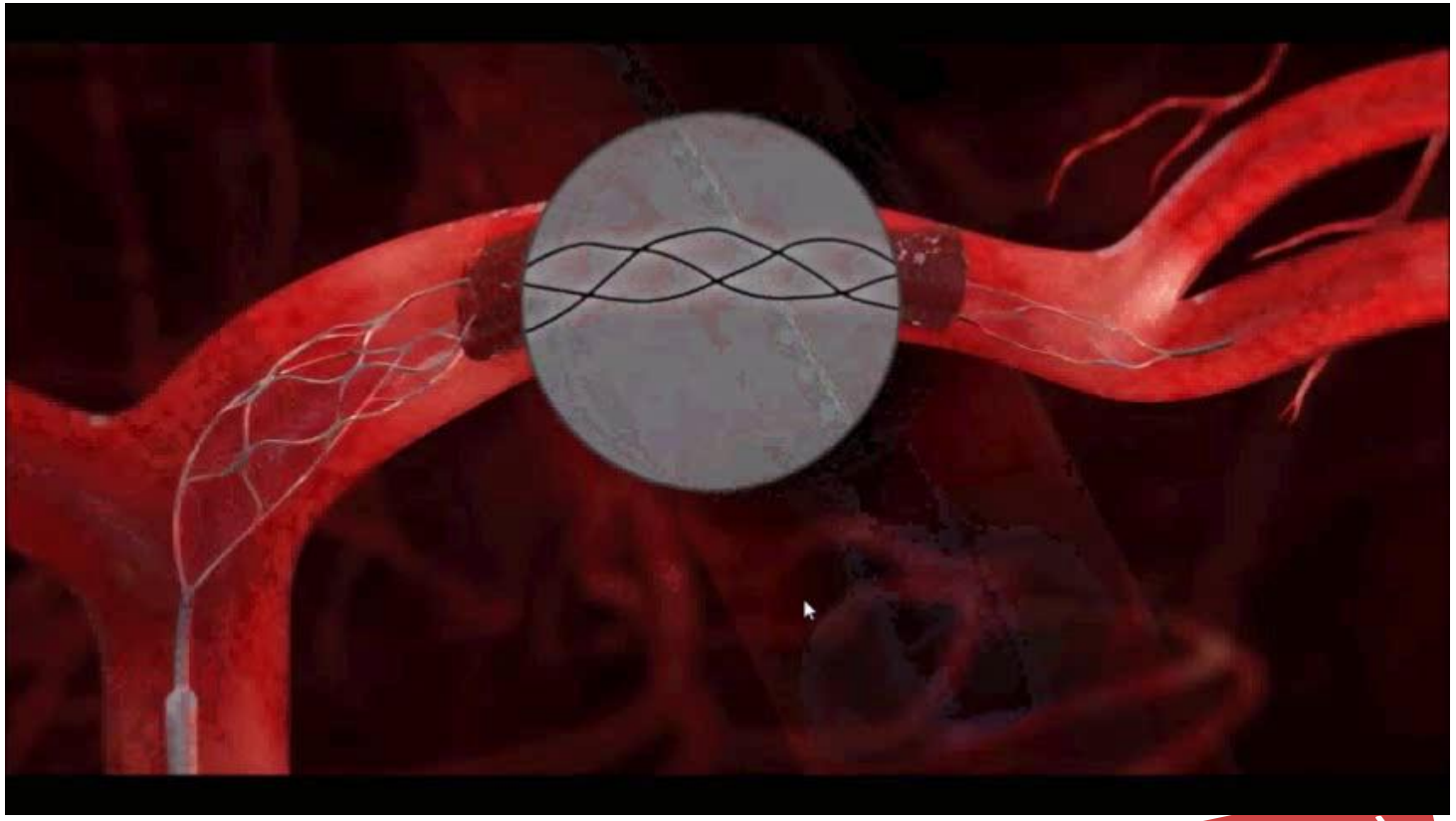
Cuore e cervello:
dalla **trombolisi** alle **procedure interventistiche**.

Analogie e differenze di due percorsi clinici e scientifici.

Mauro Gallitelli

Ospedale «Santi Giovanni e Paolo» - Venezia

XI congresso nazionale
simeu
ROMA 24-26 MAGGIO 2018



Mechanical thrombectomy (+iv rTPA)
TREATMENT OF CHOICE

Consensus

International Journal of Stroke WSO

Mechanical thrombectomy in acute ischemic stroke: Consensus statement by ESO-Karolinska Stroke Update 2014/2015, supported by ESO, ESMINT, ESNR and EAN

2018 Guidelines for the Early Management of Patients

Association/American Str

Guidelines

International Journal of Stroke WSO

European Recommendations on Organisation of Interventional Care in Acute Stroke (EROICAS)

SAGE


STEMI

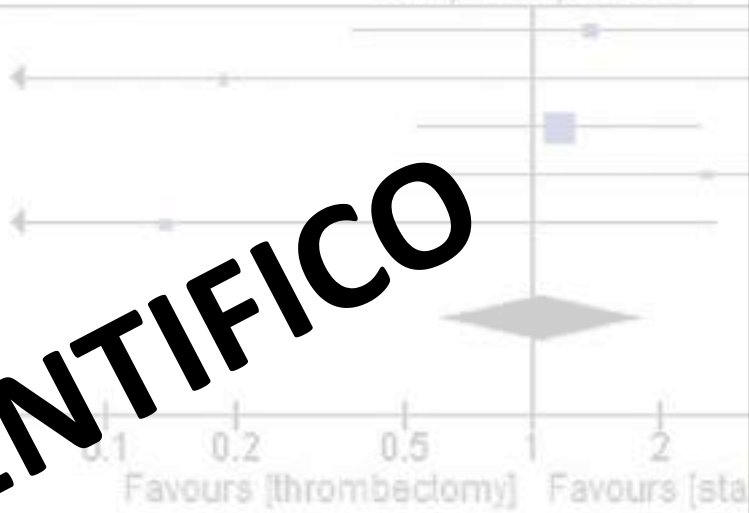
Il percorso scientifico

Il percorso clinico

Il percorso SCIENTIFICO

Thrombectomy Events	Thrombectomy Total	Standard Care Events	Standard Care Total	Weight	Odds Ratio M-H, Fixed, 95% CI
6	165	4	150	16.7%	1.38 [0.38, 4.98]
0	35	2	35	10.2%	0.19 [0.01, 4.08]
14	233	14	267	50.7%	1.16 [0.54, 2.48]
5	103	2	103	7.9%	2.58 [0.49, 13.59]
0	98	3	97	14.5%	0.14 [0.01, 2.69]
	634		652	100.0%	1.06 [0.61, 1.84]
25		25			

= 4.33, df = 4 (P = 0.36); I² = 8%
ct: Z = 0.20 (P = 0.84)



Thrombectomy Events	Thrombectomy Total	Standard Care Events	Standard Care Total	Weight	Odds Ratio M-H, Fixed, 95% CI
6	165	4	150	16.7%	1.38 [0.38, 4.98]
0	35	2	35	10.2%	0.19 [0.01, 4.08]
14	233	14	267	50.7%	1.16 [0.54, 2.48]
0	33	0	32		Not estimable
5	103	2	103	7.9%	2.58 [0.49, 13.59]
0	98	3	97	14.5%	0.14 [0.01, 2.69]
4	113	6	62	12.4%	0.96 [0.25, 3.62]
14	195	8	201	20.3%	1.87 [0.76, 4.55]
	905		947	100.0%	1.21 [0.78, 1.88]
43		39			

= 5.33, df = 6 (P = 0.50); I² = 0%
ct: Z = 0.85 (P = 0.40)

Thrombolysis

Catheter – based Interventions

STROKE

1976

Retcher et Al

Chazov et Al

1976

Meyer et Al

Hartzler et Al

1982

1983

GISSI

1986

ISIS - 2

1988

1992

Mori et Al

1995

NINDS

Gibbson et Al

Grines et Al

Zijlstra et Al

1993

FDA
approval
1996

EMA
(approval)
2002

2003

ASA guidelines

Meta-analisi, Keeley

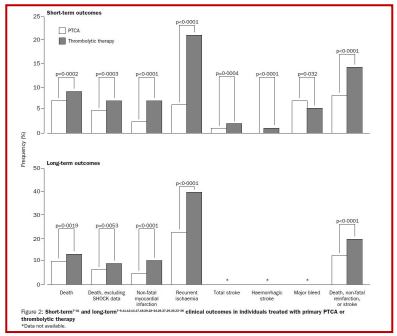
2003

2008

ECASS III

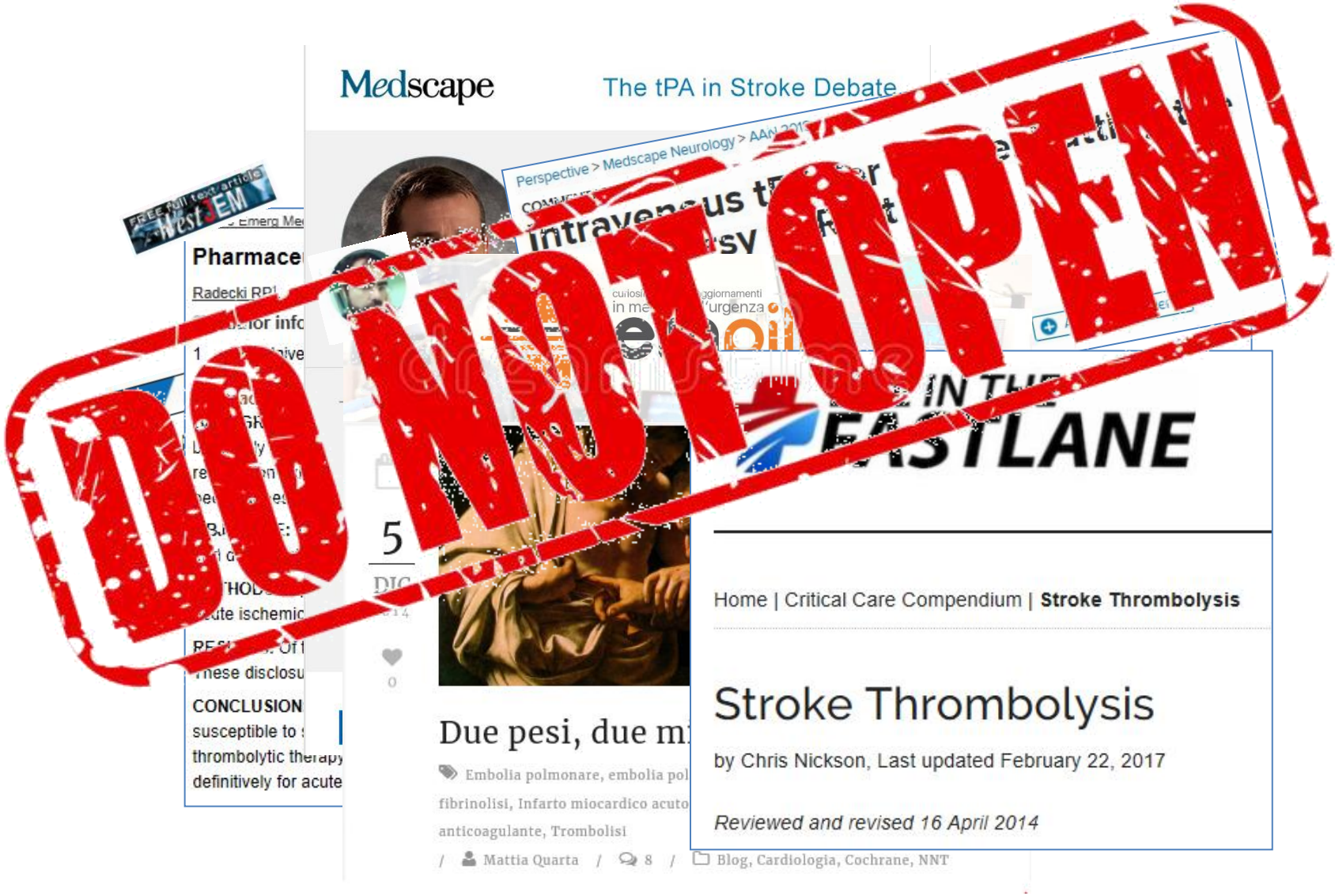
EMA
approval
2010

1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

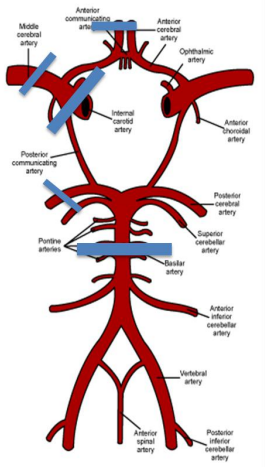


STEMI

Thrombolytics in Stroke **DEBATE**



Stroke da occlusione di **grosse arterie cerebrali**



Recanalization Rate

50%

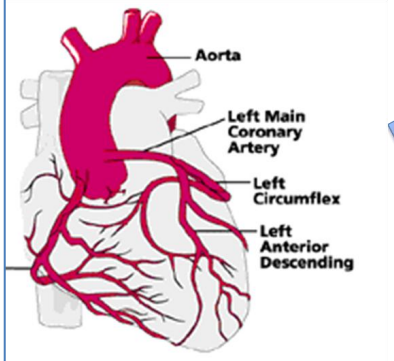
Rai A, Cline B, Williams E et Al. J Neuroimaging. 2015;25:238-43

Bhatia R, Hill MD, Shobha N, Menon B et Al. Stroke. 2

Smith WS, Lev MH, English JD et Al. Stroke. 2009;40:3

La disostruzione «chimica» è inefficace

STEMI



Recanalization Rate

50%

Morris D, Betriu A, Califf RM, et al. Circulation. 1995;91:1923-8.

Catheter-based interventions

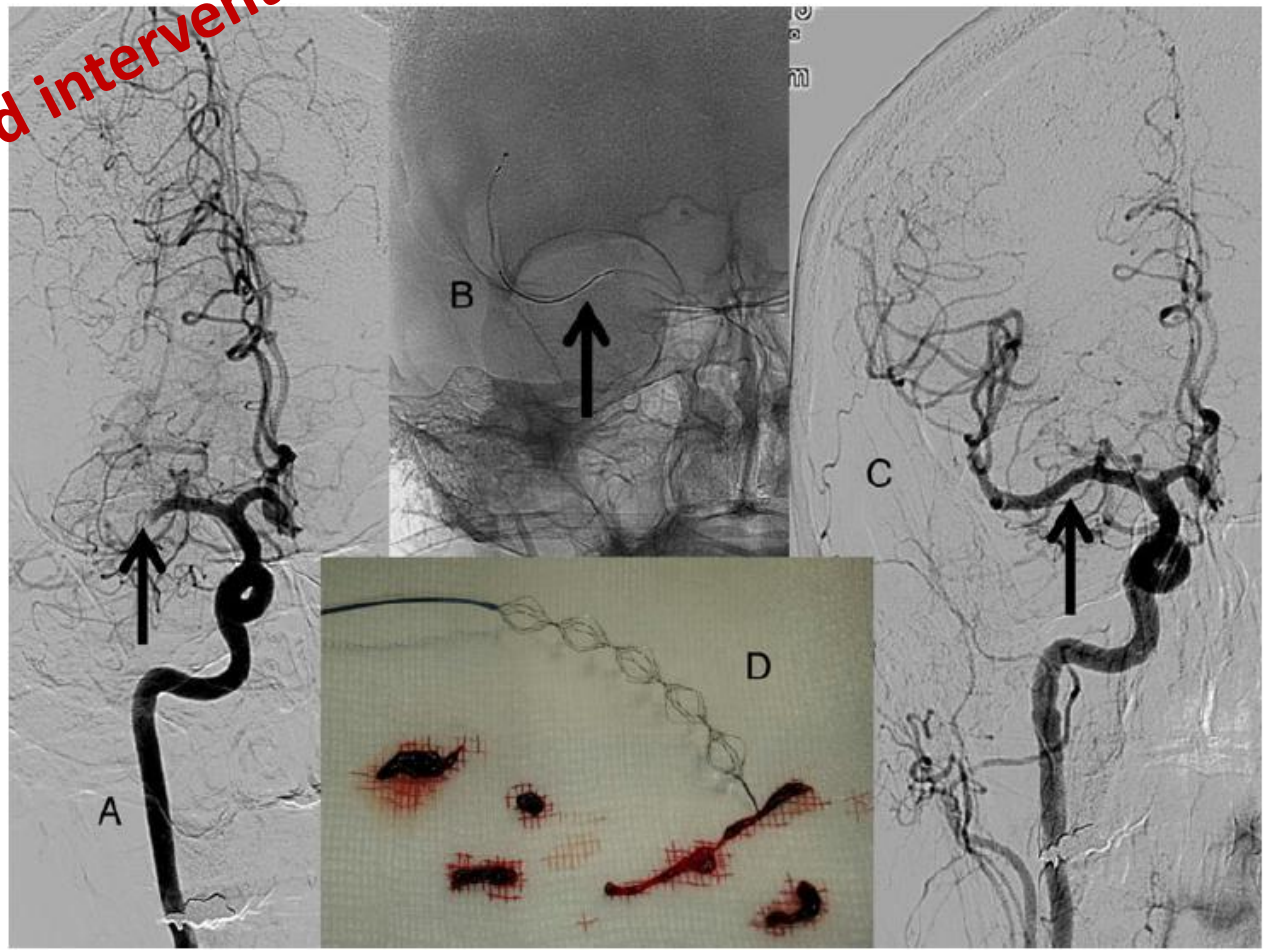


Figure 1 Catheter-based thrombectomy in acute anterior stroke. (*A*) Middle cerebral artery occlusion (arrow) at presentation, (*B*) positioning of the stent-retriever (arrow point to the occlusion site), (*C*) final result after thrombectomy (arrow points to the previously occluded site; note the absence of any underlying stenosis after thrombus extraction), (*D*) fragmented thrombus and the retriever. Patient neurological status normalized.

Widimsky P, Hopkins LN. ***Catheter-based interventions for acute ischaemic stroke.*** *Eur Heart J. 2016;37(40):3081-3089.*

Interventional Management of Stroke III (**IMS III**)

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 7, 2013 VOL. 368 NO. 10

Endovascular Therapy after Intravenous t-PA versus t-PA Alone for Stroke

N Engl J Med. 2013;368:893-903.

SYN[illegible]3 Expansion

ORIGIN[illegible]

Endovascu[illegible]te Ischemic

N Engl J Med. 2013;368:904-13.

MR RESCUE

ORIGINAL ARTICLE

A Trial of Imaging Selection and Endovascular Treatment for Ischemic Stroke

N Engl J Med. 2013;368:914-23.

1. **Pochi pazienti trattati con stent retrievers**

2. **Disegno dei trials (selezione dei pazienti)**

IMS III, Synthesis Expansion

No Angio-TC o Angio-RM

MR RESCUE

Arruolamento di pazienti con un grosso core infartuale

3. **Tempi da inizio di trombolisi ev a trattamento endovascolare molto lunghi**

IMS III

Endovascular treatment of acute ischemic stroke: the end or just the beginning?

Maxim Mokin, M.D., Ph.D.,[1] Alexander A. Khalessi, M.D., M.S.,[3] J Mocco, M.D., M.S.,[4] Giuseppe Lanzino, M.D.,[5] Travis M. Dumont, M.D.,[1] Ricardo A. Hanel, M.D., Ph.D.,[6] Demetrius K. Lopes, M.D.,[7] Richard D. Fessler II, M.D.,[8] Andrew J. Ringer, M.D.,[9] Bernard R. Bendok, M.D.,[10] Erol Veznedaroglu, M.D.,[11] Adnan H. Siddiqui, M.D., Ph.D.,[1,2] L. Nelson Hopkins, M.D.,[1,2] and Elad I. Levy, M.D., M.B.A.[1,2]

Departments of [1]Neurosurgery and [2]Radiology, School of Medicine and Biomedical Sciences, University at Buffalo, State University of New York, Buffalo, New York; [3]Division of Neurosurgery, University of California, San Diego, California; [4]Department of Neurosurgery, Vanderbilt University, Nashville, Tennessee; [5]Departments of Neurologic Surgery and Radiology, Mayo Clinic, Rochester, Minnesota; [6]Department of Neurosurgery, Mayo Clinic, Jacksonville, Florida; [7]Department of Neurosurgery, Rush University Medical Center, Chicago, Illinois; [8]Department of Neurosurgery, St. John Providence Health System, Detroit, Michigan; [9]Department of Neurosurgery, Mayfield Clinic, University of Cincinnati, Ohio; [10]Department of Neurosurgery, Northwestern University, Chicago, Illinois; and [11]Department of Neurosurgery, Capital Health Institute for Neurosciences, Trenton, New Jersey

Neurosurg Focus. 2014 Jan;36(1):E5.

2015

MR CLEAN

ESCAPE

EXTEND-IA

SWIFT PRIME

REVASCAT

Thrombectomy works!

	Recanalization		Death at 90 days		Independence (mRS 0-2) at 90 days	
	MT	Control	MT	Control	MT	Control
MR CLEAN [1]	75%	32%	21%	22%	33%	19%
ESCAPE [2]	72%	31%	10%	19%	53%	29%
EXTEND IA [3]	100%	37%	9%	20%	71%	40%
SWIFT PRIME [4]	83%	40%	9%	12%	60%	36%
REVASCAT [5]	66%	-	18%	15%	44%	28%
TOTAL [6]	***71%***	-	***15%***	***19%***	***46%***	***27%***

1. Berkhmeer et al. *NEJM* 2015
2. Goyal et al. *NEJM* 2015
3. Campbell et al. *NEJM* 2015
4. Saver et al. NEJM 2015
5. Jovin et al. NEJM 2015
6. **Goyal et al. Lancet 2016**

Thrombolysis

Catheter – based Interventions

STROKE

STEMI

1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

1976 Retcher et Al

1976 Chazov et Al

1982 Hartzler et Al

1983 Meyer et Al

1986 GISSI

1988 ISIS - 2

1992 Mori et Al

1993 Gibbson et Al, Grines et Al, Zijlstra et Al

1995 NINDS

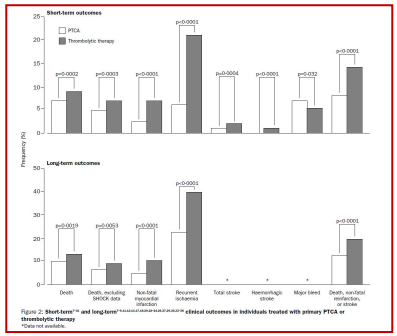
1996 FDA approval

2001 Bellon et Al

2002 EMA (approval)

2003 ASA guidelines

2003 Meta-analisi, Keeley



2008 ECASS III

2010 EMA approval

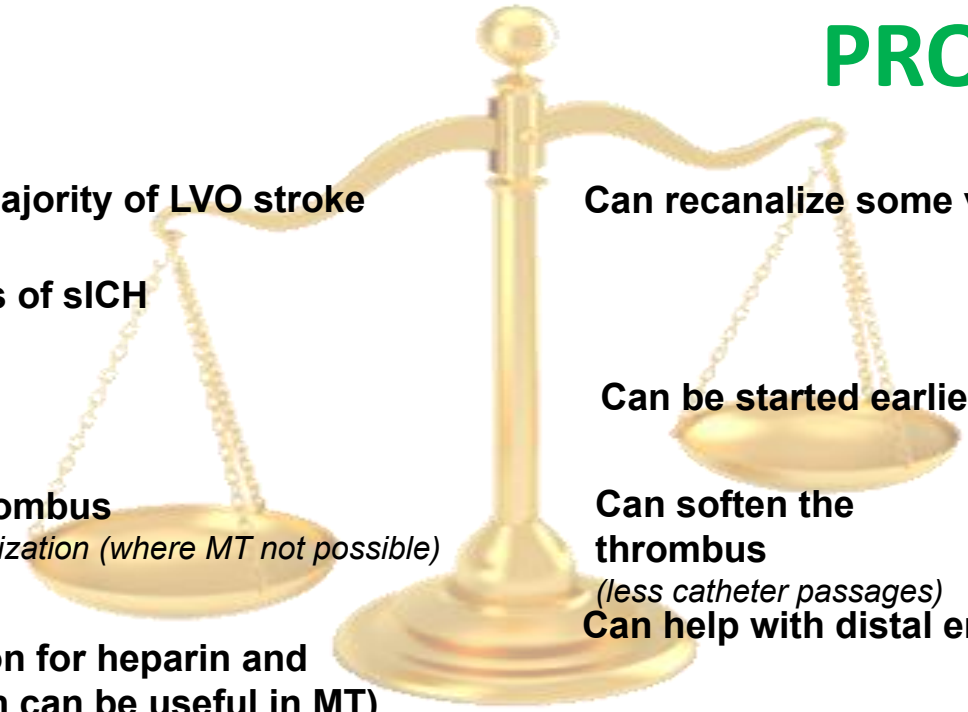
2011 IMS III, SYNTHESIS Exp., MR RESCUE

2013

2015 MR CLEAN, ESCAPE, EXTEND – IA, SWIFT-PRIME, REVASCAT

only THROMBECTOMY?

…ruolo della Trombolisi…



CONS

Ineffective in the majority of LVO stroke

Increases the risks of sICH

Can delay MT

Can soften the thrombus
and cause distal embolization (where MT not possible)

Is a contraindication for heparin and antiplatelets (which can be useful in MT)

TL can increase costs w/o advantages

PROS

Can recanalize some vessels

Can be started earlier than MT

Can soften the thrombus
(less catheter passages)

Can help with distal embolization during MT

Endovascular Thrombectomy Alone versus Combined with Intravenous Thrombolysis

Kevin Phan[1], Adam A. Dmytriw[2], Julian Maingard[3,4], Hamed Asadi[3-5], Christoph J. Griessenauer[2], Wyatt Ng[1], Kitso Kewagamang[1], Ralph J. Mobbs[1], Justin M. Moore[2], Christopher S. Ogilvy[2], Ajith J. Thomas[2]

■ BACKGROUND: To date, no randomized trial has directly addressed the question of whether intravenous (IV) tissue plasminogen activator (tPA) improves outcomes in IV tPA-eligible patients who will eventually undergo endovascular therapy (EVT), or whether a direct EVT strategy is equally effective. We performed a systematic review and meta-analysis to compare the efficacy and safety of direct EVT versus endovascular treatment with IV tPA (EVT+IV tPA) in adults with acute ischemic stroke.

■ METHODS: We performed electronic searches of 6 databases from their inception to January 2017. Data were extracted and analyzed according to predefined clinical endpoints.

■ RESULTS: Twelve comparative studies, comprising 1275 patients in the EVT-only arm and 1340 patients in the combined EVT+IV tPA arm, were included. The rates of good functional outcomes (modified Rankin Scale score ≤2) and 90-day mortality were not statistically significantly different between the EVT and EVT+IV tPA arms (44% vs. 48%; odds ratio [OR], 0.80; 95% confidence interval [CI], 0.64–1.002; $P = 0.052$ and 20.4% vs. 19.4%, OR 1.19; 95% CI, 0.83–1.71; $P = 0.34$, respectively). The rate of symptomatic intracranial hemorrhage also was not significantly different between the EVT and EVT+IV tPA arms (3.7% vs. 3.8%; OR, 0.98; 95% CI, 0.65–1.48; $P = 0.91$). There were no between-group differences in the rates of other complications.

■ CONCLUSIONS: No significant differences between the 2 groups were found in terms of favorable functional outcome, mortality rate, or complications based on contemporary endovascular therapies.

INTRODUCTION

Numerous studies have demonstrated the benefits of intravenous (IV) tissue plasminogen activator (tPA) for treating acute ischemic stroke, regardless of stroke subtype.[1] The aim of IV tPA therapy is to recanalize the affected blood vessel and establish reperfusion.[2] However, in large vessel occlusions, the efficacy of reperfusion using IV tPA alone has been suboptimal, with recanalization rates as low as 6% for occlusion of the terminal internal carotid artery.[3,4]

Recently, the publication of multiple randomized controlled trials[5-8] convincingly demonstrated that the addition of endovascular thrombectomy (EVT) to IV tPA improved outcomes after acute ischemic stroke caused by large vessel occlusions. The design of these trials was such that the majority of patients who were treated with mechanical thrombectomy also received IV thrombolysis. However, the number of patients in these trials who did not receive previous IV tPA was very small, and thus whether

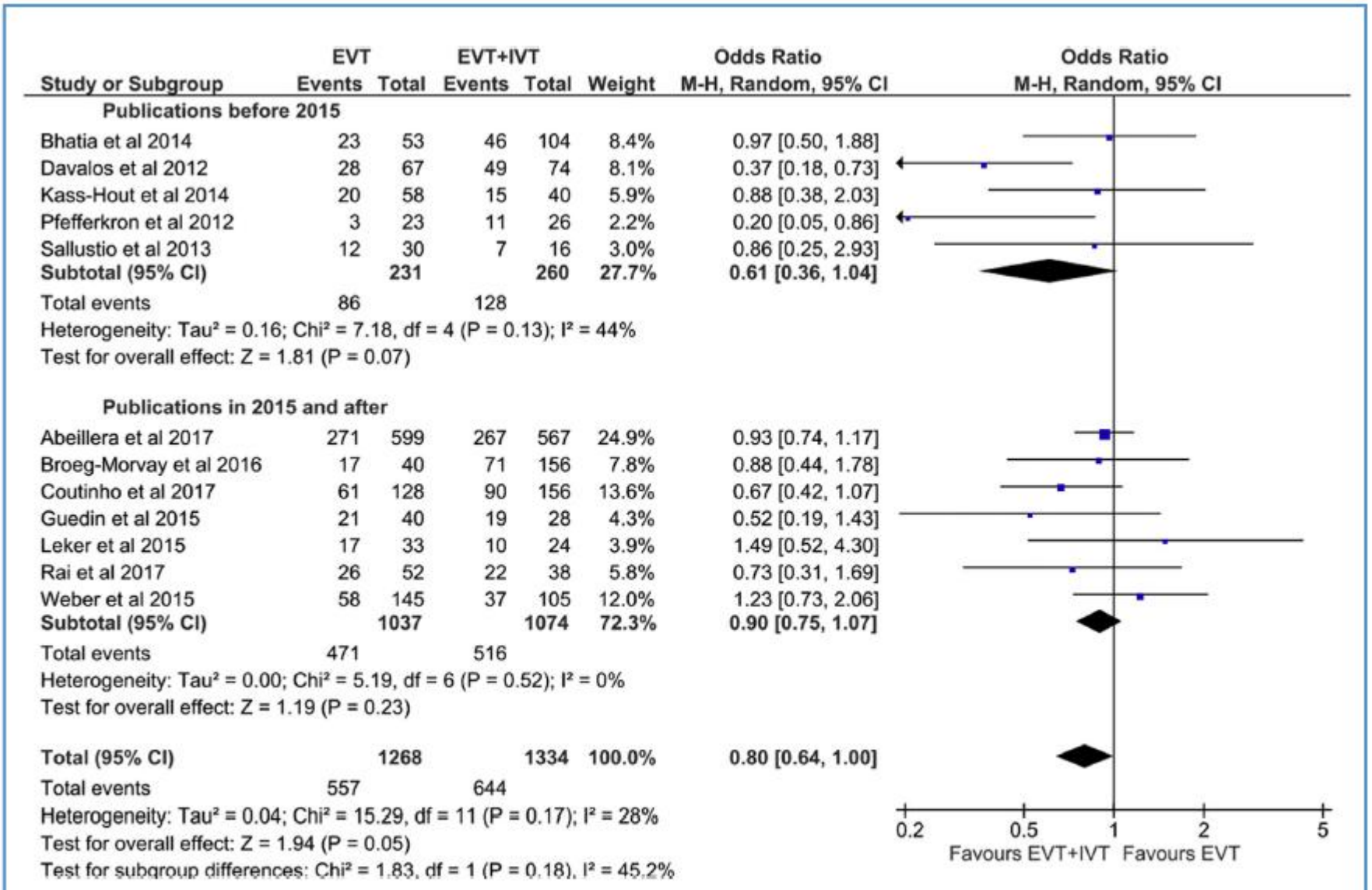


Figure 2. Forest plot of the odds ratio (OR) of 90-day favorable functional outcome (modified Rankin Scale score ≤2) for endovascular therapy (EVT) versus endovascular therapy and intravenous tissue plasminogen activator (EVT+IV tPA). Results are grouped according to publication date before 2015 or 2015 and after.

Circulation
An American Heart Association Journal
[illegible]. 2017 Sep 24. pii: CIRCULATIONAHA.117.028920. doi: 10.1161/CIRCULATIONAHA.117.028920. [Epub ahead of print]

Interhospital Transfer Prior to Thrombectomy is Associated with Delayed Treatment and Worse Outcome in the STRATIS Registry.

Froehler MT[1], Saver JL[2], Zaidat OO[3], Jahan R[2], Aziz-Sultan MA[4], Klucznick RP[5], Haussen DC[6], Hellinger FR Jr[7], Yavagal DR[8], Yao TL[9], Liebeskind DS[2], Jadhav AP[10], Gupta R[11], Hassan AE[12], Martin CO[13], Bozorgchami H[14], Kaushal R[15], Nogueira RG[8], Gandhi RH[7], Peterson EC[8], Dashti SR[9], Given CA 2nd[16], Mehta BP[17], Deshmukh V[18], Starkman S[2], Linfante I[19], McPherson SH[20], Kvamme P[21], Grobelny TJ[22], Hussain MS[23], Thacker I[24], Vora N[25], Chen PR[26], Monteith SJ[27], Ecker RD[28], Schirmer CM[29], Sauvageau E[30], Abou-Chebl A[31], Derdeyn CP[32], Maidan L[33], Badruddin A[34], Siddiqui AH[35], Dumont TM[36], Alhajeri A[37], Taqi MA[38], Asi K[39], Carpenter JS[40], Boulos A[41], Jindal G[42], Puri AS[43], Chitale R[44], Deshaies EM[45], Robinson DH[46], Kallmes DF[47], Baxter BW[48], Jumaa MA[49], Sunenshine P[50], Majjhoo AQ[51], English JD[52], Suzuki S[53], Fessler RD[54], Delgado Almandoz JE[55], Martin JC[56], Mueller-Kronast NH[15]; STRATIS Investigators.

Author information

Abstract

Background -Endovascular treatment with mechanical thrombectomy (MT) is beneficial for acute stroke patients suffering a large vessel occlusion, though treatment efficacy is highly time-dependent. We hypothesized that interhospital transfer to endovascular-capable centers would result in treatment delays and worse clinical outcomes compared to direct presentation. Methods -STRATIS was a prospective, multicenter, observational, single-arm study of real-world MT for acute stroke due to anterior-circulation large vessel occlusion performed at 55 sites over 2 years, including 1000 patients with severe stroke and treated within 8 hours. Patients underwent MT with or without IV-tPA, and were admitted to endovascular-capable centers via either interhospital transfer or direct presentation. The primary clinical outcome was functional independence (modified Rankin Score 0-2) at 90 days. We assessed 1) real-world time metrics of stroke care delivery, 2) outcome differences between direct and transfer patients undergoing MT, and 3) the potential impact of local hospital bypass. Results -A total of 984 patients were analyzed. Median onset-to-revascularization time was 202.0 minutes for direct vs. 311.5 minutes for transfer patients (p<0.001). Clinical outcomes were better in the direct group with 60.0% (299/498) achieving functional independence, compared to 52.2% (213/408) in the transfer group (odds ratio 1.38, 95%CI 1.06-1.79; p=0.02). Likewise, excellent outcome (modified Rankin Score 0-1) was achieved in 47.4% (236/498) of direct patients vs. 38.0% (155/408) of transfer patients (odds ratio 1.47, 95%CI 1.13-1.92; p=0.005). Mortality did not differ between the two groups (15.1% for direct, 13.7% for transfer; p=0.55). IV-tPA did not impact outcomes. Hypothetical bypass modeling for all transferred patients suggested that IV-tPA would be delayed by 12 minutes but MT would be performed 91 minutes sooner if patients were routed directly to endovascular-capable centers. If bypass is limited to a 20-mile radius from onset, then IV-tPA would be delayed by 7 minutes and MT performed 94 minutes earlier. Conclusions -In this large, real-world study, interhospital transfer was associated with significant treatment delays and lower chance of good outcome. Strategies to facilitate more rapid identification of large vessel occlusion and direct routing to endovascular-capable centers for severe stroke patients may improve outcomes. Clinical Trial Registration -URL: http://www.clinicaltrials.gov. Unique identifier: NCT02239640.

Guideline

EUROPEAN STROKE JOURNAL

European Stroke Journal
0(0) 1–8

DOI: 10.1177/2396987317699144
journals.sagepub.com/home/eso
SAGE

Recommendations from the ESO-Karolinska Stroke Update Conference, Stockholm 13–15 November 2016

Niaz Ahmed[1,2], Thorsten Steiner[3,4], Valeria Caso[5] and Nils Wahlgren[2]; for the ESO-KSU session participants*

Session 10: Prehospital triage for mechanical thrombectomy

B. Mechanical thrombectomy: 'Drip and ship' or 'load and go'?

3. For patients with a suspected LAO based on current clinical tools on field, there is uncertainty about the equipoise between drip and ship (that prioritizes early IVT and other standard of care therapies) and mother-ship (that prioritizes early endovascular thrombectomy) models. Data based on randomized controlled trials are needed to determine the most beneficial model for each particular patient (eligible or not for iv-tPA) in different geographical regions and to establish isochrones where a particular model may be beneficial (Grade C).
4. In the absence of evidence, for patients considered eligible to IVT in the field, if estimated transfer time to the nearest primary stroke centre is considerably shorter than time to a comprehensive stroke centre (approximately more than 30–45 min), the drip and ship model should be considered (Grade C).
5. In the absence of evidence, in a scenario where a primary stroke centre and comprehensive stroke centre are equidistant (approximately not more than 30–45 min apart) or when contraindications to IVT are known in the field, patients with suspected LAO in the field, should be considered for transfer directly to a comprehensive stroke centre, bypassing any closer primary stroke centres (Grade C).
6. In case of primary admission to a primary stroke centre, evaluation and treatment for patients with a possible LAO must be expeditious, to ensure a rapid secondary transfer to a comprehensive stroke centre, avoiding any sources of delay such as complex neuroimaging studies (i.e. perfusion studies) or waiting for effect of IVT. First picture to puncture time should be less than 90 min (Grade A).

J Neurointerv Surg. 2017 Mar;9(3):229-233. doi: 10.1136/neurintsurg-2015-012236. Epub 2016 Feb 22.

Comparison of outcome and interventional complication rate in patients with acute stroke treated with mechanical thrombectomy with and without bridging thrombolysis.

Weber R[1], Nordmeyer H[2], Hadisurya J[1], Heddier M[2], Stauder M[2], Stracke P[2], Berger K[3], Chapot R[2].

Author information

1 Department of Neurology, Alfried Krupp Krankenhaus Essen, Essen, Germany.
2 Department of Radiology and Neuroradiology, Alfried Krupp Krankenhaus Essen, Essen, Germany.
3 Institute of Epidemiology and Social Medicine, University of Münster, Münster, Germany.

Abstract

BACKGROUND: No randomized trial has investigated the effect of mechanical thrombectomy (MT) alone in patients with acute stroke. There are conflicting results as to whether prior intravenous thrombolysis (IVT) facilitates subsequent MT, and data in patients treated with MT alone owing to contraindications to IVT are limited.

OBJECTIVE: To compare consecutive patients treated with MT alone or with preceding IVT in a large tertiary neurointerventional center, with special emphasis on contraindications to IVT.

METHODS: Retrospective analysis of 283 consecutive patients with acute ischemic stroke treated with MT in a tertiary neurovascular center over 14 months. Data on characteristics of periprocedural times, recanalization rate, complications, and long-term functional outcome were collected prospectively.

RESULTS: Information on prior IVT and functional outcome was available in 250 patients. Mean (SD) follow-up period was 5.7 (5.1) months and 105 (42%) patients received both IVT and MT. No significant differences were found in successful recanalization rates (Thrombolysis in Cerebral Infarction (TICI) 2b/3, 73.8% vs 73.1, p=0.952), complication rates, and long-term favorable outcome (modified Rankin Scale 0-2, 35.2% vs 40%, p=0.444) between patients receiving MT plus IVT and those receiving MT alone. A favorable outcome in patients directly treated with MT alone who were eligible for IVT was achieved in 48.2%. Thrombectomy was safe and resulted in a favorable outcome in 32% of patients with absolute contraindications to IVT.

CONCLUSIONS: Preceding use of IVT was not an independent predictor of favorable outcome in patients with acute stroke treated with MT and complication rates did not differ whether or not IVT was used. MT is safe and achieved a favorable outcome in one-third of patients with stroke ineligible for IVT.

Direct Mechanical Intervention Versus Combined Intravenous and Mechanical Intervention in Large Artery Anterior Circulation Stroke

A Matched-Pairs Analysis

Anne Broeg-Morvay, MD*; Pasquale Mordasini, MD, MSc*; Corrado Bernasconi, MD, PhD; Monika Bühlmann, MD; Frauke Pult, MD; Marcel Arnold, MD; Gerhard Schroth, MD; Simon Jung, MD; Heinrich P. Mattle, MD; Jan Gralla, MD, MSc*; Urs Fischer, MD, MSc*

Background and Purpose—Five randomized controlled trials have consistently shown that mechanical thrombectomy (MT) in addition to best medical treatment (±intravenous tissue-type plasminogen activator) improves outcome after acute ischemic stroke in patients with large artery anterior circulation stroke. Whether direct MT is equally effective as combined intravenous thrombolysis with MT (ie, bridging thrombolysis) remains unclear.

Methods—We retrospectively compared clinical and radiological outcomes in 167 bridging patients with 255 patients receiving direct MT because of large artery anterior circulation stroke. We matched all patients from the direct MT group who would have qualified for intravenous tissue-type plasminogen activator with controls from the bridging group, using multivariate and propensity score analyses. Functional independence was defined as modified Rankin Scale score of 0 to 2.

Results—From February 2009 to August 2014, 40 patients from the direct MT group would have qualified for bridging thrombolysis but were treated with MT only. Clinical and radiological characteristics did not differ from the bridging cohort, except for higher rates of hypercholesterolemia (P=0.019), coronary heart disease (P=0.039), and shorter intervals from symptom onset to endovascular intervention (P=0.01) in the direct MT group. Functional independence, mortality, and intracerebral hemorrhage rates did not differ (P>0.1). After multivariate matching analysis outcome in both groups did not differ, except for lower rates of asymptomatic intracerebral hemorrhage (P=0.023) and lower mortality (P=0.007) in the direct MT group.

Conclusions—In patients with large anterior circulation stroke, direct mechanical intervention seems to be equally effective as bridging thrombolysis. A randomized trial comparing direct MT with bridging therapy is warranted. (***Stroke*. 2016;47:1037-1044. DOI: 10.1161/STROKEAHA.115.011134.**)

Home » The SWIFT DIRECT trial

The SWIFT DIRECT trial

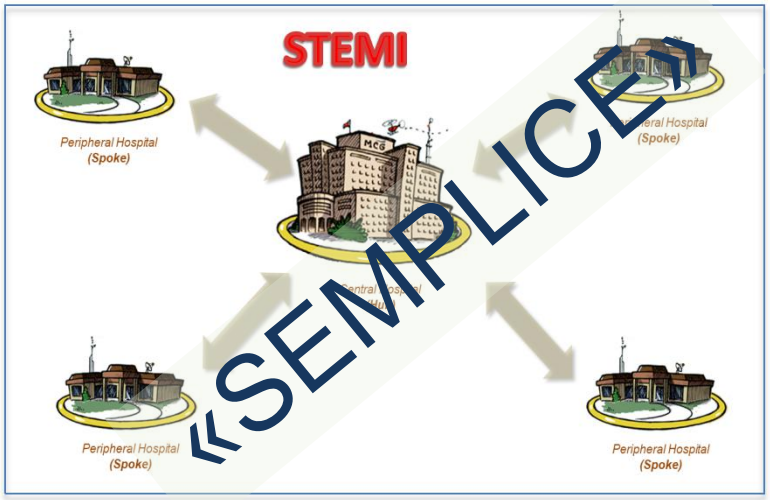
Solitaire™ With the Intention For Thrombectomy Plus Intravenous t-PA Versus DIRECT Solitaire™ Stent-retriever Thrombectomy in Acute Anterior Circulation Stroke (SWIFT DIRECT).

Bridging Thrombolysis Versus Direct Mechanical Thrombectomy in Acute Ischemic Stroke.

Please find more information on www.clinicaltrials.gov

https://www.swift-direct.ch/the-swift-direct-trial/

Il percorso CLINICO



«SEMPLICE»

COMPLESSO

Diagnosi più complessa *(Tecnologia necessaria, Capacità di Interpretazione)*

Finestra terapeutica più ristretta

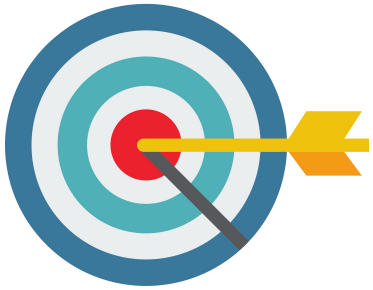
Anatomia del circolo cerebrale *(Vasi piccoli, tortuosi, variabilità anatomica)*

Danno da riperfusione *(emorragia cerebrale)*

Assente evidenza di farmaci utili nel peri-procedurale

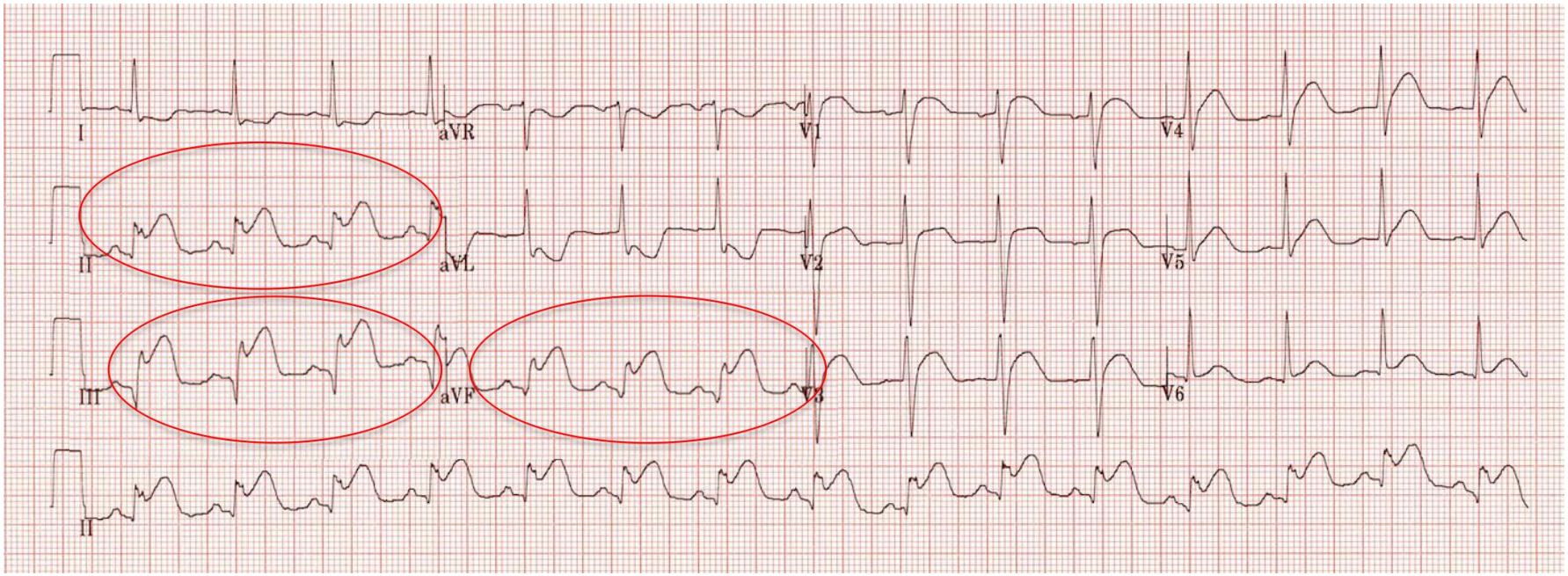
Approccio **multidisciplinare**

Basso numero di pazienti trattati *(curve di apprendimento)*



Identificazione del paziente

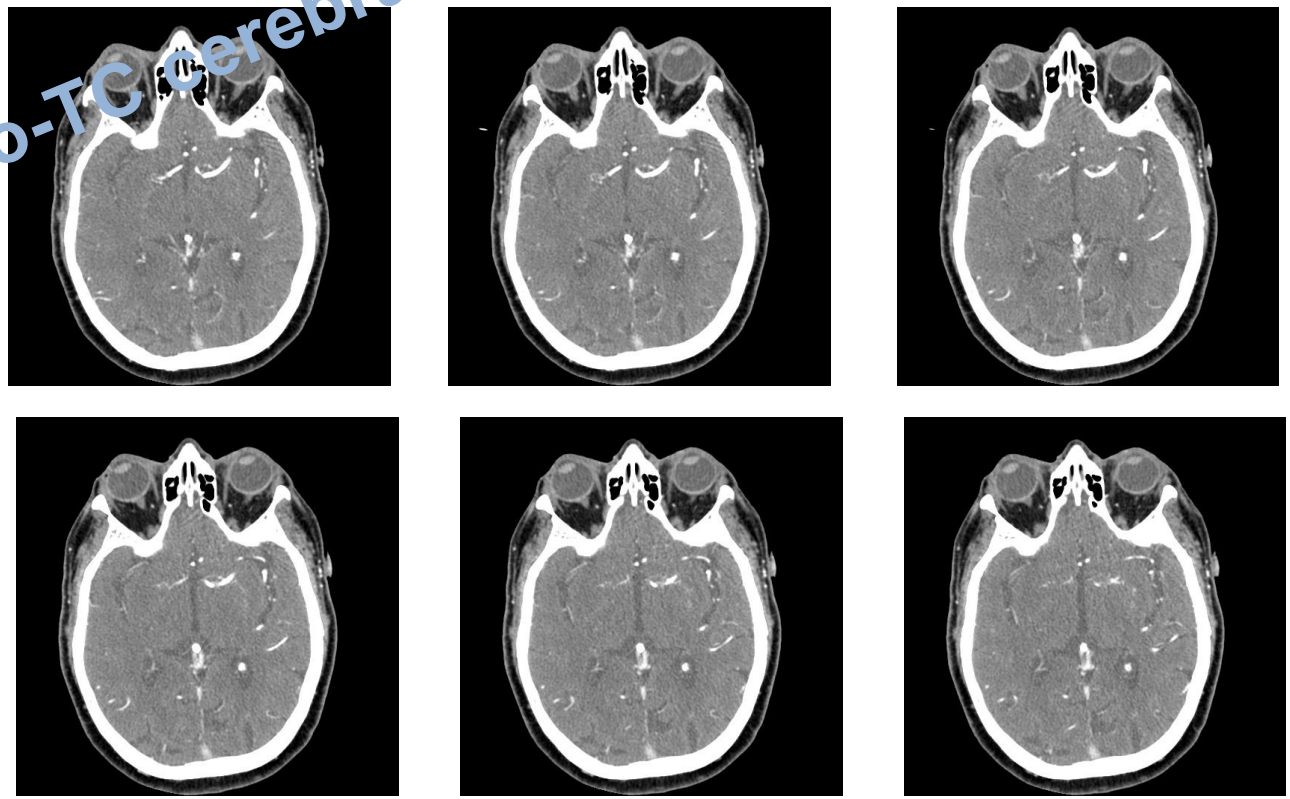
…semplice



…difficile

In ospedale

Angio-TC cerebrale



…**difficoltosa**

Sul territorio

CENTRALIZZAZIONE

DEL

PAZIENTE

Acta Neurol Scand. 2018 Feb 11. doi: 10.1111/ane.12908. [Epub ahead of print]

Prehospital stroke scales and large vessel occlusion: A systematic review.

Vidale S[1], Agostoni E[1,2].

Author information

1 Department of Neurology & Stroke Unit, Sant'Anna Hospital, Como, Italy.
2 Department of Neurology & Stroke Unit, Niguarda Ca' Granda Hospital, Milan, Italy.

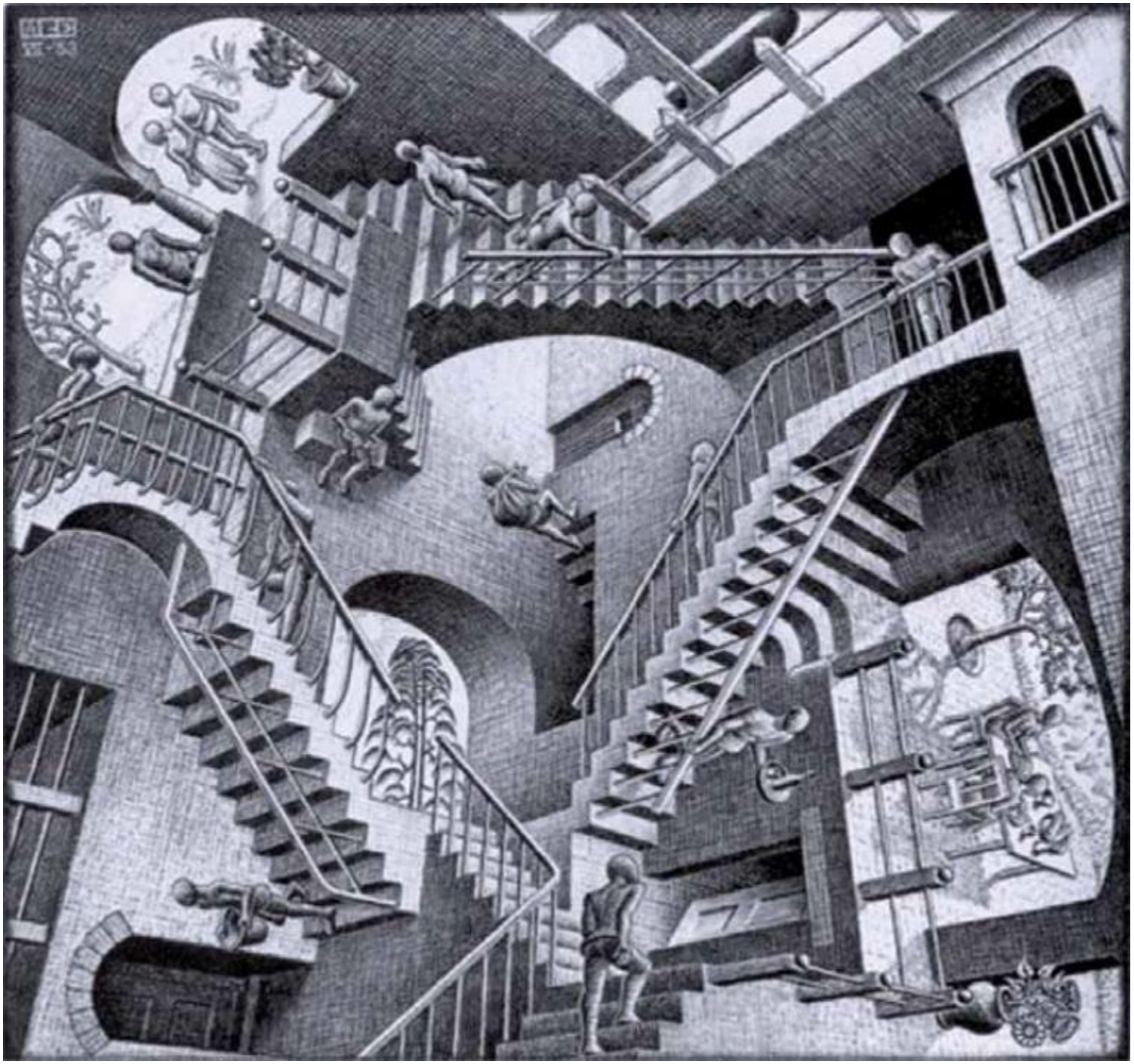
Abstract

BACKGROUND AND PURPOSE: Time sensitivity for pharmacological and mechanical arterial recanalization in acute ischemic stroke influences the choice of the reference hospital. The accurate selection and identification of patients with high probability of a large vessel occlusion (LVO) in the prehospital setting improve the rationalization of the transport in the more suitable centers. Aim of this analysis was to determine the diagnostic accuracy of prehospital stroke scales detecting LVO.

MATERIAL AND METHODS: Studies were searched into MEDLINE, EMBASE, and CINHAL databases between January 1990 and September 2017. Principal measurements of the meta-analysis were the overall accuracy level, sensitivity, and specificity of prehospital stroke scales.

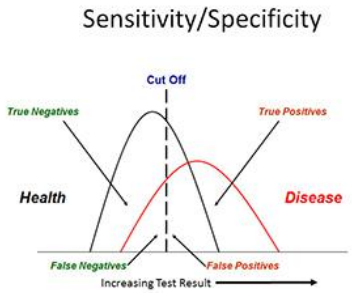
RESULTS: Nineteen scoring systems were included in the analysis coming from 13 studies. A total of 9824 patients were considered. Although a higher heterogeneity was observed in the analysis, three scores showed better results in predicting a LVO (the stroke Vision, Aphasia, Neglect assessment, the National Institute of Health Stroke scale and the Los Angeles Motor Scale). We observed significant differences of overall accuracy only for scores including hemineglect as cortical neurological sign ($P < .05$).

CONCLUSIONS: This meta-analysis suggests that some prehospital scoring systems including cortical signs showed better accuracy to predict stroke due to LVO. However, the assessment of these signs could be difficult to investigate by paramedics and personnel of Emergency Medical Services, and for this reason, further prospective evaluations are needed.



- Semplicità di utilizzo

- Accuratezza diagnostica



Guideline

EUROPEAN STROKE JOURNAL

European Stroke Journal
0(0) 1–8

DOI: 10.1177/2396987317699144
journals.sagepub.com/home/eso
SAGE

Recommendations from the ESO-Karolinska Stroke Update Conference, Stockholm 13–15 November 2016

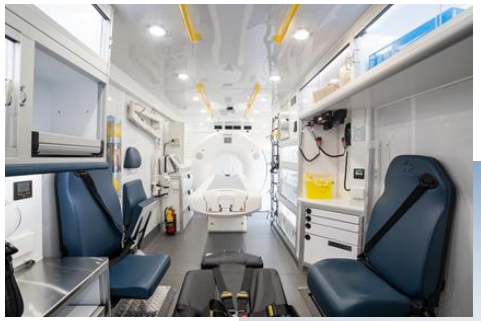
Session 10: Prehospital triage for mechanical thrombectomy

Chair: U. Fischer (Bern), Secretary: M. Mazya (Stockholm), Speakers: D. Damgaard (Aarhus), A. Davalos (Barcelona), M. Mazya (Stockholm)

A. Clinical identification of stroke patients with large vessel occlusion: Current evidence and limitations

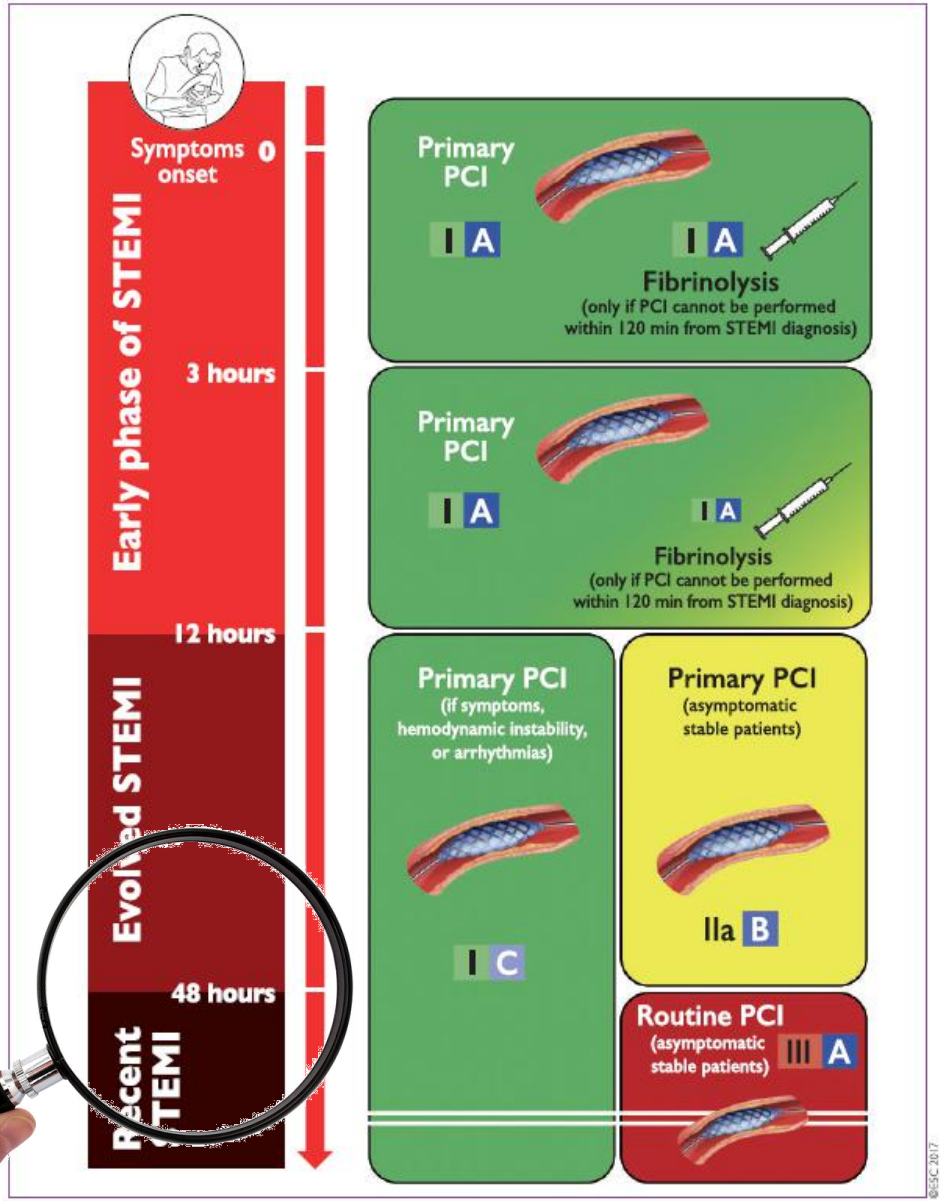
1. Several published clinical scores to predict large artery occlusion (LAO) appear to have similar predictive performance in the range of 70–80%, resulting in 20–30% of patients with LAO being missed at optimal score cut-off levels. At the same cut-off levels, 12–25% of triage positive patients would not have a LAO (Grade C).
2. Studies validating the predictive performance of currently available LAO prediction scores should be performed in pre-hospital settings in unselected patients with a suspicion of stroke following initial contact with emergency medical services (Grade C).

Mobile Stroke Units…



Finestra terapeutica

…ampia


Symptoms onset
0
Early phase of STEMI
3 hours
12 hours
Evolved STEMI
48 hours
Recent STEMI
Primary PCI
I A
I A
Fibrinolysis
(only if PCI cannot be performed within 120 min from STEMI diagnosis)
Primary PCI
I A
I A
Fibrinolysis
(only if PCI cannot be performed within 120 min from STEMI diagnosis)
Primary PCI
(if symptoms, hemodynamic instability, or arrhythmias)
I C
Primary PCI
(asymptomatic stable patients)
IIa B
Routine PCI
(asymptomatic stable patients)
III A
©ESC 2017

…stretta

NINDS

3 hours

ECASS III

4.5 hours

MR CLEAN
ESCAPE
EXTEND – IA
SWIFT-PRIME
REVASCAT

6 hours

Novembre 2017

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct

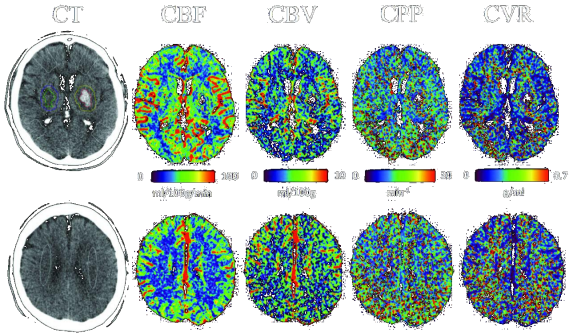
Gennaio 2018

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

Imaging avanzato (TC di perfusione o DW-MRI)



«Last time seen well»

Table 1. Characteristics of the Patients at Baseline.*

Interquartile range	2.0–18.0	3.0–18.1
Type of stroke onset — no. (%)‡		
On awakening	67 (63)	47 (47)
Unwitnessed stroke	29 (27)	38 (38)
Witnessed stroke	11 (10)	14 (14)
Occlusion site — no. (%)¶		

(Dawn trial, 2017)

Solo il **5%** dei pazienti con stroke riceve un trattamento riperfusivo

Hirsch JA, Yoo AJ, Noguiera RG et Al. ***Case volumes of intra-arterial and intravenous treatment of ischemic stroke in the USA.*** *J Neurointerv Surg 2009;1:27–31.*

Entrambi tempo - dipendenti ma fattore tempo è critico per lo **STROKE**


Cardiologi interventisti
&
Stroke

ESC European Society of Cardiology

European Heart Journal (2017) **0**, 1–9
doi:10.1093/eurheartj/ehx478

CURRENT OPINION

The role of cardiologists in stroke prevention and treatment: position paper of the European Society of Cardiology Council on Stroke

Petr Widimsky[1]*, Wolfram Doehner[2,3], Hans Christoph Diener[4], Isabelle C. Van Gelder[5], Alison Halliday[6], and Mikael Mazighi[7] on behalf of the ESC Council on Stroke

Endovascular treatment and catheter-based thrombectomy

The recent advances in interventional treatment of acute stroke[32–36] established catheter-based thrombectomy (on top of best medical therapy) as class IA indication for the treatment of anterior circulation stroke (*Figure 3*) caused by emergent large vessel occlusion presenting within <6 h from symptom onset.[37,38] The DAWN trial (presented during ESOC 2017, publication pending) showed that with the use of sophisticated magnetic resonance imaging, the therapeutic time window can be extended to 24 h. Currently, over 10% of stroke patients are eligible for endovascular treatment but future research and clinical experience will have to prove the full potential of this treatment.

A number of questions emerged from the recent trials that will be addressed in future studies: those include questions on logistics and timing as well as procedural issues, patient selection, concomitant treatments and others. One multisociety consensus document proposed general standards for hospital requirements and physician qualifications for performing endovascular stroke interventions.[39] The authors recognize that the implementation of such standards need to account for a wide variety of national clinical standards and procedural requirements. Further evaluation and interdisciplinary communication are needed to define on the basis of national and local requirements how physicians with related experience such as interventional cardiologists with carotid stenting (CAS) experience may be adequately trained for endovascular thrombectomy. Ongoing and future trials and interdisciplinary communication may answer these unresolved questions.[40]

PROS

Manualità consolidata *(PCI)*

Esperienza con stenting della carotide

Grossi volumi di attività
(Correlazione volumi – outcomes)

Network ben stabilito
(Hub & Spoke dello STEMI)

CONS

Anatomia più difficile
(Vasi più piccoli, più tortuosi, con maggiore variabilità anatomica)

Tecniche differenti

Neuro-radiologi interventisti formatisi con esperienza da più patologie
(Stroke ischemico, Aneurismi, Malformazioni vascolari)

Aspetti diagnostici
(Esame neurologico, Interpretazione TC, Angio-TC e TC di perfusione)

Aspetti procedurali


TO BE
CONTINUED...

Trombectomia Meccanica UNICO trattamento???

I cardiologi interventisti… e la nicchia vuota???