

an overall reduction of 32%. **Conclusions:** Current technologies alone may not result in radiation dose reduction. Developing DRS leads to significant reduction in DAP and contrast media volume. The benefit is reduction in radiation dose to patients and operators and contrast use reduction in patients.

## OC 1.4

### Different Techniques of Carotido-Cavernous Fistula Embolization: Single Center Experience

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**Background:** Different techniques of carotido-cavernous fistula (CCF) endovascular embolization were described in the literature. This study reports, validates and compares these techniques in our series of 34 cases, aiming to standardize the most effective and safest approach. **Methods:** A retrospective analysis of all patients that underwent endovascular embolization of either direct or indirect CCF between 2011 and 2016 at a tertiary care center was performed. The technical and clinical results of different techniques were analyzed. **Results:** Among our 34 patients, 29 had direct CCF (DCCF) and 5 had indirect CCF (ICCF). Among the 29 DCCFs, 1 was caused by intracavernous aneurysmal rupture which was coiled, 1 was caused by spontaneous rupture of a carotid dissection which was treated by carotid occlusion and 27 were caused by direct head trauma. Among these 27 cases, 3 were treated by occlusion of the fistula using detachable balloon, 13 were treated by cavernous sinus occlusion either from arterial or venous approaches using coils or coils and onyx and 11 were treated by carotid occlusion using coils and/or detachable balloons  $\pm$  histoacryl glue. Among the 5 ICCFs, 3 were treated by cavernous sinus occlusion, and 2 slow flow cases were conservatively managed. No procedure related complications. Recurrence occurred in 2 cases which were successfully treated in a second session. **Conclusions:** CCF can be effectively and safely treated by different endovascular approaches taking into consideration some technical points.

## OC 1.5 (Third place oral presentation prize winner)

### Endovascular Coil Embolization of Ruptured and Unruptured Intracranial Aneurysms: Review of a 13-year Single Center Experience

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**Background:** To report our experience with the endovascular coil embolization (ECE) of ruptured and unruptured intracranial aneurysms (ICA) during the past 13 years at tertiary care University hospital. **Methods:** A retrospective study was performed at Radiology Department, The Aga Khan University between April 2003 to April 2016. All patients with ICA undergoing ECE were included. They were divided in groups of conventional technique (CT) and remodeling technique (RT)

based on technique of ECE. Chi square was used to determine if there was a significant association between procedure technique and success. **Results:** In total, 189 patients (95 men and 94 women) underwent ECE, of these, 156 (82.5%) patients presented with ruptured ICA and 33 (17.5%) patients with unruptured ICA. 50 (32%) patients presented with Grade II subarachnoid hemorrhage (SAH) based on the Hunt and Hess scale, followed by 41 (26.3%) with Grade III SAH. 33% ICA were located in ACommArtery, followed by 17% in internal carotid artery. Mean age was 46.5 years (Range: 10-78 years). 92 (48.5%) patients had wide neck ICA. In total, 164 (86%) patients were embolized with CT and 25 (14%) patients with RT. Overall, 170 (90%) patients (46% women and 45% men) underwent successful embolization (greater than 95% occlusion of the dome without any coil prolapsing into the parent vessel). No significant difference in procedural success rate in either group [CT vs. RT: 146 (89%) vs. 24 (96%);  $P < 0.4769$ ]. Complications occurred in 41 (22%) patients; 9.5% had major complications with bad outcome; 12.5% had minor complications with good clinical outcome. Infarction was commonest complication (12%). Total 9 (4.7%) patients died including 4 (2.1%) expiries secondary to procedure related complications. 155 (82%) patients had good clinical outcome with Modified Rankin Scores of 0-2. **Conclusions:** ECE of ICA is a safe and effective technique with a small associated risk of permanent morbidity-mortality. In correctly selected patients employed technique gives good procedural success. Risk of further bleeding is small with vast majority of patients achieving independent recovery.

## OC 1.6

### Carotid Angioplasty and Stenting: A Single Center Experience

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**Background:** Carotid artery stenting is an alternative to endarterectomy in treatment of carotid artery stenosis. Comparative studies have shown different results regarding the outcome of both techniques. **Methods:** A retrospective analysis of all patients that underwent carotid artery stenting between 2011 and 2016 at a tertiary care center was performed. Periprocedural and delayed, minor and major complications rates as well as the rate of restenosis over the follow up period were analyzed. **Results:** A total of 74 patients who underwent 76 procedures of carotid artery stenting were included for analysis. Average age of patients was  $65 \pm 9$  years, with 45 male (60.8%). Symptomatic stenosis was seen in 54 cases (71%) and asymptomatic stenosis was seen in 22 cases (29%). Filter protection device was used in 66 cases (86.8%) and 10 cases (13.2%) were done without protective device. Pre-stent dilatation was performed in 12 cases (15.8%). Post-stent dilatation was performed in 74 cases (97.4%). Minor complications occurred in 3 cases (4%) in the form of 1 case of intraprocedural transient ischemic attack, one case of minimal dissection and one case of retroperitoneal hematoma. No major complications occurred. Two cases (2.3%) of insignificant restenosis were encountered. **Conclusions:** Carotid artery stenting is an effective and relatively safe alternative to carotid endarterectomy. Further studies assessing the value of embolic protective devices and the best type of stent should be conducted.