ON-LINE APPENDIX

Two interventional neuroradiologists not directly involved in patient treatment independently evaluated anatomic and angiographic results. A senior interventional neuroradiologist solved discrepancies.

Definition of Adequately Sized and Undersized WEBs

In general, WEB size was chosen following the current recommendations for oversizing (in comparison with the aneurysm dimensions) the diameter of the WEB by 1 mm and undersizing the WEB height by 1 mm. Measurements of the aneurysm were performed on 3D rotational angiography, considering the width and the height of the dome outside of additional blebs and daughter aneurysms. This method is supposed to increase the WEB radial force and obtain appropriate anatomic results.[1]

In our study, sizing was assessed by analyzing the aneurysm and WEB device in both working projections and standard projections (anteroposterior, lateral, obliques views); in addition, contrast-enhanced flat panel detector CT was performed at the end of the procedure. An adequately sized WEB was then defined if the cage completely filled the aneurysm sac, with complete wall apposition and satisfactory coverage of the aneurysm neck. Contrariwise, undersized devices were defined by the cage not completely covering the neck. In general, in case of a branching vessel arising from the aneurysm neck, the device was intentionally undersized to avoid WEB bulging and subsequent thromboembolic complications.

Oversizing was generally avoided, and there were no cases of an oversized WEB that was defined as a bulging of the WEB over the neck, impacting the parent artery.

Definition of WEB Shape Change

The modification of the WEB device was classified into 2 groups: no noticeable modifications of the WEB shape and WEB shape change that was defined as a decrease of the height of the device (shortening of the distance between the proximal and distal markers) or a deepening of the proximal and distal concave device recesses during the follow-up. Modifications were evaluated by comparing, in similar nonsubtracted angiographic views, the distance between the distal and proximal markers of the device.[2,3]

REFERENCES

1. Cognard C, Januel AC. **In reply: WEB aneurysm treatment: occlusion stability and compression.** *Neurosurgery* 2015;77:E667–69 CrossRef Medline
2. Cognard C, Januel AC. **Remnants and recurrences after the use of the WEB intrasaccular device in large-neck bifurcation aneurysms.** *Neurosurgery* 2015;76:522–30; discussion 530 CrossRef Medline
3. Herbreteau D, Bibi R, Narata AP, et al. **Are anatomic results influenced by WEB shape modification? Analysis in a prospective, single-center series of 39 patients with aneurysms treated with the WEB.** *AJNR Am J Neuroradiol* 2016;37:2280–86 CrossRef Medline

On-line Table 1: Clinical and angiographic data of the analyzed patient population

Variables	No./Statistic	95% CI
No. of patients	86	
Proportion of men	28/86 = 32.5%	23.5–43
Mean age (yr)	61 ± 11.5	
Hypertension	42/86 = 49%	37–59
Smoking	39/86 = 45%	32.5–55
Acutely ruptured	21/86 = 24%	16.5–34.5
Bifurcation aneurysms	68/86 = 79%	69–86.5
Side wall aneurysms	18/86 = 21%	13.5–30
Aneurysm location		
MCA	43/86 = 50%	39.6–60
AcomA	12/86 = 14%	80–22.9
Carotid-T	5/86 = 6%	2.2–13.2
PcomA	3/86 = 3.5%	0.7–10
ACA	4/86 = 4.6%	1.4–11.7
Pericallosal	2/86 = 2.3%	1.4–11
M1	2/86 = 2.3%	1.4–11
Distal MCA	2/86 = 2.3%	1.4–11
BT	13/86 = 15%	8.9–24.3
Mean aneurysm size (maximum dome diameter)	5.5 mm (range, 3–11.5, SD ± 1.9)	
Mean aneurysm height	5.8 mm (range, 3–8.6, SD ± 2.6)	
Mean dome/ostium ratio	1.4 (SD ± 0.3)	
Mean aspect ratio	1.8 (SD ± 0.6)	
Intrasaccular thrombosis	4/86 = 4.6%	1.4–12
Aneurysm with branching vessel coming from the ostium	50/86 = 58%	47–68

Note:—PcomA indicates posterior communicating artery; ACA, anterior cerebral artery.

On-line Table 2: Treatment characteristics and angiographic outcomes

Variables	Number/Statistic	95% CI
Type of Web		
SL	78/86 = 91%	82–95
SLS	8/86 = 9%	4.5–17.5
Additional stent	13/86 = 15%	8.9–24
Neuroform	11/86 = 12.8%	7.1–21.6
PED[a]	1/86 = 1.1%	0.1–6.9
LEO Baby[b]	1/86 = 1.1%	0.1–6.9
Use of the simulation software	55/86 = 64%	53.4–73.3
Immediate aneurysm occlusion		
RR 1	21/86 = 24.5%	16.5–34.5
RR 2	21/86 = 24.5%	16.5–34.5
RR 3	44/86 = 51%	40–61.4
Aneurysm occlusion at 6-mo follow-up		
RR 1	50/86 = 58.1%	47.5–68
RR 2	22/86 = 25.6%	17–35
RR 3	14/86 = 16.3%	9.8–25.6
Aneurysm occlusion at 12-mo follow-up		
RR 1	49/86 = 57%	46–67
RR 2	19/86 = 22%	14.5–32
RR 3	18/86 = 21%	13.5–30
Aneurysm occlusion at 24-mo follow-up		
RR 1	29/60 = 48.4%	36–60
RR 2	20/60 = 33.3%	22–45
RR 3	11/60 = 18.3%	10–30
WEB shape modification[c]	19/86 = 22%	14–32
At 6 mo	6/86 = 7%	3–15
At 12 mo	13/86 = 15%	9–24
At 24 mo	0/60 = 0%	
Aneurysms requiring retreatment	11/86 = 13%	7.1–21.6
Mean angiographic follow-up	17 ± 11.5 mo	

[a] Pipeline Embolization Device (Covidien, Irvine, California).
[b] Balt Extrusion, Montmorency, France.
[c] WEB shape modification was defined as a decrease in height of the device or a deepening of the proximal and distal concave recesses during follow-up.

On-line Table 3: Univariate and multivariate analysis of predicting factors for aneurysm occlusion during follow-up

Independent Variables for Occlusion	Univariate Analysis				Multivariate Analysis	
	Adequate Occlusion (*n* = 74)	Incomplete Occlusion (*n* = 12)	*P* Value	Odds Ratio (95% CI)	*P* Value	Odds Ratio (95% CI)
Vascular risk factor						
Yes	47 (63.5%)	9 (75%)	.4	1.7 (0.4–6.9)		
No	27 (36.5%)	3 (25%)				
Acutely ruptured						
Yes	19 (25.6%)	2 (16.4%)	.5	0.5 (0.1–2.8)		
No	55 (74.3%)	10 (83.4%)				
Aneurysm location						
PC	10 (13.5%)	3 (25%)	.3	0.4 (0.1–2)		
AC	64 (86.5%)	9 (75%)				
Aneurysm location						
MCA	38 (51.4%)	6 (50%)	.9	1.1 (0.3–3.5)		
Other	36 (48.6%)	6 (50%)				
Aneurysm location						
AcomA	11 (15%)	0 (0%)	.1	1.2 (1.1–1.3)	.9	1.5 (0.3–3.2)
Other	63 (85%)	12 (100%)				
Aneurysm location						
BT	11 (15%)	1 (8.4%)	.5	1.9 (0.2–16.4)		
Other	63 (85%)	11 (91.6%)				
Bifurcation point						
Yes	67 (90%)	1 (8.4%)	.9	1.1 (0.1–10.2)		
No	7 (10%)	11 (91.6%)				
Aneurysm shape						
Regular	51 (69%)	4 (33%)	.01	4.4 (1.2–16.2)	.01	5.9 (1.4– 24)
Irregular	23 (31%)	8 (67%)				
Wide neck						
Yes	30 (41%)	11 (91.6%)	.03	0.1 (0.01–1)	.04	0.2 (0.01–1)
No	44 (59%)	1 (8.4%)				
Vessel coming from the aneurysm						
Yes	43 (58%)	7 (58%)	.9	1 (0.3–3.4)		
No	31 (42%)	5 (42%)				
Additional stent						
Yes	10 (13.5%)	3 (25%)	.3	2.1 (0.4–9.2)		
No	64 (86.5%)	9 (75%)				
Sizing						
Correctly sized	46 (62%)	5 (42%)	.2	2.3 (0.6–7.9)		
Undersized	28 (38%)	7 (58%)				
WEB shape modification						
No	61 (82.5%)	6 (50%)	.01	4.6 (1.3–16.8)	.8	1.5 (0.04–51)
Yes	13 (17.5%)	6 (50%)				
Immediate occlusion						
Yes	38 (51%)	4 (33%)	.1	2.1 (0.5–7.6)	.2	2.7 (0.6–11)
No	36 (49%)	8 (67%)				
Age (mean) (yr)	61 ± 11	60 ± 14	.4	0.9 (0.8–1)		
Aneurysm dome size	6 ± 2.3	7.6 ± 2.4	.9	1.5 (1.1–1.8)		
Dome/ostium ratio	1.4 ± 0.3	1.3 ± 0.3)	.7	3.1 (0.5–33)		
Aspect ratio	1.5 ± 0.5	1.7 ± 0.5	.7	0.7 (0.2–2.6)		

Note:—PC indicates posterior circulation; AC, anterior circulation.

On-line Table 4: Univariate and multivariate analyses of predicting factors for WEB shape modification during follow-up

Independent Variables for WEB Shape Modification	Univariate Analysis				Multivariate Analysis	
	No WEB Shape Modifications ($n = 67$)	WEB Shape Modifications ($n = 19$)	*P* Value	Odds Ratio (95% CI)	*P* Value	Odds Ratio (95% CI)
Vascular risk factor						
Yes	43 (64%)	6 (31.5%)	.7	1.2 (0.4–3.5)		
No	24 (36%)	13 (68.5%)				
Acutely ruptured						
Yes	17 (25.3%)	4 (21%)	.6	0.7 (0.2–2.6)		
No	50 (74.7%)	15 (79%)				
Aneurysm location						
PC	10 (15%)	3 (15.8%)	.2	0.9 (0.2–3.8)		
AC	57 (85%)	16 (84.2%)				
Aneurysm location						
MCA	32 (47.7%)	12 (63%)	.2	0.5 (0.2–1.5)		
Other	35 (52.3%)	7 (37%)				
Aneurysm location						
AcomA	8 (12%)	3 (16%)	.6	0.7 (0.1–3)		
Other	59 (88%)	16 (84%)				
Aneurysm location						
BT	10 (15%)	2 (10.5%)	.6	1.4 (0.3–7.4)		
Other	57 (85%)	17 (89.5%)				
Bifurcation point						
Yes	60 (89.5%)	18 (95%)	.4	2.1 (0.2–18)		
No	7 (10.5%)	1 (5%)				
Aneurysm shape						
Irregular	19 (28.4%)	12 (63%)	.005	4.3 (1.4–12.6)	.01	5.4 (1.4–19)
Regular	48 (71.6%)	7 (37%)				
Wide ostium						
No	30 (45%)	1 (5%)	.002	14.5 (1.8–115)	.03	9.8 (1.6–60)
Yes	37 (55%)	18 (95%)				
Vessel coming from the aneurysm						
Yes	31 (46%)	5 (26%)	.3	1.4 (0.7–7.4)		
No	36 (54%)	14 (74%)				
Additional stent						
No	59 (88%)	14 (74%)	.1	2.6 (0.7–9.2)	.8	1.1 (0.2–5.4)
Yes	8 (12%)	5 (26%)				
Sizing						
Correctly sized	43 (64%)	8 (42%)	.08	2.5 (0.8–6.9)	.2	0.3 (0.1–11)
Undersized	24 (36%)	11 (58%)				
Immediate occlusion						
Yes	31 (46%)	11 (58%)	.3	0.6 (0.2–1.7)		
No	36 (54%)	8 (42%)				
Age (mean) (yr)	62 (SD = 11)	55 (SD = 11)	.6	0.9 (0.9–1.1)		
Aneurysm dome size	5 (SD = 1.9)	8 (SD = 3.1)	.01	1.1 (0.9–1.3)	.06	1.3 (0.9–1.6)
Dome/ostium ratio	1.3 (SD = 0.3)	1.5 (SD = 0.3)	.4	0.4 (0.07–3.2)		
Aspect ratio	1.4 (SD = 0.6)	1.5 (SD = 0.4)	.5	1.4 (0.5–3.8)		

Note:—PC indicates posterior circulation; AC, anterior circulation.