Carotid Endarterectomy operative technique

Anesthesia and monitoring

Most (but not all) surgeons monitor some parameter of neurologic function during carotid endarterectomy, and will alter technique (e.g. insert a vascular shunt) if there is evidence of hemodynamic intolerance of carotid clamping (only occurs in ≈ 1–4%).

1. local/regional anesthesia: permits “clinical” monitoring of patient’s neurologic function [1) 2)]

Disadvantages:

patient movement during procedure (often exacerbated by sedation and alterations in CBF), lack of cerebral protection from anesthetic and adjunctive agents. The only prospective randomized study found no di erence between local and general anesthesia [3)]. The multicenter, randomized controlled General Anesthesia versus Local Anesthesia (GALA) Trial [4)] found no significant differences in the prevention of stroke, MI, or death for either anesthetic technique. Subgroup analysis showed trends (not statistically significant) favoring local anesthesia for perioperative death, event-free survival at 1 year, and patients with contralateral occlusion. Local anesthesia was associated with a significant reduction of shunt insertion [5)].

A Cochrane Database Review found no evidence from randomized trials to favor either anesthetic technique [6)]

2. general anesthesia, possibly including barbiturates (thiopental boluses of 125–250 mg until 15– 30 second burst suppression on EEG, followed by small bolus injections or constant infusion to [7)]

a) EEG monitoring

b) SSEP monitoring

c) measurement of distal stump pressure after CCA occlusion (unreliable), e.g. using a shunt if stump pressure <25 mm Hg

d) transcranial Doppler

e) near-infrared spectroscopy.

Both general anesthesia and local anesthesia are used in the University Hospital Pilsen for carotid endarterectomy (CEA). The decision as to which anesthetic technique to use during surgery is made individually.

The satisfaction of a group of 205 patients with regard to anesthesia used and their future preferences were evaluated prospectively through a questionnaire. The reasons for dissatisfaction were assessed.

CEA was performed under general anesthesia (GA) in 159 cases (77.6%) and under local anesthesia (LA) in 46 cases (22.4%). In the GA group, 148 patients (93.1%) were satisfied; 30 patients (65.2%) in

the LA group were satisfied ($p < 0.0001$). The reason for dissatisfaction with GA were postoperative nausea and vomiting (7 patients), postoperative psychological alteration (3), and fear of GA (1). The reasons for dissatisfaction with LA were intraoperative pain (9 patients), intraoperative discomfort and stress (5), and intraoperative breathing problems (2). Of the GA group, 154 (96.9%) patients would prefer GA again, and of the LA group, 28 (60.9%) patients would prefer LA if operated on again ($p < 0.0001$). Overall, 172 patients (83.9%) would prefer GA in the future, and 33 patients (16.1%) would prefer LA.

Overall patient satisfaction with CEA performed under both GA and LA is high. Nevertheless, in the GA group, patient satisfaction and future preference were significantly higher. Both GA and LA have advantages and disadvantages for CEA. An optimal approach is to make use of both anesthetic techniques based on their individual indications and patient preference [8].

Position and incision

1. supine, neck slightly extended and rotated slightly (≈ 30°) away from the operative side

2. the incision curves gently and follows the anterior border of the sternocleidomastoid muscle, and curves posteriorly at the rostral end

3. keep the horizontal portion of the incision ≈ 1 cm away from the mandible to avoid injury to marginal mandibular branch of facial nerve (which lies in the inferior parotid gland and supplies lip depressor) due to retraction against mandible

4. retractors should not be placed deeper than the platysma to avoid injury to the recurrent laryngeal nerve, which runs between the esophagus and trachea. Blunt retractors are used to avoid internal jugular vein injury

Dissection

1. the common facial vein (CFV) usually crosses the field over the carotid bifurcation, it is doubly ligated and divided. It leads to the internal jugular vein (IJV)

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