

Experience of Vascular Interventional Procedures of Adana Numune Research and Training Hospital

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ABSTRACT

Objective: The aim of this study was to analyze our experiences of interventional procedures for diagnosis and treatment.

Methods: This study was performed retrospective between January 2016 and June 2016. 38 patients were included in this study in Neurology clinic of Adana Numune Research and Training Hospital.

Results: The mean age of the patients was 58.6. A number of males were 19. A number of females were 19. 21 (55.3 %) of the patients underwent diagnostic angiography, 6 (15.8 %) underwent stenting and 11 (28.9 %) underwent thrombectomy or endovascular coiling operation.

Conclusions: The use of interventional neurological procedures is increasing. Interventional neurological procedures are very risky. But diagnosis and treatment options are very beneficial for well-selected patient groups. Experienced experts are needed. Investments should be made for the progression of neuro endovascular therapies in our country.

Keywords: *Diagnostic angiography, carotid artery stenting, acute ischemic stroke, embolectomy, endovascular coiling operation.*

INTRODUCTION

Stroke has been the second most common cause of death and the third most common cause of disability in the world (1,2). Endovascular mechanical thrombectomy for the treatment of acute stroke due to large vessel occlusion has evolved significantly with the publication of multiple positive thrombectomy trials, mechanical thrombectomy is now a recommended treatment for acute ischemic stroke(3).

Although noninvasive neuro imaging is widely and effectively used today, conventional cerebral angiography is still currently the gold standard(4) Intravenous thrombolytic administration has been shown to be better conservatively treatment. Among patients with proximal vascular occlusion in the anterior circulation, 60 to 80% of patients die within 90 days of stroke or do not restore functional independence despite treatment with intravenous thrombolytic administration. In the Prolyse Acute Cerebral Thrombolism (PROACT) II study, was the first positive trial of endovascular treatment involving patients with angiographically visualized obstruction of the middle cerebral artery. Recently reported Multicenter Randomized Clinical Endovascular Treatment for Acute Ischemic Stroke in the Netherlands (MR CLEAN) used this technology and the results of this study showed clinical benefit with endovascular treatment. The ESCAPE(Endovascular treatment for Small Core and Anterior circulation Proximal occlusion with Emphasis on minimizing CT to recanalization times) trial is designed to test whether patients with acute ischemic stroke selected according to the results of computed tomography (CT) and CT angiography (CTA) will benefit from rapid endovascular treatment including modern endovascular techniques(5).

The guideline on the early management of the American Heart Association (AHA) and the American Stroke Association (ASA) on early management of acute ischemic stroke was updated in 2018. In the new guideline, the time interval for patient selection for post-acute mechanical endovascular thrombectomy was extended to 24 hours. In 2013, an AHA / ASA update of 2015 suggested that mechanical thrombectomy could be performed in patients with acute ischemic stroke in the first 6 hours after stroke. However, two studies published after that showed that some patients were able to benefit from the first 24 hours of intervention after 6 hours.

One of the criteria for the consideration of mechanical thrombectomy is the presence of a large clot in one of the large vessels at the base of the brain. In the guideline, thrombectomy is recommended in patients who meet the following criteria within the first 6 hours after stroke onset: A pre-stroke modified Rankin Scale (mRS) score of 0 to 1, the cause of the obstruction is the internal carotid artery or the middle cerebral artery segment 1 (M1), age greater than 18, NIHSS (National Institutes of Health Stroke Scale) score of 6 or higher, Alberta Stroke Program Early CT score of 6 or higher. In the light of new evidence from the DEFUSE-3 (Endovascular Therapy Following Imaging Evaluation for Ischemic Stroke) and DAWN (Clinical Mismatch in the Triage of Wake Up and Late Presenting Strokes Undergoing Neurointervention With Trevo) studies, it is recommended that thrombectomy be performed between 6 and 16 hours after stroke in appropriate patients (recommendation level IA). Based on the results of the DAWN study, it is suggested that thrombectomy should be performed between 16-24 hours after stroke (recommendation class IIA, level of evidence B-R). While DAWN and DEFUSE-3 studies cover patients up to

16 hours, DAWN study includes patients between 16-24 hours. In order for the patient to be taken to mechanical thrombectomy for up to 24 hours after stroke, the DAWN study must first meet the inclusion criteria. Computerized tomography or MRI (Magnetic resonance imaging) findings should also be present in these patients. As unlike previous ones, in the current manual, among patients who are not suitable for i.v.(intravenous) tissue plasminogen activator (tPA), mechanical thrombectomy may be selected within 6 hours (suggestion level IA)(6,7).

In our country, Interventional Neurology Certification Criteria; the training period is two years without interruption for the experts who will start training in 2019. Should take place as a secondary operator in at least 50 extra cranial and intracranial interventional cases. Should act as primary operator in at least extra cranial and intracranial 50 interventional cases. The qualification reports are approved by the head of the interventional neurology study group and the qualification certificate is issued. During the course of his /her education, the candidate must participate in the modular theoretical and practical courses organized by the Working Group on Interventional Neurology. The candidate who is entitled to qualification certificate for Interventional Neurology is obliged to obtain the Radiation Protection Certification given by the Turkish Atomic Energy Authority. As of 2018, education is provided in 5 centers in our country (8). Criteria for centers to provide training: Centers with at least 50 thrombectomies and intravenous thrombolytic therapy per year and more than 30 thrombectomy or neuro aspiration counts per year may be a training center. The responsible neuroscientist in the center should have at least three years of experience in neuro angiographic interventions except for the education period. If an expert who has completed his education wants to treat a cerebral aneurysm, AVM (arteriovenous malformation) and arteriovenous fistula, he should receive additional training at this center, which has at least 30 cases per year (AVM, aneurysm, fistula). This period is at least 6 months without interruption. It is recommended that each center should raise a maximum of 2 candidates per year in order to provide quality education (8).

The aim of this study was to analyze our experiences of interventional procedures for diagnosis and treatment.

MATERIALS AND METHODS

This study was performed retrospective at Adana City Hospital it was approved by the local ethics committee. 38 patients were taken to the study in Neurology clinic of Adana Numune Research and Training Hospital; from an interval of January 2016-June 2016. All patients were examined before and after the procedure. Preoperative renal function tests and he most as is tests were evaluated. Patients and relatives were informed about the procedure before angiography. A written informed consent form was obtained from all patients, and the responsible family member. We divided patients who underwent conventional angiography into three main groups. The first group: patients with angiography for diagnostic purposes only. The second group was carotid and vertebral artery stenting. The third group were patients who received intervention for acute ischemic stroke within the first 6 hours or brain aneurysms coiling process.

RESULTS

The data of 38 patients directed at the interventional neurology unit (INU) who were admitted to the interventional neurology unit (INU) of Adana Numune Research and Training Hospital for a period of 6 months was examined retrospectively. The mean age of the patients was $58.6 \pm 12,85$. There were 19(50%) patients female, 19(50%) patients male. The mean age of female was $61 \pm 10,71$ and the mean age of male was $56.2 \pm 14,58$ years. The difference was not statistically significant ($p=0.251$). 21 (55.3 %) of the patients underwent diagnostic angiography, 6 (15.8 %) underwent stenting and 11 (28.9 %) underwent thrombectomy or endovascular coiling operation. 11 (57.9%) of the female had diagnostic angiography, 3 (15.8%) had stent application and 5 (26.3%) had thrombectomy or endovascular coiling operation. 10 (52.6%) of the male underwent diagnostic angiography, 3 (15.8%) underwent stenting, and 6 (31.6%) underwent thrombectomy or endovascular coiling operation. There was no significant difference in interventional procedures for diagnosis and treatment between sexes (Table 1).

Table1: Interventional procedures for diagnosis and treatment

Patients		vascular interventional procedures			Total
		Angiography for Diagnostic Purposes	Carotid and Vertebral Artery Stenting	Thrombectomy or Brain Aneurysms Coiling	
female	n	11	3	5	19
	% within gender	57,9%	15,8%	26,3%	
male	n	10	3	6	19
	% within gender	52,6%	15,8%	31,6%	
Total	n	21	6	11	38
	%	55,3%	15,8%	28,9%	

DISCUSSION

We wanted to reflect our short-term experience in this study. The rates of neurological complications related to diagnostic cerebral angiography differ in publications and generally range between 0.3% and 6.8% (9,10). In our diagnostic angiography patient group, no temporary or permanent complications were observed. In patients with asymptomatic carotid artery stenosis with less than 75% stenosis, annual stroke risk is less than 1%, whereas, in patients with stenosis more than 75%, this risk varies between 2-5%. This risk is 10% in 1 year and 30-35% in 5

years in symptomatic patients (11, 12). Stenting was performed in 6 patients. Minor complications were observed in 2 patients who underwent stenting, but they were completely recovered in our study. No stenosis or occlusion was observed in the stents. Acute ischemic stroke due to large vessel occlusion treatment should be performed the invasive technique with conventional angiography in another saying thrombectomy (3). 11 (28.9 %) of our patients underwent thrombectomy or endovascular coiling

operation. Our endovascular treatments were successfully applied.

In conclusion the brain vascular diseases are one of the main disease groups of neurology. Interventional neurological procedures are very risky. But diagnosis and treatment options are very beneficial for well-selected patient groups. Experienced experts are needed. Investments should be made for the progression of neuro endovascular therapies in our country. Should be given priority interventional neurology training.

Acknowledgement

The authors have no financial or personal relationships with other people or organizations that could pose a conflict of interest in connection with the present work.

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