Samaniego et al. reported a multicenter experience using the LVIS Jr stent for “Y-stent”-assisted coiling embolization of bifurcation Wide necked aneurysms.

Seven centers provided retrospective data on patients who underwent Y-stenting. Technical complications, immediate posttreatment angiographic results, clinical outcomes, and imaging follow-up were assessed.

Thirty patients/aneurysms were treated: 15 basilar tip, 8 middle cerebral artery, 4 anterior communicating artery, 1 pericallosal artery aneurysm, and 2 posterior inferior cerebellar artery aneurysms. The mean aneurysm size was 11 mm and the mean dome-to-neck ratio was 1.3 mm. Twenty-four aneurysms were unruptured and treated electively, and 6 were acutely ruptured. Fifty-eight LVIS Jr stents were successfully deployed without any technical issue. One pro-cedural and transient in-stent thrombosis resolved with the intravenous infusion of a glycoprotein IIb/IIIa inhibitor. Five periprocedural complications (within 30 days) occurred: 2 periprocedural neurological complications (1 small temporal stroke that presented with transient aphasia and 1 posterior cerebral artery infarct) and 3 nonneurological periprocedural complications (2 retroperitoneal hematomas, and 1 patient developed a disseminated intravascular coagulopathy). One permanent complication (3.3%) directly related to Y-stenting was reported in the patient who suffered the posterior cerebral artery infarct. Immediate complete obliteration (Raymond-Roy Occlusion Classification [RROC] I-II) was achieved in 26 cases (89.6%). Twenty-four patients had clinical and imaging follow-up (mean 5.2 months). Complete angiographic occlusion (RROC I-II) was observed in 23 patients (96%). A good functional outcome with a modified Rankin Scale score ≤2 was achieved in 26 cases.

In this multicenter case series, Y-stent-assisted coiling of wide-neck aneurysms with the LVIS Jr device was feasible and relatively safe. Follow-up imaging demonstrated very low recanalization rates [1)].

2016

Centers across Canada using LVIS Jr were contacted and asked to participate in a retrospective registry of consecutive patients treated with LVIS Jr for intracranial aneurysms between January 2013 and July 2015.

A total of 102 patients, with saccular aneurysms in 100 patients (72 women; age range 21-78 years; mean 56.0 years; median 57.5 years) were treated with a LVIS Jr stent. The mean maximum diameter of the dome and neck of the aneurysm and dome to neck ratios were 8.3 mm±7.7 mm, 4.4 mm±1.9 mm, and 1.86±1.22, respectively. Angiographic complications arose in 23 patients, clinical complications in 9 patients, and only 3% of permanent neurological deficits occurred. Death occurred in 1 patient, unrelated to the stent. The ruptured status of the aneurysms (OR=3.29; p=0.046) and use of LVIS Jr for bailout (OR=2.54; p=0.053) showed a trend towards significant association with higher angiographic complications. At the last available follow-up, 68 class I, 20 class II, and 12 class III results were seen.

The LVIS Jr stent is a safe and effective device for stent-assisted coiling, with 3% permanent neurological complications. Stent-assisted coiling continues to be technically challenging in cases of ruptured aneurysms and bailout situations [2)].

2015

Seven patients who underwent endovascular treatment of PICA aneurysms with an LVIS Jr stent were identified. Four aneurysms were treated in the acute phase of subarachnoid hemorrhage (SAH). There

were no symptomatic complications. One patient had spasm distal to the stent as a result of mechanical straightening of the vessel. One patient was treated in the acute phase of SAH and required a gycoprotein IIb/IIIa inhibitor after the stent was implanted. This patient needed to be re-treated to complete embolization. All patients had good clinical outcomes (Glasgow Outcome Scale 5). No in-stent stenosis or occlusion was seen on short-term angiographic follow-up and the aneurysms were occluded.

This small series suggests that the use of a reconstructive technique with the LVIS Jr stent for the treatment of PICA aneurysms is feasible, safe and effective in the short term [3].

The LVIS or LVIS Jr. stent-assisted coil embolisation was performed in 78 patients harbouring 78 intracranial aneurysms. There were 59 aneurysms located in the anterior circulation and 19 in the posterior circulation. Clinical data and 6-month follow-up angiograms are presented.

The LVIS and LVIS Jr. stents were successfully delivered to the target aneurysm; however, there were seven cases in which the LVIS/LVIS Jr. stents had suboptimal opening and apposition to the parent vessel wall. The overall technical success for all groups was 91% (71 of 78 stents). There was complete angiographic occlusion in 66 (85%) of 78 cases and residual neck remnants in 12 (15%) cases. All patients had 6-month angiographic follow-up, which demonstrated complete occlusion of the target aneurysm in 64 (82%) cases, residual neck remnants in 5 (6%) cases and there was aneurysm filling in 9 (12%) cases.

The LVIS/LVIS Jr. stent system is safe and effective for the treatment of wide-neck intracranial aneurysms, providing suitable support of the coil mass, which allows for a high level of occlusion with low rates of recanalisation and subsequent treatments [4].

Eighteen intracranial aneurysms, including 13 unruptured and 5 ruptured aneurysms, were treated with LVIS Jr stent-assisted coil embolization.

A total of 18 stents were successfully delivered to the target aneurysms, and the technical success rate was 100%. There was complete occlusion in 8 (44.4%) of 18 cases, neck remnants in 7 (38.9%) cases, and partial occlusion in 3 (16.7%) cases. In-stent thrombosis occurred in 1 case, and the symptoms disappeared after transvenous tirofiban injection. The modified Rankin Scale score at discharge was 0 in 14 patients, 1 in 3 patients, and 2 in 1 patient.

The LVIS Jr stent provided excellent trackability and deliverability and is safe and effective for the treatment of wide-necked MCA aneurysms with tortuous and smaller parent vessels [5].

A retrospective analysis was performed of 32 cases comprising 34 aneurysms in which the LVIS Jr device was used for stent-assisted coil embolization of intracranial aneurysms from February to October 2012, including all clinical and angiographic data as well as mid-term follow-up (1-12 months of treatment).

The median age of the patients was 54 years (range 21-76) and 19 (59%) were women. The aneurysms were ruptured in 12/34 cases (35.3%); 26 (76.4%) were located within the anterior circulation and the remaining 8 (23.5%) were located in the posterior circulation. Eleven of the 34

aneurysms (32.3%) were treated with a Y-stent configuration. Immediate total occlusion was observed in 16/34 (47%), near total occlusion (90-95%) in 5/34 (14.7%) and a 'dog ear' or subtotal occlusion in 12/34 (35.2%). A single aneurysm was treated without coil embolization. Complications occurred in 5/34 cases (15%), including two cases of in-stent thrombosis.

Implantation of the LVIS Jr device as a support device for stent-assisted coil embolization seems to be safe and effective. The LVIS Jr device can also be implanted in a Y-stent configuration, offering a novel technique with a potentially lower risk of thromboembolic complications compared with other devices [6].

2014

55 patients with saccular aneurysms undergoing LVIS-assisted coil embolization between October 2012 and February 2013. Magnetic resonance angiography or digital subtraction angiography was performed to evaluate midterm follow-up results.

The standard LVIS device, deployed in 27 patients, was more often used in internal carotid artery (ICA) aneurysms (n=19), whereas the LVIS Jr. (a lower profile stent, n=28) was generally reserved for anterior communicating artery (n=14) and middle cerebral artery (n=8) aneurysms. With LVIS-assisted coil embolization, successful occlusion was achieved in 45 aneurysms (81.8 %). Although no instances of navigation failure or stent malposition occurred, segmentally incomplete stent expansion was seen in five patients where the higher profile LVIS was applied to ICA including carotid siphon. Procedural morbidity was low (2/55, 3.6 %), limited to symptomatic thromboembolism. In the imaging of lesions (54/55, 98.2 %) at 6-month follow-up, only a single instances of major recanalization (1.9 %) occurred. Follow-up angiography of 30 aneurysms (54.5 %) demonstrated in-stent stenosis in 26 (86.7 %), with no instances of stent migration. Only one patient suffered late delayed infarction (modified Rankin Scale 1).

The LVIS device performed acceptably in stent-assisted coil embolization of non-ruptured aneurysms due to easy navigation and precise placement, although segmentally incomplete stent expansion and delayed in-stent stenosis were issues [7].

IRB approved single-center interventional clinical study in 22 patients (10 females, 12 males, mean age 55, age range 33-74 years) for the endovascular treatment of wide-neck aneurysms. After obtaining informed consent, patients were included according to the following criteria: aneurysm fundus-to-neck ratio < 2 or neck diameter > 4 mm, and a parent vessel diameter of ≤3.5 mm. Primary end point for clinical safety was absence of death, absence of major or minor stroke, and absence of transient ischemic attack. Primary end point for treatment efficacy was complete angiographic occlusion according to the Raymond-Roy Occlusion Classification (RROC) immediately after the procedure and at follow-up after 3 and 6 months on magnetic resonance imaging (MRI).

In 20/22 (91 %) of patients, the primary end point of safety was reached; in the two remaining patients, transient ischemic attack, but no permanent deficit was observed; in 16/22 (73 %), efficient occlusion (RROC1) was reached, and in 6/22 (27 %), a residual neck remained (RROC2). Single [seven with antegrade, two in crossover configuration, and four with “first-balloon-then-stent” (FBTS) technique] or double-stent (eight patients with Y configuration and one patient with X configuration) deployment was technically successful in all cases.

Deployment of the LVIS Jr. microstent in various single- or double-stent configurations is safe and effective to assist the treatment of intracranial wide-neck aneurysms [8].

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