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Current Status of Carotid Therapy

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Stroke: General Considerations

- 3rd leading cause of death
- 1st cause of disability
- 700,000 new strokes per year
  - 1% per yr over 70

Cost: direct/indirect of approx $70,000,000,000 per year

Stroke: Etiology

- -70% thromboembolic
  - Carotid
  - Cardiac
- -30% hemorrhagic
  - Hypertensive
  - Diabetic
  - Coagulopathy

Stroke: Pathogenesis

- Carotid Thromboembolic
  - Composition of plaque
    - Heterogeneous
    - Homogeneous
  - Ulceration
    - Grade A, B, C
- Carotid Loss of flow-unusual cause of CVA

Carotid Pathogenesis

- -90% atherosclerotic
  - Composition: calcium, lipid, and stages of thrombus
- -10% other
  - Fibromuscular disease: IF, MH, MF*, PD
  - Arteritis
  - Radiation
  - Recurrent stenosis
  - Aneurysms

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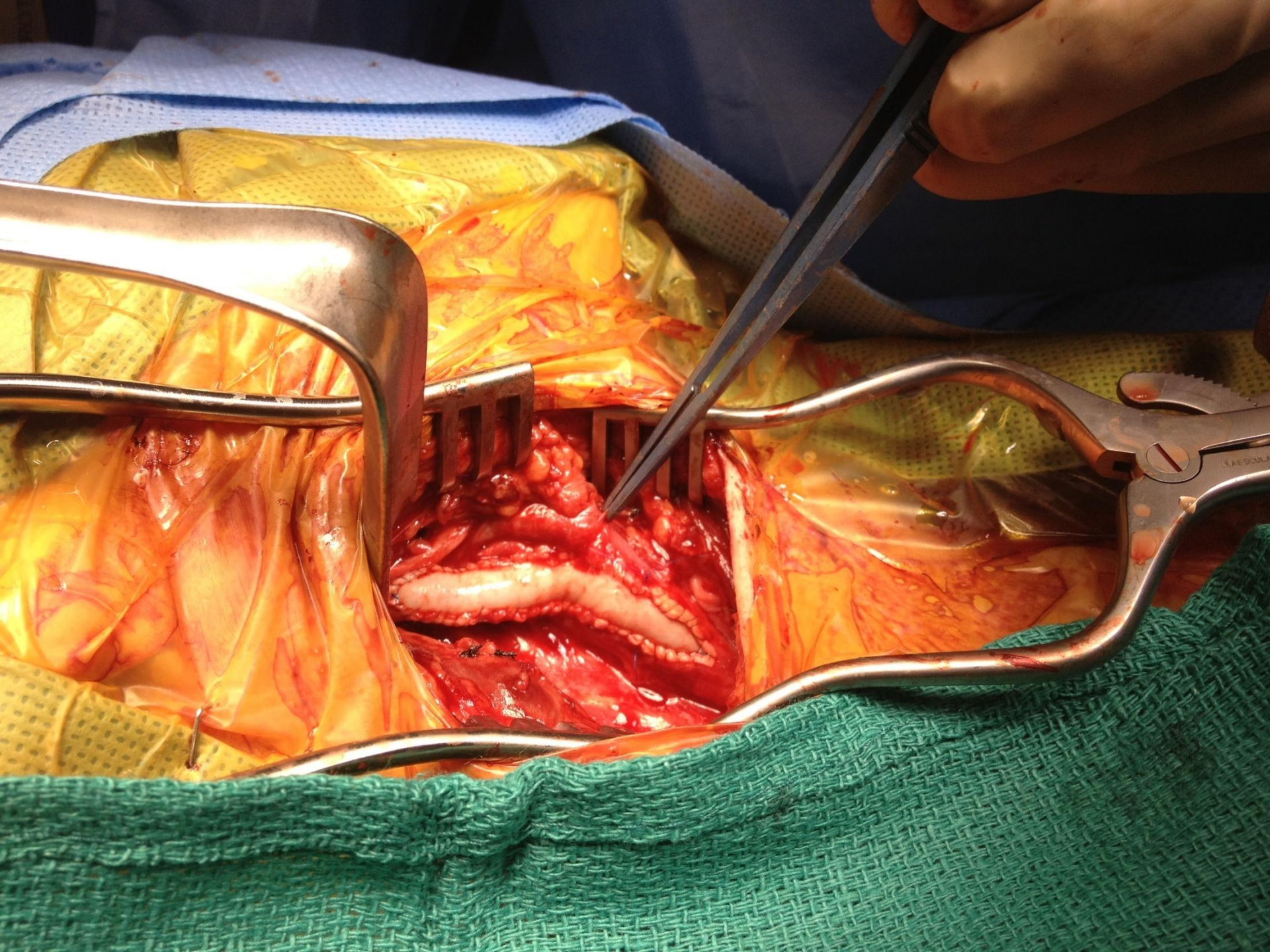
Stroke and Carotid Disease: Risk Factors

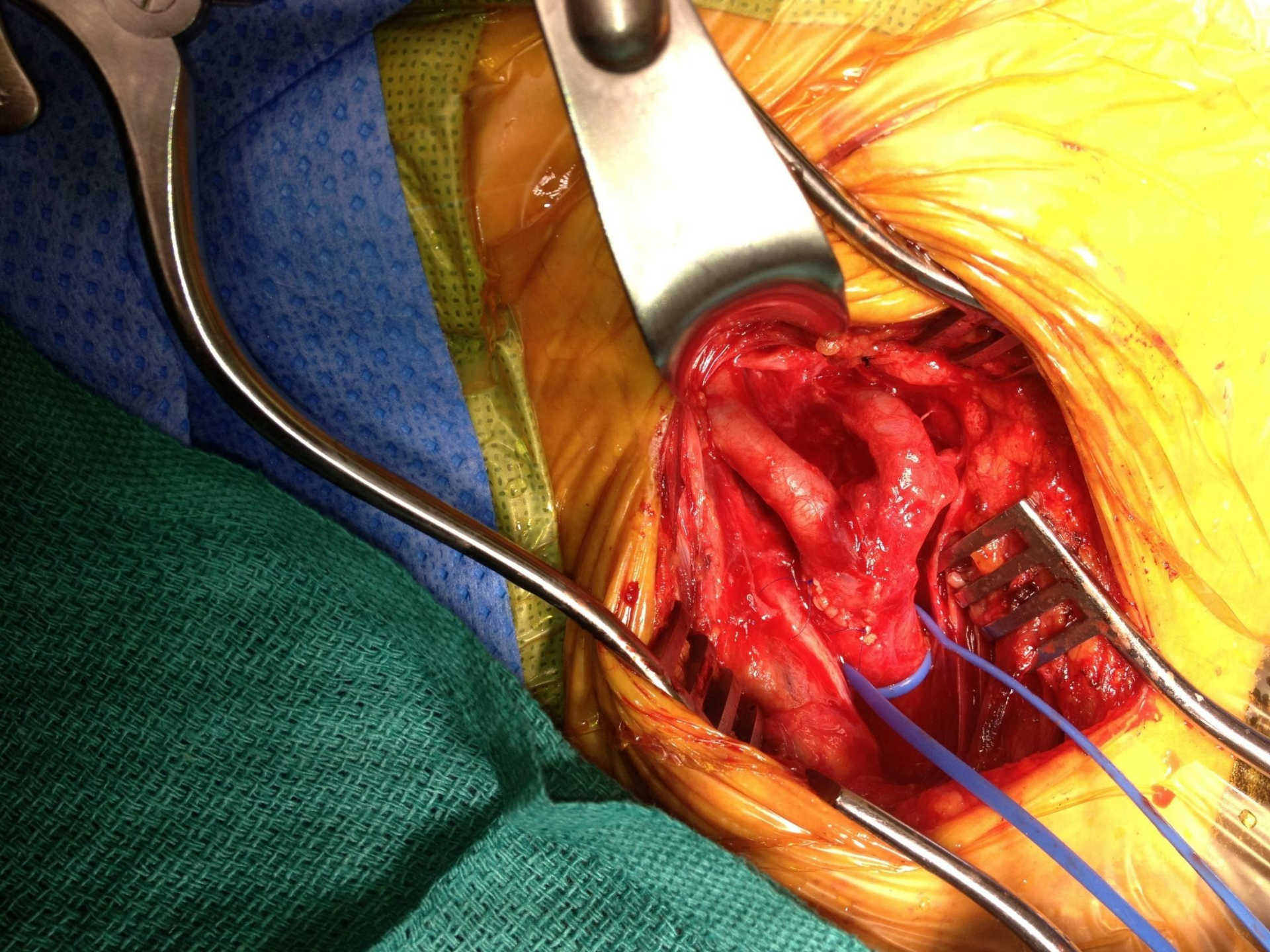
- Tobacco
- Hypertension
- Hyperlipidemia
- Diabetes
- Age
- Extent of “other site” atherosclerosis

Carotid Treatment: **Best medical therapy**

- **Tobacco cessation**: Decrease risk 8-10X
- Blood pressure control: DBP <80, MAP <100
- Hyperlipidemia: LDL <100 (best <70)
- Anti-platelet agents: ASA vs thienopyridines

Carotid Treatment: Carotid endarterectomy





Carotid Treatment: Carotid endarterectomy

- Approx 150,000 per year
- Timing
- Patching
- Results
- Durability

Carotid Treatment: Carotid Stenting

Case DD

- CAD, 3 vessel. 4 weeks post MI
- R eye amaurosis
- 6mm AngioGuard, Precise 8 x 40

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Carotid Treatment: Carotid Stenting

- Approx 12,000 per year
- Most cases with either Anat or Phys high risk
- Embolic Protection: Umbrella vs. flow reversal
- Stenting types: open vs. closed cell
- Initially rapid and now slowly evolving technology
- Timing, Age of Pt, Sx vs. Asx, CoMorbidities

Carotid Therapy: The Data

- ACAS: 1995
- NASCET: 1991
- SAPPHIRE: 2008
- SVS Guidelines: 2008
- CREST: 2010

ACAS: asymptomatic carotid atherosclerosis study

- 1662 pts, 1995
- >60% asymptomatic stenosis
- Randomized to CEA vs OMT
- 5 yr risk of IS, POS, death
  - Surgical arm: 5.1%
  - Medical arm: 11.0%
- REC: CEA if <3% periop M%M

NASCET: North American Symptomatic Carotid Endart Trial

- 2226 pts, 1991
- Randomized to CEA vs OMT
- CVA rates

Stenosis	CEA	OMT	
50-69%	15	22	5yr risk
70-99%	9	26	2yr risk

- Best results if CEA <14days
- Marked decrease in benefit if CEA >12 weeks

SAPPHIRE

- 2001 pts, 2008
- 27% sympt, 73% asympt
- 30 day MAE: 4.4%
  - Death 1.1%, CVA 3.2%, MI 0.7%
  - Major CVA only 1%
- 30 day MAE
  - Anatomic indication: 2.8%
  - Physiologic indication: 4.9%
- TLR approx 3%

SVS®
Society for Vascular Surgery

SPECIAL COMMUNICATION

Management of atherosclerotic carotid artery disease: Clinical practice guidelines of the Society for Vascular Surgery

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The Society for Vascular Surgery (SVS) appointed a committee of experts to formulate evidence-based clinical guidelines for the management of carotid stenosis. In formulating clinical practice recommendations, the committee used systematic reviews to summarize the best available evidence and the GRADE scheme to grade the strength of recommendations (GRADE 1 for strong recommendations; GRADE 2 for weak recommendations) and rate the quality of evidence (high, moderate, low, and very low quality). In symptomatic and asymptomatic patients with low-grade carotid stenosis (<50% in symptomatic and <60% in asymptomatic patients), we recommend optimal medical therapy rather than revascularization (GRADE 1 recommendation, high quality evidence). In symptomatic patients with moderate to severe carotid stenosis (more than 50%), we recommend carotid endarterectomy plus optimal medical therapy (GRADE 1 recommendation, high quality evidence). In symptomatic patients with moderate to severe carotid stenosis (≥50%) and high perioperative risk, we suggest carotid artery stenting as a potential alternative to carotid endarterectomy (GRADE 2 recommendation, low quality evidence). In asymptomatic patients with moderate to severe carotid stenosis (≥60%), we recommend carotid endarterectomy plus medical management as long as the perioperative risk is low (GRADE 1 recommendation, high quality evidence). We recommend against carotid artery stenting for asymptomatic patients with moderate to severe (≥60%) carotid artery stenosis (GRADE 1 recommendation, low quality evidence). A possible exception includes patients with ≥80% carotid artery stenosis and high anatomic risk for carotid endarterectomy. (J Vasc Surg 2008;48:480-6.)

SVS Guidelines: Hobson et al, 2008

Stenosis	Sx	Asx	Rx	Rec	Evid
<50%	x		OMT	I	H
<60%		x	OMT	I	H
>50%	x		CEA+OMT	I	H
>50%+HOR	x		CAS	II	L
>60%		x	CEA+OMT	I	H
>60%		x	No CAS	I	L*

*consider for >80% High Anat Risk

CREST: carotid revascularization endarterectomy vs stent trial

- 2522 pts, 2010
- mean FU 2.5yrs
- Results of primary endpoint
  - PO-CVA, MI, death, IP-CVA
  - 30 day: CAS 5.2%, CEA 4.5%
  - 4yr (av2.5yr): CAS 7.2% CEA 6.8%

Future of Carotid Therapy

- Randomized trial: CEA vs CAS vs BMT
  - Asymptomatic and Symptomatic arms
  - Difficult to fund and initiate
  - Will take years to complete

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