MRI Angiography in Carotid-Cavernous Fistula: A Case Report.

CLINICAL HISTORY: A 41 year old female presented with long standing history of redness of the left eye. Proptosis was noticed past one week. She had no history of diplopia, blurring or pain. On examination, elevated left intraocular pressure was found. Vision was normal.

Patient referred for MRI to rule out orbital SOL.

Fig1, 2 & 3: MR contrast Angio: Prominent left superior ophthalmic vein (SOV) and its early filling on arterial imaging.

Fig 4: MR post contrast: Prominent left cavernous sinus.
MRI FINDINGS: Plain MRI revealed almost normal study except for mild proptosis of the left eye. Post contrast MRI angiography revealed early filling of the left cavernous sinus and left superior ophthalmic vein on arterial phase imaging. The superior ophthalmic vein appeared prominent. On delayed images the left cavernous sinus appeared prominent with mild lateral convexity.

FINAL DIAGNOSIS: Carotid cavernous fistula. (CCF)

DISCUSSION:
Carotid cavernous fistulas are abnormal communications between the carotid artery and the cavernous sinus. It may be either directly or via intradural branches of the internal or external carotid arteries. Direct fistulas are high flow, frequently follow trauma, and tend to have a dramatic clinical presentation. In contrast, indirect fistulas are low flow, often spontaneous, and may have a subtle clinical presentation.

Symptoms and signs common to both types of fistulas include proptosis, chemosis, diplopia, visual loss, pulse-synchronous tinnitus, orbital bruit, elevated intraocular pressure, dilated episcleral veins, and retinal venous congestion. Complications include vision loss and, in rare cases, ischemic ocular necrosis. Non-ocular symptoms are though fatal are less common and include epistaxis, subarachnoid hemorrhage and intracerebral hemorrhage due to rupture of fistula.

Imaging findings include proptosis, engorgement of the superior ophthalmic veins, cavernous sinus distention, and abnormal flow voids within the cavernous sinuses on MR images. These flow voids at MR imaging correlate with the classic angiographic finding of filling of the cavernous sinus as the contrast material reaches the cavernous segment of the internal carotid artery. Additional radiographic findings with variable prevalence include lateral bulging of the cavernous sinus wall and enlargement of extraocular muscles. A new study reveals a striking sign of hyperintense cavernous sinus on TOF non contrast MR angiography, which is highly indicative of CCF. In our patient, superior orbital vein enlargement and early filling of cavernous sinus and superior orbital vein provided the direct evidence of CCF. Similar to other non-invasive techniques, MRI may not delineate CCF arterial feeders or detect cortical venous drainage. Hence, conventional angiography remains necessary for definitive management.

MESSAGE: MRI as well as CT angiography are non invasive tests and play a promising role in clinical diagnosis and differential diagnosis of carotid-cavernous fistula. The conventional angiography remains necessary for definitive diagnosis and management.

Regards,

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Wishing you a Happy and Prosperous New Year 2014!!!!

N.B: This case is authentic and from the archives of Radiance Diagnostics. For any queries/suggestions / feedback write to us at radiance@radiancediagnostics.in. Case of the month can also be accessed anytime online at VIEW BOX at www.radiancediagnostics.in