

## OUR EXPERIENCE IN CAROTID AND ARTERECTOMY

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**Abstract**

**Introduction:** Carotid endarterectomy (CEA) operations are more frequent in our practice last years, mostly for asymptomatic patients. In this article we present our experience in this field.

**Objectives:** We present our technical choices used in different patients and the early results of the procedure. Primary endpoints were death and stroke within 30 days of the procedure for asymptomatic patients. Secondary endpoints were acute myocardial infarction within 30 days of the procedure and peripheral nerve injury in all patients.

**Patients and method:** This is a retrospective review of our recent experience. Data of 73 consecutive CEA, 59 in asymptomatic patients, operated on from January 2004 to February 2013 are collected. All the patients were diagnosed with Duplex scanner and confirmed with multy-slice CT scanner angiography. Endarterectomy was performed either with loco-regional or general anaesthesia with selective use of shunt. Combined anti-aggregation with Clopidogrel and Aspirin was the rule at discharge. Patients were controlled for new neurological and cardiac events 30 days after the operation.

**Results:** One asymptomatic patient had major stroke and died. In this group stroke and mortality rate is 1.69%. No peri-operative new acute myocardial infarction happened in any patient. Peripheral nerve lesions happened in 2.7% of all procedures.

**Conclusions:** CEA is a safe treatment for asymptomatic internal carotid stenoses in the hands of an experienced vascular surgeon. Our results for asymptomatic carotid stenoses are according to those recommended by international guidelines.

**Keywords:** carotid endarterectomy, CEA, asymptomatic carotid stenosis.

**Introduction**

Carotid endarterectomy (CEA) in Albania began in 1991. A number of patients were treated in the service of vascular surgery until 1998 but patient

selection and timing of surgery in relation of cerebral symptoms were still not quite well established and therefore the results were not very satisfactory. After a period of pause, we began the "new era" of carotid surgery, this time being careful to follow at best the actual guideline recommendations on the subject. We usually treat asymptomatic patients who have been diagnosed during screening workup for other atherosclerotic diseases or risk factors.

**Patients and method**

In this article we present the results of CEA performed at our service during nine years. Patient data are collected from their clinical records and post operative control 30 days after the procedure. This is an observational retrospective study. Primary endpoints were death and stroke within 30 days of the procedure. Secondary endpoints were peripheral nerve injury and acute myocardial infarction within 30 days of the procedure in all patients.

From January 2004 to February 2013 we have realised 73 CEA in 72 patients, 60 men (83%) and 12 women. 59 patients (60 CEA), 46 men and 12 women, were asymptomatic. Only 14 symptomatic men were operated during this period.

One patient was operated on both sides in different, remote operating times, 7 patients simultaneously with coronary artery bypass and one simultaneously with a femoral-popliteal bypass. 17 patients were scheduled for coronary surgery and CEA was performed as the first stage procedure.

Patients were aged 50 – 80, mean age 64 years. Diagnosis was made with Duplex scans and confirmed in all cases with Angio-CT.

The first 10 interventions, 9 for asymptomatic and 1 for symptomatic disease were performed under loco-regional anaesthesia. The latter cases, 51 for asymptomatic and 13 for symptomatic disease, were performed under general anaesthesia.

We have not used any cerebral activity or oxygenation monitoring equipment, but constantly measured the retrograde perfusion pressure in the internal carotid artery we were operating on. Mean

retrograde pressure  $\leq 27$  mmHg was considered optimal for CEA without shunting. Based on this consideration intra-carotid shunt was used in 20 cases (27%), 18 of them asymptomatic. The others were considered good risk patients for CEA without protection.

Different reconstructing techniques were used. In asymptomatic patients: direct suture in 19 cases, patch angioplasty in 37 (24 Poliuretane, 9 Dacron and 4 vein) and 3 cases with eversion endarterectomy. In symptomatic patients: direct suture in 4 cases, patch in 10 (Poliuretan 6, PTFE 2, Dacron 1, vein 1).

## Results

Only one asymptomatic patient had peri-operative stroke and he died in the fourth post operative day. Thus the stroke and death rate for this group are 1.69%. The patient was operated under local anaesthesia, without shunting and had direct suture closure. Among the few symptomatic patients we had, three developed non fatal stroke (3/14), one in local infiltrative and two in general anaesthesia group, one operated with shunt and two without, all three had patch angioplasty. No other stroke happened during follow up period.

Two of 73 patients (2.7% of all CEA procedures) had peripheral nerve deficit (one facial and one laryngeal), one in each anaesthetic group.

No acute myocardial infarction occurred during the 30 day follow up period.

## Discussion

CEA should be a routine procedure for vascular surgeons, but in our recent experience it makes up less than 5% of surgical interventions for arterial disease. This is the result of a lack of knowledge of medical practitioners about the preventive value of this procedure on stroke. On the other hand there is more interest from cardiologists and cardiac surgeons on preventive CEA in their patients. 35% of our patients were sent to us by them. It is well known that the more procedures a surgeon performs better are his results.<sup>(1)</sup> We were careful to fulfil the actual guidelines of the larger international vascular societies for carotid surgery. All our asymptomatic patients had ICA stenosis  $>70\%$  and symptomatic patients  $>50\%$ .<sup>(2)</sup> Our death and major stroke rates for asymptomatic patients of 1.69% are well within the limits of 3% accepted from major studies and guidelines.<sup>(2,3,4,5,6,7)</sup> We can not say the same for our small group of symptomatic patients. However, two strokes and the only death happened

in the first 10 patients of this cohort (2004-2006). In the following 63 cases (2007-2012) we had no stroke or death among asymptomatic patients and only two strokes and no death among 13 symptomatic patients resulting in a better stroke rate for symptomatic cases. Based in the limited number of operations, we believe our results are good and encouraging.

Regarding to intra-carotid shunting for cerebral protection we have chosen to use it in selective cases based on retrograde internal carotid pressure as recommended on the recent guidelines.<sup>(2)</sup> No stroke rate difference resulted in the whole cohort with regard to shunt usage. In fact 1 in 20 CEA performed with shunt and 3 in 53 operated without it had post operative strokes.

CEA has been proved to be very effective in preventing stroke and related death in symptomatic and non-symptomatic patients with more than 60-70% internal carotid artery stenosis.<sup>(3,4,5,6,7)</sup> There is also good evidence that CEA is effective as preventive measure in cases with less important stenosis but with ulcerated plaques.<sup>(8,9)</sup> So generally speaking, the indication for CEA is related with three main items, namely the presence of symptoms, the grade of stenosis and the presence of ulcerated plaques. This last item is particularly important since ulcerative lesions, irregular surface and vulnerable plaques predispose for thrombus formation and thromboembolic TIA-s or small infarcts of the brain. In our experience we have frequently encounter specimens of endarterectomy with adherent thrombus. (fig.)

It remains not clear the timing of CEA in patients with indication for coronary artery bypass surgery.<sup>(10)</sup> In our experience 7 patients had simultaneous carotid and coronary surgery with CEA executed as the first step and 17 patients had staged procedures with coronary surgery postponed for 4–6 weeks after CEA. In total we have performed CEA before or concomitant with coronary artery surgery in 24 patients (1/3 of cases) with no new myocardial infarction or peri-operative death.

Both loco-regional and general anaesthesia have been showed to be indifferent in regard to post procedure stroke, myocardial infarction or death. GALA study very recently has confirmed this.<sup>(11)</sup> In our experience we have used both techniques without any difference in the results, although lately we have favoured general anaesthesia as it is most comfortable for the patient. Loco-regional anaesthesia may be more reliable in cases with occlusion or high-grade stenosis of the contra lateral carotid artery.

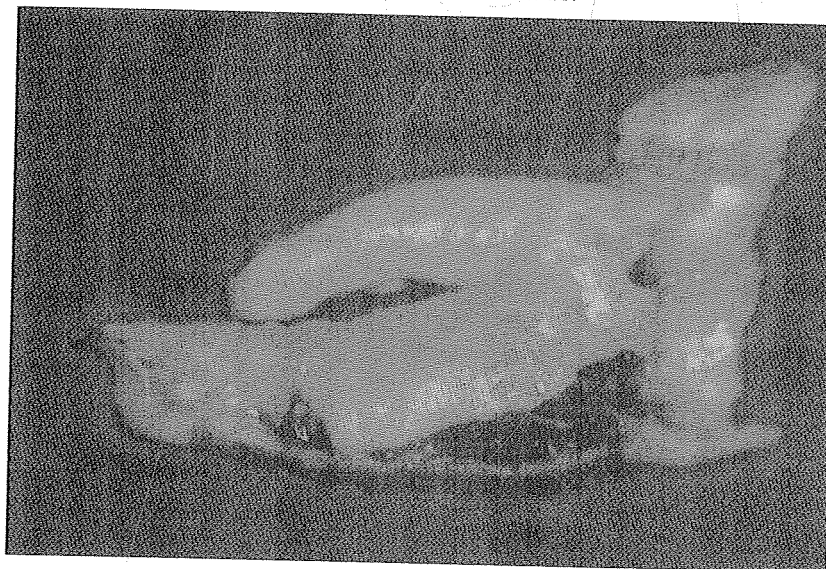
### Conclusions

CEA in asymptomatic patients is a safe procedure in the hands of an experienced vascular surgeon. Our results are comparable with those recommended by international guidelines for stroke, death, cardiac event or peripheral nerve damage but long term follow-up studies in our patients in

the future should clarify the efficacy of CEA for stroke prevention over 3 – 5 years and the rate of restenoses.

Increasing numbers of CEA procedures is crucial for surgeons to refine the technique so to insure better results even for symptomatic patient

Fig. Carotid endarterectomy specimen with adherent thrombus.



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