

OC1.10**Clinical Efficacy and Economic Impact of an Augmented Reality Navigation System: Experience On 498 Percutaneous Computed Tomography-Guided Pulmonary Biopsies**

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Background: To validate the reality navigation system SIRIO performance on CT-guided percutaneous pulmonary biopsy (PLB). Complications rate and histological sample quality were evaluated, in relation to lesion size and location. The economic impact was analyzed by comparing device and patient management costs and refunds by national healthcare system. **Method(s):** 496 patients over 18 years with lung nodules suspected of malignancy and non-diagnostic bronchoscopy or inadequate us-guided biopsy, were included. Patients with an affected coagulative profile or performance status were excluded. Maximum lesion diameter (ID), distance between lesion and pleural surface (DPS), distance traveled by the needle (DTP), procedure timing (PT) and validity of histological sample were evaluated. Costs for the consumptive material, procedure, CT and histocytopathologic analysis of the sample were analyzed, considering surgical day-hospital and PAC (comprehensive outpatient performance) as two different repayment options. **Result(s):** Histopathological diagnosis was obtained in 96.2%. LD mean was 20.7 mm, DPS 12.4 mm, DTP 7.9 mm and PT 29.5 minutes. The thoracic radiation dose was 51.2±49.1 mGy-cm. Procedural complications were reported in 156 cases, with 23 (4.6%) major complications. In these cases, DTP was significantly higher. About economical analysis, 44 PLB/month for 4 years, considering day-hospital, and 33 PLB/month for 2 years, considering PAC, are needed to get a complete depreciation. **Conclusion(s):** SIRIO is a useful tool for improving success rate and diagnostic accuracy with a significant reduction of complications and pt. Economic analysis is also positive, not considering its possible use for tumor ablation, with much higher refunds.

OC1.11**Carotid Stenting by Proximal Protection, Aspiration Flow Reversal and Distal Anchoring using Double Mesh Stent: An Ideal Technique for Unstable Plaques**

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Background: Carotid artery stenting (CAS) with distal protection/Endarterectomy are established novel procedures. A modified technique of carotid stenting was found to further minimise the procedural and post procedural embolic events and has superior ease, efficacy and safety profile compared to existing techniques. **Method(s):** Dedicated plaque characterisation and diffusion

imaging of brain was done on the previous day by 3T MRI. Stenting was done under local anesthesia, temporary pacing, radial arterial line and via femoral access as routine. 9 F balloon guide catheter was placed just proximal to the stenosis and connected to the aspiration pump. The forward flow in CCA was arrested by balloon inflation and flow reversal in ICA was achieved by continous aspiration using pump, during each step – Initial wire passage, pre dilatation, negotiation of stent and during deployment. A double mesh stent was used, the distal end of which was positioned distally in landing and slowly deployed. Aspirated material was sent for histopathology study. Diffusion MRI of brain was done the next day. **Result(s):** There were no neurological events during or post procedure. No incidence of intimal injury which may happen with filter especially in cases of ICA tortuosity. Excellent stent apposition and total absence of plaque intrusion through struts due to additional mesh was worth noting. An OCT can demonstrate this excellently. Not a single diffusion restricting lesion in MRI next day. **Conclusion(s):** Proximal protection with ICA flow reversal during each step and use of double mesh stent with distal anchoring can potentially nullify embolic events associated with CAS. This technique holds high promise to be the procedure of choice in CAS especially with unstable plaques.

OC2.1**Endovascular Treatment in Acute Basilar Artery Occlusion “Experience in Indian Patients”**

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Background: To assess the efficacy and feasibility of endovascular treatment in acute basilar artery occlusion. **Method(s):** Total 90 patients who underwent treatment with low-dose intraarterial alteplase combined with mechanical clot disruption for basilar artery occlusion were studied over period of ten years. All patients undergone either cerebral CT/MR with cerebral angiography followed by intraarterial treatment. We did not use intravenous route in all patients. After diagnosis of an occlusion on diagnostic angiography, an end-hole microcatheter over a microguide wire was advanced through 6-f guide catheter into occlusion site. The microcatheter tip was placed into the thrombus, and then a 20 mg bolus of alteplase was manually infused over 3 to 5 minutes. Mechanical clot disruption by multiple passes of the microwire with microcatheter through the clot was done after 20 mg bolus of alteplase. Followed by withdrawal of the microwire from the microcatheter, an additional 10 mg was manually infused for 3 to 5 minutes through microcatheter at the site of the remaining thrombus. Mechanical clot disruption using microcatheter and microwire was performed in remaining thrombus. Patients in whom distal migration of thrombus into posterior cerebral artery was additionally infused the 10 mg of alteplase through microcatheter. Percutaneous angioplasty or/and stent insertion performed in patients who were not achieved the complete recanalization. Recanalization status was classified according to the thrombolysis in cerebral ischemia (TICI) scale and recanalization was defined as TICI grades II or III. Variable parameters like age, sex, time to treatment, alteplase dose, duration of the procedure, recanalization, and symptomatic hemorrhages were analyzed. Clinical outcome measures were

assessed on admission and at discharge of national institutes of health stroke scale (NIHSS) score, at 3 months after treatment modified rankin score (mRS). **Result(s):** 90 patients with acute basilar artery occlusion (32 women, 58 men) with a median age of 69 years (range, 44 -85 years). The median NIHSS score was 14.4 (range, 2-33) on admission and median time from symptom onset to intraarterial alteplase therapy was 320 minutes (range, 160-820 minute). The median intraarterial alteplase treatment duration was 20 minute (range, 10-25) and the alteplase dose was 20- 50 mg (median, 35 mg). Of these patients, sixteen patients were performed the additional injection of alteplase due to distal migration of thrombus into the posterior cerebral artery. Five patients were the severe stenosis of basilar artery after alteplase infusion and mechanical clot disruption with microcatheter and microwire. Of these patients, three patients were performed the stent placement after angioplasty and two patients were performed the angioplasty. Recanalization (TICI grade II or III) was achieved in 85 patients (94.44%). TICI grade III was occurred in 43 patients (47.78%) include, and TICI grade II was achieved in 42 patients (46.67%). Five patients (5.55%) was failed the recanalization of posterior circulation. Of these failed treatment patients, three patients had a massive thrombus into the vertebrobasilar artery, one was stopped the treatment due to procedure-related subarachnoid hemorrhage, and one had a diffuse and long segmental stenosis of basilar artery. There was symptomatic hemorrhage in four patients. Two patients were occurred the procedure-related hemorrhage. Eight patients (8.89%) died within one-week after procedure. At discharge, the median NIHSS score was 7.2 (range, 0-27). The NIHSS score of 55 patients was improved. In 30 patients, the NIHSS score was increased. At the 3-month follow-up, the functional outcome was favorable (MRS, 0-2) in 50 (55.56%) of the 90 patients. Unfavorable (MRS, 3-6) in 40 (44.44%) patients. **Conclusion(s):** We concluded from the study that low-dose intraarterial thrombolytics with mechanical clot disruption is feasible, safe and effective treatment for the acute basilar artery occlusion. A high rate of recanalization, high rate of survival rate and good functional outcome can be achieved.

OC2.2

Finding Predominant Vessels Supplying Presurgical Embolization of Nasopharyngeal Angiofibroma

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Background: Nasopharyngeal angiofibroma is a benign fibrovascular tumor affecting young adolescent boys, originating from the posterolateral wall of the nasal cavity. The young patients mostly present with chronic epistaxis, Nasal obstruction, rhinorrhea, Conductive hearing and diplopia. Study is done to find the predominant arterial feeder during pre surgical embolization of Juvenile Nasopharyngeal angiofibroma (JFA) in order to reduce blood loss and intra operative time during surgery. **Method(s):** Four vessels angiography (DSA) was done in all patients including internal and external carotid angiography with superselective angiography of vessel supplying tumor. Presurgical embolization of 150 patients done with spongostone in angiography suit of Neuroradiology department, Lahore General Hospital, Lahore, Pakistan with age ranging from 12-18 years males from January

2014 to December 2017. All patients underwent surgery within 24 hours. **Result(s):** Out of 150 patients Internal maxillary artery was supplying 111 patients, 30 were supplied by accessory meningeal artery and 09 were supplied by ascending pharyngeal artery. Presurgical embolization with Spongostone proved significant reduction in intra operative blood loss and reduced surgical resection time. **Conclusion(s):** Internal maxillary artery proved to be the major feeder supplying JNFA. Presurgical embolization appears to be the treatment of choice prominently reducing intra operative blood loss, minimizing the need of blood transfusion with short intra operative time resulting in quick and better surgery.

OC2.3

Cookie Cutter Technique for Percutaneous Direct Puncture Glue Embolization of High-Flow Craniofacial Arteriovenous Malformations

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Background: Direct puncture embolization with glue is an effective technique for pre-operative devascularisation of craniofacial arteriovenous malformations. Venous outflow and arterial inflow of the lesion need to be limited during injection of embolic material. Manual compression is the standard procedure for flow reduction, but when an AVM has multiple channels of venous drainage, achieving successful blockage of blood is technically difficult. This study demonstrates the use of a circumferential cookie cutter ring to reduce flow, with better results compared to manual compression. **Method(s):** This is a retrospective study of ten patients, over a period of two years, with craniofacial arteriovenous malformations who were treated with direct percutaneous injection of glue. Pre-embolization angiography was performed to see arterial feeders and venous draining veins. Adjunctive manoeuvres were used during embolization, including external compression of venous pouch with circular cookie cutter rings of different sizes varying based on lesion size. Glue cast was localized within and around the margins of circular cookie cutter ring without any distal migration. **Result(s):** No neurological complications secondary to the embolization procedure were observed. The arteriovenous shunts were successfully occluded in all cases. There was partial occlusion in two cases. Total occlusion achieved in five cases when embolization was followed by surgery. Only one case required a second session to achieve total occlusion. Post embolization, there was minimal residual flow in one patient, who declined further treatment due to mitigation of symptoms. The shape of glue cast was changed in two cases after removal of cookie cutter when low concentrated glue was used. No skin necrosis was seen post embolization. **Conclusion(s):** Percutaneous direct puncture embolization with glue saves time and is a safer method for superficial craniofacial AVMs with prominent venous pouch when external compression was applied with circumferential cookie cutters to reduce venous outflow.

OC2.4

Posterior Fossa Arteriovenous Malformations: Endovascular Management Challenges

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