Original research

Contour Neurovascular System for endovascular embolization of cerebral aneurysms: a multicenter cohort study of 10 European neurovascular centers

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ABSTRACT

Background Intrasaccular devices have become increasingly popular in the treatment of cerebral aneurysms, particularly at the bifurcation. Here we evaluate the Contour Neurovascular System, an intrasaccular device for the endovascular treatment of cerebral aneurysms, in a multicenter cohort study, the largest to the best of our knowledge.

Methods Consecutive patients with intracranial aneurysms treated with the Contour Neurovascular System between February 2017 and October 2022 at 10 European neurovascular centers were prospectively collected and retrospectively reviewed. Patient and aneurysm characteristics, procedural details, and angiographic and clinical outcomes were evaluated.

Results During the study period, 279 aneurysms (median age of patients 60 years, IQR 52–68) were treated with Contour. In 83.2% of patients the device was placed electively, whereas the remaining patients were treated in the setting of acute subarachnoid hemorrhage. The most common locations were the middle cerebral artery (26.5%) followed by the anterior communicating region (26.2%). Median aneurysm dome and neck size were 5.2 mm (IQR 4.2–7) and 3.9 mm (IQR 3–5). Contour size 7 (39%) and 9 (25%) were most used. Thromboembolic and hemorrhagic complications occurred in 6.8% and 0.4% of aneurysms, respectively. Raymond-Roy 1 and 2 occlusions at last follow-up were achieved in 63.2% and 28.3%, respectively, resulting in adequate occlusion of 91.5% of aneurysms.

Conclusion This is the largest multicenter study reporting the outcome on the Contour Neurovascular System. At 1 year, the self-evaluated data on safety and efficacy are comparable to data of existing intrasaccular devices. Contour is a promising technology in the treatment of cerebral aneurysms.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Intrasaccular devices, particularly the Woven EndoBridge (WEB), have been widely used for treating cerebral aneurysms, especially those at major branch points and with wide necks. However, alternatives to the WEB device have faced challenges in gaining acceptance. The Contour Neurovascular System, a novel intrasaccular implant, has shown promise as an alternative.

WHAT THIS STUDY ADDS

⇒ This multicenter cohort study, involving 10 European neurovascular centers, provides the largest dataset on the Contour Neurovascular System to date. The study reveals excellent outcomes with a 91.5% rate of adequate aneurysm occlusion and a favorable safety profile. Notably, the study includes real-world cases, expanding the understanding of Contour's performance beyond classic bifurcation locations.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The findings demonstrate that the Contour Neurovascular System is a promising technology for the endovascular embolization of cerebral aneurysms. With its high occlusion rates and safety profile, Contour could be considered a viable alternative to existing intrasaccular devices. The study emphasizes the importance of further research and consideration of Contour in the evolving landscape of cerebral aneurysm treatment.

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INTRODUCTION

Intrasaccular devices have gained popularity in the treatment of cerebral aneurysms over more than a decade.[1] They offer advantages for aneurysms located at major branch points of the cerebral arteries and those with a wide neck. Traditional endovascular treatment of wide-necked aneurysms previously required the use of additional devices, and often the insertion of a permanent intraluminal device within the parent artery, such as a stent, neck-bridging device, or a flow diverter. This led to the necessity of initiating antiplatelet therapy, which comes with inherent risks and limitations, especially in patients who have experienced acute subarachnoid hemorrhage (SAH). The most established

Table 1 Summary of patients and aneurysm characteristics

Characteristic	N=279
Age, median (IQR)	60 (52–68)
Female sex	173 (62.0%)
Presentation	
Unruptured	232 (83.2)
Acute SAH	31 (11.1)
Prior SAH	16 (5.7)
Aneurysm location	
MCA	74 (26.5%)
ACOM	73 (26.2%)
Basilar tip	65 (23.3%)
ICA terminus/bifurcation	27 (9.7%)
ICA sidewall	15 (5.4%)
PCOM	16 (5.7%)
PICA	3 (1.1%)
Pericallosal artery	3 (1.1%)
SCA	3 (1.1%)
Morphology	
Lobulated	17 (6.1%)
Saccular	260 (93.2%)
Saccular, partially thrombosed	2 (0.7%)
Aneurysm neck size (mm), median (IQR)	3.90 (3.00–5.00)
Aneurysm dome size (mm), median (IQR)	5.20 (4.20–7.00)
Aneurysm height (mm), median (IQR)	5.7 (4.3–7.8)
Dome-to-neck ratio, median (IQR)	1.34 (1.13–1.68)
mRS	
0	219 (78.5%)
1	39 (14.0%)
2	3 (1.1%)
3	5 (1.8%)
4	6 (2.2%)
5	7 (2.5%)

ACOM, anterior communicating artery; ICA, internal carotid artery; MCA, middle cerebral artery; mRS, modified Rankin Scale; PCOM, posterior communicating artery; PICA, posterior inferior cerebellar artery; SAH, subarachnoid hemorrhage; SCA, superior cerebellar artery.

Table 2 Summary of treatment details

Characteristic	N=279
Prior treatment of the same aneurysm	
No	253 (91%)
Coiling	16 (5.7%)
WEB	8 (2.9%)
Stent-assisted coiling	2 (0.7%)
Antiplatelet regimen	
DAPT	130 (46.6%)
Monotherapy	137 (49.1%)
None	12 (4.3%)
Contour size*	
5	48 (18.2%)
7	103 (39.0%)
9	66 (25.0%)
11	45 (17.0%)
14	2 (0.8%)
Contour deployment	
Normal	256 (91.7%)
Device exchange	8 (2.9%)
Difficult	7 (2.5%)
Jailed microcatheter	5 (1.8%)
Not completely open	2 (0.7%)
Placed below WEB	1 (0.4%)

*Missing values: Contour Size=15.
DAPT, dual antiplatelet therapy; WEB, Woven EndoBridge.

intrasaccular device, the Woven EndoBridge (WEB) device (MicroVention, Aliso Viejo, CA), is the 'top dog' in this device class. Other intrasaccular devices thus far have been much less successful in gaining traction, until the Contour Neurovascular System (manufactured by Cerus Endovascular, based in Fremont, CA, and recently acquired by Stryker, located in Kalamazoo, MI) became available.[2–7] In this context, we present the findings of a European registry focused on the Contour involving high-volume neurovascular centers across Europe.

METHODS

Consecutive patients with intracranial aneurysms treated with the Contour Neurovascular System between February 2017 and October 2022 at 10 European neurovascular centers were prospectively collected and retrospectively reviewed. Data were collected according to the first-in-man clinical study on Contour.[6]

Data collection

Patient and aneurysm characteristics, procedural details, and angiographic and clinical outcomes were evaluated at the individual sites and shared using a common database. Cases with an intention to treat with Contour that were not treated with Contour were recorded but excluded from the analysis. Aneurysm occlusion was classified according to the modified Raymond-Roy Classification (RRC 1, 2, 3a, and 3b)[8] and the O'Kelly-Marotta (OKM) scale. In the OKM scale aneurysms are assigned grades on the basis of the amount of contrast filling of the aneurysm lumen (filling grades A, B, C, D) and how long contrast persists in the aneurysm lumen with respect to the angiographic phase (stasis grades 1, 2, 3).[9] Adequate occlusion was defined as RRC occlusion class 1 or 2 on the last angiographic assessment.

Contour Neurovascular System and procedural details

The Contour Neurovascular System is a self-expandable endovascular intrasaccular implant. It is made up of two layers of nitinol wire mesh filled with a total of 144 wires and a radiopaque platinum core. The device is connected to a pusher wire and guided to the target aneurysm through a 0.021 inch or 0.027 inch microcatheter. The design allows for full retrieval and redeployment to reposition the device and is electrolytically detached. The size of the implant is determined by the width of the largest part of the aneurysm (the equatorial plane) and five sizes are available (5, 7, 9, 11, and 14). Because of the bowl-shaped mesh structure and oversizing, the Contour should stay securely in place at the neck of the aneurysm once deployed, preventing any unintended movement.

Table 3 Summary of technical and safety outcomes

Characteristic	N=279
Thromboembolic complications	19 (6.8%)
Hemorrhagic complications	1 (0.4%)
Device-related complications*	
Other reported device-related complications	17 (6.1%)
Premature detachment	4 (1.4%)
Other periprocedural complications	13 (4.7%)

*Not included in the regression analysis for the predictors of thromboembolic and hemorrhagic complications.

Patients were started on antiplatelet therapy before the procedure and continued thereafter per institutional preference. Procedures were performed through a 6 to 8 French access under general anesthesia with the patient heparinized. The choice of guide, intermediate, microcatheter, and microwire were at the discretion of the treating physician. Both bi- and triaxial systems were allowed. Digital subtraction angiography was performed to assess Contour placement and aneurysm occlusion immediately after the procedure.

Statistical analysis

Categorical variables were presented as frequencies and percentages, and continuous variables were expressed as medians and interquartile ranges. To test different associations and identify significant predictors of adequate occlusion and periprocedural complications, we used logistic regression, and the results were represented as odds ratios (OR) and 95% confidence intervals (95% CI). Aneurysms treated eventually with another device were excluded from the adequate occlusion logistic regression. All analyses were done using R software version 4.3.1 (R Foundation for Statistical Computing, Vienna, Austria), and a P value <0.05 was considered significant.

RESULTS

Patient and aneurysm characteristics

During the study period, 279 aneurysms (median age of patients 60 years, IQR 52–68) were treated with Contour. There were 13 aneurysms with an initial intention to treat with Contour, but a different treatment strategy (WEB in eight aneurysms (61.5%), coiling in five (38.5%)) was ultimately used. Those cases were not included in the analysis but will be discussed below. In 83.2% of patients, the device was placed electively whereas the remainder were treated in the setting of acute SAH (11.1%) or a prior SAH (5.7%). The most common locations were the middle cerebral artery (26.5%) followed by the anterior communicating region (26.2%) and basilar tip (23.3%). Median aneurysm dome, height, and neck size were 5.2 mm (IQR 4.2–7), 5.7 mm (IQR 4.3–7.8), and 3.9 mm (IQR 3–5) (table 1).

Treatment details

Contour size 7 (39%) and 9 (25%) were most used. Deployment was classified as normal in 91.7% of aneurysms and difficult in 2.5%. Use of a different Contour than originally used occurred in 2.9% of aneurysms (table 2).

Technical and safety outcomes

Overall, thromboembolic and hemorrhagic complications occurred in 6.8% and 0.4% of aneurysms, respectively. Other device-related complications and premature detachment were reported in 6.1% and 1.4%, respectively (table 3).

Table 4 Summary of angiographic and clinical outcomes

Characteristic	N=279
Follow-up (months), median (IQR)	12 (6–12)
OKM last follow-up*	
D1	138 (65.1%)
C1	30 (14.2%)
C2	3 (1.4%)
C3	9 (4.2%)
B1	6 (2.8%)
B2	7 (3.3%)
B3	14 (6.6%)
A1	3 (1.4%)
A3	2 (0.9%)
RROC last follow-up†	
1	134 (63.2%)
2	60 (28.3%)
3a	9 (4.2%)
3b	9 (4.2%)
Retreatment	7 (2.5%)
Retreatment method	
Flow diverter	3 (43%)
Unknown	2 (29%)
Surgical clipping	1 (14%)
Stent-assisted coiling	1 (14%)
Discharge mRS‡	
0	210 (78.1%)
1	37 (13.8%)
2	3 (1.1%)
3	4 (1.5%)
4	3 (1.1%)
5	8 (3.0%)
6	4 (1.5%)
mRS last follow-up§	
0	206 (92.4%)
1	6 (2.7%)
2	1 (0.4%)
3	3 (1.3%)
4	2 (0.9%)
5	1 (0.4%)
6	4 (1.8%)
Cause of death at discharge	
Fulminant pulmonary embolism	1 (0.4%)
Renal failure	1 (0.4%)
Respiratory insufficiency	1 (0.4%)
Unknown	1 (0.4%)
Cause of death at last follow-up	
Appendicitis	1 (0.4%)
Complications of SAH grade 5 initial presentation	2 (0.7%)
Unknown	1 (0.4%)

*OKM=67.
†RROC=67.
‡Discharge mRS=10.
§mRS last follow-up=56.
mRS, modified Rankin Scale; OKM, O'Kelly-Marotta grading; RROC, Raymond-Roy Occlusion Classification; SAH, subarachnoid hemorrhage.

Table 5 Characteristics and outcomes of patients presenting with acute subarachnoid hemorrhage

Characteristic	N=31
Aneurysm location	
ACOM	11 (35%)
Basilar tip	6 (19%)
ICA	3 (9.7%)
MCA	6 (19%)
PCOM	4 (13%)
PICA	1 (3.2%)
Aneurysm neck size (mm), median (IQR)	3.80 (3.05–5.20)
Aneurysm dome size (mm), median (IQR)	5.70 (4.75–8.45)
Aneurysm height (mm), median (IQR)	6.2 (4.8–9.5)
Morphology	
Lobulated	3 (9.7%)
Saccular	28 (90%)
Dome-to-neck ratio, median (IQR)	1.65 (1.26–1.76)
Antiplatelet regimen	
DAPT	7 (23%)
Monotherapy	22 (71%)
None	2 (6.5%)
Complications	
Thromboembolic complications	5 (16%)
Hemorrhagic complications	1 (3.2%)
OKM last follow-up*	
B1	2 (8.7%)
C1	4 (17%)
D1	17 (74%)
RROC last follow-up*	
1	17 (74%)
2	4 (17%)
3a	2 (8.7%)
Recurrence	0 (0%)
Retreatment	0 (0%)
mRS last follow-up†	
0	14 (64%)
1	1 (4.5%)
2	1 (4.5%)
3	1 (4.5%)
4	1 (4.5%)
5	1 (4.5%)
6	3 (14%)
Mortality	6 (19%)

*OKM/RROC=8.
†mRS last follow-up=9.
ACOM, anterior communicating artery; DAPT, dual antiplatelet therapy; ICA, internal carotid artery; MCA, middle cerebral artery; mRS, modified Rankin Scale; OKM, O'Kelly-Marotta grading; PCOM, posterior communicating artery; PICA, posterior inferior cerebellar artery; RROC, Raymond-Roy Occlusion Classification; SAH, subarachnoid hemorrhage; SCA, superior cerebellar artery.

Angiographic and clinical outcomes

The median angiographic follow-up duration was 12 months (IQR 6–12). Raymond-Roy 1 and 2 occlusions at last follow-up was achieved in 63.2% and 28.3%, respectively. The adequate occlusion rate was thus 91.5%. The OKM grades D1 and C1 were reported in 65.1% and 14.2%, respectively. Retreatment was performed in 2.5% of aneurysms. Functional outcome of modified Rankin Scale (mRS) 0 or 1 was reported in 92.4% and 2.7%, respectively. There were four mortalities reported each at discharge and last follow-up, respectively, neither related to the Contour procedure (table 4).

Subarachnoid hemorrhage cases

There were 31 aneurysms treated acutely in the setting of aneurysmal hemorrhage. They were most commonly located in the anterior communicating artery complex (35%). Thromboembolic and hemorrhagic complications occurred in 16% and 3.2%, respectively. There was one acute rebleed in a patient in their 70s with an acutely ruptured anterior communicating artery aneurysm measuring 11.7 mm in maximum diameter that reruptured during Contour positioning and required additional coiling. The last occlusion grade at discharge was recorded as OKM C2 and mRS 5. Raymond-Roy 1 and 2 occlusions at last follow-up was achieved in 74% and 17%, respectively (table 5).

Predictors of adequate aneurysm occlusion and thromboembolic and hemorrhagic complications

In the univariable analysis, increasing aneurysm height lowered the odds for adequate occlusion (OR 0.84, 95% CI 0.75 to 0.94, P=0.002). In the logistic regression analysis, the only factor associated with adequate aneurysm occlusion was age (OR 1.06, 95% CI 1.01 to 1.11, P=0.024). The observation of increased odds for adequate occlusion with advanced age disappeared when aneurysm height was removed from the model as younger patients had increased aneurysm height (table 6).

Importantly, there was no association with rupture status or aneurysm size measurements. In terms of neurologic complications, there were no factors associated with increased odds for thromboembolic or hemorrhagic complications (table 7).

DISCUSSION

We report the largest multicenter cohort of cerebral aneurysms treated with the Contour Neurovascular System. Two hundred and seventy-nine aneurysms were embolized with the Contour device at 10 European neurovascular centers. The cohort was made up of more than 80% electively treated aneurysms located primarily in the classic bifurcation locations of the middle cerebral artery, the anterior communicating artery complex, as well as the basilar tip. Aneurysms were about 6 mm in size and most frequently treated with a 7 mm Contour device. Thromboembolic complications occurred in 6.8% of aneurysms. At a median follow-up time 63.2% of aneurysms were completely occluded and 28.3% had a neck remnant. While age was the only factor associated with adequate occlusion, treatment in the setting of acute SAH carried increased risk.

Aneurysm occlusion

The Contour Neurovascular System must be compared with the WEB device, the most established intrasaccular device thus far, to elucidate insights into its ability to occlude the aneurysm. The WEB device was studied extensively in several prospective, multicenter, core lab reviewed, independent event adjudicated good clinical practice studies. Those include the WEBCAST (51 subjects, 100% double layer, no longer in use),[10] French observatory (62 subjects, 48% single layer, currently in use),[11] WEBCAST

Table 6 Regression analysis for the predictors of adequate occlusion (Raymond-Roy 1 and 2) at the last follow-up

	Univariable				Multivariable			
		95% CI				95% CI		
Predictor	OR	Lower	Upper	P value	OR	Lower	Upper	P value
Age	1.04	1	1.08	0.074	1.06	1.01	1.11	0.024*
Male sex (vs female)	0.58	0.22	1.52	0.266	0.83	0.29	2.40	0.728
Presentation (ruptured vs unruptured)	1.70	0.37	7.74	0.493	1.77	0.34	9.31	0.502
Aneurysm neck size (mm)	0.8	0.61	1.04	0.101	0.87	0.43	1.75	0.693
Aneurysm dome size (mm)	0.85	0.72	1.01	0.061	1.04	0.61	1.76	0.885
Aneurysm height (mm)	0.84	0.75	0.94	0.002*	0.82	0.65	1.02	0.078
Dome-to-neck ratio	1.18	0.41	3.39	0.755	1.08	0.12	9.75	0.943

Missing values: adequate occlusion=67.
*Statistically significant.

2 (55 subjects, 100% single layer),[12] WEB-IT (US investigational device exemption study, 150 subjects, 80+% single layer),[1] CLARYS (60 subjects, ruptured, 100% single layer),[13] WEB-IT China (100% single layer),[14] and CLEVER (160 subjects, WEB 0.017 system, 100% single layer).[15] WEBCAST, French observatory, and WEBCAST-2 were subsequently combined and are also analyzed as such.[16] The Contour differs from the WEB in a number of ways. Rather than the cylindrical shape in the WEB, the Contour is bowl shaped and placed at the aneurysm neck. It comes in five different sizes and is deployed through a 0.021 inch (three smaller sizes) or 0.027 inch (two largest sizes) microcatheter. The WEB on the other hand comes in 37 different sizes and shapes (29 SL and eight SLS) and is deployed through 0.017 inch up to 0.033 inch microcatheters. Complete occlusion according to the WEB occlusion scale (WOS),[17] which includes complete occlusion (WOS A) and a recess at the center of the WEB (WOS B), at 1 year in WEB-IT was 53.8% with a neck remnant (WOS C) in 30.8%.[18] The three studies WEBCAST, French observatory, and WEBCAST-2 reported complete occlusion (WOS A and B) and neck remnant (WOS C) in 52.9% and 26.1%, respectively,[16] but are less reflective of current practice as those at a higher proportion of double layer WEBs are no longer in use. While the WOS does not apply to Contour (central recess as in WOS B is not seen with Contour), the results can be approximated and are comparable to the findings of this study at 1 year. Here adequate occlusion was achieved in 91.5% of aneurysms and assessment of occlusion was not blinded. In the CERUS study abstract on Contour, complete occlusion was seen in 69% at 12 months and adequate occlusion in 84% at the last available follow-up in the per-protocol group.[6] A recent meta-analysis of Contour reported a pooled adequate occlusion rate of 84.2%.[4] The WorldWideWEB Consortium data comprising 683 aneurysms treated with WEB, again not blinded, reported complete occlusion in 57.8% of aneurysms and adequate occlusion in 85.7%,[19] again similar to all previously mentioned data. How occlusion with Contour is going to fare in longer terms, and whether the comparison remains favorable to the WEB where 5 year data[1] are available, remains to be seen.

The concomitant use of coils with Contour has been proposed in selected cases to stabilize the device and enhance occlusion, particularly in the setting of SAH.[20] Jailing of a coiling catheter was reported in five cases in this study and was not associated with any adverse events. Four of those aneurysms had aneurysm heights between 10 mm and 19 mm. It appears as if this maneuver is possible in very selected cases, but we cannot make any definitive recommendations whether this should be routinely used in larger aneurysms or those with SAH.

Safety information

The main argument for intrasaccular devices for cerebral aneurysms is the favorable safety profile. The predefined shapes of those implants allow the treatment of aneurysms even with necks too wide to be treated with simple coiling. Morbidity at 1 year in WEB-IT was 1.4% and there was no mortality.[18] The aforementioned three studies analyzed combined reported morbidity in 1.3% and 0.7% mortality.[16] Of the 150 patients in WEB-IT, only nine (6%) were ruptured, and were either Hunt and Hess 1 or 2. CLARYS, all

Table 7 Regression analysis for the predictors of thromboembolic and hemorrhagic complications

	Univariable				Multivariable			
		95% CI				95% CI		
Predictor	OR	Lower	Upper	P value	OR	Lower	Upper	P value
Age	1.00	0.96	1.04	0.965	0.99	0.96	1.04	0.801
Male sex (vs female)	1.10	0.43	2.77	0.848	1.12	0.43	2.89	0.819
Presentation (ruptured vs unruptured)	2.28	0.83	6.27	0.111	2.3	0.78	6.77	0.130
Aneurysm neck size (mm)	1.12	0.85	1.47	0.426	1.12	0.60	2.09	0.720
Aneurysm dome size (mm)	1.08	0.91	1.29	0.371	0.91	0.60	1.38	0.650
Aneurysm height (mm)	1.08	0.97	1.19	0.168	1.08	0.92	1.28	0.351
Dome-to-neck ratio	1.28	0.51	3.16	0.599	1.32	0.22	7.73	0.761
DAPT (vs monotherapy)	0.94	0.37	2.40	0.905	0.76	0.07	8.07	0.820

DAPT, dual antiplatelet therapy.

ruptured WEB cases, reported overall 1-year morbidity and mortality rates of 9.6% and 3.8%, respectively, none related to WEB.[13] In the present study, the rate of ruptured aneurysms was close to 20% and included all grades of SAH. Two of the mortalities at last follow-up were due to consequences of their initial SAH grade 5 presentation. Thromboembolic and hemorrhagic complications were reported in 6.8% and 0.4% of aneurysms and no predictive factors of neurologic complications were identified. In the previously mentioned meta-analysis on Contour, overall functional independence rate was 94.7%. Thromboembolic events were encountered in 8.5% of the patients.[4]

In terms of antiplatelet agents, dual antiplatelets were given in 46.6% of aneurysms and monotherapy in 49.1%. We conclude that at least one antiplatelet agent should be administered. If there are specific factors, such as significant device protrusion into the parent vessel, another agent may be added based on the discretion of the interventionalist. No antiplatelets were given in only 4.3% of aneurysms.

Cases intended for contour treated with other modalities

There were 13 aneurysms intended for Contour which were ultimately treated with a different treatment strategy (WEB eight aneurysms (61.5%), coiling five aneurysms (38.5%)). Those included four (30.7%) middle cerebral artery bifurcation, two (15.4%) anterior communicating, two (15.4%) pericallosal, two (15.4%) basilar tip, one (7.7%) posterior communicating, one (7.7%) internal carotid artery, and one (7.7%) internal carotid artery terminus aneurysm. The median neck, dome, and height in those aneurysms were 4.5 mm, 5.0 mm, and 6.2 mm, respectively. The Contour deployment was classified as difficult in all (100%) of those cases, and the initial Contour device was replaced with a different one in 10 (77%) aneurysms before abandoning the Contour. In two (15.4%) cases the attempted Contour placement was associated with a thromboembolic complication and no hemorrhagic complications. While the specific reason for switching to WEB or coiling was not provided in all cases, the practitioner specifically mentioned 'failure to position properly' as the ultimate reason to change treatment strategy in three aneurysms.

Limitations

The main limitations of this study are the retrospective design and the lack of blinding for outcome assessment. The angiographic data for this study were not evaluated in a core lab. Interrater agreement between treating physican and core lab has been reported as poor for the Raymond-Roy occlusion scale (kappa=0.39, 95% CI 0.38 to 0.40) with the core lab assigning higher scores (worse occlusion) than treating physicians (28.2% vs 11.4%).[21] Furthermore, this study includes Contour cases as managed in the real world with atypical aneurysm locations (sidewall and not bifurcation) included.

CONCLUSIONS

This is the largest multicenter study reporting the outcome on the Contour Neurovascular System. At 1 year, the self-evaluated data on safety and efficacy are comparable to data of existing intrasaccular devices. Contour is a promising technology in the treatment of cerebral aneurysms.

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Ethics approval This study involves human participants and all patients were treated according to the Declaration of Helsinki. The study was approved by the institutional review board of the State of Salzburg (approval number 1171/2023), the approval board for the Paracelsus Medical University in Salzburg, Austria. Participants gave informed consent to participate in the study before taking part.

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