E-271 INTRACRANIAL INTERNAL CAROTID BLOWOUT SYNDROME (ICABS): A SYSTEMATIC REVIEW AND POOLED COHORT ANALYSIS

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Introduction Acute carotid blowout syndrome (aCBS) commonly refers to a rare emergency caused by a rupture of the extracranial carotid artery or its branches, resulting in rapid and profuse bleeding from the cervical carotid arteries. There is an equally dangerous but less common entity called acute intracranial internal carotid artery blowout syndrome (ICABS), which occurs iatrogenically during transnasal surgeries or after radiotherapy but can also be secondary to trauma or tumor invasion.

Objective This study aims to perform a systematic review of the clinical predictors for iatrogenic ICABS postoperative course.

Methods We searched in PubMed, Embase, Scopus, Web of Science, and Google Scholar until December 23, 2022. The risk of bias (RoB) and quality of the studies were assessed using the Joanna Briggs Institute (JBI) assessment tool for case series and case reports. Primary outcomes were overall success rate and mortality at last follow-up, while secondary outcomes were postprocedural complications rate and death cause. A logistic multivariate regression was performed to identify predictors of mortality and postoperative complications.

Results A total of 23 studies with 53 pooled patients were included in the analysis. Predominant age was 51.2 ± 16.14. Most frequent initial diagnosis was head and neck cancer (53%), mainly referring to cases of nasopharyngeal carcinoma. Three main groups of iatrogenic interventions were reported: radiotherapy (36%), surgery (42%), and endovascular treatment (4%). The JBI risk of bias assessment revealed demographic data and site demographic information, as well as description of adverse events and take away lessons, as the most neglected components in case series and case reports, respectively. Reported overall success were achieved as devascularization (53%) and revascularization (28%) procedures. The most frequent lesion was a pseudoaneurysm (42%) located on the petrous segment (45%) of the internal carotid artery. After running the logistic regression, the only significant clinical predictor identified for postoperative complications was female gender (OR = 3.25 (1.06 - 9.97), p = 0.039).

Conclusion Despite being a iatrogenic injury, ICABS is seldom reported on literature as case series and case reports with serious methodological mishaps. Most frequently after surgical procedures involving transnasal endoscopic resections. Nevertheless, due to its usual intraoperative occurrence, the major hemorrhage can be rapidly treated by endovascular procedures. More primary studies are needed to identify further predictors of postoperative complications and mortality.

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E-272 NOVEL USE OF A TRIPLE STENT RETRIEVER 'BOUQUET' DEPLOYMENT WITH ZOOM 88 LARGE-BORE ASPIRATION AND WALRUS BALLOON-GUIDE CATHETER FLOW ARREST FOR DEFINITIVE THROMBECTOMY OF A CAROTID FREE FLOATING THROMBUS

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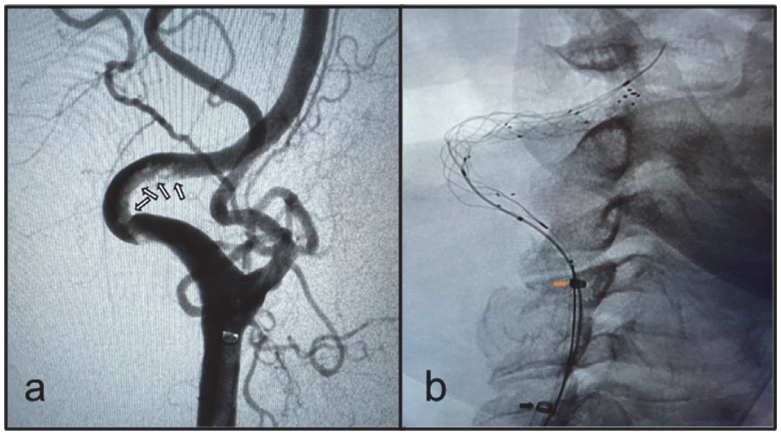
Introduction/Purpose Intraluminal carotid free-floating thrombus (CFFT) is a rare but potentially devastating condition. Current literature provides no conclusive evidence for endovascular techniques that can safely and reliably remove CFFTs. Historically, CFFTs have been managed medically with or without carotid thromboendarterectomy. In this report, we demonstrate a novel technique utilizing a combined approach of direct 0.088' aspiration with a triple stent retriever (SR) 'bouquet' deployment under balloon guide flow arrest with concomitant 0.088' flow reversal aspiration to safely thrombectomize a proximal cervical CFFT.

Materials and Methods A 78-year-old woman with a history of prior right internal carotid artery (ICA) mechanical thrombectomy and antiplatelet noncompliance presented with transient ischemic attacks secondary to a recurrent CFFT in the right ICA. Given her symptomatic presentation and recurrent CFFT, the decision was made to proceed with endovascular mechanical thrombectomy. An 8-Fr Walrus balloon guide catheter (BGC; Q'Apel Medical, Fremont, CA) and an 8-Fr Zoom88™ (Imperative Care, Campbell, CA) distal access catheter was brought into the right distal common carotid artery and proximal ICA bulb, respectively. Three 0.021-inch microcatheters were navigated beyond the CFFT into the upper cervical ICA, taking care to avoid disrupting the thrombus. Each 0.021-inch catheter was loaded with a unique SR and they were deployed in a bouquet fashion: Tigertriever (Rapid Medical, Yokneam, Israel), Trevo (Stryker Neurovascular, Fremont, CA), SolitaireX (Medtronic Neurovascular, Irvine, CA), from distal to proximal, respectively. BGC was inflated to achieve flow arrest, and under concomitant BGC aspiration, the Zoom88 aspiration catheter was tracked over the three bouquet SRs to partially ingest and 'cork' the thrombus. The Walrus balloon was deflated under continued aspiration, while the Zoom88 was synchronously removed with the SRs and CFFT.

Results Immediate follow-up angiography demonstrated recanalization of the proximal cervical ICA without evidence of residual thrombus. Twenty-four-hour postoperative CT imaging did not reveal any evidence of new frank infarction. The patient was discharged home 8-days postprocedurally with an intact neurological examination, compliant on aspirin and apixaban.

Conclusion Endovascular mechanical thrombectomy of CFFTs utilizing a combined technique of a multiple SR 'bouquet' deployment with simultaneous flow arrest/aspiration may offer



Abstract E-272 Figure 1 (A) AP DSA view of the right CCA and visualized CFFT (arrows). (B) AP native view of the inflated Walrus BGC (black), Zoom88 (orange), and deployment of the triple-SR 'bouquet' intercalated within the thrombus of the common carotid artery

a safe and curative technique for historically difficult-to-treat lesions.

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E-273 HEAD AND NECK ENDOVASCULAR REPAIR OF VASCULAR MALFORMATIONS

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Purpose To determine the efficacy of ethanol embolotherapy of extracranial head and neck vascular malformations of all types, particularly after failure of other endovascular and surgical treatments.

Materials and Methods One hundred and sixty-six patients (64 males, 102 females; mean age: 38 yrs) presented with extracranial arteriovenous malformations (AVMs) of the head and neck area. Over half of the patients had undergone previous failed therapies (Glue, Onyx, PVA, Coils). All patients underwent ethanol embolotherapy under general anesthesia. Forty-five patients had AVMs and 121 patients had venous malformations (VM).

Results Of 45 AVM patients, 26 patients are cured (mean follow-up 2 ½ years); of 121 venous malformation patients, 65 are at end-therapy (mean follow-up 4 ½ years). The remaining patients are not at end-therapy and are being treated for their residual malformations. In AVM follow-up, arteriography is the main imaging modality to determine cure or residual AVM as MR is less sensitive in the evaluation of residual AVM. In VM follow-up, MR is the main imaging tool, particularly with T- 2 fat suppression and/or STIR imaging. All patients demonstrated improvement post-therapy. Complications were 4.5%, to include bleeding (self-limited), partial 7th nerve palsy (with recovery), skin injury (not requiring skin grafts), infection, and pain.

Conclusions Ethanol has proven its consistent curative potential at long-term follow-up for high-flow AVMs and low-flow VM lesions at long-term follow-up as lesions in the periphery. Complication rates remain low. The procedures are tolerated well by the patients and done on an out-patient basis. Prior surgery and embolization procedures can cause difficulty in lesion access, but does not obviate further ethanol endovascular treatment.

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E-274 ENDOVASCULAR MANAGEMENT OF HIGH-GRADE CEREBRAL ARTERIOVENOUS MALFORMATION

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Introduction High grade cerebral AVM (Spetzler grade 4 and 5) have a very complex structure and architecture. Accordingly, their management is very challenging. Their natural history also is known to be poor. We present our experience of patients with high-grade cerebral AVM and their management with endovascular methods.

Methods Sixty-seven patients with high-grade cerebral AVM with one embolization session between 2010 and 2021 were included in this study. The baseline and treatment outcomes were collected and reported.

Results The mean age of patients was 29.2 years ± 15.8 (SD) with predominant of men (63.6%). The most common presentations were hemorrhage (57.6%), seizure (18.2%), and focal neurological deficit (13.6%). At patient admission, median range of modified Rankin scale was 1 (range of 0 to 4). The majority of AVMs were located in cortical and subcortical area (47%), 53 were grade 4 of Spetzler- Martin, and 14 grade 5. Mean nidus diameter was 47.8 mm ± 14.2 (SD). Median number of embolization sessions was 3 with range of 1-13. Eighteen AVMs (26.9%) were completely excluded by embolization (33% in grade 4 and 7% in grade 5). Significant complications occurred in 24 (36%) patients including hemorrhage (66.7%) and ischemia (33.3%). Fifty patients (75.8%) had good outcome (mRs 0-2) and one patient died following embolization.