

## Tandem Occlusion of the Internal Carotid Artery: About Two Cases Report

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### ABSTRACT

*Tandem occlusion is a simultaneous occlusion of internal carotid and the average brain artery. It is a very serious radio-clinical entity with a bad vital and functional prognosis. The diagnosis is brought by medical imaging in the occurrence magnetic resonance angiography (MRA) and the angioscan of the supra-aortic trunks (SAT). The treatment is essentially endovascular in developed countries. On the other hand, in our environments where the technical plate is limited, the care is a big challenge. Thus we report two cases of tandem occasion confirmed respectively by magnetic resonance angiography (MRA) and Angioscan of SAT in order to evaluate the evolutionary profile of our patients under the drug treatment.*

### Keywords

Angioscanner, MRA, Endovascular, Occlusion, Tandem, SAT.

### Introduction

Tandem occlusion is a simultaneous occlusion of internal carotid and the average cerebral artery (M1 segment) responsible for a serious ischemic stroke associated with a bad vital and functional prognosis [1,2]. According to Gao F. et al., 25% of patients with an average occasion of the cerebral artery (ACM) had a concomitant occlusion of the internal carotid artery (ACI) [3]. Brain imaging specially angioscan and magnetic resonance angiography (ARM) of the supra aortic trunks make it possible to restore the positive diagnosis [2,4]. The etiology of extra and intracranial occlusions is dominated by the atheromatous causes followed by cervical arterial dissection in young adults according to the authors [3,5]. Therapeutic care is essentially endovascular with stenting angioplasty or mechanical thrombectomy added to intravenous thrombolysis (IVT) practiced mainly in developed countries [2,3,5]. On the other hand, in our underdeveloped countries where the endovascular therapy is not currently, patient management is a big challenge and is only limited to drug treatment. In addition, there are no data in our context for tandem occlusions. It is

important for us to report two cases of tandem occlusion confirmed by the MRA and Angioscan of SAT. Thus we will describe the diagnostic, therapeutic, especially evolution aspects.

### Observation 1

58-year-old, right-handed, accountable, having a history of high blood pressure (HBP), had been brought to the emergencies for sudden alteration of consciousness, motor deficit of right side of the body and motor aphasia. The clinical examination at admission had founded a blood pressure at 165/88 mm Hg, a 1.32g /dl blood sugar, an oxygen saturation at 96% under ambient air, a scale 1 coma, a motor aphasia, flask right hemiplegia, a right lateral homonymal hemianopsia, a deviation of eyes to the left. The National Institute of Health Stroke Scale (NIHSS) was 20. A brain magnetic resonance imaging (MRI) diffusion sequence showed an ischemic lesion in a left average cerebral artery (Figure 1a), the flair sequence did not reveal hyper corresponding signal (Figure 1b), in T2 \* no microbleeds or hemorrhage (Figure 1c); the magnetic resonance angiography time of flight of Willis polygone and supra aortic trunk showed a simultaneous occlusion of left internal carotid and the average cerebral artery explicative of the ischemic lesion (Figure 1d). The electrocardiogram (ECG) was

part of sinus rhythm with a left branch block. The low LensPerotein (LDL) cholesterol was high at 2.11g /l (normal <to 1.50g /l). The patient had benefited from acetylsalicylic acid 300 mg intravenous, mannitol and symptomatic treatment. Then, the patient was put under perindopril, atorvastatin, acetylsalicylic acid by naso-gastric tube due to the false silent roads. He had benefited from functional and speaking sessions. The clinical evolution after three months was marked by a slight decline of the motor deficit and a modified Rankin Score (mRS) to more than 3 out of six (+3/6).

### Observation 2

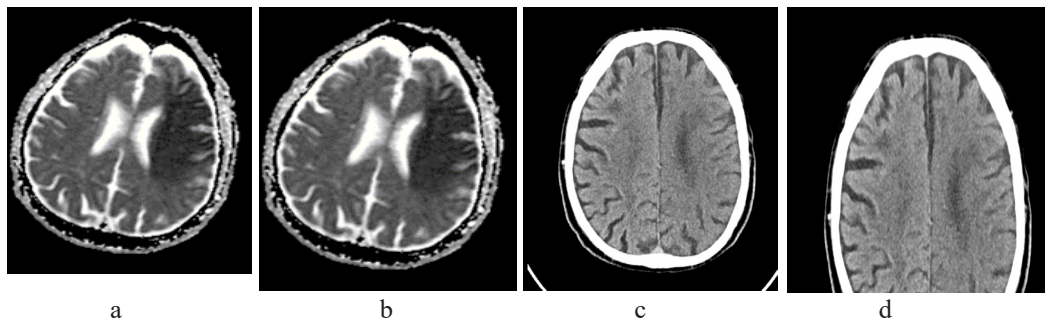
A 60-year-old, autonomous, journalist, having a history of high blood pressure, had been led to emergencies for a per-prandial discomfort of sudden occurrence associating an aphasia and a motor deficit of the right side of the body. At admission, the patient worsen with an alteration of consciousness, vomiting and a state of agitation. The clinical examination had noted a blood pressure at 190/110 mm Hg, a 1.0 g / dl blood sugar, an oxygen saturation at 86% under a ambient air, a scale 3 of coma, symmetrical pupils in myosis, a flask right side hemiplegia, a deviation of eyes to the left, a polypnese with a tractoring thoraco-abdominal. The NIHSS was 24. Under oxygen, the patient had benefited from a brain scanner with the angiography of the supra aortic trunks which had found an erase of cortical sulci to the left side in relation to an ischemic in process of constitution (Figure 2a), a deficiency of the opacification of the internal carotid, the average cerebral artery and the earlier cerebral artery reflective in tandem occlusion (Figure 2b, 2c and 2d). LDL-cholesterol was 1.88 g / l (normal <to 1.50g / l). The patient had been put under oxygen, benefited from acetylsalicylic

acid 300mg, the mannitol and symptomatic treatment, and, has been transferred to resuscitation to be intubated. It had been put under perindopril, atorvastatin and acetylsalicylic acid (Kardég 160 mg) by naso-gastric tube. He had benefited from functional and speech rehabilitation. The clinical evolution three months later marked a massive engine deficit with a modified Rankin Score (mRS) to 4 out of six (4/6).

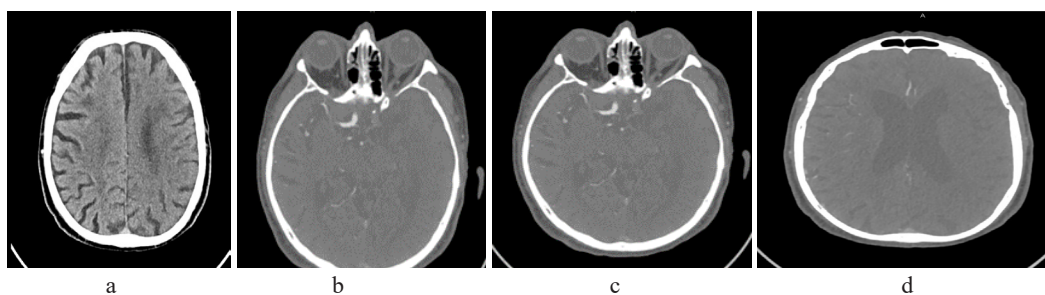
The figures below showed the MRI and scan of the brain, the internal carotid and their terminal branches.

### Discussion

The limits of our series were in the low sample (two cases) so non-representative and the absence of endovascular treatment and intravenous thrombolysis in our environments. Nevertheless, it allows to confront our results with those of literature and to intervene the health authorities for the establishment of innovative therapeutics. The ischemic strokes in tandem occlusion are associated with a poor vital and functional prognosis even in the developed countries depending on the authors despite their advanced technologies [1,2,6]. Thus, Fahed R. et al., in their study on 70 patients, had shown to 3 months, 50.8% of patients had a bad clinical evolution with 13.4% of patients deceased. This very high rate of lethality confirms the gravity of tandem occlusion; which gravity would be strictly related to the extent of the ischemic lesion as reported in literature [1,2]. According to the authors, all unanimously recognized that the occlusion of large front brain traffic vessels translated into a poor clinical state illustrated by a high initial NIHSS score [3,4,6,7]. This gravity explains the Coma



**Figure 1:** A brain magnetic resonance imaging (MRI) diffusion sequence showed an ischemic lesion in a left average cerebral artery (Figure 1a), the flair sequence did not reveal hyper corresponding signal (Figure 1b), in T2 \* no microbleeds or hemorrhage (Figure 1c); the magnetic resonance angiography time of flight of Willis polygone and supra aortic trunk showed a simultaneous occlusion of left internal carotid and the average cerebral artery explicative of the ischemic lesion (Figure 1d).



**Figure 2:** Brain scanner with the angiography of the supra aortic trunks which had found an erase of cortical sulci to the left side in relation to an ischemic in process of constitution (Figure 2a), a deficiency of the opacification of the internal carotid and the earlier cerebral artery reflective in tandem occlusion (Figure 2b, 2c and 2d).

of the onset and the deep motor deficit observed in our series and reported by the authors. In their series, Rubiera M. et al. had reported a median NIHSS score of 16 with extremes ranging from 13 to 18. This data are superposable to ours with a difference due to bias due to the interpretation of the NIHSS score. The positive diagnosis of tandem occlusion is brought by the neuro-imaging in particular the magnetic resonance angiography (MRA) and the angiogram of supra aortic trunks widely shared by all authors [2,3,6]. This is the case in our series where brain imaging had played a vital role while setting the diagnosis of tandem occlusion. The etiology of tandem occlusions remains dominated by the atheromatous causes followed by cervical arterial dissections [1,5]. What is the similar in our cases. On therapeutic level, the treatments that have proved in the tandem occlusions are mostly endovascular coupled with thrombolysis as largely reported in literature [1,2,4,5]. All authors are unanimous as endovascular treatments seem to improve the vital and functional prognosis [4,6]. While in our series, our patients had benefited from the medical treatment associated with the resuscitation for lack of adequate technical tray. This had bad consequences on the functional recovery of our patients compared to those in the literature [4,8]. Thus, on the evolutionary level, in the series where the endovascular treatment was made, the modified Rankin scores (mRS) means at three months were around two to six (2/6) rarely three to six (3/6). On the other hand, in our series, these score of mRS were around four out of six (4/6) thus testifying the low benefit from the drug treatment although the one is necessary to preserve the vital prognosis. This perfectly explains the importance and efficiency of endovascular treatment for urgent arterial re-tariffing although these mRS score are relatively low in series where patients were thrombolysed [4,6,8,9]. Indeed, if the thrombolysis was feasible in our country, the patient of our observation 1 could benefit all the more than there was a discordance (Mismatch) between the diffusion sequence and the flair sequence with an absence of microbleeds on the sequence T2\* therefore perfectly eligible for intravenous thrombolysis. And this could probably improve its neurological functional prognosis that had been made by a mRS score around four out of six (4/6). In the final, this rightly confirms that the functional evil truly profile of the patients who have received endovascular treatment seems to be better than those who have been treated medically as in our series. This being, the endovascular treatment becomes unfavorable in the care of the patients who are victims of the ischemic strokes within the four-hour and a half-year-old time limited by the authors although these treatments are at the origin of the hemorrhagic reworks most often [7-10].

## Conclusion

Tandem occlusions are provided with the serious ischemic strokes whose vital and functional prognosis remains mostly pejorative.

Endovascular care seems to improve its functional prognosis. However, in our environments where the endovascular treatment is not yet a matter of the case, the urgent care of our patients is a great challenge and is only limited to medical treatment associated with a resuscitation. This thus causes a functional bad prognostic although the vital prognosis is preserved. In front of serious average artery ischemia, it is important to achieve an angiography of supra-aortic trunks so not to ignore a tandem occlusion whose endovascular treatment is very desired.

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