Poppen Clamp Application and Internal Carotid Artery Ligation For The Treatment of Traumatic Carotico-Cavernous Fistula With Associated Pseudoaneurysm

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Introduction:
• CCFs are abnormal shunts, allowing flow from the ICA into the cavernous sinus. Traumatic CCFs are most common, up to 75% of cases, and reported in 0.2% of patients with trauma. Association of CCF with concomitant pseudoaneurysm of the intracranial ICA is uncommon.

Case:
• We present a case of direct CCF with pseudoaneurysm and its treatment
A 25 year old Filipino male, with history of trauma (June 5, 2019), causing fractures of the left orbit, nasal bone and sphenoid, subsequently developed blindness, diplopia and pulsatile tinnitus.

Exam showed proptosis, chemosis, bruit, abducens palsy and no light perception on the left.
DSA confirmed left direct CCF, draining into the cavernous sinuses; retrograde flow to the vein of Labbe, vein of Trolard, superior and inferior petrosal sinuses, with a left cavernous ICA pseudoaneurysm, directed into the sphenoid sinus.
Multiple episodes of massive epistaxis prompted admission, transfusions and emergent Poppen clamp application to the left ICA, with eventual left ICA ligation. Post-op, there were no new deficits; proptosis and bruit resolved.

2 months after ICA ligation, there was another episode of epistaxis prompting repeat angiogram showing filling of the CCF from the left vertebral artery via a patent left posterior communicating artery [PCom]. He underwent left pterional craniotomy, clip ligation of the left ICA; the left Pcom was preserved.
CCF have varied presentations, imaging manifestations, and treatment options. Transarterial/transvenous embolization is the first-line treatment. Should endovascular treatment be ineffective, direct repair of the fistula within the sinus is possible; trapping of the ICA can also be done. Goal of treatment is to obliterate flow through the fistula. Historically, application of Poppen and Selverstone clamps to reduce flow have been used to treat aneurysms and CCFs. In a low-middle income country setting where endovascular treatment is not readily available due to financial limitations, other treatments options maybe effective in treating complex vascular cases.