

Carotid endarterectomy

Carotid endarterectomy is a surgical procedure in which there is the removal of atherosclerotic plaque from the bifurcation a. carotis communis and the detachment of a. carotis interna from a longitudinal arteriotomy. As many as 20-30% of ischemic strokes are caused by carotid stenosis - this is the condition we try to prevent by endarterectomy and thus reduce the risk of stroke [1][2].

Indications and contraindications

Stenosis of a. carotis interna may or may not be symptomatic. In asymptomatic patients, in a very general sense, the indication is a stenosis exceeding 70% of the artery lumen, in the case of an exulcerated plaque even in a minor stenosis. Symptomatic patients are most often indicated for surgery after ischemic attack or with stenosis of less than 60% of lumen. However, these values are very indicative; in addition to the stenosis itself, the individual symptoms in the given patients are also decisive. [3][4]

Surgery is contraindicated in the presence of severe bodily comorbidities (possibility of replacing CAE with angioplasty or stenting), in severe stroke with progression to hemiplegia or coma, or in disorder of consciousness eg in brain edema, or signs of bleeding into the CNS. [5]

Technique

The procedure can be performed under local or general anesthesia [6]. A fundamental requirement of perioperative management is the prevention of neurological complications caused by reduced brain perfusion when clamping an operated artery. When choosing a regional anesthesia technique, the neurological finding is monitored; during general anesthesia, evoked potentials can be monitored with the assistance of a neurologist. From the point of view of anesthesiology management, the crucial point is the control of the mean arterial pressure sufficient for perfusion of the brain after loading the clamp. A **temporary short** circuit is established in case of suspected cerebral perfusion insufficiency with Willis circuit anastomoses bridging the clamped part of the artery.. The technique of this type of operation can be divided into classic and eversion. In the classical technique, a longitudinal arteriotomy is performed (the incision is in the longitudinal line of the sternocleidomastoid muscle), while in the eversion technique, the arteriotomy is transverse and involves anatomical reimplantation of the a. carotis interna at the carotid sinus. The artery itself is not so prone to restenosis, sutures are performed only on the most distant aspect of the artery. [7][8]

Complications

Complications associated with carotid endarterectomy are divided into two groups. Paradoxically, the most common complication is the stroke (or TIA), as well as the postoperative hematoma at the incision site.

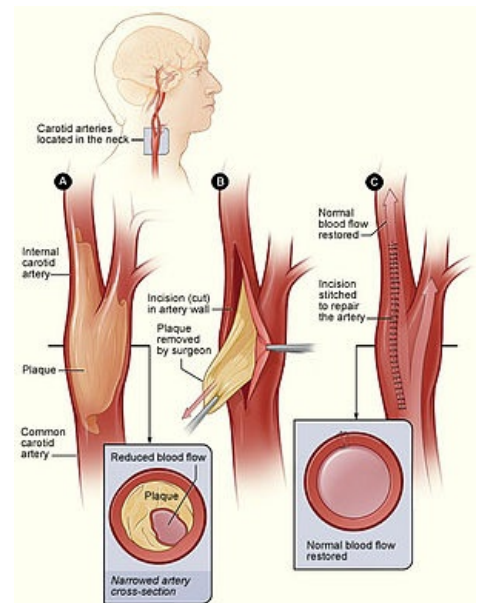
Neurological

The most typical neurological complications include intracerebral hemorrhage, embolization into the cerebral circulation, as well as peripheral nerve involvement:

- *n. hypoglossus* - most often affected [9],
- *r. marginalis n. mandibularis*,
- *n. laryngeus recurrens*, *n. laryngeus superior*.

Hyperperfusion complications may also occur - the development of cerebral edema as a possible consequence of bleeding into the cerebral parenchyma .. [10]

Non-neurological



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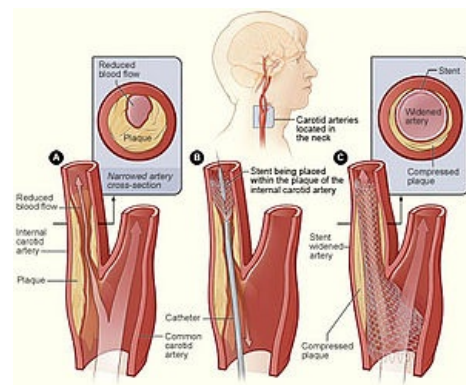
Carotid Plaque

Clinically significant hematoma at the incision site occurs after about 2% of carotid endarterectomies, most often as a result of capillary bleeding from the incision site. However, it can also have very dramatic manifestations - during bleeding from the carotid artery, there is a rapid progression of compression of the airways and surrounding vascular structures. In this case, an urgent surgical revision is indicated, often with the need to evacuate the hematoma under local anesthesia before tracheal intubation, which is prevented by deviation of the trachea by the hematoma. There is also a risk of high blood loss during this procedure. Subsequent complications of massive hematoma include laryngeal damage, severe neurological impairment, or myocardial ischemia.. [11][12]

This group also includes general perioperative systemic complications, especially myocardial infarction and arrhythmias [9].

Alternatives to CAS

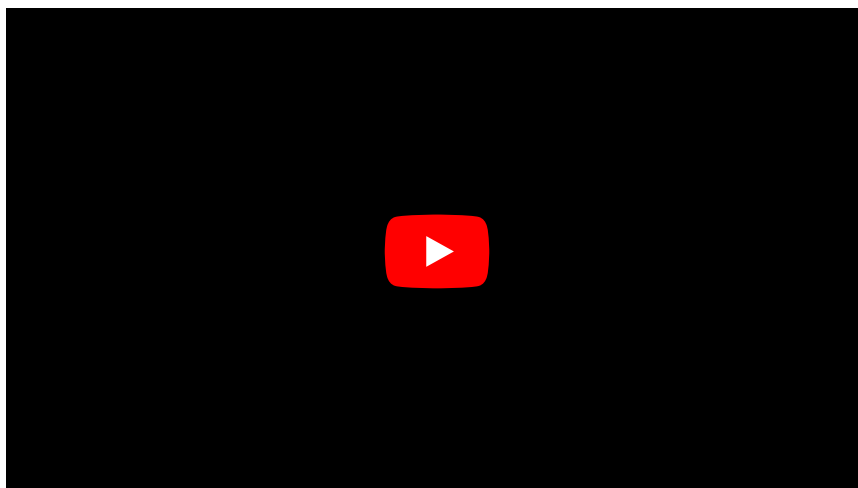
CAS (CAS – *carotid artery stenting*) is an alternative to **endovascular introduction of the stents**. The indication may be, for example, a medical condition unsuitable for surgery (see contraindications mentioned above), excess of the risks of surgery over the risks of stenting or previous endarterectomy failure. Complications of this treatment modality are more or less the same as those in CEA, but due to the introduction of the stent, there may also be, for example, bleeding, perforation of the artery itself, etc. [13]



Carotid artery stent placement

Video Library

Video describing the issue of atherosclerosis in connection with carotid endarterectomy, its indications, design and complications.



References

Related Articles

- thromboendarterectomy
- Artery reconstruction
- Arteria carotis interna
- Stroke
- Brain vessels
- Brain ischemia
- Ischemia

External links

- Template:Akutně
- CEA na anglické Wikipedii (https://en.wikipedia.org/wiki/Carotid_endarterectomy)
- CAS na anglické Wikipedii (https://en.wikipedia.org/wiki/Carotid_stenting)

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