (ruptured/unruptured) who had been treated through endovascular obliteration of the aneurysm. Mean age of the study cohort was 55 years (range: 34 □80). Patients presented with clinical neurological symptoms associated with cerebral aneurysms were subjected to Clinical Neurological examination to assess their condition. Clinical outcome scales (mRS) and WFNS, Hunt and Hess in case of SAH, were used for evaluation of the patients. All patients underwent diagnostic CT/CTA or MRI/MRA before treatment. Professor Osama Yassin and his team performed Endovascular treatment in the Interventional Neuroradiology department. Treatment included the use of coils and different stent types. Stents were used in 95% (n= 40) of the cases. Two types of endovascular stents were applied: Nitinol (n= 27, 67.5%) and Flow Diverter (n=13, 32.5%). After successful obliteration of the aneurysm, patients were examined clinically and radiologically to assess the outcome and exclude any post-operative complications. Patients underwent diagnostic digital subtraction angiography (DSA) 1 year after treatment to analyze the occlusion rate, geometrical parameters, parent vessel angles and clinical outcome.

#### Results:

The most common presenting symptom was Headache (n= 26, 65%), followed by dizziness (n= 11, 27.5%) and then weakness (n=8, 11%). Most of the cerebral aneurysms were located at the anterior circulation (88.1%) (n= 37) and 11.9 % (n= 5) were located at the posterior circulation. After endovascular treatment, 74.9 % had good outcome and 25.1% had poor outcome. At the 1-year follow-up, 86% of the patients had a good outcome while 14% had poor outcome. Statistically significant relations were found between gender and aneurysm height (larger in male patients).

At the 1-year follow-up, there was a statistically significant decrease in the aneurysm height, size of the aneurysm neck, and the occlusion rate. At the 1-year follow-up, a statistically significant increase in Angle A was observed. There was no statistically significant difference in other geometric parameters. There was a statistically significant relation between Angle A and mRS follow-up outcome. FD stents induced larger angiographic geometric angular change than



nitinol stents (NOT statistically significant).

Conclusions:

- Cerebral Aneurysm size is larger in Males than females
- Old age, larger aneurysms size and posterior circulation aneurysms are associated with worse clinical outcome (not statistically significant)
- Intracranial stenting of parent vessel leads to angular geometric changes, in the vessel, obliteration of the neck of the aneurysm and a decrease in the aneurysm height
- Angiographic geometric changes are correlated with the clinical outcome
- Flow Diverter stents are associated with bigger angiographic geometrical angular changes (not statistically significant)

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Keywords:** Unruptured aneurysms, interventional neurology, Ruptured aneurysm, stent assisted coiling technique (SACT), Angiographic geometry

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** Unruptured brain aneurysms management

**Citation:** Hashem MS and Mansour OY. Angiographic Geometric changes of the lumen Arterial Wall after Intracranial Stenting of Cerebral Aneurysm and its Clinical and Radiological correlation. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

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## AOP 5

## EVENT ABSTRACT

## Cilostazol combined with aspirin for secondary prevention of acute ischemic stroke: a meta-analysis of randomized controlled trials

Ahmed H. Al-Shaf'e<sup>1, 2\*</sup>

<sup>1</sup> Neurology and psychiatry, Shebin Teaching Hospital, Egypt

<sup>2</sup> Neurology and psychiatry, Menoufia University, Egypt

**Background:** Stroke is a major cause of death and disability worldwide.(1) Aspirin remains the corner stone treatment regarding secondary stroke prevention.(2) Some antiplatelets have been used combined with aspirin such as clopidogrel and dipyridamole but with frequent side effects such as headache and intracranial hemorrhages.(3) Many patients fail to adhere to these combinations, so we offer a new combination with fewer side effects and a potential for prolonged use.This is the first meta-analysis to discuss the combination of aspirin plus cilostazol in the secondary prevention of acute ischemic stroke.

**Objectives:** Assess both the efficacy and safety of the combination of cilostazol and aspirin in stroke patients.

**Methods:** We searched PubMed, Embase, web of science and Cochrane Library electronic databases for published studies which compared aspirin-cilostazol group with aspirin-placebo group, conducted a meta-analysis of all RCTs.

**Results:** Four studies, consisting of 685 stroke patients, were identified.

**Conclusions:** stroke patients may benefit from dual antiplatelet therapy using cilostazol plus aspirin over monotherapy using aspirin alone.

**Keywords:** stroke, dual antiplatelet, aspirin, cilostazol, Randomized control trials

## Acknowledgements

Many thanks for Professor.Dr Mohamed Elwan for the great help and support.

## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Keywords:** Stroke, dual antiplatelet, Aspirin, cilostazol, Randomised control trials, metaanalysis

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation

**Topic:** Ischemic stroke management: which technique? Combination of techniques? Enlargement of indications?

**Citation:** Al-Shaf'e AH. Cilostazol combined with aspirin for secondary prevention of acute ischemic stroke: a meta-analysis of randomized controlled trials. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

\* **Correspondence:** Dr. Ahmed H. Al-Shaf'e, Neurology and psychiatry, Shebin Teaching Hospital, Shibin al Kawm, Menofia, Egypt, ahmedhanei04@gmail.com

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## AOP 6

## EVENT ABSTRACT

## Medical grade 3D print in Endovascular Training and Pre-procedure Simulation- The Customer Perception

EZAMIN RAHIM<sup>1\*</sup>, Ahmad Sobri Muda<sup>1</sup>, Yusri Mohammed<sup>2</sup> and Muhammad Izzat Ahmad Sabri<sup>1</sup>

<sup>1</sup> Radiology, Putra Malaysia University, Malaysia

<sup>2</sup> Radiology, Serdang Hospital, Malaysia

**Introduction:** The additive manufacturing which is formerly known as 3D print has made its way into medical training. This technology allows the doctors to be trained using a replica of 3D printed model based on real patient data. **Purpose:** To determine the user perception and satisfaction of the medical grade 3D endovascular training. **Methods:** We have conducted a hands-on workshop using the medical grade patient-specific 3D printed model of a 60 years old patient with left ICA aneurysm. This locally developed 3D printed model was mounted on a silicon base holder that allows opacification of contrast upon contrast injection during angiography run, allows roadmap technique and 3D rotational angiography technique. This was made possible by the continuous flow of water within the 3D printed lesion. The participants had multiple chances to deploy the intravascular coils and flow diverters under angiography. The verbal feedback was from the trainers, endovascular related manufacturer representatives and the teaching participants were evaluated. **Results:** There were 15 respondents participated in this study. Up to 72% of the respondents were satisfied with the 3D printed training. **Complaints** were as follows; 1) Tactile indifference as compared with real endovascular training, 2) Followed by not limited time given to deploy coils/flow diverter per participant, 3) Unrealistic body to house the 3D printed lesion and 4) No bone image during fluoroscopy mode. **Conclusions:** Medical grade 3D printed lesion opens to a new frontier in Neuro-endovascular training. However, further evaluations are needed to determine its efficacy.

**Keywords:** Printing, 3D, Endovascular procedure, Aneurysm, Angiography

### Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Keywords:** Endovascular procedure, 3D, Printing, Aneurysm, Angiography

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** New devices & Innovations

CHAKRABORTY RAHIM L, MOHA S, MUHAMMAD T and ZAHIDU JABRI M. Medical grade 3D print in Endovascular Training and Pre-procedure Simulation- The Customer Perception. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO)*.

\* **Correspondence:** Dr. EZAMIN RAHIM, Radiology, Putra Malaysia University, Universiti Putra Malaysia, Seri Kembangan, Malaysia, ezamin@upm.edu.my

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## AOP 7

## EVENT ABSTRACT

## Angiographic Geometric changes of the lumen Arterial Wall after Intracranial Stenting of Cerebral Aneurysm and its Clinical and Radiological correlation

Mohamed S. Hashem<sup>1, 2\*</sup> and Osama Y. Mansour<sup>2</sup>

<sup>1</sup> Neurology Department, Faculty of Medicine, Cairo University, Egypt

<sup>2</sup> Neurology, Faculty of Medicine, Alexandria University, Egypt

### Abstract

#### Objective:

The aim of the present study is to assess the angiographic geometric changes after intracranial stenting of cerebral aneurysm and its clinical and radiological relations.

#### Patients and methods:

This retrospective study is a combined work of Faculty of Medicine, Cairo University and Faculty of Medicine, Alexandria University. The study was conducted on 40 patients (23 females and 17 males) with 49 cerebral aneurysms (ruptured/unruptured) who had been treated through endovascular obliteration of the aneurysm. Mean age of the study cohort was 55 years (range: 34-80). Patients presented with clinical neurological symptoms associated with cerebral aneurysms were subjected to Clinical Neurological examination to assess their condition. Clinical outcome scales (mRS) and WFNS, Hunt and Hess in case of SAH, were used for evaluation of the patients. All patients underwent diagnostic CT/CTA or MRI/MRA before treatment. Professor Osama Yassin and his team performed Endovascular treatment in the Interventional Neuroradiology department. Treatment included the use of coils and different stent types. Stents were used in 95% (n= 40) of the cases. Two types of endovascular stents were applied: Nitinol (n= 27, 67.5%) and Flow Diverter (n=13, 32.5%). After successful obliteration of the aneurysm, patients were examined clinically and radiologically to assess the outcome and exclude any post-operative complications. Patients underwent diagnostic digital subtraction angiography (DSA) 1 year after treatment to analyze the occlusion rate, geometrical parameters, parent vessel angles and clinical outcome.

#### Results:

The most common presenting symptom was Headache (n= 26, 65%), followed by dizziness (n= 11, 27.5%) and then weakness (n=8, 11%). Most of the cerebral aneurysms were located at the anterior circulation (88.1%) (n= 37) and 11.9 % (n= 5) were located at the posterior circulation. After endovascular treatment, 74.9 % had good outcome and 25.1% had poor outcome. At the 1-year follow-up, 86% of the patients had a good outcome while 14% had poor outcome. Statistically significant relations were found between gender and aneurysm height (larger in male patients).

At the 1-year follow-up, there was a statistically significant decrease in the aneurysm height, size of the aneurysm neck, and the occlusion rate. At the 1-year follow-up, a statistically significant increase in Angle A was observed. There was no statistically significant difference in other geometric parameters. There was a statistically significant relation between Angle A and mRS follow-up outcome. FD stents induced larger angiographic geometric angular change than

nitinol stents (NOT statistically significant).

Conclusions:

- Cerebral Aneurysm size is larger in Males than females
- Old age, larger aneurysms size and posterior circulation aneurysms are associated with worse clinical outcome (not statistically significant)
- Intracranial stenting of parent vessel leads to angular geometric changes, in the vessel, obliteration of the neck of the aneurysm and a decrease in the aneurysm height
- Angiographic geometric changes are correlated with the clinical outcome
- Flow Diverter stents are associated with bigger angiographic geometrical angular changes (not statistically significant)

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Keywords:** Unruptured aneurysms, interventional neurology, Ruptured aneurysm, stent assisted coiling technique (SACT), Angiographic geometry

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Oral Presentation **Topic:** Unruptured brain aneurysms management

**Citation:** Hashem MS and Mansour OY. Angiographic Geometric changes of the lumen Arterial Wall after Intracranial Stenting of Cerebral Aneurysm and its Clinical and Radiological correlation. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

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## AOP 8

## EVENT ABSTRACT

## Invasive vertebral hemangioma, management

Ahmed E. Sultan<sup>1\*</sup>, Tamer Hassan<sup>1</sup> and Ahmed yehia<sup>1</sup><sup>1</sup> Faculty of Medicine, Alexandria University, Egypt

**Background:** Hemangioma is a common benign lesion of the vertebral column with a rare incidence of spinal compression due aggressive nature of some of them. Massive intraoperative hemorrhage is encountered during surgery. We describe management of some cases of the aggressive lesions.

**Methods:** retrospective analysis of cases of aggressive vertebral hemangioma revealed 8 cases treated in our institution in the last ten years

**Results:** eight patients presented with progressive neurological deficits (8), back pain (7) and neck pain (1) was diagnosed with invasive vertebral hemangioma with neural structure compression. One patient with cervical C4 lesion undergone transarterial embolization followed by corpectomy and fixation. The other patients undergone vertebroplasty using bone cement and decompression with or without fixation. All patient are doing well after intervention. The neurological deficits improved during 6 months. One of the patient was completely paraplegic but with intact deep sensation, this patient improved dramatically and can walk unsupported.

**Conclusion:** vertebral hemangioma can present in an invasive manner that necessitate intervention. Preoperative embolization or vertebroplasty are helpful methods to decrease intraoperative hemorrhage

## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Keywords:** Vertebral hemangioma, invasive, Neurological compression, Transarterial chemoembolization, Vertebroplasty

**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

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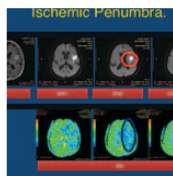
**Citation:** Sultan AE, Hassan T and yehia A. Invasive vertebral hemangioma, management. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO).*

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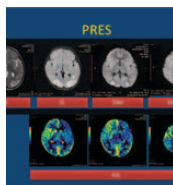
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**Figure 4**



## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Conference:** 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO). Cairo, Egypt, 20 Jun – 23 Jun, 2018.

**Presentation Type:** Eposter **Topic:** New interventional imaging technologies

**Citation:** Elnekeby A and darwish r. Arterial spin labeling cerebral perfusion. *Conference Abstract: 3rd Middle East North Africa Stroke and interventional Neurotherapies Organization congress (3rd MENA-SINO)*.

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## AOP 9

**Intravenous thrombolysis with recombinant tissue-type plasminogen activator (r-tPA), in acute ischemic stroke: A single arm open-label trial: Assiut Experience**

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**Department of Neuropsychiatry and Radiology, Assiut University, Assiut EGYPT**

**Abstract**

**Background and Purpose** Improving neurological outcome after an ischemic stroke is a major societal priority and has attracted intense attention of clinical and basic researchers. We performed a clinical trial with 0.9 mg/kg recombinant tissue plasminogen activator (rtPA) aiming to assess the efficacy and safety of rTPA in acute ischemic stroke for the Egyptian patients.

**Methods**—Our prospective, single-arm, open-label trial was designed with a sample size of 54 (33 male/21female) out of 1221 patients presented with acute stroke that were recruited during the period from August 2017-March 2018. The mean age was  $61 \pm 9.5$  years, and the mean National Institutes of Health Stroke Scale (NIHSS) at base line assessment was  $11.5 \pm 3.2$  (5-19) and mRS  $3.9 \pm 0.6$  (range 2-5). The primary outcome was the percent of improvement in a modified Rankin Scale (mRS) score at the end of third month and the incidence of intracranial hemorrhage (ICH). The protocol was defined according to the National Institute of Neurological Disorders and Stroke (NINDS) rtPA stroke study.

**Results**—Among the 54 patients enrolled, 26 had had good recovery (48%) with mRS of 0 to 1 at 3 months; 18 had incomplete recovery (33.3%), and 10 cases (18.7%) complicated, 5 out of them developed ICH, 1 patient developed gum and per-rectum bleeding, 2 patients developed another stroke, one patient developed pulmonary edema and another one died with unknown cause. Six (11.1%) patients out of the complicated patients died.

**Conclusions**—the outcome and the incidence of ICH were nearly similar to published data. These findings indicate that rTPA, to Egyptian patients with acute ischemic stroke, might offer a clinical efficacy and safety that are compatible with previously published data in other countries.

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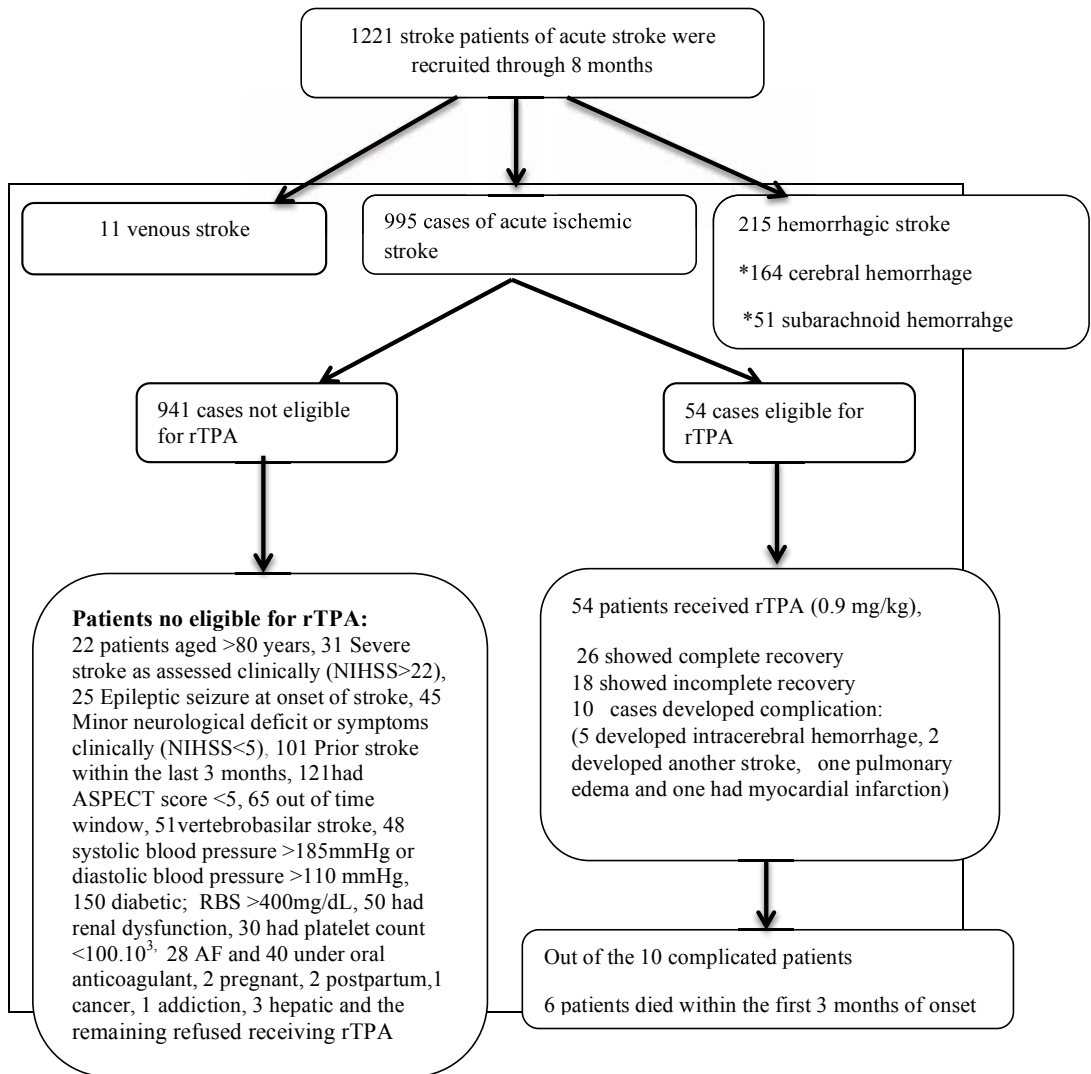


Figure 1: flow chart

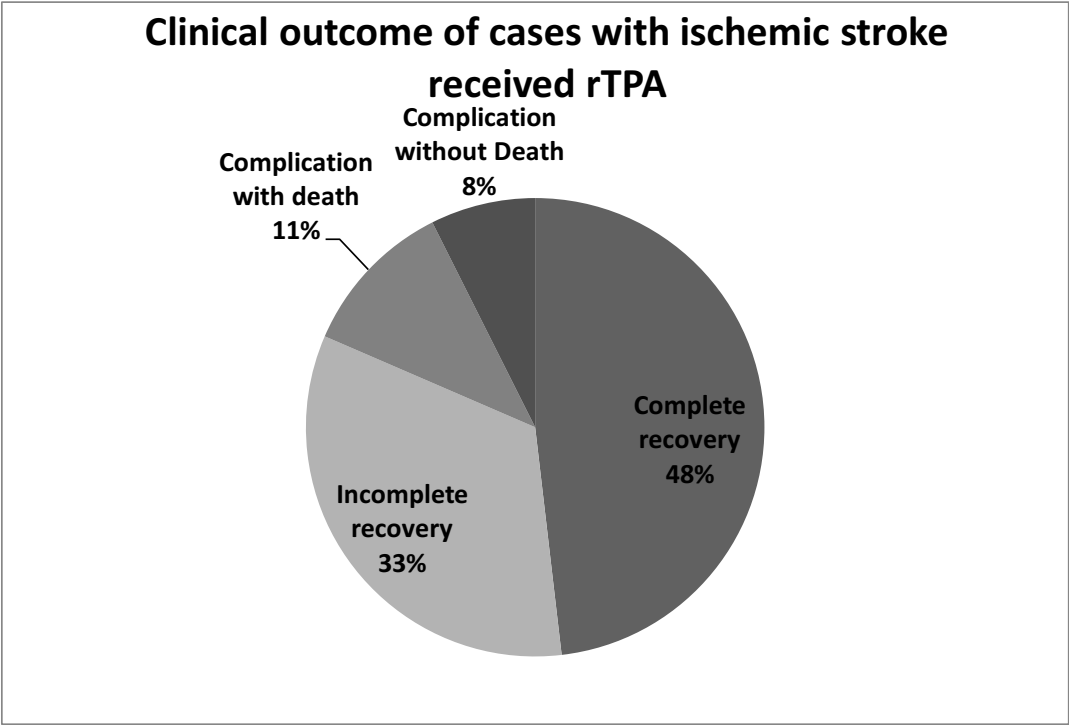


Figure 2

Clinical outcome of cases with acute ischemic stroke patients after intravenous rTPA injection

## Notes



Notes

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