**Chronic Cerebro Spinal Venous Insufficiency (CCSVI), Anatomical variants and Ménière Disease (MD): a new way to think the management of MD patients**

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Despite many well-controlled studies over 159 years since is definition, the medical and surgical management of Ménière disease (MD) remains quite empirical. The post-mortem criterion necessary for the diagnosis of patients affected with “Certain MD” keeps very difficult investigations on the disease. Although Endolymphatic Hydrops (EH) is the worldwide most accepted mechanism of MD and may been seen on MRI with contrast evaluation, the causes that induce it are still not clear. In many papers a correlation has been done to a wide and different causes ranging from an autoimmune disease process to virus infection and a variety of anatomo-pathological conditions. Anatomical variants regarding the temporal bone and the venous system have been found in patients with MD and it is sufficiently demonstrated that Chronic Cerebro Spinal Venous Insufficiency (CCSVI)is very frequent in MD. In our experience with 50 MD patients with definite MD studied with echo-colour Doppler (ECD) all of them had a CCSVI at various degrees. In 29 of them a Contrast Enhanced -Magnetic Resonance Venography (CE-MRV) analysed through a mathematical model described by one of the authors (F.E. Toro) showed increased cerebro-spinal fluid (CSF) pulsatility within the Aqueduct of Sylvius (AoS) that is an indirect measure of reduced brain compliance, a marker common to diseases such as idiopathic normal pressure hydrocephalus and idiopathic intracranial pressure. A significantly high total CSF volume, a reduced total gray matter (GM) volume and, at less extension, a total white matter (WM) volume was also significantly increased. This result suggests hindered CSF and Interstitial fluid (ISF) drainage, increased intracranial pressure (ICP) and possible compression of GM in MD patients.

CCSVI may potentially induce EH through a pure “hydraulic” mechanism but CCSVI per se does not explain how the various disorders correlated with MD may interact with CCSVI and provoke EH. The aim of this presentation is an attempt to approach MD into the context of the more recent findings about the global brain waste clearance system, to which inner ear is anatomically and functionally connected, in order to build a reasonable model of MD pathogenesis. In our opinion CCSVI is considered an anatomical predisposition to develop the disease more than a direct cause of because of the interaction between it, the brain lymphatic system (BLS) and the glymphatic system (GS). In this model that takes into consideration an already published mathematical model of the human circulation, endolynphatic hydrop and then MD, is the consequence of a failure of the anatomo-functional compensation of the congenital venous abnormalities, as collateral pathways and/or functional compensation at the GS and BLS level, with the development of an autoimmune process that, as well known, always develops after an anatomical damage. This model explains the major part of the disturbances correlated to MD and why old and new surgical treatments of MD ranging from endolynphatic sac surgery, endolynphatic duct clipping and surgery to correct CCSVI as Percutaneous Transluminal Angioplasty (PTA), PTA + Venous Stent and surgery to eliminate external compression of the IJV due to the omohyoid muscle (OM), the carotid artery or osseous strictures at the exit of the skull base are getting so encouraging results.