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## Acute Carotid Artery Stent Thrombosis

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Dear Editor,

We have read the article «Acute carotid artery stent thrombosis» by Koklu et al. [1] with a great interest, especially with regard to the treatment outline the authors have chosen.

The authors chose not to treat the complication surgically and the patient went to physical rehabilitation alone.

We would like to report an open surgical management of acute thrombosis in a stented carotid artery in two patients.

First patient was a 68-year-old female patient with a 70% right internal carotid artery (ICA) stenosis. She underwent carotid artery stenting (CAS) procedure due to a failed carotid endarterectomy (CEA). A closed cell type of stent (Xact®, Abbott Laboratories, Abbott Park, Illinois) 6–8/40 mm was placed under filter protection using EPD with a balloon postdilatation. Clopidogrel 75 mg once daily and acetylsalicylic acid 100 mg a day were administered. Ninety minutes after CAS, she developed contralateral hemiplegia and aphasia. Doppler ultrasound (DUS) confirmed stent occlusion. Urgent stent removal was performed in local anaesthesia. After longitudinal incision of the ICA, CAS was removed and the artery was directly sutured with 6/0 Prolene.

Second patient was an 80-year-old man with asymptomatic 70% left ICA stenosis. He underwent CAS procedure as well. A hybrid cell stent (MER®, Balton, Poland) 7 × 40 mm stent was placed, and a postdilatation was performed with a 4-mm balloon. Clopidogrel 75 mg once daily and acetylsalicylic acid 100 mg a day were administered. Starting on a day after the procedure, he developed several episodes of TIAs. Four days after CAS, he developed aphasia, contralateral hemiplegia and soon after lost his consciousness. Computed tomography angiography revealed stent occlusion. Urgent surgery was performed in general anaesthesia. After longitudinal incision of the ICA, CAS was removed. Despite the stent removal, no back flow was gained and we performed an additional thrombectomy with 3 French Fogarty catheter. A 10-cm-long thrombus was drawn out, and the back flow bleeding washed out additional parts of the thrombus (Fig. 1).

Within 6 months after the urgent surgery both patients improved up to modified Rankin score 1 and 3.

Both patients were on dual antiplatelet therapy. The antiplatelet resistance tests are not routinely performed in our institution, and these tests are yet to be done. Before we start with the operative procedure, we stop one antiaggregation medication unless the patient has had myocardial infarction (MI) and/or stent implantation. However, according to our experience, the risk of bleeding due to preparation is significantly smaller than the risk of MI or the CAS occlusion. Most of the bleeding complications are local haematomas that do not compromise breathing and are usually not even necessary to be evacuated.

Muolkakis et al. [2] published a review in 2016 with 24 acute CAS thrombosis. Minority of the patients were treated by surgical removal of CAS, and those were the

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**Fig. 1** Removed MER®, Balton, Poland 7 × 40 mm carotid artery stent with the thrombus next to it, extracted by 3F Fogarty catheter

patients with the favourable outcome [2]. If there is a severe deterioration of the neurological status soon after CAS, we believe that urgent surgery and the stent removal should be performed. We have removed carotid artery stents in several patients due to in-stent restenoses appearing several years after the procedure. In our

experience, CAS removal in those patients might be difficult due to a stent ingrowth. Quality of the remaining artery wall after the CAS removal is very poor. Such arteries seem to be rather thin and lacking elasticity. Our concern is that they might rupture, although we have not had such cases. CAS removal on the acute onset of the CAS thrombosis symptoms soon after the procedure seems to be technically simple procedure. Without clear guidelines, one might postpone surgery in these challenging cases, though “time is tissue” might be applicable here as well. We would advocate urgent surgery with stent explantation in symptomatic CAS thrombosis.

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#### Compliance with Ethical Standards

**Conflict of interest** The authors have declared that they have no conflict of interest.

**Ethical Approval** This article does not contain any studies with human participants or animals performed by any of the authors.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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