



**UNIKLINIK
KÖLN**

Management bei Blutungskomplikation in der Carotischirurgie



Th. Lübke

Postoperative Blutung

-Inzidenz: 0,7% - 3,0%

-Ursachen: *Diffuse, kapilläre Blutung bei Antikoagulation
*Verletzung / inadequate Ligatur von Venen,
Venolen und Arteriolen
*Patch- / Nahtinsuffizienz
(DD: Ausmaß und Zeitkomponente!)

*Späte Blutungskomplikation bei Patchinfektion



Risikofaktoren

-Clopidogrel (+/- Aspirin) ???

längere OP-Zeit !

Chechik et al., Vascular 20; 2012: 193-197

Oldag et al., Langenbecks Arch Surg 397; 2012: 1275-1282

Risikofaktoren – Clopidogrel / ASS

Severe wound hematoma/bleeding necessitating operative re-exploration in patients under

Investigated intensified antiplatelet regimes	Aspirin (reference)	Adjusted odds ratio	95 % confidence interval		<i>P</i>
Aspirin and clopidogrel	3.6 %	1.2 %	2.844	0.706– 11.448	0.141
Clopidogrel	4.3 %	1.2 %	3.434	1.006– 11.717	0.049

Risikofaktoren – Clopidogrel / ASS

Table V. Studies examining the association between antiplatelet/antithrombotic medication (*AM*) and neck bleeding after carotid endarterectomy (*CEA*)

<i>First author</i>	<i>Year</i>	<i>Medication, patients</i>	<i>Neck bleeding</i>
Rosebaum ¹⁰	2010	Clopidogrel: 50; ASA: 171	More wound hematomas requiring re-exploration in the clopidogrel group than in the ASA group (16% vs 1.7%, $P = .0004$)
Wait ²⁵	2010	Clopidogrel up to 5 days pre-CEA: 42 Clopidogrel up to 8 days pre-CEA: 58	Small but significant increase in nonoperative neck swelling Statistically insignificant trend toward more nonoperative neck swelling
Payne ²⁶	2010	AM in most of the patients: 448	No association with any preoperative AM among 27 patients with postoperative neck bleeding requiring re-exploration
Di Fiore ²⁵	2009	Clopidogrel; ASA	Trend toward a higher risk of bleeding in the clopidogrel group than in the ASA group (OR, 1.84; $P = .09$).
Fleming ²⁸	2009	Clopidogrel: 19; no clopidogrel: 81	Only one neck bleeding not requiring re-exploration in the non-clopidogrel group
Self ²¹	1999	ASA, ticlopidine, heparin, Coumadin: 249	At univariate analysis, preoperative ASA was identified as predictive factor (OR, 3.4; 95% CI, 1.0-11.4; $P = .04$) in 29 cases of post-CEA neck hematoma

ASA, Acetylsalicylic acid; *CI*, confidence interval; *OR*, odds ratio.

Risikofaktoren - Protamin

Table IV. Studies examining the use of protamine during carotid endarterectomy to date

<i>Author</i>	<i>Year</i>	<i>Treated patients (N)</i>	<i>Bleeding complications</i>	<i>Thrombotic complications</i>
Treiman et al. ¹⁰	1990	328	Increased wound hematoma in untreated patients (6.5% vs 1.8%, $P = .004$)	No effect on CVA (1.8% vs 2.7%, $P = .6$)
Mauney et al. ¹³	1995	348	No effect on significant hematoma (1.0% vs 1.9%, $P = \text{NS}$)	Increased CVA with protamine (2.6% vs 0%, $P < .05$)
Fearn et al. ¹²	1997	64	Decreased wound drainage with protamine (69 mL, vs 35 mL, $P < .001$); no change in neck swelling	Increased CVA with protamine (3 patients with ICA thrombosis)
Levison et al. ⁹	1999	407	Decreased wound hematoma with protamine (1.9% vs 9.5%, $P = .02$)	Increased CVA with protamine (2.7% vs 0%, $P = .33$)
Dellagrammaticas et al. ⁸	2008	594	Decreased wound hematoma with protamine (7.4% vs 10.4%, $P = .04$); no difference in reoperation with protamine (3.7% vs 3.2%, $P = .58$)	No effect on CVA (4.4% vs 2.9%, $P = .1$)
Stone et al.	2009	2087	Decreased reoperation for bleeding with protamine (0.64% vs 1.66%, $P = .001$)	No effect on CVA (0.78% vs 1.15%, $P = .2$) No effect on MI (1.1% vs 0.91%, $P = .51$) No effect on death (0.23% vs 0.32%, $P = .57$)

CVA, Cerebral vascular accident; ICA, internal carotid artery; MI, myocardial infarction.

Klinische Risikofaktoren

Table V. Review of existing literature of risk factors for wound hematoma formation after carotid endarterectomy

Risk factor	Univariate analysis	Multivariate analysis	Incidence of hematoma (%)	Author
Preoperative use of APT	+	N/A	2.5	Collins and colleagues ¹
Postoperative hypertension	+	N/A		
Preoperative aspirin	+	–	12.0	Sullivan and colleagues ⁴
Neurosurgery service	+	–		
General anaesthesia	+	–		
Carotid shunt placement	+	+		
Intraoperative hypotension	+	+		
Non-reversal of heparin	+	+		
Intraoperative hypertension	+	N/A	1.9	Gansmuller and colleagues ¹¹
Postoperative hypertension	+	N/A		
Preoperative use of APT	NS	N/A		
No protamine reversal	NS	N/A		
Dacron patch (reduced risk)	+	N/A	N/A	Beard et al. ¹⁹
Postoperative control of BP	+	N/A		
Introduction of local anaesthesia (reduced risk)	+	N/A		

+ represents $p < 0.05$; – $p > 0.05$; NS, nonsignificant trend; N/A, paper did not perform analysis.

Folgekomplikationen

Table IV. Postoperative 30-day morbidity and mortality along with hospital stay (* $p < 0.05$)

Characteristic	Cases ($n = 27$)	Controls ($n = 54$)	p -value
Deaths, n (%)	1 (3.7)	1 (1.9)	1.0
Stroke, n (%)	1 (3.7)	1 (1.9)	1.0
Dextran-40, n (%)	3 (11.1)	1 (1.9)	0.11
Localized neurology, n (%)	2 (7.4)	2 (3.7)	0.60
Infection, n (%)	1 (3.7)	0 (0)	0.33
Transfusion requirement, n (%)	16 (59.3)	1 (1.9)	0.0001*
ITU/HDU stay, days, mean \pm SD	1.33 \pm 1.11	0.30 \pm 0.53	0.001*
Ward stay, days, mean \pm SD	4.92 \pm 2.2	2.98 \pm 2.34	0.001*



Management – Akute Blutung

-Blutungskontrolle durch externe Kompression

-Kreislaufstabilisierung

*Hypertonie: verstärkte Blutung, Dissektion

*Hypotonie: Thrombose, cerebrale Malperfusion

Management – Akute Blutung

-CAVE: Atemwegsobstruktion:

- *Intubation, Glidescope
- *Fiberoptische Intubation
- *Notfall-Tracheotomie / Coniotomie



Management – Akute Blutung

-Bei Intubationsproblemen durch
Kehlkopfverlagerung/Trachealkompression und drohendem
Ersticken:

- *Eröffnen der Wunde im OP,
- *Entlasten des Hämatoms,
- *Digitale Kompression (keine
Klemmen),
- *Intubation



Management – Akute Blutung

- Einstellen des Situs
- Anschlingen proximal und distal
- Je nach Länge des Revisionseingriffs (Einzelnaht am Patch, Austausch des Patches) temporäres Ausklemmen oder primäre Shunteinlage
- Ggf. Thrombektomie der Carotisstrombahn

Management – Diffuse Blutung

- Ausspülen des Situs
- Aufsuchen und Versorgen möglicher chirurgischer Blutungsquellen
- Ggf. Fibrinkleber oder Lyostyptika
- Ggf. Ausspülen mit Rifampicinlösung (bei alloplastischem Patchmaterial)

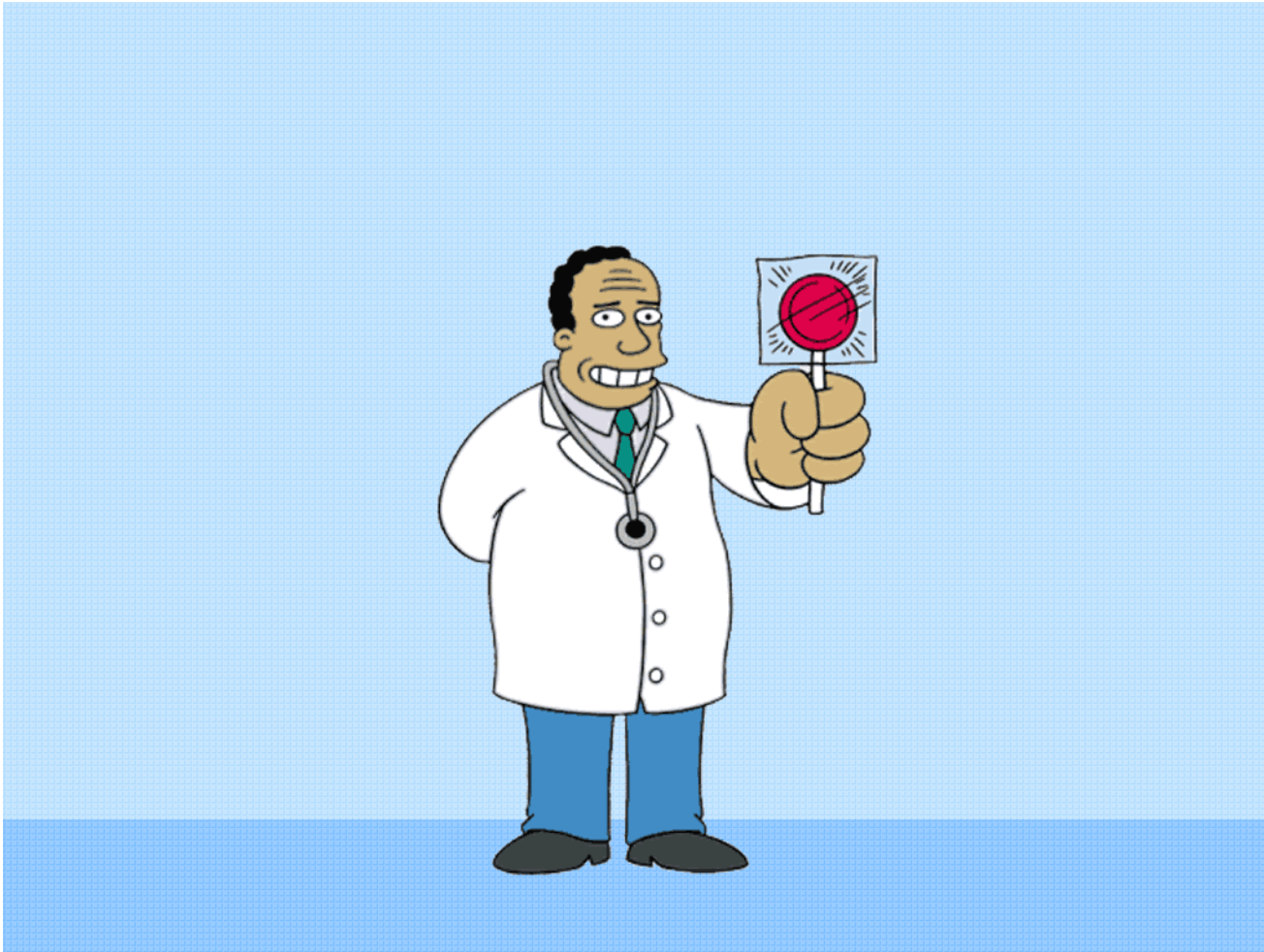




Management

- Ggf. Einlage Wund-Drainage (12, 14F)
- Oberkörperhochlagerung
- Vor Extubation HNO-Konsil, Bubble - Test
- Ggf. vor Extubation Cortison i.v.
- Ggf. peri Extubation NSAR

Vielen Dank für Ihre Aufmerksamkeit





Schlussfolgerung

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