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Effective diagnostic imaging for spinal arteriovenous fistula

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[Introduction]
In spinal arteriovenous fistula (SPAVF), diagnostic screening by MRI and definitive diagnosis by spinal digital subtraction angiography (DSA) has been regarded as the gold standard. However, the flow void signals of abnormal vessels aren’t sometimes depicted even if spinal cord edema was detected in MRI. In such cases, diagnosis of SPAVF is difficult. Meanwhile, selective spinal DSA is an important modality for definite diagnosis of SPAVF, but DSA procedure over the entire spinal cord takes long time with technical proficiency. Here, we introduce the effective diagnostic procedure with 3T MRI (T2Cube sequence) followed by reconstruction of 3D-CTA (64 rowMDCT).

[Material and Methods]
Fifteen consecutive cases of SPAVF was reviewed based on departmental database from April 2006 to June 2017, and 5 spinal dural AVF cases and 2 non-SPAVF cases, which took 3T MRI and/or 3D-CTA were enrolled.

[Result]
Four cases of SPAVF showed flow void signals around the spinal cord in 1.5T MRI, and 1 case didn't show it. In 3T MRI, all 5 cases showed flow void signals. In the reconstructed VINCENT image of 3D-CTA, all cases showed engorged vessels around spinal cord. We can speculate easily the entry point of influx vessels, and selective spinal DSA became simplified and efficient.

[Conclusion]
Diagnostic procedure of 3T MRI 3D T2Cube followed by reconstructed image of 3D-CTA markedly contributes to the diagnosis of SPAVF and identification of the entry point of influx vessels, and is helpful for efficient spinal DSA and surgical simulation.
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Therapeutic strategy for tentorial dural arteriovenous fistula

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Background: Sinus belonged to the tentorium cerebelli play an important role in the venous return system of the parietooccipital lobes, cerebellum and brain stem. Dural arteriovenous fistula (DAVF) on the tentorium cerebelli is associated with various clinical symptoms and have possibility to locate all over the tentorium cerebelli. Treatments for preventing aggravation are necessary, but have some difficulty in judging the way of treatment.

Patients and Method: From April 2015 to May 2018, we retrospectively identified 5 patients with DAVF on the tentorium cerebelli. Data included: age, sex, clinical symptoms, location of the lesion, Cognard classification, the method of treatment, mobidity and modified Rankin Scale (mRS) at discharge.

Result: Five patients (2 womwn), mean age 61 years old (43-76). Various clinical symptoms such as seizure, visual disturbance, cerebellar symptoms and myelopathy. Lesions: tentorial sinus 3 cases, Galenic system 1 case and superior petrosal sinus 1 case. Cognard classification: type IIb 1 case, type III 2 cases, type IV 1 case and type V 1 case. Three patients underwent direct surgery, one endovascular therapy and the other combination of direct and endovascular therapy. None of the patients developed new neurological deficits. The morbidity is one liquorrhea after the direct surgery. All discharged mRS 0 or 1. Angiographic follow-up revealed no recurrence.

Conclusion: We have no choice but to decide the therapeutic strategy for the patient with DAVF on the tentorium cerebelli case by case.
Significance of Iomazenil SPECT for the evaluation of venous congestion of dural arteriovenous fistula with retrograde leptomeningeal venous drainage

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Introduction
The severity of cerebral hemodynamic disturbance caused by retrograde leptomeningeal venous drainage (RLVD) of a dural arteriovenous fistula (dAVF) is related to neurological morbidity and unfavorable outcome. However, the significance of 123I-iomazenil (IMZ) single photon emission computed tomography (SPECT) for the evaluation of venous congestive encephalopathy have not been elucidated well. The aim of this study was to assess the usefulness of IMZ SPECT.

Methods
Based on the pre- and posttreatment T2 HIAs associated with venous congestion encephalopathy, patients were divided into 3 groups: a normal group, an edema group, and an infarction group. Early and late images of IMZ SPECT were evaluated at the region with RLVD and compared among the groups.

Results
There were 14, 5, and 2 patients in the normal, edema, and infarction groups, respectively. All patients in the edema and infarction groups developed neurological symptoms. The early images of IMZ SPECT in the edema group was lower than the normal group, and higher than the infarction group. The late images of IMZ SPECT of the infarction group was lower than the normal and edema groups. After treatment, the uptake of early images of IMZ SPECT increased in the normal and edema groups, but not in the infarction group.

Conclusions
IMZ SPECT is useful for evaluating venous congestion encephalopathy of dAVF. The reduction of uptake in the early images was correlated with the severity of venous congestive encephalopathy, and the decreased uptake in the late images is an indicator of irreversible venous infarction.
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Cavernous sinus dural Arteriovenous Fistula Selected embolization VS Sinus packing

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Purpose: Endovascular therapy has been used to manage intracranial dural AVFs safely with satisfactory results. However, sinus packing (SP) as classical treatment option for cavernous sinus dAVF bears risks, such as obliteration of normal venous drainage, perioperative complications, and worsening neurological symptoms. Aim of this study was to compare the outcome of SP and selected embolization technique (SE) for CS dAVF.

Material and method: 63 CS-dAVF patients treated by TVE between 2005 and 2018 at our facility were included. 32 cases were treated with SP, whereas 31 cases were treated with SE of the most upper-stream shunted pouches adjacent to CS.

Result: Mean number of coils used during SE were 12 and 20 during SP. Complete occlusion after initial treatment were 45% and 63%, after 6 months 77% and 94% in SE and SP respectively. Complete resolution of symptoms was achieved in 77% of SE group and 73% in SP. Perioperative neurological complications were seen in 6.5% in SE with subsequent complete resolution and 15.7% in SP, though 9.4% of these symptoms persisted. Moreover, cranial nerve palsy occurred after 3 years in 6.3% of SP group.

Conclusion: SE is a safe and effective treatment for TVE in CS dAVF with full patent venous drainage provided by fewer coil mass and without permanent neurological complication compared to SP.
Surgery for Arteriovenous Malformation: Results of Consecutive 20 cases

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Although after ARUBA Study it is said that a surgical intervention is inferior to medical treatment, symptomatic case or recurrent minor bleedings needs a appropriate surgical treatment.

We experienced consecutive surgical 20 cases in past five years. Female 50%, average age 44.5, Spetzler-Martin Grade(SMG) Median 3, average nidus size 35.6mm, ruptured 9, unruptured 11. seizures 3, trigeminal neuralgia 1, headach 1, asymptomatic 6. Fronto-parietal 71%, non-eloauent 2, eloquent 18. SMG1:10%, 2:40%, 3:30%, 4:10%, 5:10%. Preoperative embolization was performed in 4, SMG3:2, 4:1, 5:1. Total removal were achieved in all cases. Postoperative cognitive disturbance 14%, visual disturbance14%, hemiparesis18%, coma 5%. mRS0-2 at discharge 70%, at 6 month 95%. Morbidity 20%, Mortality 0%.

Even high grade or high flow AVM could be treated surgically safely with proper preoperative embolization.