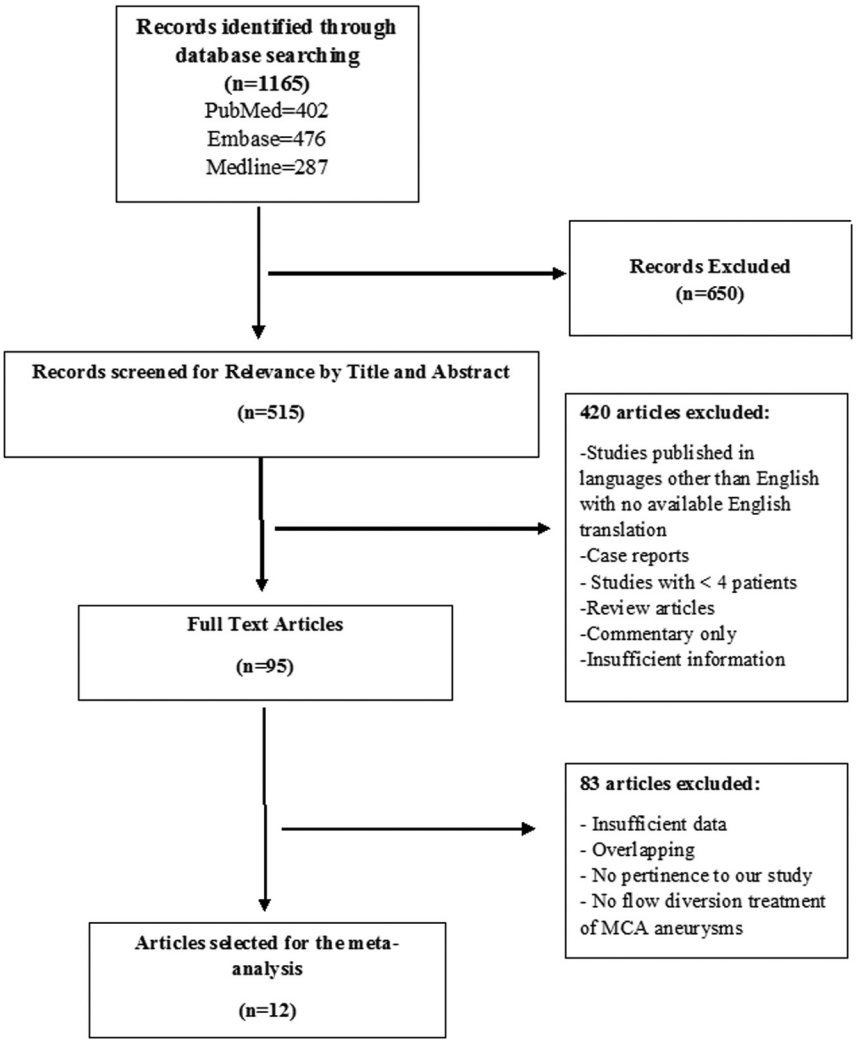
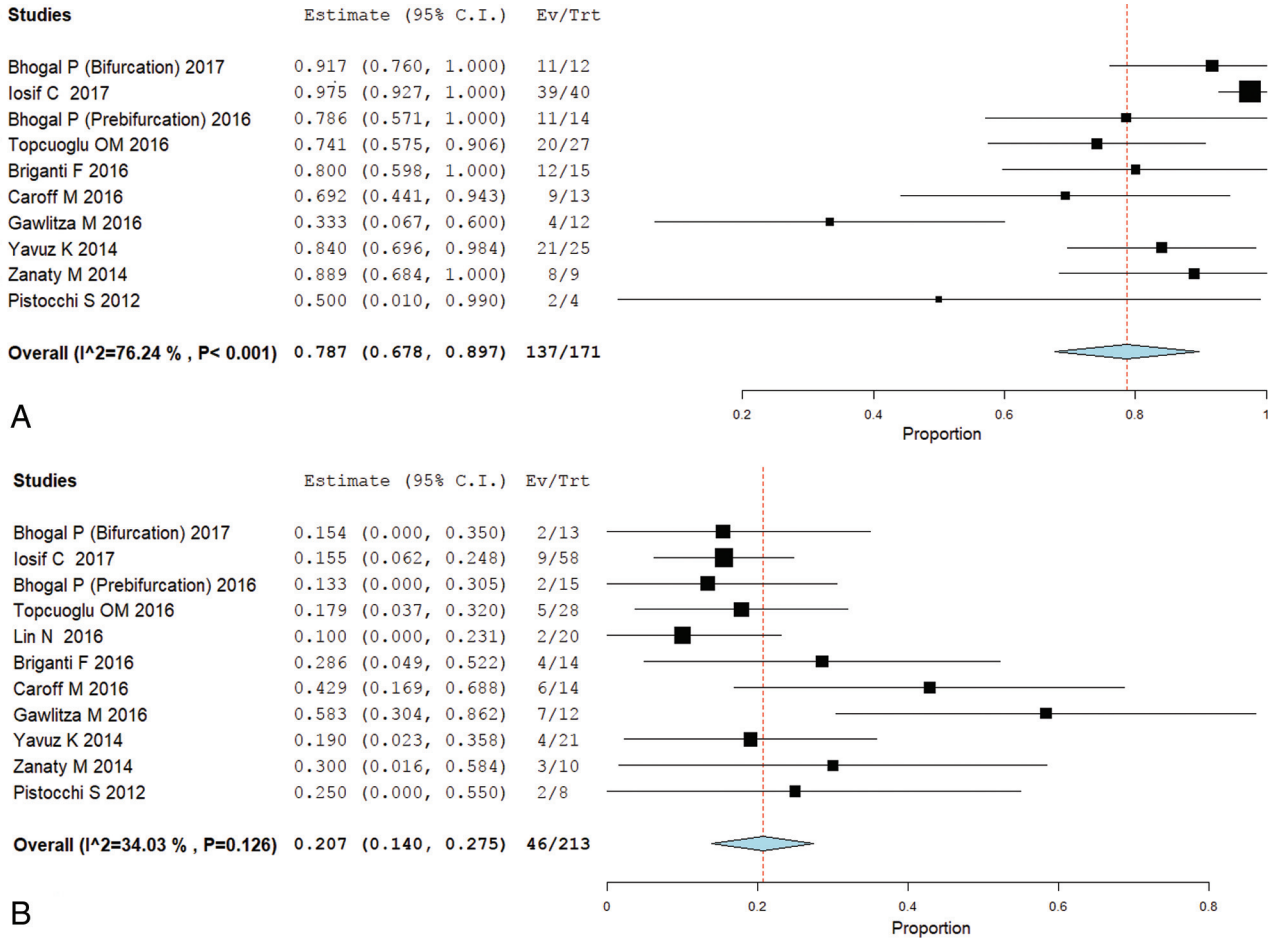
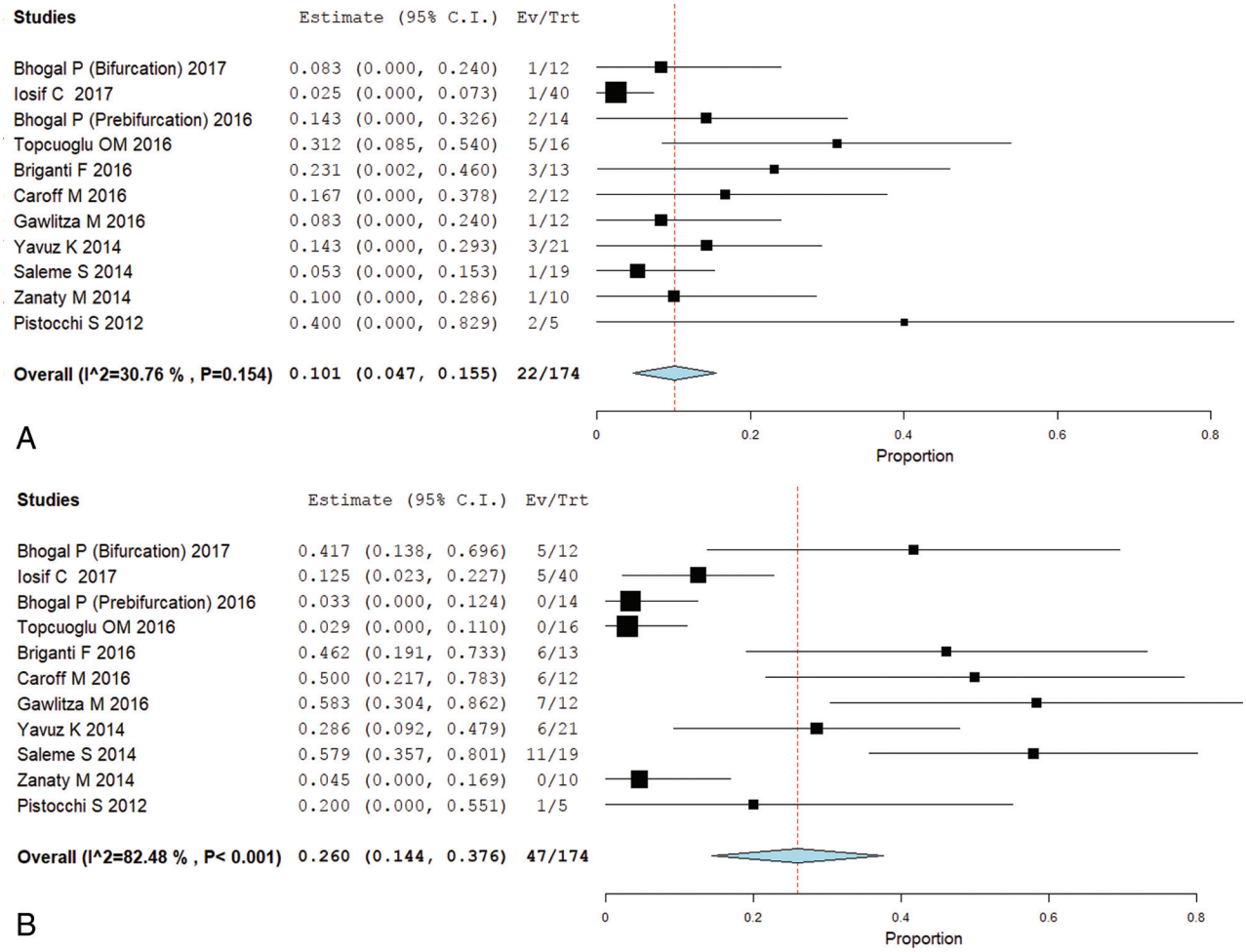


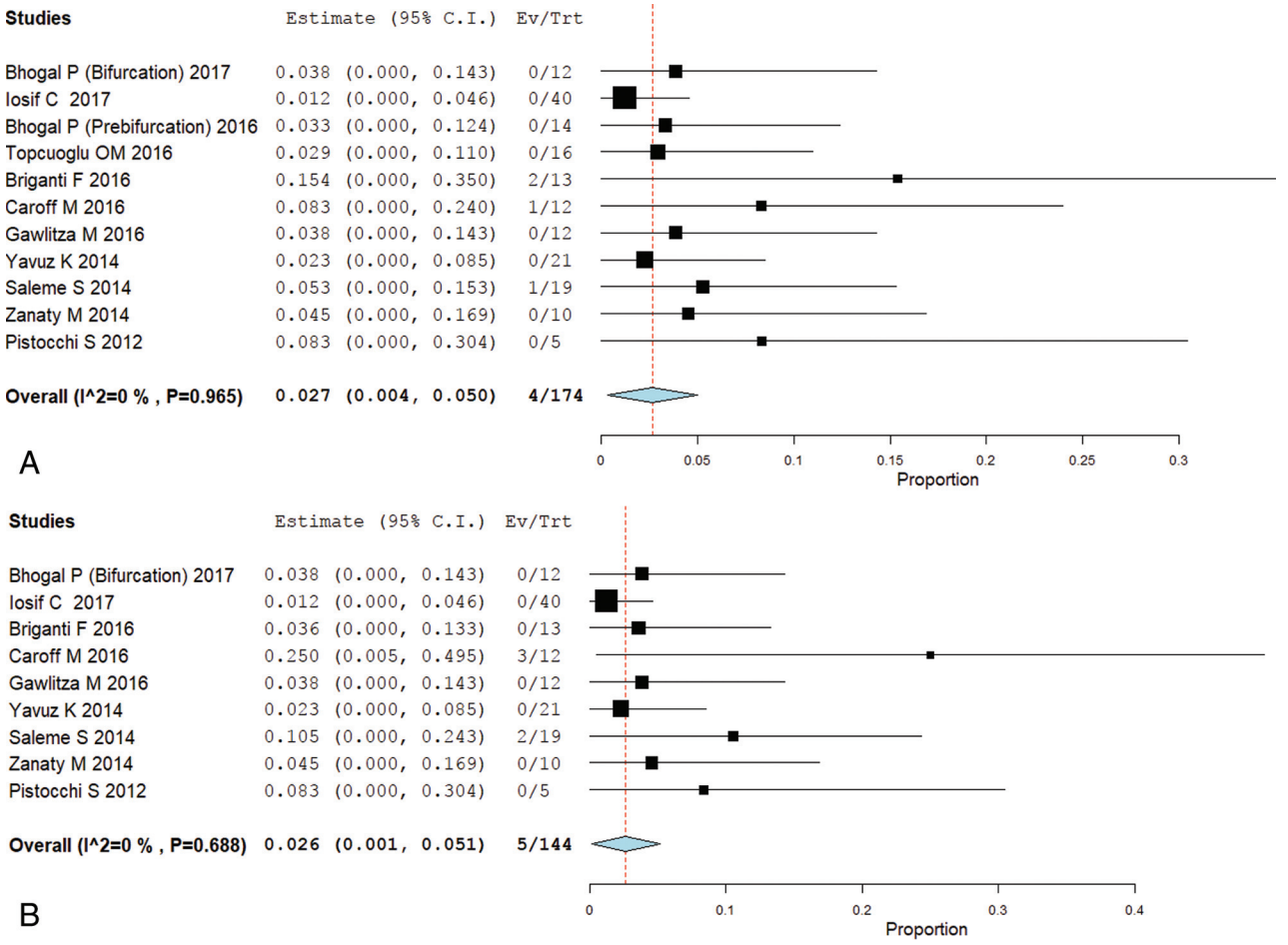
ON-LINE FIG 1. PRISMA diagram detailing the specifics of the systematic literature review.



ON-LINE FIG 2. Forest plot demonstrating the rate of complete/near-complete MCA aneurysm occlusion after treatment (*A*) and the rate of treatment-related complications (*B*).



ON-LINE FIG 3. Forest plot demonstrating the overall rate of arterial occlusion (*A*) and diminished flow (*B*) after flow diversion.



ON-LINE FIG 4. Forest plot demonstrating the incidence of symptoms related to occlusion (*A*) and diminished flow (*B*) of covered arterial branches.

On-line Table 1: Search syntax

PubMed Search Accessed on May 2, 2017 (402 Articles)	Embase Search Accessed on May 2, 2017 (476 Articles)	MEDLINE Search Accessed on May 2, 2017 (287 Articles)
((((middle cerebral artery[Title/Abstract]) AND aneurysms[Title/Abstract]) AND (flow-diverter[Title/Abstract] OR flow diversion[Title/Abstract] OR pipeline[Title/Abstract]))) AND ("2008/01/01"[Date - Publication]: "3000"[Date - Publication])	'middle cerebral artery':ab,ti AND aneurysms:ab,ti AND ('flow diverter':ab,ti OR flow:ab,ti AND diversion:ab,ti OR pipeline:ab,ti) AND [2008–2017]/py	(middle cerebral artery and aneurysms and (flow-diverter or flow diversion or pipeline)).ti.
((((anterior circulation[Title/Abstract]) AND aneurysms[Title/Abstract]) AND (flow-diverter[Title/Abstract] OR flow diversion[Title/Abstract] OR pipeline[Title/Abstract]))) AND ("2008/01/01"[Date - Publication]: "3000"[Date - Publication])	anterior:ab,ti AND circulation:ab,ti AND aneurysms:ab,ti AND ('flow diverter':ab,ti OR flow:ab,ti AND diversion:ab,ti OR pipeline:ab,ti) AND [2008–2017]/py	
((((middle cerebral artery[Title/Abstract]) AND aneurysms[Title/Abstract]) AND endovascular[Title/Abstract])) AND ("2008/01/01"[Date - Publication]: "3000"[Date - Publication])	'middle cerebral artery':ab,ti AND aneurysms:ab,ti AND endovascular:ab,ti AND [2008–2017]/py	(anterior circulation and aneurysms and (flow-diverter or flow diversion or pipeline)).ab. middle cerebral artery.ab. and aneurysms.ti. and endovascular.ti.

On-line Table 2: Summary of studies included in meta-analysis

Study	Design	No. of MCA AA and Location	Type of FDS	No. of AA Previously Treated (Clipping or Coiling)	No. of AA with Good Occlusion after FD (>90%)[a]	Patients Experiencing Complications	Mean Radiologic Follow-Up (mo)	Quality of Studies
Bhogal et al, 2017[5]	R (ProDB)	13 M1–M2bif	1 PED + 12 p64[b]	3	11/12	2/13	15.8	6
Iosif et al, 2017[9]	R (ProDB)	63 M1–M2bif	57 PED + 5 FRED[c] + 1 Silk	11	39/40	9/58	28	7
Bhogal et al, 2016[6]	R (ProDB)	5 M1 + 10 ECB	4 PED + 11 p64	4	11/14	2/15	18.7	6
Topcuoglu et al, 2016[12]	R	10 M1 + 10 ECB + 6 M1–M2bif + 3 Dist	24 Silk + 3 Surpass[d] + 9 Leo[e] + 3 Enterprise[f]	4	20/27	5/28	10.3	7
Lin et al, 2016[10]	R	12 M1 + 8 MCAbif	20 PED	NA	17/19	2/20	10.7	6
Briganti et al, 2016[29]	R	2 M1 + 13 M1–M2bif	15 PED	5	12/15	4/14	12	6
Caroff et al, 2016[8]	R	15 M1–M2	Silk + FRED + PED	7	9/13	6/14	16	6
Gawlitza et al, 2016[20]	R	12 M1–M2bif	2 Silk + 6 PED + 4 FRED	6	4/12	7/12	16	5
Yavuz et al, 2014[13]	R	21 M1–M2bif + 4 Dist	25 PED	4	21/25	4/21	18	7
Saleme et al, 2014[34]	R	19 M1–M2bif	19 PED	5	NA	NA	6	5
Zanaty et al, 2014[14]	R	5 M1 + 3 M1–M2bif + 2 Dist	10 PED	2	8/9	3/10	7.5	5
Pistocchi et al, 2012[11]	R	2 M1 + 6 M1–M2bif	2 Silk + 6 PED	4	2/4	2/8	12	5

Note:—R indicates retrospective; ProDB, prospectively maintained data base; AA, aneurysm; M1–M2bif, main bifurcation of MCA; ECB, early cortical branches; Dist, aneurysms of the M2–M3 branches; FD, flow diversion; FDS, flow diverters; NA, not applicable; MCAbif, middle cerebral artery bifurcation.

[a] Number of aneurysms available during follow-up.

[b] p64 Flow Modulation Device (Phenox, Bochum, Germany).

[c] Flow-Redirection Endoluminal Device (MicroVention, Tustin, California).

[d] Surpass stent (Stryker Neurovascular, Kalamazoo, Michigan).

[e] LEO stent (Balt Extrusion, Montmorency, France).

[f] Enterprise self-expanding stent (Codman & Shurtleff, Raynham, Massachusetts.

On-line Table 3: Patient and aneurysm characteristics and treatment-related outcomes after flow diversion of MCA aneurysms

Variables	Raw Numbers (%)	No. of Articles	95% CI
Population characteristics			
No. of Patients	229	12	
Mean age (range) (yr)	54.5 (3–76)	9	
Male/female ratio	72/121 = 0.6	9	
MCA aneurysm characteristics (No.)			
MCA aneurysms treated with an FD	244	12	
Unruptured (%) vs previously ruptured	215 (88.1%)	11	83.4–91.6
	vs		
	29 (11.9%)		8.3–16.5
Aneurysm morphology (No.)			
Saccular	198 (81.1%)	12	75.7–85.5
Fusiform	43 (17.6%)		13.3–22.9
Blister	3 (1.3%)		0.2–3.7
Mean aneurysms size (range) (mm)	8.2 (2–20)	8	
MCA locations (No.)		12	
Prebifurcation (M1–early cortical branches)	58 (23.7%)		18.8–29.5
Bifurcation	186 (76.3%)		70.5–81.1
Treatment and angiographic outcome of aneurysms (No.)			
Type of device		10	
PED	178 (71%)		64.1–75.3
Silk	29 (11.4%)		80.3–15.9
p64	23 (9%)		6–13.2
FRED	9 (3.5%)		1.8–6.7
Surpass	3 (1.2%)		0.2–3.5
Other (multiple LEO or Enterprise)	12 (4.7%)		2.6–8.1
Flow-diverter stents/aneurysms	1.14	10	
First treatment	169/224 = 75.5%	11	69.4–80.6
Mean radiologic follow-up (range) (mo)	14.5 (6–18.7)	12	

On-line Table 4: Flow changes among MCA branches covered with flow-diverter stents

Variables	Raw Numbers[a]	No. of Articles	95% CI	I^2	*P* Value
Angiographic outcomes of covered MCA branches (meta-analysis)					
Occlusion (during follow-up)	22/174 = 10.1%	11	4.7–15.5	30.76%	.154
Diminished flow (during follow-up)	47/174 = 26 %	11	14.4–37.6	82.48%	<.001
Rate of symptoms related to branch occlusion	4/174 = 2.7 %	11	0.4–5	0%	.965
Rate of symptoms related to diminished flow	5/144 = 2.6%	9	0.1–5.1	0%	.688

[a] Results of meta-analysis.