

The Carotid Artery Surgery in Mali: A Case Report

Modibo Doumbia^{1, *}, Baba Ibrahima Diarra¹, Mamadou Toure³, Karamoko Diguiba³, Asamaou Keita^{1, 4}, Assa Badiallo Toure³, Dramane Coulibaly³, Siriman Koita¹, Sanoussy Daffe³, Salia Traore¹, Birama Togola⁴, Nouhoum Ouologuem³, Seydou Togo⁴, Moussa Abdoulaye Ouattara⁴, Sadio Yena⁴

¹André Festoc Department, Centre Hospitalier Universitaire le Luxembourg Mère- Enfant, Bamako, Mali

²Department of Anesthesia and Intensive Care, Centre Hospitalier Universitaire le Luxembourg Mère-Enfant, Bamako, Mali

³Cardiology Department, Centre Hospitalier Universitaire le Luxembourg Mère-Enfant, Bamako, Mali

⁴Faculty of Medicine and Odontostomatology, University of Technical Sciences and Technology of Bamako, Bamako, Mali

Email address:

modibodoumbia25@yahoo.fr (Modibo Doumbia)

*Corresponding author

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Abstract: Carotid surgery is a preventive measure against cerebrovascular accidents, but it is not widely practised in Mali. This was a case series carried out in the André Festoc surgery department in Bamako, Mali. We operated on two male patients under general anaesthesia. Carotid endarterectomy involves removal of the sequestrum via an approach running alongside the cleidomastodial muscle. This surgery is performed in Mali with encouraging results.

Keywords: Carotid Artery, Stenosis, Carotid Endarterectomy, Surgery, Mali

1. Introduction

Carotid surgery or carotid endarterectomy almost exclusively concerns stenosing plaques of atheromatous origin most commonly affecting the carotid bifurcation and the origin of the internal carotid artery [1]. Atherosclerosis of the carotid arteries is a major cause of cerebral infarction [1, 2]. Surgical treatment (carotid endarterectomy) is likely to reduce the risk of stroke. The aim of surgical treatment of symptomatic carotid bifurcation stenosis is to remove the causative lesion in order to prevent stroke recurrence [3].

In Mali, this type of carotid surgery is not well known among hospital practitioners. We report two cases operated on for carotid surgery in the cardiovascular surgery department of the André Festoc Centre at Bamako's Luxembourg Hospital, and review the literature.

2. Cases Presentation

2.1. Case 1

S. T, 72 years old, male, diabetic and hypertensive, admitted for the management of a carotid stenosis discovered during an ischemic stroke work-up. Questioning revealed an ischemic stroke 3 months previously, with left hemiparesis and dysarthria. Examination revealed good general condition with colored conjunctiva and clear consciousness. Glasgow score was 15/15. A right carotid murmur was noted. Cardiopulmonary examination was normal. The rest of the physical examination was unremarkable. Doppler ultrasonography of the neck vessels revealed a calcified stenosing plaque with an irregular surface at the carotid bifurcation, extending to the origin of the internal carotid artery with a narrowing of over 70% according to NASCET, and the vertebral arteries were permeable.

Angioscan of the neck vessels showed a tight stenosis of the carotid bulb extending to the internal carotid artery (Figure 1), and the brain scan showed an ischemic stroke in the sylvian territory. Biological tests were normal. In view of this situation, the indication for surgery was given and the procedure was performed under general anaesthetic. The patient was positioned on an operating table with the head hyperextended and a log placed under the shoulder. The approach was a pre-sternocleidomastoid cervicotomy. Careful dissection of the carotid artery was performed, and hemostasis was achieved using an electric scalpel. After the carotid tripod had been placed on laces at a distance from the bifurcation, clamping was performed in the sequence internal carotid, primary carotid, external carotid (Figure 2), after general heparinization at a dose of 100 IU/Kg. Once clamping was complete, dissection of the carotid bifurcation was completed. This avoided the risk of embolic migration associated with plaque mobilization during dissection. Longitudinal arteriotomy (approx. 2cm) is performed straddling the carotid bifurcation and the origin of the internal carotid artery, remaining as anterior as possible to the cold blade and extending beyond the bifurcation (Figure 2). Endarterectomy at the hook of the sequestration is performed using forceps, followed by saline lavage. The arteriotomy was closed with a patch of synthetic 6/0 prolene pericardium, followed by perfection of hemostasis (Figure 3) and of the various planes. The patient was placed on an antiplatelet agent and sodium heparin until 7 days post-op. Progress was favorable.



Figure 1. Angioscan of the supra-aortic trunks showing stenosis.



Figure 2. Intraoperative view of an arteriotomy showing the presence of a sequestrum after clamping of the various arteries.



Figure 3. Intraoperative view of a patch closure after declamping.

2.2. Case 2

D T, 76 years old, male, diabetic and hypertensive, admitted for the management of carotid stenosis discovered during a workup for dysarthria and visual disturbances. Questioning revealed a transient ischemic attack 2 months previously. Examination revealed good general condition with colored conjunctiva and clear consciousness. Glasgow score was 15/15. A right carotid murmur was noted. Cardiopulmonary examination was normal. The rest of the examination was unremarkable. Doppler ultrasonography of the neck vessels revealed a stenosing plaque at the carotid bifurcation extending to the origin of the internal carotid artery, with a narrowing of more than 68% according to NASCET. Angioscan of the neck vessels showed a tight stenosis of the carotid bifurcation (Figure 1); the brain scan showed an ischemic stroke in the sylvian territory. Biological tests were normal. The indication for surgery was given and the procedure was performed under general anaesthetic. The patient was positioned on an operating table with the head hyperextended and a log placed under the shoulder. The approach was a pre-sternocleidomastoid cervicotomy. Careful dissection of the carotid artery was performed, and hemostasis was achieved using an electric scalpel. After the carotid tripod had been placed on laces at a distance from the bifurcation, clamping was performed in the sequence internal carotid, primary carotid, external carotid (Figure 2), after general heparinization at a dose of 100 IU/Kg. Once clamping was complete, dissection of the carotid bifurcation was completed. This avoided the risk of embolic migration due to plaque mobilization during dissection. The arteriotomy is performed astride the carotid bifurcation and the origin of the internal carotid artery, remaining as anterior as possible to the cold blade and extended beyond the bifurcation (figure 2). The sequestrum is removed with forceps and washed with saline. The arteriotomy was closed with a patch of synthetic 5/0 prolene pericardium, followed by perfection of haemostasis (Figure 3) and of the various planes. The patient was placed on an antiplatelet agent and sodium heparin until 7 days post-op. Progress was favorable.

3. Discussion

Stroke is the third leading cause of death and the most common cause of long-term disability. Severe narrowing (stenosis) of the carotid artery is a major cause of stroke.

Atherosclerosis of the carotid arteries is a major cause of cerebral infarction. The aim of surgical treatment of carotid bifurcation stenosis is to remove the causative lesion in order to prevent recurrence. The basic technique is endarterectomy, which involves removing the atherosclerotic plaque. However, this surgical technique remains little-known in Mali. Currently, the debate is between the surgical (endarterectomy) versus endovascular (stenting) approach to carotid revascularization. Two major randomized trials have investigated the benefit of surgery in patients with recently symptomatic carotid stenosis [4, 5] and have shown that the benefit of surgery is very high for stenoses of 70% or more, moderate for those between 50 and 69%, and nil if the stenosis is less than 50%. A meta-analysis of data from patients included in the three largest trials showed that operative mortality was 1.1%, and the risk of stroke and perioperative death 7.1% [2, 6]. In these trials, the benefit of surgery was greater in men, in patients aged over 75 and in those randomized within 2 weeks of the qualifying event. Three major European randomized trials (EVA-3S, SPACE, ICSS) compared surgery with stenting in patients with newly symptomatic stenosis. These studies have shown that stenting is associated with an increased risk of stroke or death during or in the immediate aftermath of treatment, compared with surgery [6, 7]. In a meta-analysis of these three randomized trials, the risk of stroke or death within 30 days was increased by 74% (7.7 vs. 4.4%; $p = 0.0001$). The American CREST study, which randomized patients with symptomatic and asymptomatic stenoses, confirmed the excess risk of stroke or death associated with stenting: 6% for stenting and 3.2% for surgery. For asymptomatic stenoses, carotid revascularization should be proposed in well-selected patients with a stenosis of between 70% and 90%, if the risk of the procedure can be estimated at less than 3%. Two major trials have investigated the benefit of carotid surgery in patients with asymptomatic stenosis of over 60%. Their results are broadly consistent, with an absolute reduction in the 5-year risk of stroke of around 5% in operated patients. But what is the risk of stroke under medical treatment alone? In these trials, it turned out to be low, around 2% per year. In the surgical approach (endarterectomy) versus medical treatment, three studies were conducted. Have compared carotid endarterectomy combined with medical therapy (MT) to MT alone in patients with significant asymptomatic carotid stenosis: Veterans Affairs Cooperative Study (VACS), Asymptomatic Carotid Atherosclerosis Study (ACAS) and Asymptomatic Carotid Surgery Trial (ACST-1). In the VACS study, the risk of homolateral stroke for stenoses greater than 50% was greater in the TM alone group (4.7% vs. 9.4%), but this difference was not statistically significant ($p = 0.06$) [11]. In ACAS, the reduction in the 5-year risk of homolateral stroke is estimated at 53% ($p = 0.004$) in the surgical group. In ACST-1, the largest randomized study to date, with 3120 patients included, the 5-year stroke risk in the surgical group was 6.4 vs. 11.8% in the TM alone group, and at 10 years, it was 13.4% for surgery vs. 17.9% TM alone [3, 11]. The results of these studies confirm that carotid revascularization significantly reduces the risk of stroke at 5 and 10 years.

4. Conclusion

In the presence of symptomatic tight carotid stenosis, the surgical approach is the option of choice and feasible in Mali, whereas carotid stenting angioplasty, a therapeutic revolution in developed countries, is not feasible in Mali.

Conflicts of Interest

The authors have declared no conflict of interest in relation to this article.

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