

Endovascular treatment of acute ischemic stroke

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentlig försvaras i Kammaren, Vita Stråket 12, Sahlgrenska Universitetssjukhuset, Göteborg, fredagen den 22 september, kl. 09:00

av

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Leg. Läkare

Fakultetsopponent:

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Avhandlingen baseras på följande delarbeten

- I. Rentzos A, Lundqvist C, Karlsson JE, Vilmarsson V, Schnabel K, Wikholm G. Mechanical embolectomy for acute ischemic stroke in the anterior cerebral circulation: The Gothenburg experience during 2000-2011. *AJNR Am J Neuroradiol.* 2014;35(10):1936-41
- II. Rentzos A, Karlsson JE, Lundqvist C, Rosengren L, Hellström M, Wikholm G. Endovascular treatment of Acute Ischemic Stroke in the Posterior Circulation. *Manuscript submitted 2017.*
- III. Löwhagen Hendén P, Rentzos A, Karlsson JE, Rosengren L, Sundeman H, Reinsfelt B, Ricksten SE. Hypotension during endovascular treatment of ischemic stroke is a risk factor for poor neurological outcome. *Stroke.* 2015;46(9):2678-2680
- IV. Löwhagen Hendén P*, Rentzos A*, Karlsson JE, Rosengren L, Leiram B, Sundeman H, Dunker D, Schnabel K, Wikholm G, Hellström M, Ricksten SE. General anesthesia vs. conscious sedation for endovascular treatment of acute ischemic stroke - The AnStroke trial. *Stroke.* 2017;48(6):1601-1607. *Contributed equally

ENDOVASCULAR TREATMENT OF ACUTE ISCHEMIC STROKE

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Background: Intravenous thrombolysis is effective in patients with minor stroke but not in patients with moderate or major stroke due to large vessel occlusion. Endovascular stroke treatment offers a high recanalization rate, which is associated with favorable neurological outcome. The aim of our studies was to evaluate the efficacy and safety of the endovascular stroke treatment in the anterior and posterior circulation, respectively, as performed in the Neurointerventional unit of Sahlgrenska University Hospital. Two major anesthesia forms are used in endovascular stroke treatment, general anesthesia, and conscious sedation. The aim was also to evaluate the impact of intra-procedural hypotension and to compare general anesthesia and conscious sedation with respect to radiological and neurological outcome.

Methods: Paper I and Paper II are retrospective studies on efficacy and safety of endovascular stroke treatment in the anterior and posterior circulation, respectively. Paper III is a retrospective study on the impact of intraprocedural hypotension on neurological outcome in patients treated under general anesthesia. Paper IV is a prospective randomized study, where patients eligible for endovascular stroke treatment were randomized to general anesthesia or conscious sedation.

Results: Paper I showed that the successful recanalization rate in endovascular stroke treatment in the anterior circulation was 74%, the complication rate was 5% and favorable neurological outcome at 3 months was found in 42%. Paper II showed successful recanalization in 73% of patients treated for stroke in the posterior circulation with serious procedural complications in 5 % and favorable outcome in 35% at 3 months. Paper III showed that a fall in mean arterial pressure of >40% is an independent predictor of poor neurological outcome. Paper IV showed no difference in neurological outcome at 3 months between patients randomized to general anesthesia or conscious sedation when a strict protocol for avoidance of intra-procedural hypotension was followed.

Conclusion: Endovascular treatment in patients with acute ischemic stroke in the anterior and posterior circulation can achieve high recanalization rates with low complication rates. Intra-procedural hypotension is associated with poor neurological outcome but the choice of anesthesia method does not influence the neurological outcome if severe hypotension is avoided.

Keywords: stroke, endovascular treatment, embolectomy, thrombectomy, general anesthesia, conscious sedation