Carotid Duplex Surveillance May Not Be Necessary after CEA with Patch Closure

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Background

• The incidence of post-CEA stenosis ranges from a few % to 36%
• Depends on: Dx methods
  Criteria used
  Length of follow-up
  Type of closure

Post-CEA Surveillance

• Several studies reported on value of postop. carotid DUS surveillance
• Most had small sample size and/or didn’t analyze cost-effectiveness
• Advantages: detection of sig. restenosis before onset of neuro events
• Aids in prevention of potential strokes
• FU on contralat. carotid artery stenosis
• No consensus has been reached

Speaker Disclosure:
– Nothing to Disclose
Cons of Routine Postop. CDU

• Postop. CEA st. is benign in nature
• Therefore, a large number of strokes may not be prevented by surveillance
• Routine surveillance after CEA is not efficacious

Patient Population/Methods

• Retrospective analysis of prospectively collected data during recent 3-yr. period
• 501 CEA pts. with patch closure
• All had immediate postop. DUS and at 1, 6, 12 months and then annually
• Restenosis defined as: abnormality that was not detected on first immediate postop. DUS
• Used previously validated carotid DUS criteria to define ≥50% & ≥80% post-CEA restenosis

Cost Analysis of Post-CEA DUS Surveillance

• Used hospital charges to estimate cost of postop. DUS surveillance
• Estimation method: Charge for single DUS x mean no. of DUS x no. of CEs
• Similar calculation → using actual global reimbursement to hospital
• Payer mix: 60% Medicare, 30% other insurance, 5% Medicaid, 5% self-insured or no insurance
• Estimated reimbursement: $399 x mean no. of DUS x no. of CEs

Results

• Out of 501 CEAs, 12 didn’t have immediate postop. DUS (for technical reasons or because patients wanted to leave)
• Of 489 CEAs: 10 had residual disease
• 37 had no 2nd DUS
• 442 had more than one DUS

Late Follow-up/Post-CEA Restenosis

• Mean follow-up: 20.4 mos. (range: 1-63 mos.)
• Mean no. of postop. DUS: 3.6 (range: 1-7)
• Mean time to ≥50-%80% post-CEA restenosis: 14.7 mos. (range: 1-35 mos.)
• Mean time to ≥80% post-CEA restenosis: 19.8 mos.
• Mean time to restenosis for whole series: 19.3 mos. (range: 1-56 mos.)

• 15/442 (3.1%) had ≥50% restenosis
  – 9 with 50-%80% restenosis
  – 4 with ≥80-99% restenosis
  – 2 late carotid occlusions
• No statistically sig. difference between pts. with normal and mild stenosis on immediate postop. DUS on rate of ≥50% restenosis (11/397, 2.8% vs 4/45, 8.9%, p=0.055)
**Post-CEA Restenosis & Symptoms**

- All 15 pts. with restenosis were Asx., except 1 with ≥80% restenosis (TIA)
- 4 pts. had ≥80% restenosis:
  - 2 had CAS
  - 2 were observed

**Freedom from >50 & > 80 Restenosis**

<table>
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<td>48</td>
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**Cost Analysis of Post-CEA Surveillance**

- Overall cost (hospital charge) of surveillance: $1,408,320
- Overall reimbursement: $702,400 to detect only 4 patients with ≥80-99% stenosis, who may have been potential candidates for reintervention
- Only 2 of these 4 underwent stenting

**CDUS Surveillance after CEA: Review of Literature**

- Low rate of restenosis
- Low probability of postop. stroke
- Poor cost-effectiveness

  **Meanwhile:**
  - Progression of contralat. sten. → justify DUS surveillance

  (Kownator, Ann Cardiol Angiol, Paris, 2004)

**Value of CDUS Surveillance for Stroke Prevention**

- Review of 9-yr. vascular surgical database
- All pts. enrolled in CDUS surveillance program for Asx CAS or Post-CEA: 2000-2008
- 11,531 CDUS performed on 3,003 pts. (mean: 3.84 scans per pt.) - CEA for Asx CAS in 225 pts. (8%)
- Prevented 13 strokes (871 CDUS per stroke prevented)
- Mean cost of each CDUS - $332
- Total cost of CDUS surveillance program was approx. $3,830,000 or $290,000 per stroke prevented

Value of CDUS Surveillance for Stroke Prevention (Cont.)

- Conclusions
  - Costly and inefficient
  - Reappraisal of value of CDUS surveillance in stroke prevention is warranted

Updated SVS Guidelines for Management of Carotid Stenosis

- Postop DUS <30 days is recommended (assess CEA site)
- If ≥50% sten. → carotid DUS surveillance
- If normal: 1ry closure → CDUS surveillance
  - Patch closure → CDUS surveillance only for multiple risk factors (J. Ricotta and A. AbuRahma, JVS, Sept, 2011)

Timing of Postop CDUS Surveillance

- Initial CDUS within 1 mo.: residual stenosis
- Repeat @ 6-12 mos. for progression
- Repeat @ 1-2 yrs. as long as restenosis and contralateral stenosis remain <50%
- Repeat q 6 mos. if ≥50% restenosis
- Repeat when Sx
- If post-CEA DUS and/or 6-12 mos. is nl → none

Conclusions

- Routine frequent postop. DUS surveillance after CEA with patch closure may not be necessary and/or cost effective, particularly if the immediate postop. DUS was normal or had minimal disease

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Thank you!