Clinical Article

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Spinal Dural Arteriovenous Fistulas: Clinical and Radiological outcome of Endovascular Treatment

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Abstract

Background Data: Spinal dural arteriovenous fistulas are a rare entity that, if left untreated, can lead to considerable morbidity. Early diagnosis and effective methods of treatment are badly needed in clinical application.

Purpose: To evaluate the clinical and radiological outcome of patients with spinal dural arteriovenous fistulas who were treated with endovascular embolization, with assessment of feasibility, safety and efficacy of endovascular treatment.

Study Design: A retrospective clinical case study.

Patients and Methods: A retrospective study was conducted on patients with Spinal Dural Arteriovenous Fistulas (SDAVFs) who underwent endovascular treatment in the period between February 2010 and February 2014 in the Departments of Neurosurgery in Ain Shams University, Cairo and Souhag University, Souhag, Egypt. Data were collected as regard clinical history, patient demographics, clinical presentation, neurologic examination, and diagnostic work-up, location of the fistula, duration of symptoms before diagnosis, treatment details, duration of follow-up, and the functional status (gait and micturition) (preoperative and postoperative). The study included twenty-two patients.

Results: Age ranged from 39-69 years with a mean59.3 ± 9.7 years. There were 17 males (77.3%) and 5 females (22.7%). Clinical presentations at diagnosis included the following: lower extremity weakness was seen in 90.9%, sensory deficit symptoms in 72.7%, back pain in 50%, and urinary symptoms in 27.3%. The average duration of symptoms before treatment was 23.9 months. Six patients (27.7%) had a progressive stepwise worsening of symptoms. Endovascular treatment was successful in twenty patients (90.9%). There was 5% treatment-related complication. The mean interval follow up was 18 months. Recurrence occurred in two cases (10%) that needed further endovascular embolization without further morbidity. According to preprocedure and postprocedure Aminoff & Logue's Scale of disability (ALS), improvement in gait was seen in 55% and, stabilization of gait in 45%, gait improvement was statistically significant, while Improvement

in micturition disorder was seen in 25% and, stabilization in 75%, micturition disorder improvement was statistically insignificant.

Conclusion: Endovascular embolization of SDAVF with cyanoacrylate glue was technically feasible in 90.9% of patients, relatively safe with low morbidity (5 % transient) and efficient with high favorable outcome, with statistically significant improvement in patients' gait disability by almost one grade at follow-up, and micturition disorder improved in posttreatment follow up yet not statistically significant.

Key words: Spinal dural arteriovenous fistula, endovascular embolization, outcome.

Introduction

SDAVFs consist of an abnormal shunt between a dural artery branch and a radicular vein at dural sleeve of the nerve root, leading to increased pressure in the venous system with consecutive venous congestion. Despite its rarity, SDAVF is the most common type of spinal vascular malformation, accounting for 70% of the vascular lesions involving the spinal cord. Patients often experience nonspecific symptoms.[14,20,21,36] The time between the onset of symptoms and diagnosis of the lesion is usually late in the disease course. This is because of the nonspecific clinical presentation.[16,24] Patients may present with gait disturbances, difficulty climbing stairs, sensory symptoms, and even radicular pain that may affect 1 or both extremities. The neurologic symptoms show progression with time.[18] Bowel and bladder incontinence, erectile dysfunction, and urinary retention are seen late in the course of the disease process.[37] If the lesion is not treated, 50% of patients will become severely disabled and less than 10% will be able to walk independently after 3 years.[9] Favorable outcome depends on the progression of neurologic deficits at the time of diagnosis, which makes early diagnosis preferable.[15] SDAVFs can be treated by surgery with clip placement or coagulation of the vein from a posterior spinal laminectomy approach.[33] Endovascular embolization is an effective therapy in the treatment of SDAVFs and can be used as a definitive intervention in most patients.[30] The success of endovascular treatment is believed to be dependent on complete occlusion of the proximal radicular draining vein and the site of the fistula itself. The goal of treatment, regardless of the type of intervention, is to eliminate the abnormal arteriovenous communication to avoid progression or worsening of the neurologic symptoms. [30] The aim of this study was to evaluate the clinical and radiological outcome of patients with SDAVFs that were primarily treated with endovascular embolization in our institutions, with assessment of feasibility, safety and efficacy of endovascular treatment.

Patients and Methods

A retrospective study was conducted on patients with SDAVF who underwent endovascular treatment in the period between February 2010 and February 2014 in the Departments of Neurosurgery in Ain Shams University, Cairo and Souhag University, Souhag, Egypt. The medical records of these patients were retrospectively reviewed. Data were collected as regard clinical history, patient demographics, clinical presentation, neurologic examination, and diagnostic work-up, location of the fistula, duration of symptoms before diagnosis, treatment details, duration of follow-up, and the functional status (preoperative and postoperative). Functional status (gait and micturition) was measured by use of the ALS[3] shown in table 1, it was calculated retrospectively from the preoperative and postoperative clinical notes. The interval between the onset of initial symptoms and diagnosis of SDAVF by angiography was calculated at the time of diagnosis.

Spinal angiography was performed before and after treatment in all patients. It included a study of the site of the artery of Adamkiewicz, its involvement in the fistulous supply, its venous drainage and search for its delayed venous filling (indication of venous congestion interfering with normal venous drainage, which is normally ≤ 12 seconds). Also complete evaluation of the fistula: as regard feeders and venous drainage was done. Digital subtraction angiography (DSA) runs were performed to improve fistula and venous drainage visualization, and identify any contraindications of embolization, such as the presence of an anterior or posterior spinal artery arising from the same pedicle or a neighboring one to form a common trunk. If no fistula was found after selective thoracic

and lumbar injections, and delayed venous filling was present at the artery of Adamkiewicz territory, comprehensive selective spinal angiography was performed, including injection of common carotid, vertebral, thyrocervical, costocervical, and internal iliac arteries.

All suspected lesions on MR imaging were confirmed by DSA. Preoperative MR imaging was performed in all patients. Postoperative MR imaging was available for 12 patients. If available, pre- and posttreatment imaging characteristics were compared. The treatment strategy was identical for all patients; an attempt of endovascular obliteration was the first choice of treatment. Surgery (in two cases) was offered whenever embolization failed or was abandoned for technical reasons.

Technique of Endovascular Embolization:

All spinal angiograms were performed with the patients under general endotracheal anesthesia to avoid patient discomfort and minimize motion artifacts. Patients were placed supine on the angiographic table, and transfemoral access and sheath placement was obtained by use of a modified Seldinger technique. All patients were given intravenous heparin (70 U/kg–100 U/kg) to maintain an activated coagulation between 250 and 300 s. Spinal angiography was performed in all patients to identify the anterior and posterior spinal arteries and the site of the fistula. After the diagnostic portion of the procedure, a 4F or 5F catheter was placed in the segmental artery supplying the SDAVF.

Coaxially, through the catheter an Excelsior SL 10 (Stryker, Neurovascular, Raynham, Massachusetts), Magic (Balt, Montmorency, France), Echelon 10 (ev3 Neurovascular, Irvine, California), or Marathon (ev3 Neurovascular) microcatheter was advanced under road mapping over a microwire to reach the most distal aspect of the segmental artery supplying the SDAVF. Microcatheter superselective angiography was performed to determine microcatheter position and if there was filling of the anterior spinal, posterior spinal, or a radiculomedullary artery.

Endovascular embolization of the SDAVF was performed with cyanoacrylate glue: n-BCA (Codman Neurovascular), Glubran 2 (GEM, Viareggio, Italy), or Histoacryl (Braun, Melsungen, Germany), with Lipidol in a diluted mixture of 25-75% .The aim of the embolization was to deliver the liquid embolic agent into the proximal draining vein while occluding the fistula site and feeding arterial vessels. After injection and delivery of the embolic agent, the microcatheter was quickly removed to prevent its adhesion to the vessel wall. Repeated segmental angiography after embolization was performed bilaterally at the level of the arterial feeder and the adjacent 2 segmental levels above and below the site of the fistula. Venous phase response of the artery of Adamkiewicz was also evaluated by use of control angiography (normal ≤ 12 second). If the fistula persisted after embolization, surgical recommendation was made. After the procedure, the patient was admitted to the neurointensive care unit for close monitoring for 24–48 hours.

If the patient's physical examination was worse after embolization, spinal MR imaging and another spinal angiogram were performed. If the repeat spinal angiogram revealed no residual fistula and an exceptional second fistula could not be identified, patients were treated with anticoagulants, steroids, and hypertensive volume expansion therapy. During follow-up spinal angiography, selective spinal angiography was performed.

Follow-Up:

Occlusion of the fistula was confirmed by repeated spinal angiography in all patients before discharge from the hospital. Spinal angiogram and MR imaging were obtained at 12 months after treatment in all patients; however, we were only able to review the follow-up MR imaging results in 12 patients. If there was a delay in recovery or a clinical deterioration or recurrent symptoms, MR imaging and angiography studies were repeated immediately.

Statistical Analysis:

Software program SPSS version 16 was used for statistical analysis of data, qualitative variables as numbers and percentages, and quantitative variables as mean and SD. The nonparametric Wilcoxon signed rank test was used to compare pre- and posttreatment ALS gait and micturition scores, P values < .05 were considered significant.

Results

Between February 2010 and February 2014 in the Departments of Neurosurgery in Ain Shams University and Souhag University a total of twenty-two patients were treated for an SDAVF. Our study population, age range from 39-69 years with a mean

59.3 ± 9.7 years, there were 17 males (77.3%) and 5 females (22.7%). Diagnosis of SDAVF was confirmed by spinal angiography. Twenty-two patients were primarily treated by an endovascular approach. Endovascular treatment was feasible in 20 patients (90.9%) while failures occurred in 2 cases and were referred to surgery.

Clinical Data:

Table 2 shows clinical presentation at diagnosis. Most common Clinical presentations at diagnosis included the following: of the 22 patients, lower extremity weakness was seen in 20 patients (90.9%), sensory deficit symptoms in 16 (72.7%), back pain in 11 (50%), and urinary symptoms in 6 (27.3%), lastly was defecation disorder and sexual dysfunction each in 4 (18.2%). The average duration of symptoms before treatment was 23.9 months (range, 2–62 months). Six patients (27.7%) had a progressive stepwise worsening of symptoms. In this series, there were 2 sacral, 4 lumbar, 10 low thoracic (T8–T12), and 6 mid thoracic fistulas (T4–T7). Most of the fistulas had a single segmental arterial feeding artery; however, there were 2 fistulas that demonstrated multiple feeding arteries.

Treatment:

Endovascular treatment was successful in twenty (90.9%) of the twenty-two patients, while in two patients (9.1%) initial embolization failed, one due to failure to have a stable distal position for the injection, and the other the glue was proximal to occlude the intradural draining vein completely with closure of the feeder, as documented by control angiogram and persistent filling of the fistula via collateral circulation that couldn't be accessed by endovascular approach. Both cases were referred to surgical treatment.

There was one treatment-related complication. One patient had clinical deterioration of clinical symptoms after penetration of the embolic material to a trans-medullary anastomosis may be connected to the anterior spinal artery; however, this improved after administration of heparin, steroids and hypertensive measures.

The mean interval follow up was 18 months (range, 6–36 months). Our clinicoradiological results will be applied to the twenty patients who received endovascular treatment with exclusion of the 2 patients referred to surgery.

According to preprocedure and postprocedure ALS, improvement in gait was seen in 11 (55%) of 20 patients, stabilization of gait in 9 (45%). One patient experienced worsening of gait ALS post procedural, this patient's symptoms probably worsened because of penetration of embolic material too far into the venous system, yet he was treated by steroids, heparin and increasing blood pressure to show improvement to base line. Two (10%) of the 20 patients (with endovascular treatment) underwent repeated embolization. In these 2 patients, clinical deterioration at follow-up at 6, 10 month, prompted a repeated diagnostic angiography study revealing a persistent SDAVF, which was treated with subsequent embolization. On final follow-up, both patients improved clinically based on ALS gait and micturition scores. Therefore, all patients (100%) who received endovascular treatment had either improvement or unchanged outcome. Improvement in micturition was seen in 5 of 20 patients (25%) and micturition stabilized 15 of 20 patients (75%), respectively. Comparing pre- and last follow-up post-treatment disability in quantitative terms for all embolized patients, mean ALS gait disability grade improved and was statistically significantly (2.3±1.3 versus 3.1±1.2 [P =. 0008]). Mean micturition grade improved but was not statistically significant (1.4± 0.9 versus 1.6±1.0 [P=. 27]). (Data were summarized in table 3)

Table 1: Aminoff & Logue's Disability Scale[3]

Gait		Micturition	
G0	Normal	M0	Normal
G1	Leg weakness, abnormal gait or stance, restricted activity	M1	Infrequent hesitancy or urgency , altered sensation , but continent
G2	Restricted activity but no support required	M2	Occasional urinary incontinence or retention
G3	One stick required for walking	M3	Total incontinence or persistent retention
G4	Two sticks , crutches , or frame required for walking		
G5	Confined to wheelchair		

Table 2: Symptom distribution at time of Diagnosis

	Symptom at Diagnosis
Back Pain	11 (50%)
Leg weakness	20(90.9%)
Sensory Deficit	16 (72.7%)
Micturition Disorder	6 (27.3%)
Defecation Disorder	6 (27.3)%
Sexual dysfunction	4 (18%.2%)

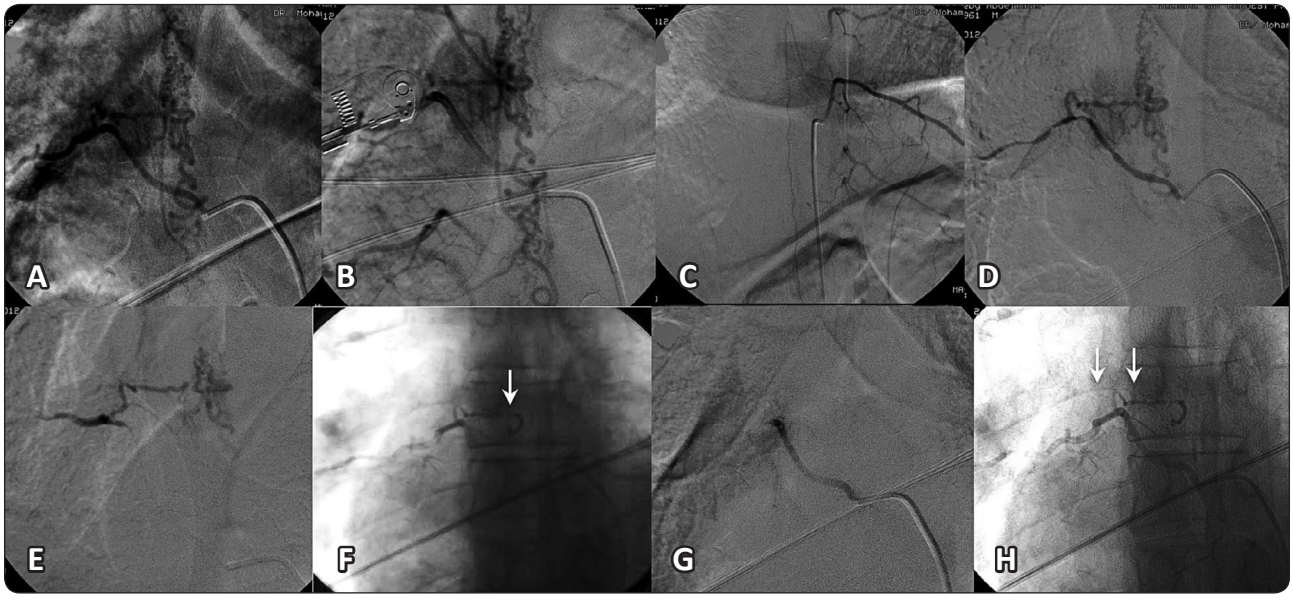

Figure 1. **a-h.** A Case of 54-years-old Male with bilateral lower extremity weakness, urinary disorder and sexual dysfunction **a**, **b**: Spinal Digital Subtraction Angiography (DSA) Antroposterior view (AP) with injection of right 6th thoracic intercostal artery, filling of a SDAVF with pial venous drainage. **c, :** Spinal DSA , AP view with injection of left 11th thoracic intercostal artery, filling of artery of Adamkiewicz (anterior spinal artery contribution). **d, e** Spinal DSA AP with superselective injection of the fistula feeder ,showing the fistulous site and draining pial veins. **f,** Subtracted images AP Spine view, showing the glue cast occluding draining vein and fistula refluxing into the feeder. **g,** Spinal DSA AP view control injection showing no more filling of the fistula with glue cast occluding draining vein and fistula refluxing into the feeder. **h,** same as **g** but subtracted images.

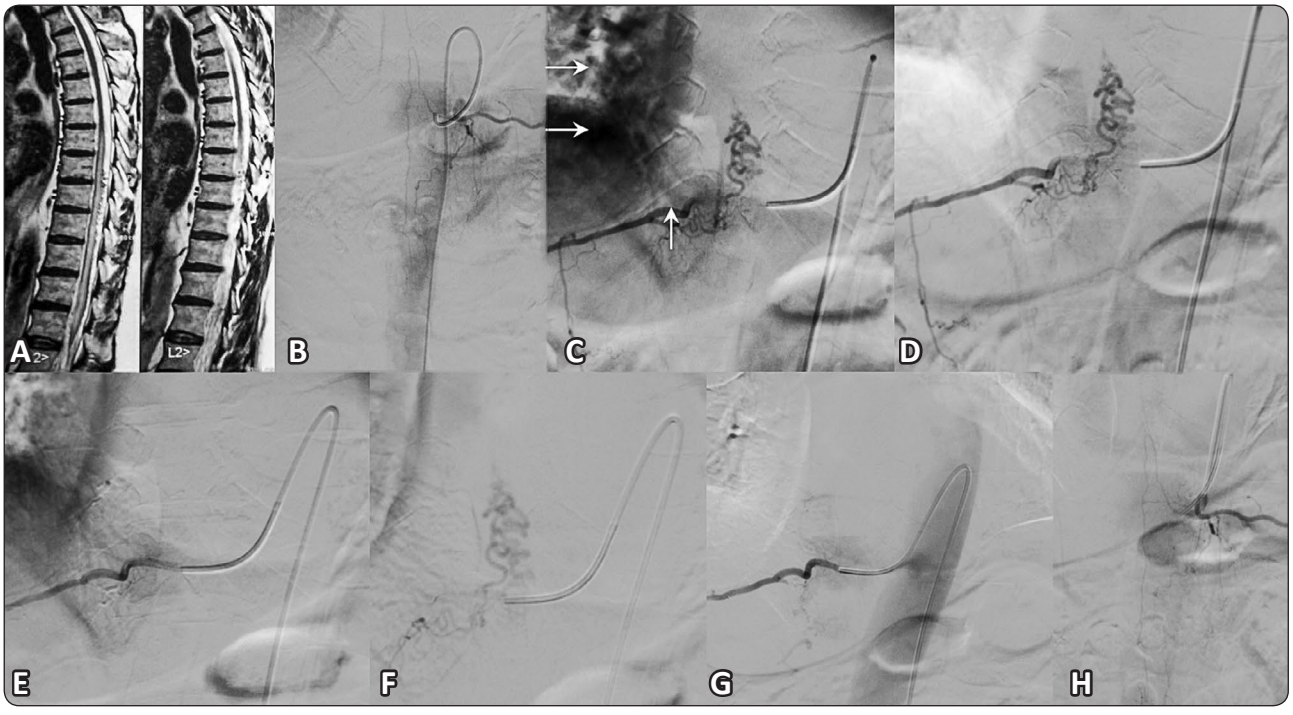

***Figure 2* a-h.** A Case of 64-years-old, Male with bilateral lower extremity weakness, urinary disorder, defecation dysfunction. **a**, MRI dorsal spine , sagittal T2 weighted images showing medullary signal from thoracic 6 down to conus, associated with a tuft with abnormal tortuous flow signal voids overlying the dorsal aspect of the cord at levels of thoracic 8,9,10,suggesting SDAVF. **b :** Spinal DSA , AP view with injection of left 9th thoracic intercostal artery, filling of artery of Adamkiewicz (anterior spinal artery contribution). **c,d**: Spinal DSA AP with injection of right 10th thoracic intercostal artery, filling of a SDAVFwith pial venous drainage. **e** :Spinal DSA AP with superselective injection of the fistula feeder, showing the fistulous site and draining pial veins. **e,** Subtracted images AP Spine view, showing **f,g,** Spinal DSA AP view control injection showing no more filling of the fistula with the glue cast occluding draining vein and fistula refluxing into the feeder. **h :** Spinal DSA, AP view with injection of left 9th thoracic intercostal artery, showing good filling of artery of Adamkiewicz post-treatment

Table 3: AL functional Grades, before and after intervention for 20 patients did endovascular embolization

	Post Improvement	Post Unchanged	Post Worsen	Mean, SD Pre	Mean, SD Post	Sig
AL Gait	11/20 (55%)	9/20 (45%)	----------	3.2±1.4	2.4±1.4	.008 SS
AL Mic.	5/20 (25%)	15/20 (75%)	----------	1.7±1.1	1.4±1.0	0.28

Discussion

SDAVFs arise from a spontaneous or acquired abnormal communication between a segmental radicular artery and the corresponding radicular vein at its site of dural penetration. SDAVFs are relatively rare, and their diagnosis is often missed because of nonspecific clinical symptoms at presentation.[12,13,19]

The delay to diagnosis in our patients 23.9 months (range, 6–36 months) is comparable to other series.[11,13,14,23] We did not correlate the severity of the clinical presentation with the time of diagnosis. Most of the patients in our study were males 77.3% (17 patients) with an average age of 59.3± 9.7.This finding also correlates with the demographics seen

in several other large studies.[14,19,23] We had only one patient younger than 40 years in our study, which illustrates the rarity of this diagnosis in the younger patient population.

Presenting symptoms in our patient population included the following: lower extremity weakness was seen in 20 patients (90.9%), sensory deficit in 16 (72.7%), back pain in 11 (50%), and urinary symptoms in 6 (27.3%), lastly was defecation disorder and sexual dysfunction each seen in 4 patients (18.2%). These symptoms at clinical presentation are similar to those reported in other large series.[11,14,23,24,32]

Development of upper motor neuron signs with gait and micturition impairment is usually seen late in the course of the disease process. Early diagnosis and successful treatment of the fistula correlates with improvement in clinical symptoms.[6] Even with successful treatment, late presentation is associated with poor clinical and functional outcomes. Also in accordance with previous studies, most SDAVFs in our series originated from the thoracic and lumbar levels.[14,22,23]

Several prior studies have reported results after endovascular treatment of SDAVFs. Niimi et al,[25] reported 49 patients who were primarily treated with n-BCA, but isobutyl-2-cyanoacrylate and polyvinyl alcohol were also used. According to those authors, adequate embolization was achieved in 39 patients (80%); however, angiographic recurrence was seen in 8 (23%) of the 35 patients.[25] Westphal and Koch[40] found recurrent fistulas in 20 (57%) of 35 patients treated with embolization at a mean follow-up time of 7.5 months. In another reported series of 27 SDAVFs, Song et al[31] showed a 25% failure rate in patients treated with n-BCA.

Furthermore, several studies have reported outcomes after embolization of SDAVFs. Eskander et al,[10] reported on their experience in 26 consecutive patients who were treated for a 6-year period. Nine (39%) of the 23 patients in whom liquid acrylic embolization was performed or attempted ultimately required surgery.[10] All patients were stabilized or their condition improved after definitive treatment, as assessed by the ALS.[10] Van Dijk et al,[37] reported a cure rate of only 25% (11/44 patients) after treatment with n-BCA embolization. After failed endovascular treatment, 31 patients were cured surgically; the 2 other patients refused surgery.[37] Motor and bladder function scores were significantly improved in 35 patients who had long term follow-up (both $P < .005$).[37] Sherif et al,[29] in their study of 26 patients in which embolization with Histoacryl was performed in 19 patients (73.1%) and direct surgery in 7 patients (26.9%), reported a statistically significant improvement was seen in both the mRS score and the ALS gait scale score ($P < .05$). In addition, Andres et al[4] in a group of 21 patients showed that surgical and endovascular treatment resulted in significant improvement in ALS scores (62.5% and 31.4%, respectively; $P < .05$). Furthermore, Narvid et al,[24] in a group of 63 patients in whom 39 were treated by an endovascular approach and 24 by a surgical approach, reported a significant improvement was observed in ALS scores in both the endovascular and surgery groups (gait, $P < .001$; micturition, $P= .005$). Gemmete et al[11] in their study of 38 patients reported a significant improvement was observed in ALS scores for gait and micturition in patients treated by both glue and Onyx, with a 17% failure rate.

Symon et al,[34] reported a series of twenty surgically treated patients who were followed up beyond 3 years, with follow-up ranging from 3 to 24 years. They found that at 18 to 36 months after surgery, improvement (particularly regarding gait) and stabilization of total disability (gait, micturition, and bowel control) was documented in 84% of patients. However, at last follow-up (mean, 147 months), only 35% of available patients were improved or stabilized. In this series investigators assessed overall disability without investigating its components separately.[34,35] Oldfeild et al,[28] reported a series of 19 patients were followed up a mean of 37 months. They showed a significant improvement of less than one grade (0.4) in mean gait disability at last follow-up. In this series investigators did not investigate micturition disability.[1,28]

In our study, Endovascular treatment was successful in 20 out of 22 (90.9%), and failure occurred in 2 out of 22 patients, (9.1%) who were referred to surgery. We had only one patient (5%) out of 20 patients who had endovascular procedures, with procedure related complication in the form of worsening of symptoms post treatment that improved later on. Two patients had recurrence (10%) that needed further treatment without further morbidity. We had improvement in gait seen in 11 (55%) of 20 patients, stabilization of gait in 9

(45%), Improvement in micturition was seen in 5 of 20 patients (25%) and micturition stabilized 15 of 20 patients (75%), respectively. ALS gait scores showed improvements after treatment, mean ALS gait disability grade was (2.3±1.3 versus 3.1±1.2 [P = .0008]), this improvement was statistically significant (P < .05, Wilcoxon signed rank test), while ALS micturition scores showed improvement, (1.4± 0.9 versus 1.6±1.0 [P =. 27]) but was not statistically significant. Our study compares favorably with the other reports described above.

The goal of treatment of SDAVF is to arrest neurologic deterioration. Studies have shown no significant correlation with duration of symptom onset and the extent of cord edema on MR imaging.[2,32] A trend has suggested that earlier exclusion of the fistula correlates with improved motor function.[30] In general, studies suggest that bladder function, if affected, does not recover.[6,17,32] In our study improvement in motor function after treatment was more likely to occur than improvement in micturition dysfunction.

In our study, the time from symptom onset to diagnosis of the SDAVF was 23.9 months. This finding may have influenced our results because, even with proper treatment, a long duration of initial neurologic symptoms is associated with poor clinical and functional outcomes.[33]

In our study, there was only a 9.1% (n=2/22) failure rate after embolization and a low recurrence rate of 10% of the treated cases (n=2/20), which is an improvement for endovascular treatment compared to the studies described above. Such a rate may be the result of improvements in diagnostic imaging, a better understanding of the pathophysiology of SDAVFs, further developments in microcatheter and microwire technology, or the technical experience of the operators regarding use of liquid embolic agents.

Ethylene vinyl alcohol (Onyx) is a relatively new liquid embolic agent used to treat cerebral arteriovenous malformations and fistulas. [8,27,39] Because of the physical properties of the agent, this may allow a longer, more controlled injection with better penetration of the vascular bed (i.e, venous aspect of the fistula) compared with conventional liquid agents, which polymerize immediately on contact with blood. Gemmete et al,[11] in their series had a 10% (2/20) failure rate with cyanoacrylate glue (close to our failure rate 9.1%) and a 33.3% (3/9) failure rate with Onyx. This finding may be related to the experience the authors have with the injection of glue. Since 2003, a total of 3 small case series have described the use of Onyx in the treatment of SDAVFs.[8,26,38] To the best of our knowledge, Gemmete et al,[11] series of 9 patients, in whom SDAVF was treated with Onyx, is the largest to date. We did not use onyx in our series, due to limited experience using it in spinal lesions, as well as safety concerns since it needs a safe area for possible reflux, which is not always possible with SDAVF. Additionally it could not be diluted to reach distally the foot of the vein, and this may lead to higher rates of failure and recurrence. This is in accordance with the high rate of failure reported by others, up to 33% by Gemmete et al,[11] when compared to this series' failure rate of 10 % with Glue.

Patients should be monitored with clinical examination and MR imaging after treatment; however, at present no statistical data suggested correlation between resolution of T2-weighted cord hyperintensity and clinical outcome. The persistence of flow voids despite treatment should prompt further spinal angiography to exclude persistent fistula from the same or adjacent level with collateral flow.[2,5,7,32]

In our study 6 out of 12 patients (50%) with available MRI, experienced complete resolution of flow voids/vessels within the spinal canal, whereas Song et al,[31] reported a 73% resolution of flow voids/ vessels within the spinal canal after successful treatment in their series. Our imaging findings are similar to those reported in the previous literature.[2,7,5] Limitations of our study were the relatively small sample and the retrospective, design. Furthermore, pre- and post-MR imaging studies were not available in 40% of patients with successful endovascular treatment.

Conclusion

Endovascular embolization of SDAVF with cyanoacrylate glue was technically feasible in 90.9% of patients, relatively safe with low morbidity (5 % transient) and efficient. There was a high rate of favorable outcome, with statistically significant improvement in patients' gait disability by almost one grade at follow-up. Micturition disorder also

showed a statistical trend towards improvement in posttreatment follow up. Recurrence occurred only in 10%. Although endovascular embolization can result in good clinical outcomes, offers the benefits of less invasiveness and earlier rehabilitation. Surgery remains the treatment of choice when safe embolization of the proximal radicular draining vein cannot be obtained or in the event that the shunting artery of the SDAVF also supplies the anterior spinal, posterior spinal, or radioculomedullary artery.

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الملخص العربي

النواسير الشريان - وريدية للأم الجافية الشوكية السحائية: النتائج السريرية والإشعاعية للعلاج من خلال الأوعية

البيانات الخلفية: أن الناصور الشوكى الشريانى الوريدى السحائى مرض نادر الحدوث، تركه بدون علاج يؤدى إلي مضاعفات جسيمة . التطبيقات الطبية فى أشد الحاجة لتشخيص مبكر وطرق علاج متعددة لهذا المرض.

الهدف: تقييم النتائج الأكلينيكية والأشاعية لمرضى الناصور الشريان الوريدى الشوكى السحائى الذى تم علاجهم بالعلاج التداخلى للشرايين ، مع تحديد مدى أمان وفاعلية و جدوى هذا العلاج.

طرق البحث: تم عمل دراسة استعادية على مرضى الناصور الشوكى الشريانى الوريدى السحائى الذين اجرو علاج تداخلى فى الفترة من فبراير ٢٠١٠ إلى فبراير ٢٠١٤ وذلك بقسم جراحة المخ والأعصاب بمستشفيات جامعة عين شمس و جامعة سوهاج. تم تجميع البيانات من السجلات الطبية للمرضى فيما يخص التاريخ الطبى، العرض الأولى للمريض، الفحص العصبى، الفحوصات التشخيصية، مكان الناصور، مدة الأعراض الطبية، العلاج، الأستنتاج ، المتابعة الطبية، الحالة الوظيفية للمشى والتبول ما قبل وما بعد العلاج .اثنان وعشرون مريض تتراوح اعمارهم من ٣٩ إلى ٦٥ عام ومتوسط العمر ٣,٥٩، سبعة عشر ذكر (٣,٧٧ ٪) وخمس سيدات (٧,٢٢ ٪) .

النتائج: اكثر الأعراض المرضية حدوثاً كان الخزل بالطرفين السفليين فى ٩,٩٠٪ من الحالات، الآم الظهر فى ٥٠ ٪، وإضطرابات التبول فى ٣,٢٧ ٪ . متوسط مدة الأعراض ٩,٢٣ شهر. ستة مرضى (٣,٢٧ ٪) كانوا يعانون من تدهور بالأعراض المرضية، نجح العلاج التداخلى فى عشرون مريض ، ٩,٩٠٪ من الحالات . المضاعفات المؤقتة حدثت فى ٥ ٪. متوسط المتابعة الطبية كان١٨ شهر . ارتجاع المرض حدث فى ١٠ ٪ مما أستلزم علاج تداخلى مرة أخرى دون مضاعفات جديدة. حدث تحسن وظيفى فى المشى فى ٥٥ ٪ من الحالات بينما استقر فى ٤٥ ٪ و كان التحسن ذو دلاله إحصائية، وحدث تحسن وظيفى فى التبول فى ٢٥ ٪ من الحالات بينما استقر فى ٧٥ ٪ من الحالات و لم يكن ذو دلاله احصائية.

الإستنتاج: غلق الناصور الشوكى الشريانى الوريدى السحائى عن طريق الحقن بواسطة العلاج التداخلى للشرايين اثبتت جدواة فى ٩,٩٠٪ من الحالات وكان امن ذو نسبة مضاعفات قليلة نسبياً و تحسن وظيفى فى المشيه ذو دلالة احصائية كبيرة، مع تحسن وظيفى فى التبول ولكن دون دلالة أحصائية. تبقى الجراحة بديل لبعض الحالات التى لا يمكن علاجها بأمان.