

**Methods** Patients with wide neck bifurcation aneurysm were included in WEBCAST2 if the aneurysm was not previously treated. An independent medical monitor independently analyzed adverse events. Follow-up imaging was obtained at 6 and 12 months up to 5 years after the procedure. An independent expert in Interventional Neuroradiology evaluated anatomical results using the 3 grades scale: complete occlusion, neck remnant, and aneurysm remnant.

**Results** From August 14 to May 15, 55 patients (38 females, 69.0%) with 55 aneurysms including 4 ruptured (7.2%) were included. Aneurysm locations were: middle cerebral artery in 25 patients (46.0%), anterior communicating artery in 16 patients (29.0%), basilar artery in 9 patients (16.0%), and internal carotid artery terminus in 5 patients (9.0%). Placement of the WEB device was feasible in 53/55 aneurysms (96.4%). Forty-seven aneurysms were treated with the WEB-SL and 6 with WEB-SLS. Adjunctive devices were used in 4 patients (7.3%). Procedure-related morbidity and mortality at one month were reported in 1/54 patients (1.8%) and 0/54 patients (0.0%), respectively (1 patient was missing one-month follow-up).

Anatomical results at 6 months were complete aneurysm occlusion in 28/49 aneurysms (57.1%), neck remnant in 11/49 aneurysms (22.4%), and aneurysm remnant in 10/49 aneurysms (20.4%).

**Conclusion** Preliminary results of WEBCAST2 show similar safety and efficacy of WEB-SL/SLS compared to WEB-DL (WEBCAST) with low morbidity and no mortality and a high rate of adequate occlusion (79.5%).

**Disclosures** L. Pierot: 2; C; Sequent. A. Molyneux: 2; C; Sequent. J. Byrne: 2; C; Sequent.

**0-021 FLOW DIVERSION IN RUPTURED INTRACRANIAL ANEURYSMS: A SYSTEMATIC REVIEW**

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**Background and purpose** Flow diversion is an established technique to treat unruptured intracranial aneurysms not amenable to standard endovascular or microsurgical techniques. The suitability of flow diverting devices (FDD) to treat ruptured aneurysms is less clear.

**Materials and methods** An in-depth search of multiple electronic publication databases was performed for reports describing ruptured intracranial aneurysms treated by flow diversion. Clinical and radiological characteristics, interventional details, and outcomes were pooled and analyzed in aggregate.

**Results** The pooled cohort comprised of 126 patients with a mean age of  $52.6 \pm 12.5$  years. Mean Hunt Hess/World Federation of Neurosurgical Societies grading scale at presentation was  $2.2 \pm 1.2$ . Treated aneurysms were located in the anterior circulation in 64% (81/126) cases and 36% (45/126) in the posterior circulation. Five distinct aneurysm morphologies were present, including dissecting (28%, 35/125), fusiform (9.6%, 12/125), giant (3.2%, 4/125), blister (37.6%, 47/125), and saccular (21.6%, 27/125) types. Favorable clinical outcome (defined as Modified Rankin Scale (mRS) = 0–2 or Glasgow Outcome Scale (GOS) = 4–5) was achieved in 81.5% (101/124) of treated patients. Unfavorable clinic outcome (defined by mRS = 3–6 or GOS = 1–3) occurred in 18.5% (23/124)

of patients. Clinically significant hemorrhagic complications occurred in 5.5% (7/126) of cases, the majority of which were due to aneurysm re-rupture (4.8%; 6/126). Aneurysm size greater than 2 cm was associated with a greater risk of re-rupture when compared to aneurysms smaller than 2 cm ( $p = 0.001$ ). Aneurysm size greater than 7 mm was associated with more unfavorable clinical outcomes ( $p = 0.03$ ).

**Conclusion** For ruptured aneurysms not amenable to other treatment strategies, the use of flow diversion may allow for reasonably high rates of good clinical outcomes, particularly in small aneurysms. There was a risk of re-rupture in these aneurysms, especially those larger than 2 cm.

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**0-022 GENERAL ANESTHESIA, BASELINE ASPECTS, TIME TO TREATMENT, AND IV TPA IMPACT INTRACRANIAL HEMORRHAGE AFTER STENTRIEVER THROMBECTOMY: POOLED ANALYSIS FROM SWIFT PRIME, SWIFT AND STAR TRIALS**

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**Introduction** Despite the proven benefit of Solitaire for treatment of acute ischemic stroke, symptomatic intracranial hemorrhage (ICH) remains the most feared procedural complication. The aim of this analysis was to identify the factors determining ICH after neurothrombectomy with Solitaire stentriever.

**Methods** All patients (N = 389) treated with Solitaire in SWIFT, SWIFT PRIME, and STAR trials were analyzed for incidence of 5 different ICH subtypes. Each ICH subtype was correlated with baseline clinical, imaging and procedural characteristic (age, NIHSS, hypertension, diabetes, atrial fibrillation, hyperglycemia, INR, platelet count, ASPECTS, general anesthesia, collateral grade, number of devices passes, final TICL, rescue therapy, IV TPA). Multivariate stepwise logistic regression model was used to identify the predictors of individual ICH subtypes.

**Results** ICH was observed in 21.6% (N = 84) of which sICH was 1.0% (N = 4), hemorrhage in ischemic territory (HIT) 19.3% (N = 75), PH 5.4% (N = 21), and SAH 2.3% (N = 9). The most significant predictors of any ICH, HIT, and PH are included in Table 1. No specific predictors of SAH, and sICH were identified. Patients who achieved functional independence at 90 days (mRS 0–2) had significantly lower incidence of any ICH, HIT, PH, and no sICH (Table 2).

**Conclusions** Higher baseline ASPECTS, better collaterals and general anesthesia are associated with lower incidence of ICH after neurothrombectomy with Solitaire stentriever. Prolonged

time to treatment increases the risk of parenchymal hematoma and hemorrhage in ischemic territory. Parenchymal hematoma is distinctly associated with IV TPA. Of all ICH subtypes, sICH has the strongest impact on functional independence.

**Abstract O-022 Table 1** Predictors of ICH

Any ICH (HI, PH, SAH, IVH, RIH)				
Predictor	Odds ratio	Lower CI	Upper CI	p-value
ASPECTS	0.80	0.66	0.98	0.032
General anesthesia	0.36	0.18	0.71	0.003
Collateral grade	0.71	0.50	1.01	0.057
<b>Hemorrhage in ischemic territory (HI and PH)</b>				
ASPECTS	0.78	0.68	0.91	0.001
General anesthesia	0.54	0.31	0.92	0.023
Onset to groin puncture (per 15 min)	1.08	1.03	1.12	0.001
<b>Parenchymal hematoma</b>				
IV TPA	7.63	1.52	17.35	0.013
Onset to groin puncture (per 15 min)	1.11	1.02	1.20	0.015

Abbreviations: HI – hemorrhagic infarction; PH – parenchymal hematoma; SAH – subarachnoid hemorrhage; IVH – intraventricular hemorrhage; RIH – remote intracranial hemorrhage

**Abstract O-022 Table 2** Clinical outcome

ICH subtype	Functional independence with ICH	Functional independence without ICH	p-value
Any ICH (HI, PH, SAH, IVH, RIH)	32.1% (27/84)	61.4% (183/298)	<0.001
HIT (HI + PH)	30.7% (23/75)	60.9% (187/307)	<0.001
SAH	44.4% (4/9)	55.2% (206/373)	0.74
PH	19.0% (4/21)	57.1% (206/361)	0.001
sICH	0.0% (0/4)	55.6% (210/378)	0.040

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**0-023 THE CURRENT STATE OF NEUROINTERVENTIONAL SURGERY RESEARCH HIGHLIGHTS THE NEED FOR COLLABORATION**

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**Introduction** No studies have sought to provide a quantitative or qualitative critique of the research produced in the field of neuro-interventional (NI) surgery. We designed a pilot study to analyze recent publications from the *Journal of Neurointerventional*

*Surgery* (JNIS) to understand the current state of NI research and collaboration.

**Methods** We reviewed all JNIS Online First publications from February 25, 2015 to February 24, 2016. All publications including human or non-human research, systematic reviews, meta-analyses or literature reviews were included; editorials and commentaries were excluded. For each publication, study design, number of patients, authors, and contributing centers and study subject were recorded. Level of evidence was defined for each study using a novel scale (Table 1).

**Results** A total of 206 JNIS research articles met inclusion criteria. The average number of centers and authors per study was 2.1 (standard deviation 1.6, range 1–10) and 6.8 (SD 2.9, range 1–17), respectively. Only 4% of published studies were prospective studies (Table 2). Twenty-eight percent of scientific research published featured patient series of 9 or less. Forty-seven percent of publications involved individuals from a single center, with the vast majority (87%) having collaboration of individuals from 3 centers or less (Table 3). While 256 distinct institutions from all over the world were represented, 66% of centers were represented in only a single publication. The majority of publications were categorized as poor quality (level 4 or 5) evidence (91%; Table 4).

**Conclusions** This pilot study designed to assess the quality of research and inter-institution collaboration suggests that most published NI research is of low quality with few contributing institutions. Observations from this study therefore support the need for collaborative, multicenter prospective databases of NI cases.

**Abstract O-023 Table 1** Modified level of evidence scale for NI research

Level of evidence	Study type
1	Systematic reviews or meta-analyses of randomized controlled trials or individual randomized controlled trials
2	Systematic reviews or meta-analyses of predominantly prospective studies, or individual prospective studies
3	Systematic reviews or meta-analyses of predominantly retrospective studies, or retrospective case-control studies
4	Retrospective non-case-control studies of 10 or more patients
5	Case reports, case series of 9 patients or less, national or state retrospective database studies, animal studies, or other non-human studies

**Abstract O-023 Table 2** Types of studies

Study type	Number of studies	Percent
Randomized controlled trial	1	0.5
Prospective series (10+ pts)	7	3.4
Retrospective series (10+ pts)	91	44.2
Case report	35	17.0
Case series (2–9 pts)	23	11.2
Animal study	9	4.4
Non-human or imaging study	21	10.2
Systematic reviewer meta-analysis	7	3.4
National or state database analysis or literature review	12	5.8