Conclusion The CREST-2 eligibility criteria were specified to recruit individuals with a high degree of stenosis. However, even within this group of patients with a (likely) high degree of stenosis, there was a surprising heterogeneity between patients in the pattern of flows that qualified for the study, introducing the opportunity to assess differential treatment effects between those with different patterns.

Disclosures D. Heck: 2; C; Stryker. G. Roubin: 2; C; Consultant for Inspire MD Inc, Contego Medical, Cook Inc. W. Moore: None. G. Howard: None. J. Meschia: None. R. Brown: None. T. Brott: None. B. Lal: None.

Abstract E-078 Figure 1

Conclusion The CREST-2 eligibility criteria were specified to recruit individuals with a high degree of stenosis. However, even within this group of patients with a (likely) high degree of stenosis, there was a surprising heterogeneity between patients in the pattern of flows that qualified for the study, introducing the opportunity to assess differential treatment effects between those with different patterns.

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E-078 STANDARD UMBILICAL ARTERY CATHETERS USED AS DIAGNOSTIC AND NEUROINTERVENTIONAL GUIDE CATHETERS IN THE TREATMENT OF NEONATAL CEREBROVASCULAR MALFORMATIONS

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Background High-flow intracranial arteriovenous malformations in neonates, including vein of Galen malformations (VOGMs), pial arteriovenous fistulas (AVFs) and dural sinus malformations (DSMs), often present with high-output cardiac failure requiring urgent or emergent intervention. Objective Vascular access in neonates is limited by the small size of the femoral artery and the risk of complications, including thrombosis and limb ischemia. Although umbilical artery access has been described in neonates, previous reports detail exchange of the umbilical artery catheter for a conventional arterial sheath, which can be difficult and cumbersome.

Here we aim to describe direct use of the umbilical artery catheter as the sheath and guide catheter in neonatal patients requiring endovascular treatment for life-threatening intracranial arteriovenous shunts.

Methods We describe a direct approach to cerebral angiography and neurointerventions in newborns using umbilical artery catheters that does not require catheter exchange, and that allows for repeated, relatively straightforward endovascular access in neonates across multiple interventions.

Results Seven consecutive neonates underwent endovascular neurointerventional procedures for the treatment of life threatening, high-flow arteriovenous shunts using a direct umbilical artery catheter access technique without procedural morbidity. Five of seven patients underwent more than one procedure in the neonatal period, between day 1 and day 10 of life.

Conclusions Use of the umbilical artery catheter itself as a diagnostic catheter for cerebral angiography or as a guide catheter for neurointerventions greatly facilitates endovascular interventions in newborns and is ideal for patients requiring multiple interventions in the neonatal period. This technique helps to mitigate the risk of neonatal femoral artery access and its complications, including thrombosis, dissection, spasm, stenosis and limb ischemia.

Disclosures A. Kappel: None. D. Orbach: None.

Abstract E-079 Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-Embolization</th>
<th>Post-Embolization</th>
<th>Mean Difference Reduction (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subdural Hematoma</td>
<td>66.54 (34.67)</td>
<td>54.75 (33.0)</td>
<td>12.1 (9.32 - 14.27)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Volume (ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midline Shift (mm)</td>
<td>3.79 (2.85)</td>
<td>2.99 (2.47)</td>
<td>0.80 (0.24 - 1.36)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

E-079 MIDDLE MENINGEAL ARTERY EMBOLIZATION ASSOCIATED WITH REDUCTION IN CHRONIC SUBDURAL HEMATOMA VOLUME AND MIDLINE SHIFT REDUCTION IN THE ACUTE POST-OPERATIVE PERIOD


10.1136/neurintsurg-2022-SNIS.190

Background Chronic subdural hematomas (cSDH) are associated with significant morbidity and high rates of recurrence, and effective management is essential to reducing the disease burden. Middle meningeal artery (MMA) embolization is a minimally invasive treatment strategy which is growing in popularity. We sought to evaluate whether hematoma volume and midline shift were reduced in the immediate post-operative window (<24h) following embolization.

Methods We performed a retrospective analysis of 81 unique patients with 98 chronic subdural hematomas managed via MMA embolization. SDH volumes and midline shift were quantified through image segmentation pre- and post-operatively (24-hour post-procedure) through computed tomography (CT) scans. Other demographic, clinical and operative parameters were abstracted from the medical record in a subset of patients for multivariate analysis. Paired t-tests were used to compare pretreatment and post-treatment volumes.

Conclusions Use of the umbilical artery catheter itself as a diagnostic catheter for cerebral angiography or as a guide catheter for neurointerventions greatly facilitates endovascular interventions in newborns and is ideal for patients requiring multiple interventions in the neonatal period. This technique helps to mitigate the risk of neonatal femoral artery access and its complications, including thrombosis, dissection, spasm, stenosis and limb ischemia.

Disclosures A. Kappel: None. D. Orbach: None.

Abstract E-077 Table 1

Impact of embolization of subdural hematoma and midline shift
Lessons From the Other Side: The Origins and Evolution of Transvenous Techniques in Neurointerventional Surgery

Abstract:

Introduction/Purpose Neurointerventional surgery emerged in the early 1960’s, when Lusenhop and Spence described the first intravascular embolization of a cerebral arteriovenous malformation. Since then, neuroendovascular techniques have grown exponentially, becoming the standard of care for many pathologies. To date, this growth has been attributed largely to transarterial techniques; however, there has been a resurgence of interest in transvenous (TV) neurointerventional methods, driven by a groundswell in technical innovation and advances in knowledge of the role of the cerebral venous system in health and disease. The purpose of this historical review is to chronicle the origins and evolution of TV neurointervention by highlighting seminal achievements, technical breakthroughs, and controversies, all of which shape the phylogeny of TV techniques in the modern era.

Methods A systematic review of seminal papers in TV neurointervention was performed using Google Scholar and Medline indices, following PRISMA guidelines. The search strategy sought to identify landmark manuscripts describing TV neurointerventional techniques in three pathophysiologic states: 1) arteriovenous shunts 2) cerebral venous thrombotic disease 3) disorders of intracranial pressure homeostasis. Reference lists of selected articles were also reviewed for additional potential citations.

Results Foundational manuscripts in each of the three disease categories were identified: The genesis of therapeutic TV neurointerventional surgery can be traced to 1981, when Debrun et al. described TV occlusion of direct carotid-cavernous fistulas via detachable balloons. In 1986, Mickle and Quisling performed the first TV embolization of Vein of Galen malformation, representing the first TV therapy in a child. In 1989, Halbach et al. demonstrated efficacy of TV embolization for dural arteriovenous fistulas. In 1995, King et al. identified cerebral venous stenosis as the culprit for idiopathic intracranial hypertension (IIH), with innovative use of TV manometry. The first application of rheolytic venous sinus thrombectomy was reported by Dowd et al. in 1999. In 2002, Higgins et al. demonstrated efficacy of TV stenting in IIH. These, and other landmark innovations are the direct antecedents of ongoing revolutions in TV therapy including AVM embolization, CSF-diversion, and embolization of CSF-venous shunts.

Conclusions Pioneering work in the 1980s and 1990s paved the way for modern transvenous neurointervention. Despite the relative paucity of literature investigating transvenous approaches, their role in disease management has been clearly established and is expected to grow considerably. Therefore, the importance of transvenous skills for contemporary neurointerventionalist cannot be understated.


Combined Transradial and Transvenous Accesses in the Treatment of Carotid Cavernous Fistulae

Abstract:

Introduction The expansion of indications for neurointerventional procedures, combined with the need to treat a diverse patient population, has driven a need for broader access options. Concurrent arterial and venous access is often necessary for diagnosis and treatment of various neurovascular diseases. Although complication rates are low, life-threatening severe complications have been reported with these access methods. Moreover, venous access through traditional routes can be challenging in patients with large body habitus. There is a growing trend of utilizing radial artery access for neuroendovascular procedures due to the increased ease of access and similar efficacy. Nevertheless, the use of upper limb veins in neurointerventional procedures is still rare. Upper extremity transvenous access (UETV) has recently emerged as an alternative strategy for the neurointerventionalists, but data is limited.

Methods Case study

Case Description Case #1 An 82-year-old male underwent successful mechanical thrombectomy for large vessel occlusion of the right middle cerebral artery (MCA) M1 segment. During the procedure, he sustained perforation of the cavernous internal carotid artery (ICA) at the posterior genu due to severe tortuosity and underlying atherosclerosis, resulting in a direct CCF. The next day, the patient was noted to have worsened visual acuity of the right eye along with chemosis and proptosis. The senior author was consulted, and the decision was made to perform embolization of the CCF using combined transradial and transvenous approaches.