

THE INTRA AND EXTRA CRANIAL VEINS IN RELATIONSHIP WITH CHRONIC MIGRAINE

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BACKGROUND

Primary headaches* are disorders in which headache and associated features occur in the absence of any exogenous causes.

The most common are migraine with and without aura.

It is a widespread disease characterized by recurrent pain involving only one side of the head matched by nausea, vomiting, photophobia and / or hyperacusia.

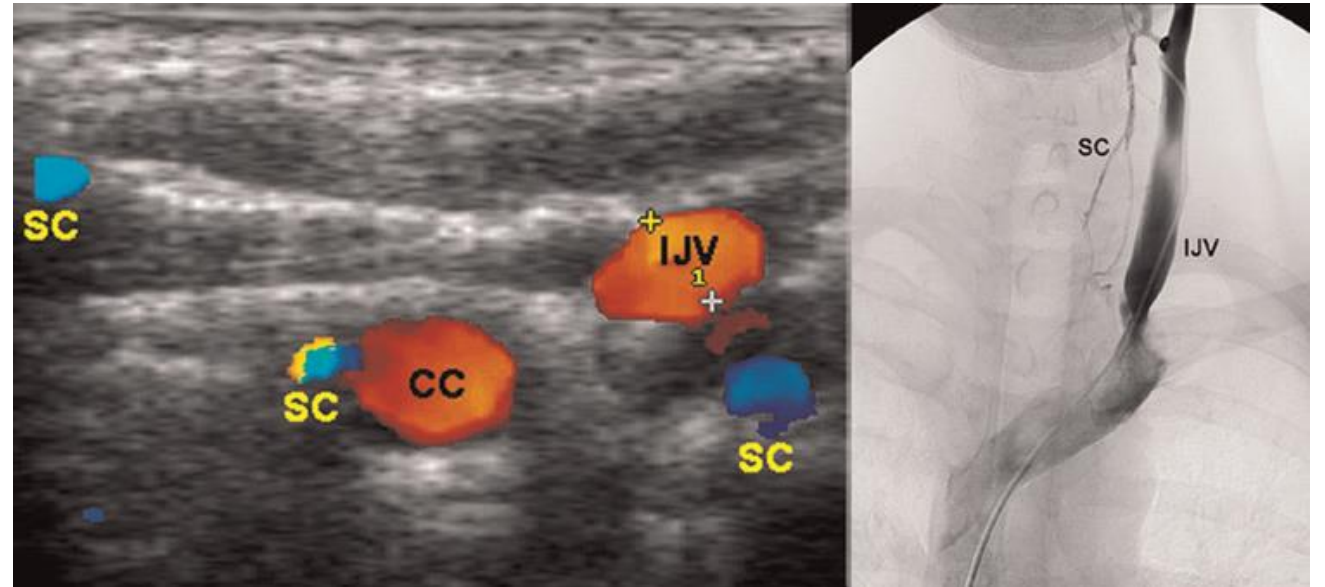
It is defined as **chronic** if present for at least 15 days / month for more than 3 months.

[*Harrison's Principles of Internal Medicine, 19e](#)

BACKGROUND

Chronic Cerebrospinal Venous Insufficiency (CCSVI) is a syndrome characterized by stenoses or obstructions of the internal jugular and/or azygos veins with disturbed flow and formation of collateral venous.

Venous narrowings are primary obstructions, mainly related to segmental hypoplasia or to intraluminal defects like webs, fixed valve leaflets, membrane, inverted valve orientation.



Zamboni P and Galeotti R CCSVI ; Phlebology 2010;25:269–279

METHODS

From 2013 to 2019, 28 persons were examined (12 males, 16 females, mean age 43 ys, SD \pm 18.57) with clinical diagnosis of CCSVI and Chronic Migraine;

- 14 performed an intracranial MRI venography and an EchoColourDoppler (ECD) of the Internal Jugular Veins, resulting positive for venous asymmetry and stenosis;
- 11 performed an intracranial MRI venography with positive results for venous asymmetry;
- 3 performed ECD of IJV, resulting positive for stenosis.

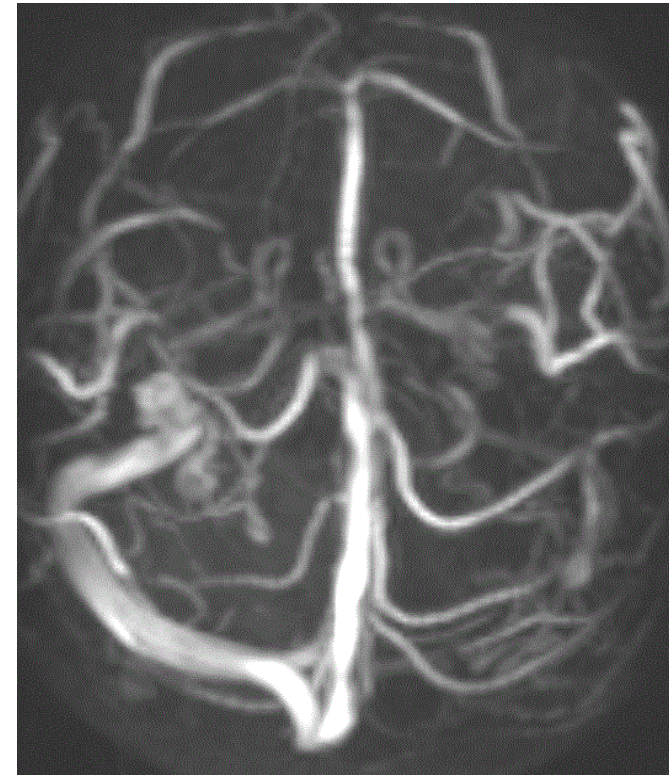
Of the persons observed, 23 are in medical-treatment, and **5 underwent jugular balloon angioplasty.**

METHODS

The Intracranial Magnetic Resonance Imaging (MRI) venography of the persons underwent jugular balloon angioplasty, show the asymmetry of intracranial venous circulation (anatomical variations or anomalies of veins drainage?).



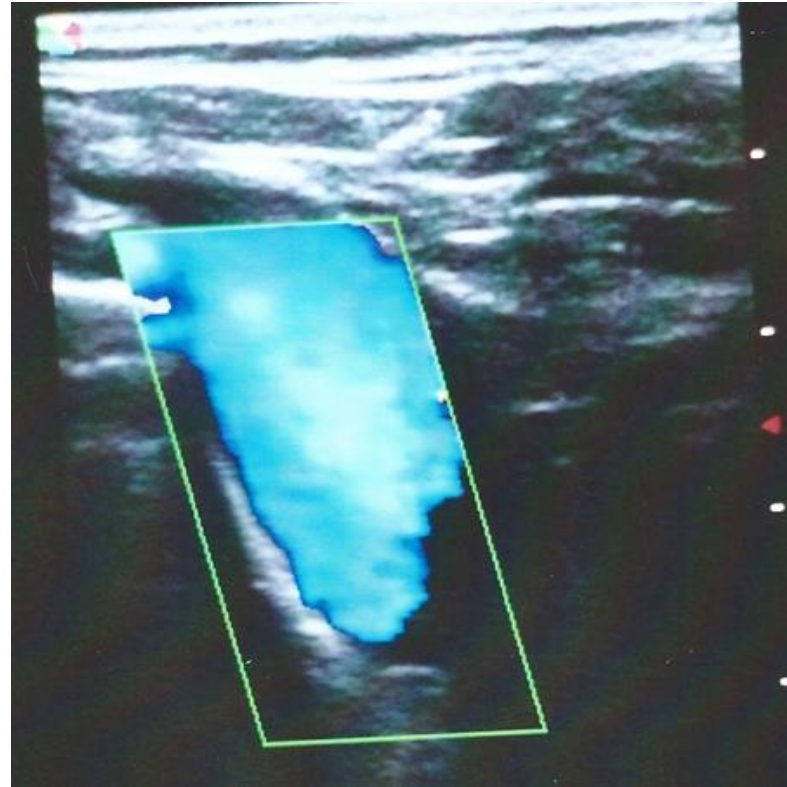
Person with CCSVI, CM and CIDP, coronal view



Person with CCSVI, CM and CIDP, axial view

METHODS

Echo Colour Doppler (ECD) of the Internal Jugular Veins, resulted positive for stenosis.



METHODS

Percutaneous Transluminal Angioplasty (PTA)
Long sheath (Terumo Medical Corporation, Elkton, Md) was introduced under local anesthesia in the common femoral vein.

Phlebography was carried out at different levels in the IJV in every patient.

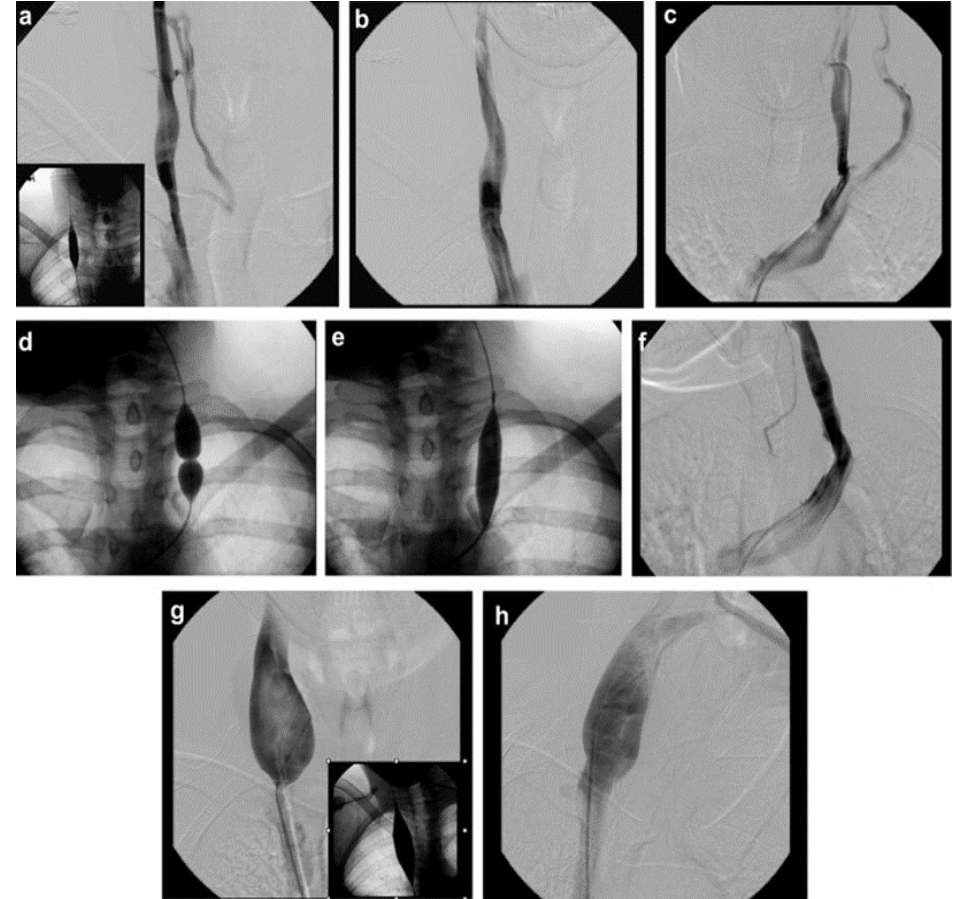
Angioplasty was carried out at the same time of phlebography. Before dilatation with balloon, the patients were given heparin (70 U/kg). **A stenosis greater than 50% was considered the threshold for balloon dilatation.**



METHODS

Raw Data Analysis:

Measurement of emptying times of the jugular veins was performed before and after the angioplasty operation by examination of the venographic data by two well-trained independent examiners.



Lupattelli et al JOURNAL OF VASCULAR SURGERY, December 2013

RESULTS

PERSON 1:

Man 42-year-old, comes to visit for Chronic Migraine diagnosis in the ophthalmic region, matched with Endocranic Hypertension;

- An angio-MRI revealed moderate stenosis of the right transverse sinus (dominant);
- In July 2017 an intracranial angiography and phlebography was carried out which showed “stenosis of the internal jugular vein at C1 level”.
- An Echo Colour Doppler of the jugular veins revealed alteration of the venous circulation with increased flow velocity in the sitting position.
- After PTA an improvement of blood flow velocity from the internal jugular veins (IJVleft 35,7%, IJVright 19,2%) was obtained.



PTA IJV Right



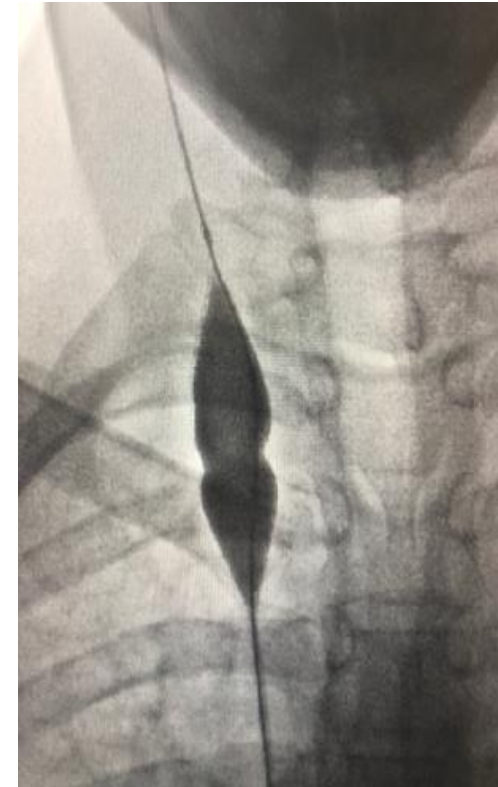
PTA IJV Left

RESULTS

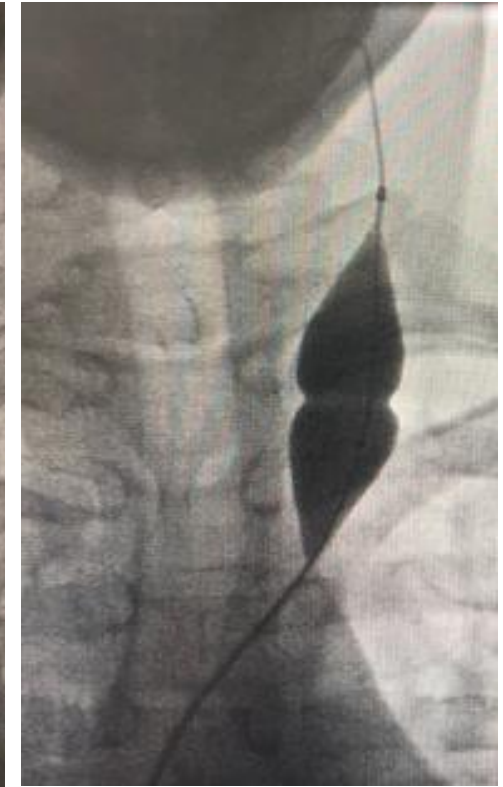
PERSON 2:

Adolescent male 17-year-old, comes to visit for Chronic Migraine and Cyclical Vomiting Syndrome.

- An Echo Colour Doppler of the jugular veins revealed alteration of the venous circulation with diagnosis of CCSVI;
- First intervention of PTA in February 2017 with significant improvement of the Cyclical Vomiting and cephalagic symptoms (morning or, more rarely, nocturnal; very often linked to sporting activity).
- After second PTA in 2018, migraine without aura was reduced in frequency and intensity. Furthermore, an improvement in blood flow velocity from the internal jugular veins was obtained (IJVleft 37.5%, IJVright 26.7%)



PTA IJV Right



PTA IJV Left

RESULTS

PERSON 3:

Woman 46-year-old, comes to visit for diagnosis of Chronic Migraine with aura and diffuse rachis pains.

- Diagnosis of Chronic Inflammatory Demyelinating Polyneuropathy (CIDP);
- Angio MRI showed asymmetry of the intracranial venous circulation, with an important prevalence of flow at right, confirmed by an Echo Color Doppler of the venous neck vessels.
- After PTA an improvement of blood flow velocity from the internal jugular veins was obtained (IJV left 30%, IJV right 20%).



PTA IJV Right



PTA IJV Left

RESULTS

PERSON 4:

Adolescent female 15-years-old, come to visit for diagnosis of Chronic Migraine and Cyclical Vomiting Syndrome.

- Episodes of "Projectile Vomiting" without nausea and a drug-resistant headache, on average every 2 months (in correspondence with the end of the ovarian cycle);
- An encephalic MRI with angio-sequences did not show morphological alterations, but an echo-color-doppler showed a strong asymmetry of the jugular circulation with stenosis.
- After PTA an improvement of blood flow velocity from the internal jugular veins was obtained (IJV 23,3%)



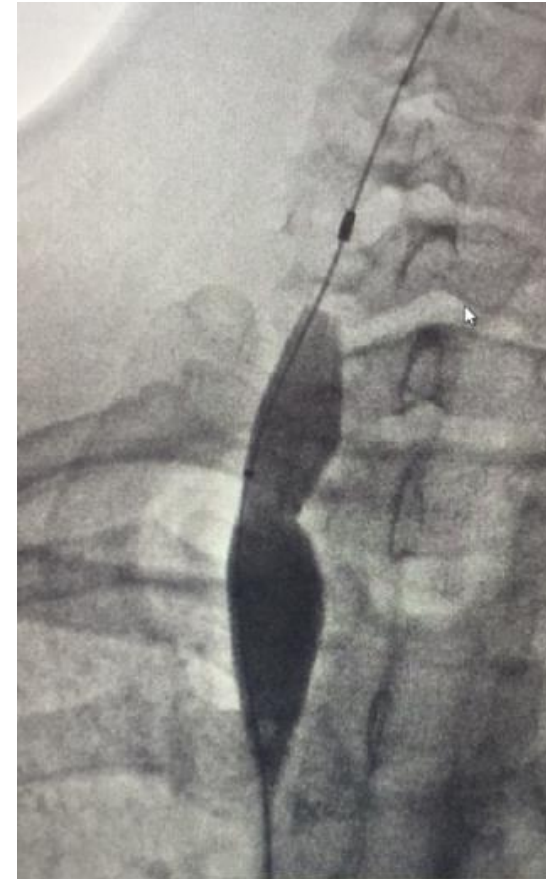
PTA IGV Left

RESULTS

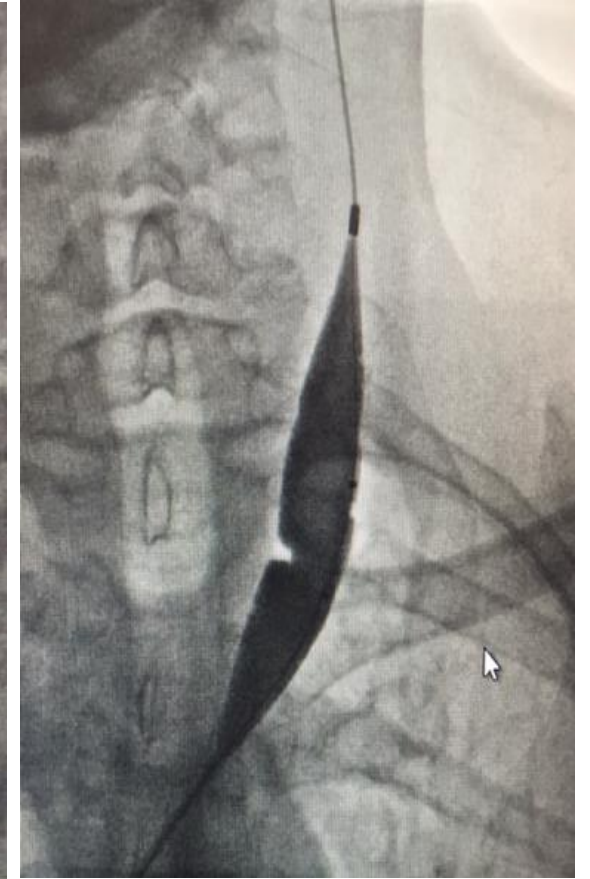
PERSON 5

Man 38-years-old, comes to visit for diagnosis of Chronic Migraine and Meniere's Syndrome.

- Diagnosis of CCSVI with flow blocked in to right internal jugular;
- Previous severe cranial traumatism with zygomatic and right temporal fracture;
- After PTA an improvement of blood flow velocity from the internal jugular veins was obtained (IJV left 19,2%, IJV right 37,5%).



PTA IJV Right



PTA IJV Left

RESULTS

After jugular balloon angioplasty, the range of improvement of the internal jugular flow is included between 19.2% and 37,7%

All 5 persons undergoing PTA, suffered from **chronic migraine** and each of them was characterized by different concomitant symptoms.

ID	% IMP. J. LEFT	% IMP. J. RIGHT	DIAGNOSIS
P1	35,7	19,2	CM + EH
P2	37,5	26,7	CM+ CVS
P3	30	20	CM+ CIDP
P4	23,3	23,3	CM+ CVS
P5	19,2	37,5	CM+ MENIERE SYNDROME

CM= CHRONIC MIGRAINE

EH= ENDOCRANIC HYPERTENSION

CVS= CYCLICAL VOMITING SYNDROME

MS= MENIERE SYNDROME

CIDP= CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY

CONCLUSIONS

In this group of 28 persons visited, chronic migraine seems associated with anatomical variations of the cranial venous circulation.

In the 5 persons with CCSVI and Chronic Migraine, underwent balloon angioplasty, it was found: in 3 positivity both to the MR venography and to the ECD, 1 was negative to MR venography, but positive to the ECD, 1 had only ECD, positive for stenosis.

All had an improvement in their symptoms after PTA.

The results, based on clinical evidence, should be the subject of future research.