

Editorial

Venous Compression in Cerebral Venous System: Light and Shadows

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An obstacle in the drainage of the cerebrospinal venous system of the internal jugular veins and vertebral veins, with stagnation in the territory of derivation causes Chronic Cerebrospinal Venous Insufficiency (CCSVI) [1-3].

The internal jugular veins and vertebral veins, for their particular course, are the vessels of the neck more exposed to a mechanical compression (venous compression syndrome, VCS). This condition is evident examining venous EchocolorDoppler of the neck: it is not possible to display these veins in their anatomical site because they are totally crushed by the tissues that surround them and are therefore not visible by ultrasound nor is it possible to detect any flow in them (white compression) Figure 1. This condition may manifest itself or in the supine position, or in the vertical position or in both. The internal jugular veins shall run along the carotid arteries and the vagus nerve in a lodge bordered by bands from the base of the skull until the clavicle. Vertebral veins instead shall run along the vertebral arteries in a bony canal, the vertebral canal, located in the transverse processes of the cervical spine. If the first vertebra or another cervical vertebra has a rotation, a lateral or anterior dislocation or abnormal angle, we could have a direct effect of internal jugular or vertebral compression syndrome [4]. VCS is multifactorial, in fact there are at least three structures involved in its genesis. The bone apparatus (cervical vertebrae), the muscular apparatus (sternocleidomastoid, omohyoid, sternum thyroid and scalene) and the fascial system (superficial, medium and deep fascia). When the internal jugular EDC is not visible, could be for one of the following reasons: 1. Atresia (a congenital lack of the vase) 2. Hypoplasia (small vessel congenital) 3. Post-thrombotic syndrome without recanalization of the vessel 4.

Venous Compression Syndrome (VCS).

To diagnose the VCS of an internal jugular vein, not visible with EcoColorDoppler, we need the patient turns the head inward to see the vein expand. If this maneuver may be ineffective, we use the Valsalva maneuver. These maneuvers allow us to understand whether the vein is only compressed or falls in one of the first three above conditions. A dislocation of the first vertebra (C1-Atlas) or more distal vertebrae such as C3, C4 or other even more distal, can determine a VCS. VCS can affect the vertebral veins at various levels with a circle of compensation via the intra-vertebral veins or other veins vicarious such as the cervical ones how can be highlighted with the venous RMI. In this case vertebral veins will not be visible with

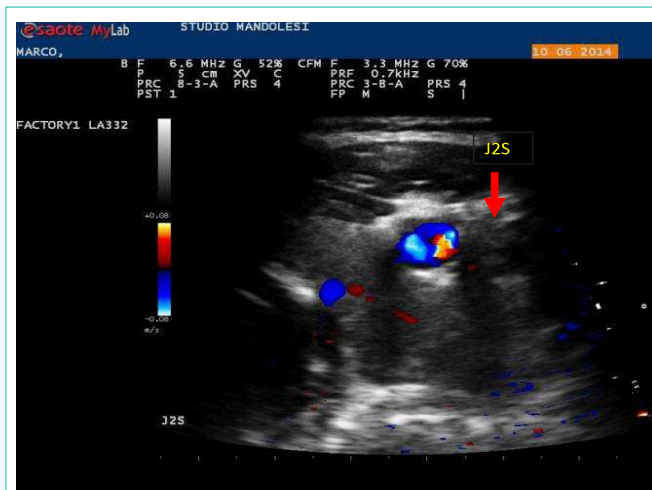


Figure 1: Full Compression (white compression) of left internal jugular vein in J2 (red arrow).



Figure 2: Reopening of the left internal jugular vein in J2 after RIMA adjustment method of the cervical column.

Doppler ultrasound in the middle part (V2) or in the proximal (V3) which are the segments that run in the vertebral canal. The cause of venous compression can depend on various factors such as a marked cervical spine lordosis, a rotation of the cervical vertebrae, abnormal insertion of a head muscle, a fibrous congenital bander, a mega doligo common carotid, an ectatic carotid bulb, a hole jugular hypoplastic, an altered posture post traumatic hypertrophy of the neck muscles [5]. In our recent studies, we found that the these compression of the internal jugular vein is equally distributed to the lower levels (J1), medium (J2) and the upper (J3) of the vessel and affects 48% of patients with CCSVI and MS. In some subjects is to a single level, in other on two levels and in others on are involved all three levels. The SCV can be seen both in the upright position as well as in the supine position; some subjects (7%) have also a bilateral VCS [6]. The decompression treatments are possible and can be non-invasive and invasive. The currently used are: 1. adjustment of the first cervical vertebra, 2. adjustment of all cervical vertebrae, 3. postural gymnastics, 4. resection omohyoid muscle [7]. The decompression treatments to be developed in the future are 1. Decompressive fasciotomy 2. Resection of the scalene muscle 3. The re-alignment of the cervical spine with exo-prosthesis or arthrodesis. In the presence of a VCS of jugular veins, decompressive spine manipulative adjustment RIMA method [8] in symptomatic patients have a specific indication in order to reduce symptoms and in those with the lack of symptoms to prevent clinical vascular worsening (Figure 1-2). There are still many shadows on site and also on the pathogenesis of symptoms observed in individuals with VCS. We are at the beginning of a journey that we expect will be very helpful to those who have symptoms of chronic diseases “no responders” to the usual therapies and are not yet be labeled with exact etio-pathogenesis, but suffering from VCS.

References

1. Zamboni P, Menegatti E, Weinstock-Guttman B, Schirda C, Cox JL, Malagoni AM, et al. The severity of chronic cerebrospinal venous insufficiency in patients with multiple sclerosis is related to altered cerebrospinal fluid dynamics. *Funct Neurol.* 2009; 24: 133-138.
2. Ciccone MM, Galeandro AI, Scicchitano P, Zito A, Gesualdo M, Sassara M, et al. Multigate quality Doppler profiles and morphological/hemodynamic alterations in multiple sclerosis patients. *Curr Neurovasc Res.* 2012; 9: 120-127.
3. Ciciarello F, Mandolesi S, Galeandro AI, Marceca A, Rossi M, Fedele F, et al. Age-related vascular differences among patients suffering from multiple sclerosis. *Curr Neurovasc Res.* 2014; 11: 23-30.
4. Mandolesi S, Marceca G, d'Alessandro A, Ciccone MM, Zito A, Manconi E, et al. C1-C2 X-Ray assessment of misalignment parameters in patients with Chronic Cerebra-spinal Venous Insufficiency and Multiple Sclerosis versus patients with other pathologies. *Annali Italiani di Chirurgia [In Press]*.
5. Radak Djordje. Incidence and distribution of extravascular compression of extracranial venous pathway in patients with chronic cerebrospinal venous insufficiency and multiple sclerosis. *Phlebology.* 2014.
6. Mandolesi S, d'Alessandro A, Niglio T. Incidence of anatomical compression of the internal jugular veins with full block of their flow in patients with chronic cerebro-spinal venous insufficiency and multiple sclerosis. *Minerva Medica 21st Eurochap-IUA.* 2013.
7. Simka M, Majewski E, Fortuna M, Zaniewski M. Internal jugular vein entrapment in a multiple sclerosis patient. *Case Rep Surg.* 2012; 2012: 293568.
8. Mandolesi S, Ricci D. Internal jugular Venous Compressive Syndrome: hemodynamic outcomes after cervical vertebral decompressive manipulations. *Annali Italiani di Chirurgia.* 2015.