Correlation Between Postoperative Cervical Haematoma in Carotid Surgery and Antiplatelet Treatment

Jerzicska Ernő, Fărcaș Felix, Győrbíró László

Clinic of Cardiovascular Surgery, County Emergency Clinical Hospital, Tîrgu Mureș, Romania

Introduction: Cervical haematoma is one of the local complications of carotid endarterectomy. Cervical haematoma may determine oesophageal compresion or tracheal deviation. We evaluated the correlation between cervical haematoma and preoperative antiplatelet treatment.
Material and methods: We evaluated retrospectively 100 consecutive patients operated with carotid endarterectomy between 2009 and 2011. Group A of 48 patients had monoantiaggregant preoperative treatment, group B of 52 patients had dual preoperative antiaggregant treatment.
Results: We observed cervical haematomas in 16 patients from the total of 100, 13 of them being in group B. Evaluation of age, sex, surgical technique and local drainage showed no differences between the two groups. The group with monoantiaggregant preoperative treatment had a smaller chance to develop cervical haematoma (p=0.022).
Conclusions: Preoperative antiplatelet treatment is crucial for a succesful carotid endarterectomy procedure. We sustain the use of monoantiaggregant preoperative treatment, which is associated with less cervical haematomas as a local haemorrhagic complication, instead of dual antiaggregant preoperative therapy.

Keywords: cervical haematoma, carotid endarterectomy, antiaggregant

Received: 15 May 2012 / Accepted: 20 July 2012

Introduction

Cervical haematoma represents one of the local complications of carotid endarterectomy. Cervical haematoma may determine in its advanced phases of evolution oesophageal compression or tracheal deviation, the latter imposing supportive respiratory treatment [1,2].

Carotid endarterectomy is a preventive surgical intervention, so the rate of complications must be reduced to minimum [3,4]. In developed countries, a 6% rate of major complications is accepted, in order for this kind of procedures to be allowed [5].

There are two causes of cervical haematomas, the first one being the surgical haematoma, which is a result of a hemorrhage from a surgical source (arterial or venous) and which needs surgical treatment (surgical ligation = redo). The second cause is the nonsurgical haemorrhage, which is a diffuse bleeding that does not need treatment if it does not compress the oesophagus or the trachea [6,7].

The causes of postcarotid surgery diffuse hemorrhages may be due to inadequate dissection (too much blunt dissection in a highly vascular area), to heparin administration during the intervention (vascular clamping and intravascular shunt), or preoperative anticoagulant and/or antiplatelet treatment.

Preoperative antiplatelet treatment is essential in reducing intra- and postoperative stroke risk, being recommended by the guidelines of the European Society of Vascular Surgery. There are opinions that suggests that a dual preoperative antiplatelet treatment is more efficient than preoperative monoantiplatelet treatment in preventing perioperative ischaemic events [8]. This study aims to evaluate this opinion, correlating it with the incidence of postoperative cervical haematoma.

Material and methods

Due to the short- and long-term complications generated by the cervical haematoma, which affect the quality of the outcome of a surgical intervention, we followed 100 patients treated in the Cardiovascular Surgery Clinic of the Institute of Cardiovasculare Diseases and Transplantation Tîrgu Mureș, between 2009–2011. This study is a retrospective observational study. We evaluated the medical data of these patients, in order to obtain informations about their medical evolution and applied treatments. The Institutional Review Board consent was waived.

We included in the study a group of patients with carotid endarterectomy, without any other concomitant interventions, consecutively from the mentioned period. The surgical procedures used in these patients were direct carotid endarterectomy with patch plasty or eversion endarterectomy.

For statistical evaluation we used the GraphPad Prism 5.0 software. Evaluation of qualitative variables was performed using Chi-square test. Significance limit was set to $p \leq 0.05$.

Results

We postulated that preoperative dual antiplatelet treatment affects positively the incidence of postoperative cervical hematoma.

In order to evaluate this hypothesis, we separated the 100 patients into 2 groups, based on the preoperative antiplatelet treatment. In group A, represented by 48 patients,

Correspondence to Ernő Jerzicska
Email: erno.jerzicska@gmail.com

we selected cases with single antiplatelet drug preoperatively (acetylsalicylic acid 75 mg or 100 mg, or clopidogrel 75 mg). There were no other antiplatelet agents used preoperatively.

Cervical hematoma was found in 16 patients (16%) of the 100. One patient (group B) needed surgical reintervention, due to massive haemorrhagic drainage (500 ml in 2 hours). There was no surgical hemorrhagic source found during reintervention.

Two patients (1 from each group) needed prolonged ventilation time (over 24 h), until stabilization of the hematoma and radiologic evaluation of the degree of tracheal deviation. One patient (group B) needed reintubation after the first postoperative day, due to increased respiratory effort with obstructive secondary hypoventilation.

Tracheal deviation was observed in 2 patients from group B with cervical haematoma, both being ventilated over 24 hours postoperatively.

Esophageal compression due to cervical hematoma was encountered in 9 patients (2 from group A, 7 from group B). All patients with cervical hematoma presented a significant limitation of cervical mobility.

Three patients (1 from group, 2 from group B) described postoperative pain in the ipsilateral parotid region, which disappeared once with the cervical haematoma.

Four patients (1 from group, 3 from group B) complained of limitation of cervical motion at postoperative control on day 14.

We evaluated a few general data of these groups, in order to check for the homogeneity and statistical distribution of these patients.

Evaluation of demographic data

Age is an important independent risk factor for postoperative haemorrhage. The main age of the patients in group A was 66.75±5.17 years and for group B 66.30±5.39 years. There was no statistically significant difference between the 2 groups ($p>0.05$).

The distribution of patients by gender was the following: group A – 48 patients, 18 women (37.5%), 30 men (62.5%), and group B – 52 patients, 24 women (46.1%), 28 men (53.9%).

Table II. Distribution of patients by the performed surgical procedure

Type of intervention	Total number	Group repartition	Cervical hematomas group A	Cervical hematomas group B
Eversion endarterectomy	61	(A 20, B 37)	1	5
Direct endarterectomy with saphenous vein patch	6	(A 5, B 1)	0	1
Direct endarterectomy with facial vein patch	8	(A 4, B 4)	0	1
Direct endarterectomy with Dacron patch	2	(A 0, B 2)	0	0
Direct endarterectomy with PTFE patch	23	(A 19, B 8)	2	6

We used chi-square test to compare the 2 groups, the obtained result demonstrating a lack of statistically significant difference between groups A and B ($p=0.501$).

Surgical intervention

The type of surgical intervention is also important in evaluating postoperative hemorrhagic risk. This risk increases with the length of arterial suture line and the area of vascular exposure. Use of prosthetic patch materials increases the postoperative hemorrhagic risk.

In our group of patients, we used saphenous vein, facial vein, PTFE or Dacron patches. More than half of the interventions were eversion endarterectomies, with their advantages in hemorrhagic risks: shorter suture line and lack of patch material. We categorized the 100 patients by the performed surgical procedure as seen in Table I.

Carotid drainage

We perform carotid drainage routinely, considering that this is the only efficient solution to avoid severe complications of cervical hematoma. In the studied group, 96 patients had carotid drainage.

Group A 48 patients – 3 patients without drainage

Group B 52 patients – 1 patient without drainage

No patients without carotid drainage had developed postoperative cervical hematoma. The surgeon's decision not to drain periarterially was based on intraoperative evaluation of bleeding in the surgical wound.

Statistical evaluation

We compared statistically the results obtained after evaluation, respectively the incidence of postoperative cervical hematomas in the 2 studied groups, in group A (48 patients) with an incidence of 3 cases and group B (52 patients) with an incidence of 13 cases.

For comparing we had used chi-square test, obtaining 5.208 with one degree of freedom, corresponding to a p value of 0.022. The 2 characteristics defining the contingency table are the association between the treatment and complication, respectively incidence in the two studied groups of this postoperative complication.

The results of chi-square test sustain that the two characteristics defining the contingency table are highly correlated ($p=0.022$).

Calculated relative risk is significantly higher than 1. The chances that a patient from group A to develop postoperative cervical hematoma are significantly lower in case of preoperative mono antiplatelet therapy ($p=0.022$).

The chance rate is significantly lower than 1. Preoperative monoantiplatelet therapy decreases the chances for patients to develop a cervical hematoma postcarotid endarterectomy ($p=0.022$).

Discussions

We could not find any article in the literature we have studied (Pubmed database) on the correlation between

antiplatelet treatment and cervical haematoma postcarotid endarterectomy.

Monoantiplatetelet therapy preoperatively is advised by the actual guidelines, is safe for the patients, and immediately in the postoperative period is associated with a lower risk of cervical haematoma, especially if carotid drainage is used.

In our study the type of surgery (direct or eversion endarterectomy, with or without patch plasty) was irrelevant statistically for the incidence of cervical haematoma.

Conclusions

Evaluation of incidence of postoperative cervical hematoma associated with the preoperative antiplatelet therapy demonstrated that in case of dual antiplatelet therapy the risk is significantly higher than in case of monoantiplatelet therapy. Use of surgical techniques that limit the arterial suture lines, avoidance of patch materials and the carotid drainage are welcome in prevention and limitation of postoperative cervical hematomas with significant secondary complications (esophageal compressions, tracheal deviation).

References

1. Aburahma AF, Stone PA, Elmore M, Flaherty SK, Armistead L, AbuRahma Z. Prospective randomized trial of ACUSEAL (Gore-Tex) vs Finesse (Hemashield) patching during carotid endarterectomy: long-term outcome. J Vasc Surg. 2008;48(1):99-103.
2. Debus ES, Larena A, Wintzer Ch. Open therapy of carotid stenosis by endarterectomy. Chirurg. 2004;75(7):658-66.
3. de Sousa AA, Dellaretti MA, Faglioni W Jr, Carvalho GT. Monitoring of activated coagulation time in carotid endarterectomy. Surg Neurol. 2005;64 Suppl 1:S1:6-9.
4. Palombo D, Lucertini G, Mambrini S, Spinella G, Pane B. Carotid endarterectomy: results of the Italian Vascular Registry. J Cardiovasc Surg (Torino). 2009;50(2):183-7.
5. Liapis CD, Sir Bell PRF, Mikhailidis D, Sivenius J, Nicolaides A, Fernandes e Fernandes J, Biasi G, Norgren L, on behalf of the ESVS Guidelines Collaborators. ESVS Guidelines. Invasive Treatment for Carotid Stenosis: Indications, Techniques. Eur J Vasc Endovasc Surg. 2009;37:S1-S19.
6. Naylor R, Hayes PD, Payne DA, Allroggen H, Steel S, Thompson MM, London NJ, Bell PR. Randomized trial of vein versus dacron patching during carotid endarterectomy: long-term results. J Vasc Surg. 2004;39(5):985-93.
7. Raso JL, Darwich RZ, Lucca Jr F, Santana RV, Tanure MT, Cariri GA, Furtado LM. Bridge-therapy with enoxaparin in the preoperative period of endarterectomy. Arq Neuropsiquiatr. 2010;68(5):775-7.
8. Marković DM, Davidović LB, Maksimović ZL, Kuzmanović IB, Ilić NS. Comparative analysis of conventional and eversion carotid endarterectomy — prospective randomized study. Srp Arh Celok Lek. 2008;136(11-12):590-7.