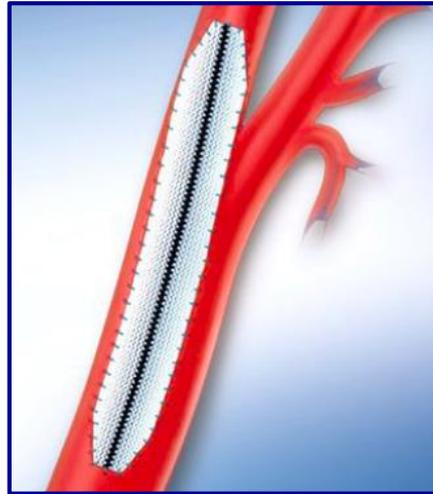


# Managing the Infected Carotid Patch



Mike Wyatt



THE SOCIETY FOR  
VASCULAR TECHNOLOGY OF  
GREAT BRITAIN AND IRELAND

**The Vascular Societies' Annual  
Scientific Meeting 2018**

*In conjunction with the Vascular Society of Great Britain and Ireland, the Society of Vascular Nurses, and the Society for Vascular Technology of Great Britain and Ireland.*

**28th – 30th November 2018**  
Scottish Event Campus, Glasgow

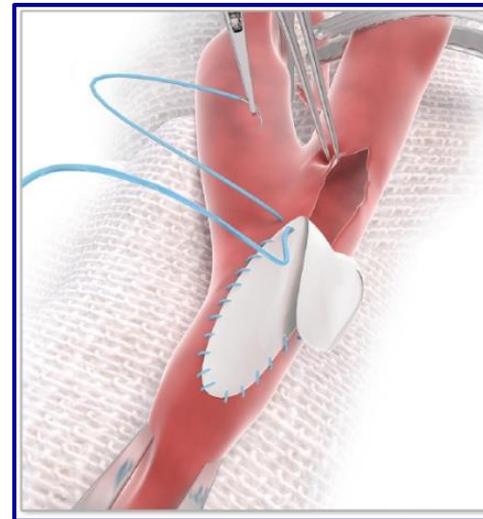
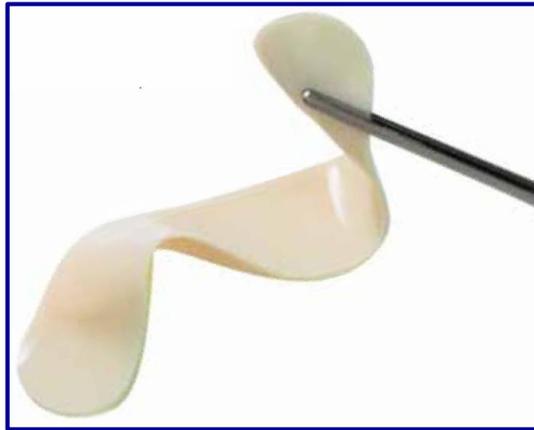
# Freeman Carotid Experience

- 13 years (2004 – 2017)
- 1420 carotid interventions
- 8 infections – 0.56%
- Dacron patches
- Now all bovine pericardium



# Scope of the problem

- Essentially synthetic patches
- Little data on bovine pericardial patches





## Annals of Vascular Surgery

Volume 50, July 2018, Pages 218-224



Clinical Research

# Durability of Carotid Endarterectomy with Bovine Pericardial Patch

Presented as an oral presentation at the Society for Clinical Vascular Surgery (SCVS) March 21, 2017 at Disney's Yacht & Beach Club, Lake Buena Vista, Florida.

Warner A. Oldenburg  , Tariq Almeray, Mahmoud Selim, Houssam Farres, Albert G. Hakaim

- 680 patients over 7 years at Mayo Clinic
- Median FU – 39.6 months
- No patch infections reported

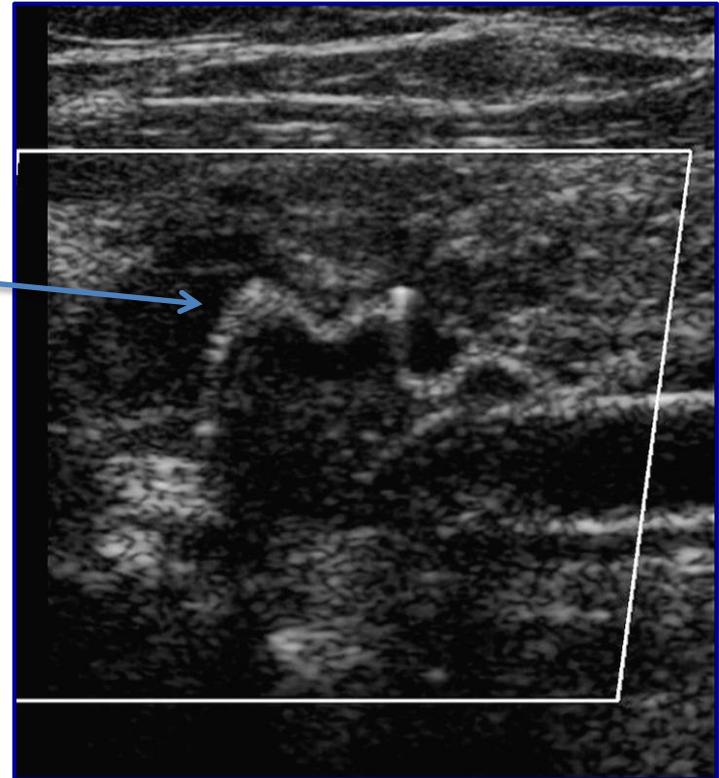
# Carotid Patch Infection Presentation

- Less than 2m – 33%
  - Wound infection
  - Abscess formation
  - Patch rupture
- More than 6m – 63%
  - Chronic sinus discharge
  - False aneurysm



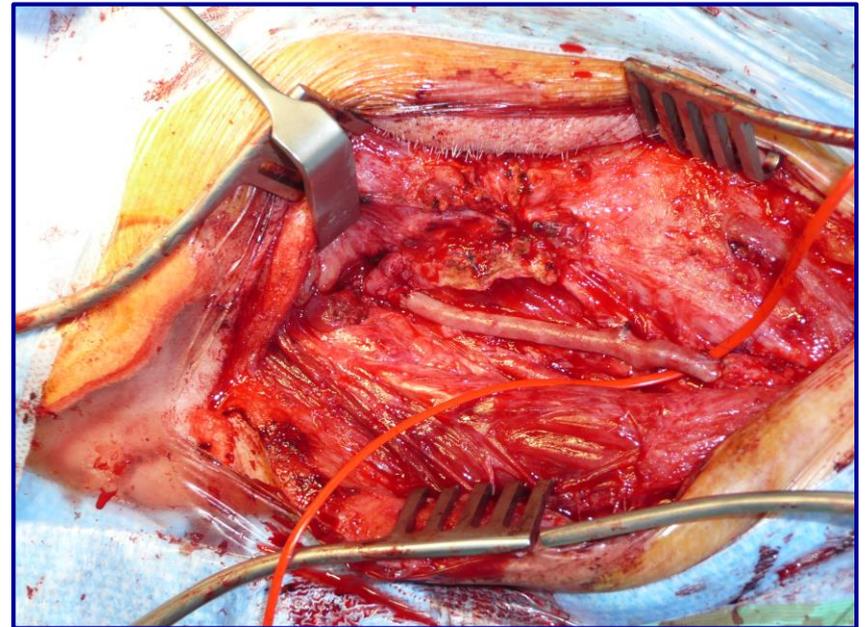
# Investigation

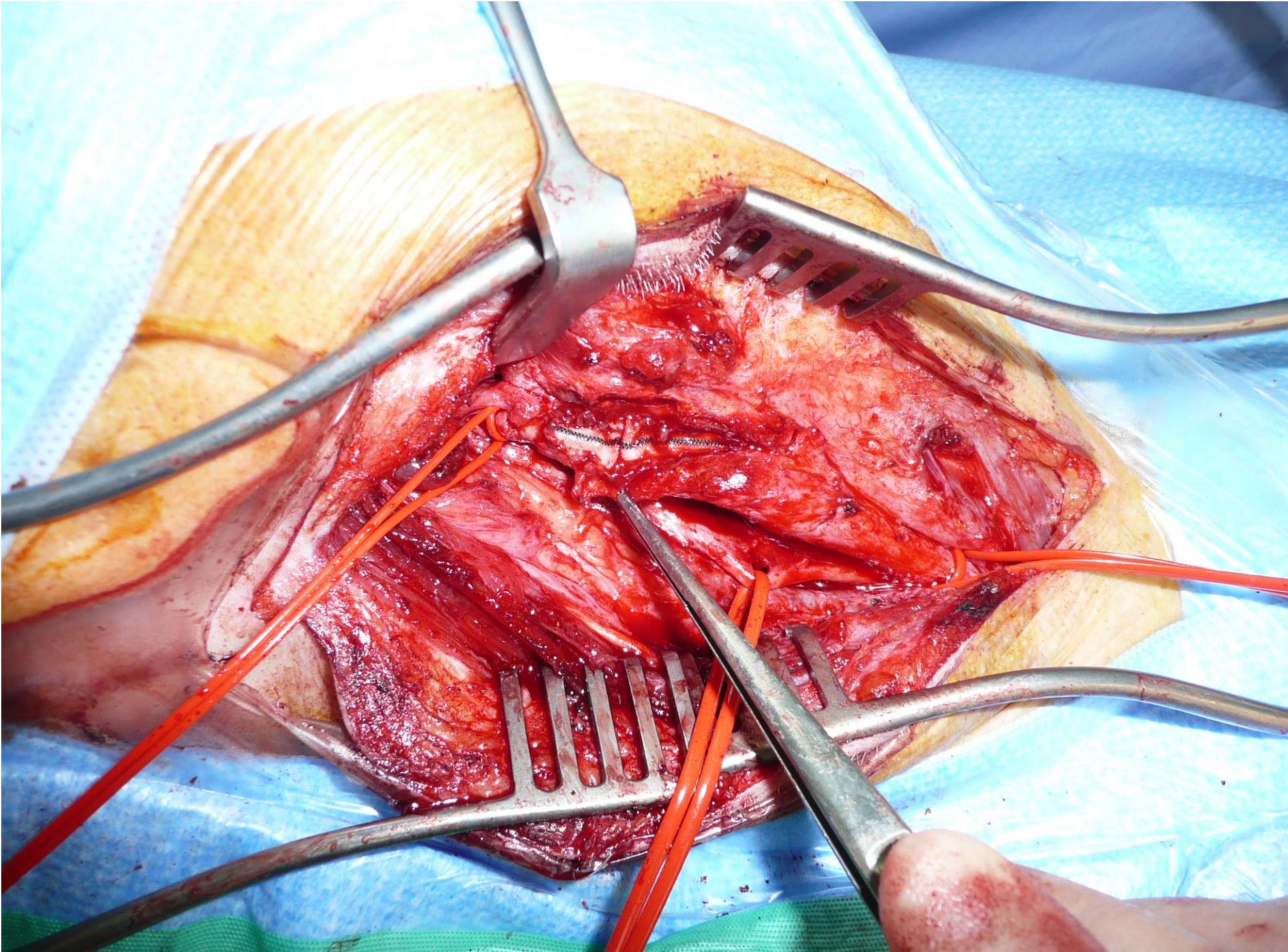
- Carotid duplex
  - False aneurysm
  - Fluid/gas
  - Residual stenosis
  - Patch corrugation
- CTA
  - Dissection
  - Distal ICA
  - Endovascular suitability
- Determine organism
  - Swabs/blood cultures
  - Staphylococcus/Streptococcus – 90%

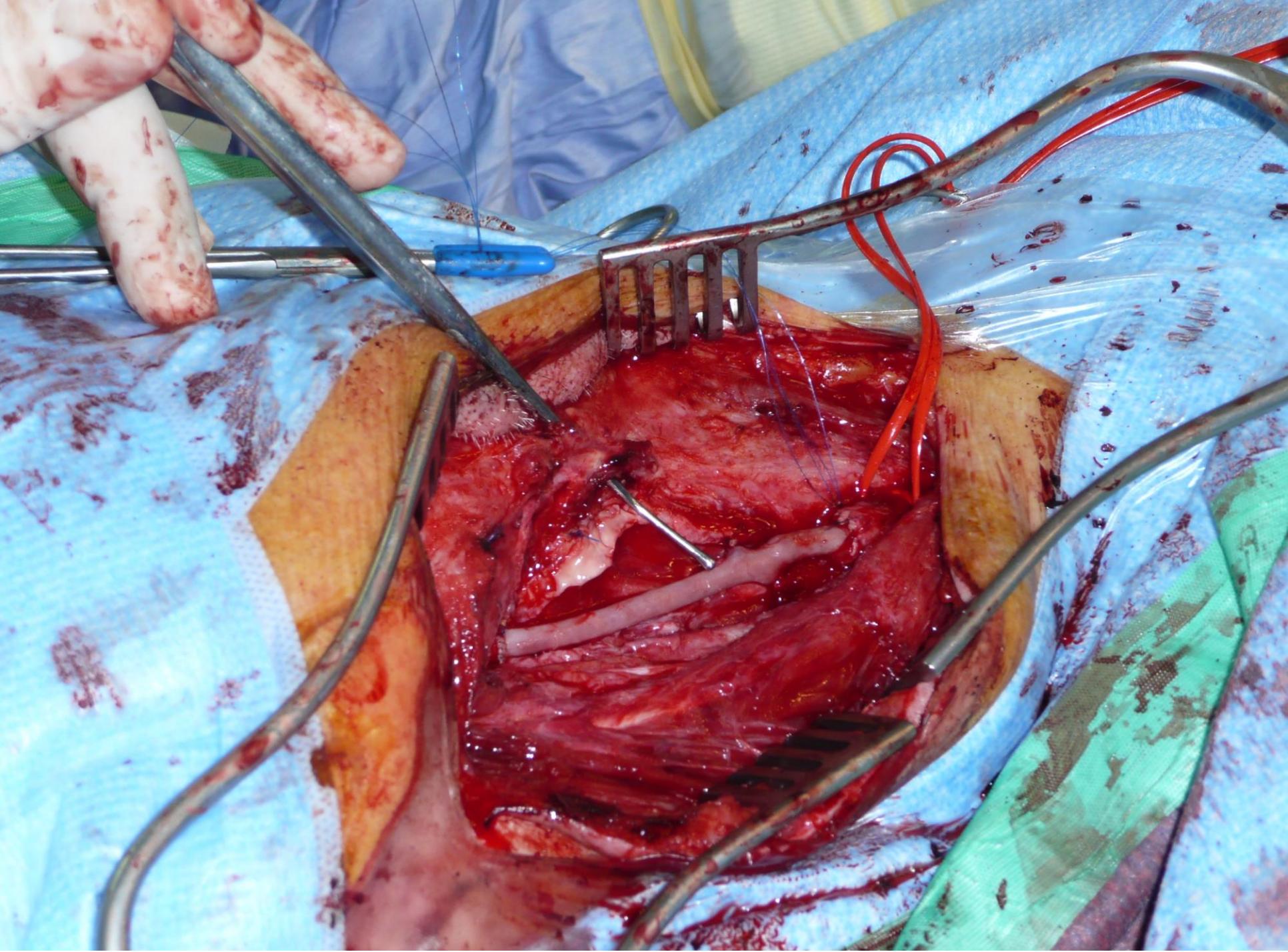


# Management

- Gold standard is:
  - Patch excision
  - Debride all infected tissues
  - Shunting
  - Vein graft repair
- Seek help from ENT if high
- Ligation – 40% risk of stroke







# Alternatives

- Debridement
- IV antibiotics
- Antibiotic irrigation
- Muscle/flaps
- Skin grafts
- Negative therapy
- Stent grafts



# EndoVAC Hybrid Repair

Eur J Vasc Endovasc Surg (2016) 51, 724–732

## Editor's Choice — Long-term Outcome After EndoVAC Hybrid Repair of Infected Vascular Reconstructions

K. Thorbjørnsen <sup>a,b</sup>, K. Djavani Gidlund <sup>a,b</sup>, M. Björck <sup>a</sup>, B. Kragsterman <sup>a</sup>, A. Wanhainen <sup>a,\*</sup>

<sup>a</sup> Department of Surgical Sciences, Section of Vascular Surgery, Uppsala University, Uppsala, Sweden

<sup>b</sup> Centre for Research and Development, Uppsala University/County Council of Gävleborg, Gävle, Sweden

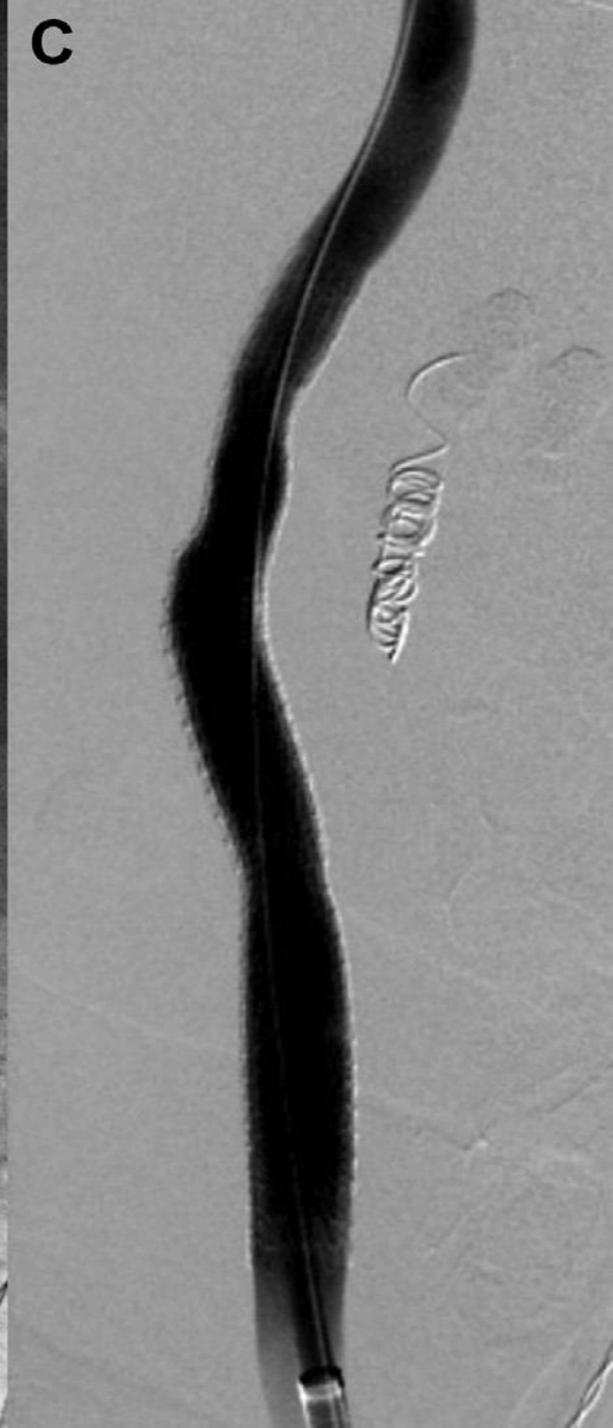
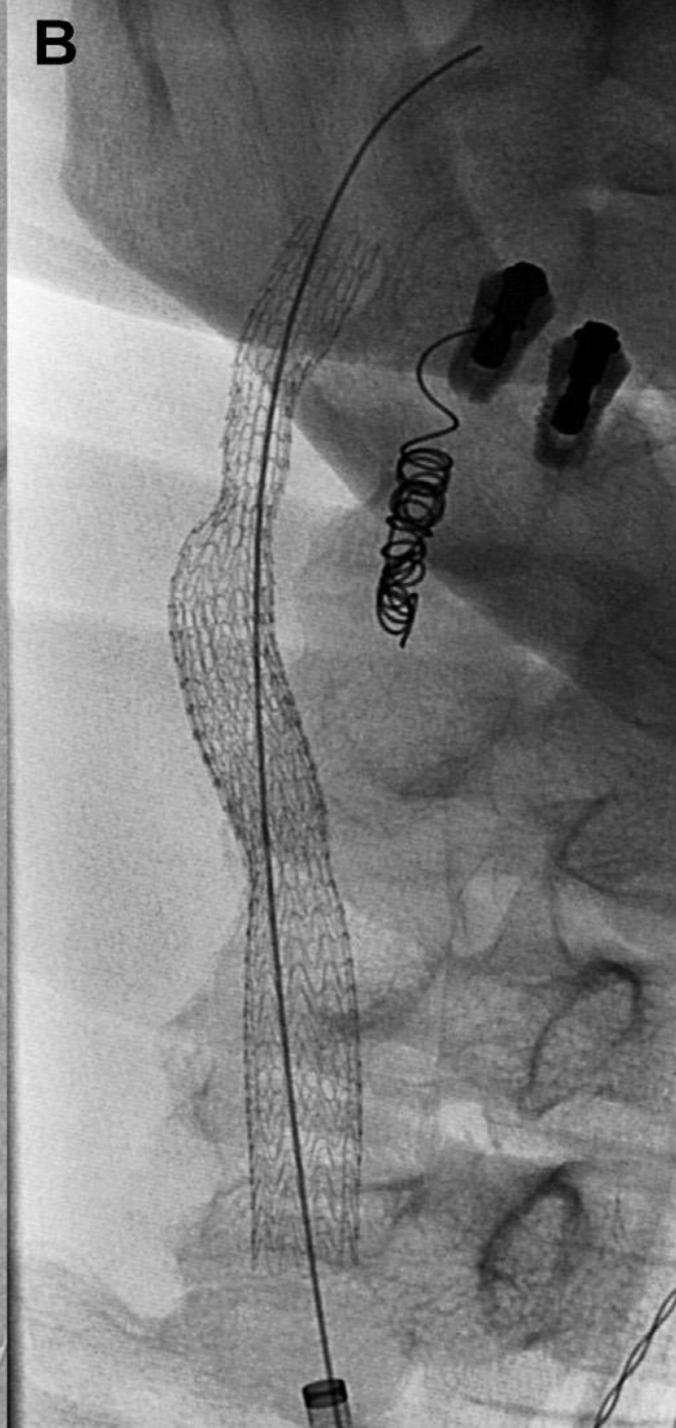
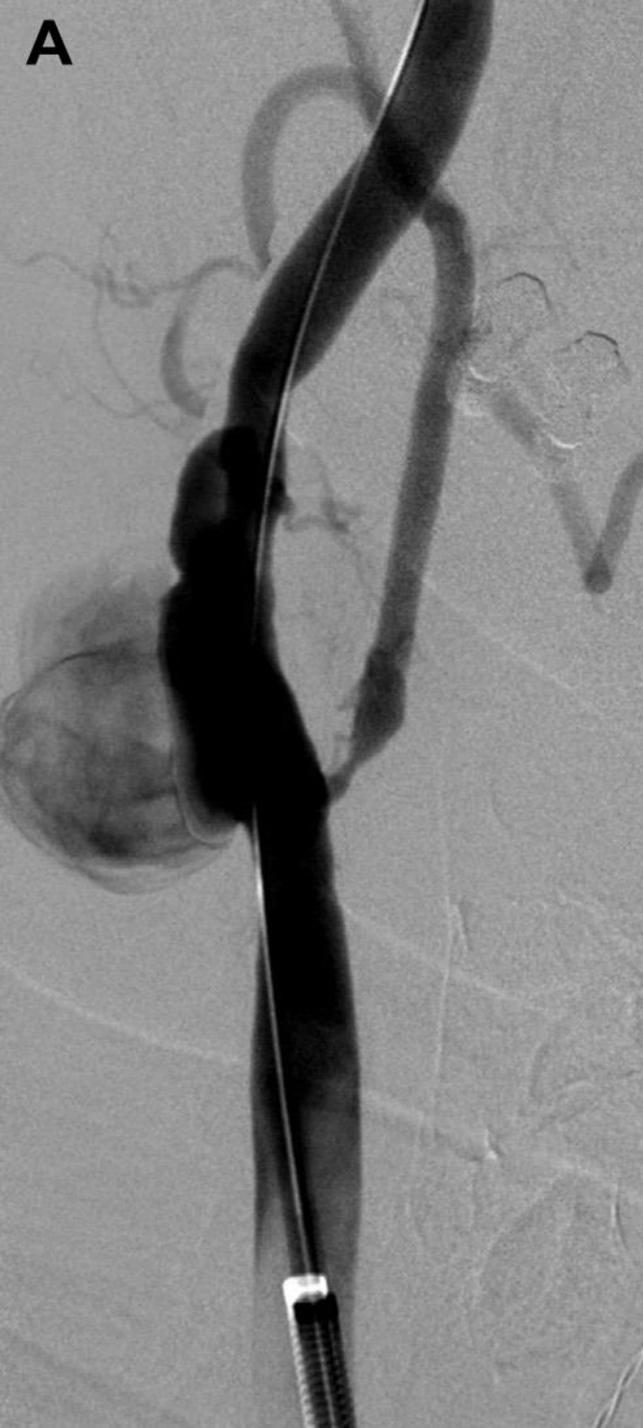
# EndoVAC Hybrid Repair

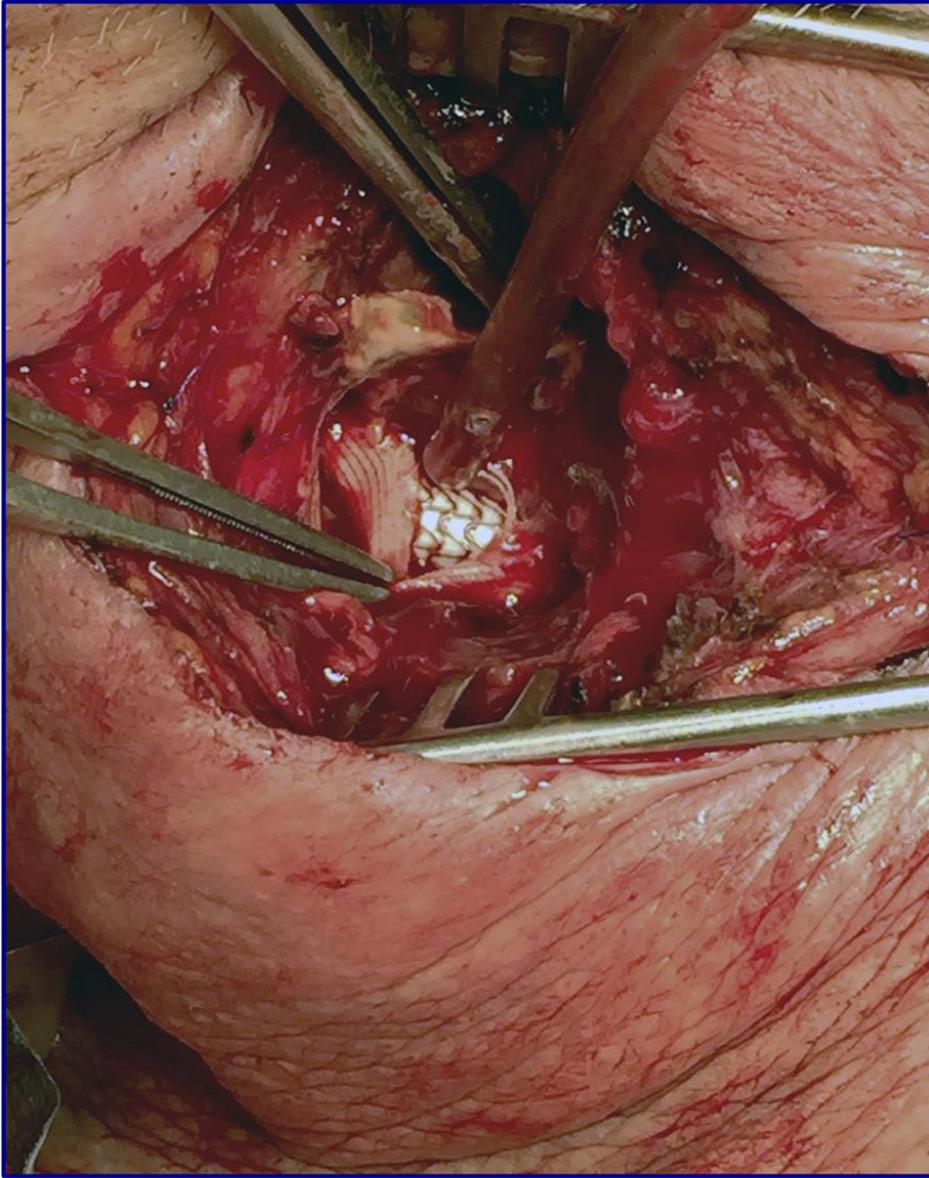
## Indications

- Where radical/VAC therapy not indicated/feasible
  - Bleeding
  - Adverse anatomy
  - Severe comorbidity

## Technique

- Stent graft relining
- Surgical revision
- VAC treatment
- Antibiotics





# Patients

- Nov 2007 – June 2015
- 6 infected carotid patches

Case	Age (y)/sex	Primary procedure	Graft material	Time from primary procedure to infection	Local signs and symptoms of infection	Culture
1	77/M	Carotid patch	Polyester	14 mo	Neck mass with fistula, recurrence after previous open surgical revision	<i>Propionibacterium acnes</i> , CNS
2	72/F	Carotid patch	Polyester	4 mo	Neck mass with fistula	CNS
3	63/F	Carotid patch	Polyester	2 mo	Neck mass with fistula, recurrence after previous open surgical revision	CNS
4	67/F	Carotid patch	Polyester	4 mo	Neck mass with fistula	Negative
5	68/F	Carotid patch	Polyester	2 mo	Neck mass	Negative
6	63/M	Carotid patch	Polyester	5 y	Infected rapid expanding pseudoaneurysm	<i>Staphylococcus aureus</i> , <i>Propionibacterium acnes</i>

# Results

- 100% technical success
- Antibiotics median 3 months

Case	Follow up (mo)	Negative 18-FDG PET/CT scan during follow up	Outcome of local infection	Complications	General outcome
1	49	Yes (3, 5, and 8 mo, and 3 and 4 y)	Healed	Moderate stent graft stenosis (asymptomatic) after 37 mo	Alive
2	50	Yes (3 mo)	Healed	—	Alive
3	60	Yes (3 months and 2-years)	Healed	—	Alive
4	68	Not performed	Healed	Transient hypoglossal nerve palsy	Alive
5	51	Yes (6 mo)	Healed	—	Death (cardiac)
6	3	Not performed (planned)	Healed	—	Alive

- Useful in selected cases

# Imposters

Eur J Vasc Endovasc Surg (2017) 54, 423–429

## Late Dacron Patch Inflammatory Reaction after Carotid Endarterectomy

M. Alawy<sup>a</sup>, W. Tawfick<sup>a</sup>, M. ElKassaby<sup>a</sup>, A. Shalaby<sup>b</sup>, M. Zaki<sup>a</sup>, N. Hynes<sup>c</sup>, S. Sultan<sup>a,c,\*</sup>

<sup>a</sup> Western Vascular Institute (WVI), Department of Vascular and Endovascular Surgery, University College Hospital, Galway (UCHG), Newcastle Road, Galway, Ireland

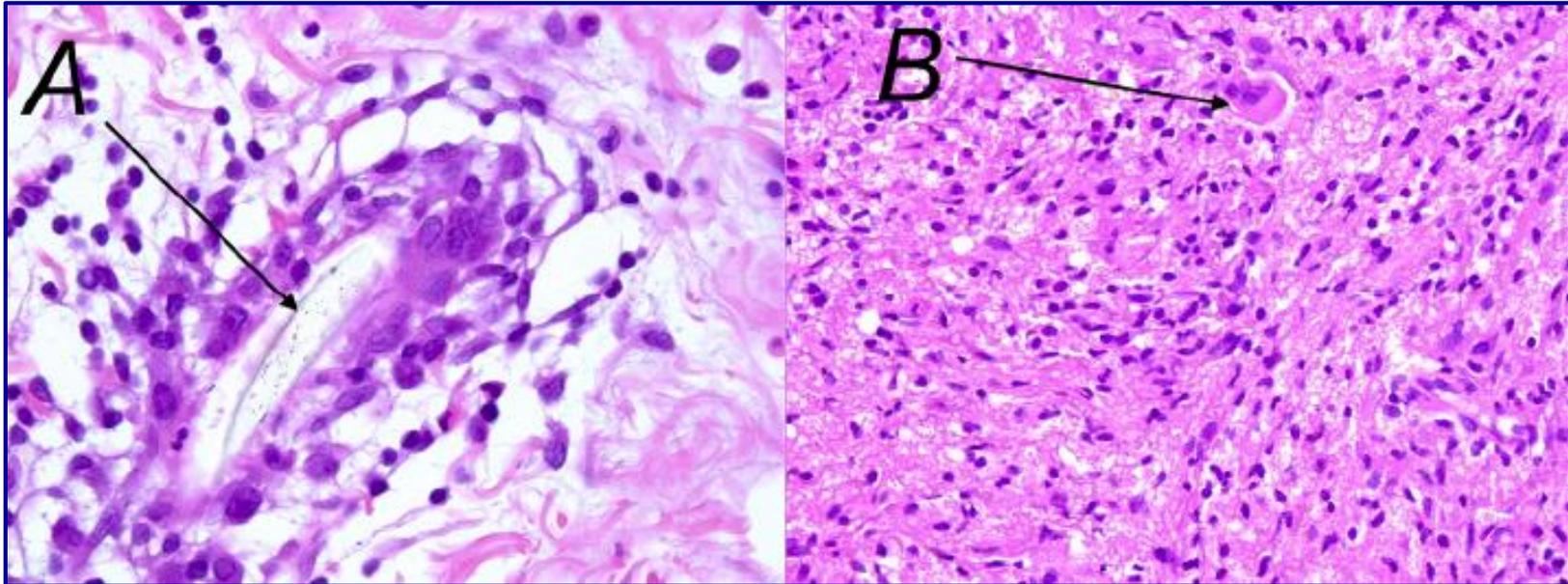
<sup>b</sup> Department of Histopathology, University College Hospital, Galway (UCHG), Newcastle Road, Galway, Ireland

<sup>c</sup> Department of Vascular Surgery, Galway Clinic, Doughiska, Galway, Ireland

### WHAT THIS PAPER ADDS

The microbiological and histopathological assessment performed in the cases, shows that not all Dacron patch reactions are secondary to infection. If this is confirmed in other case series, then a more conservative approach might be adopted, to avoid the high morbidity associated with re-intervention.

# Histology



- A – birefringent foreign body material
- B – surrounding inflammation with foreign body giant cell

# Bioglue

EJVES Short Reports (2017) 37, 12–13

## CASE REPORT

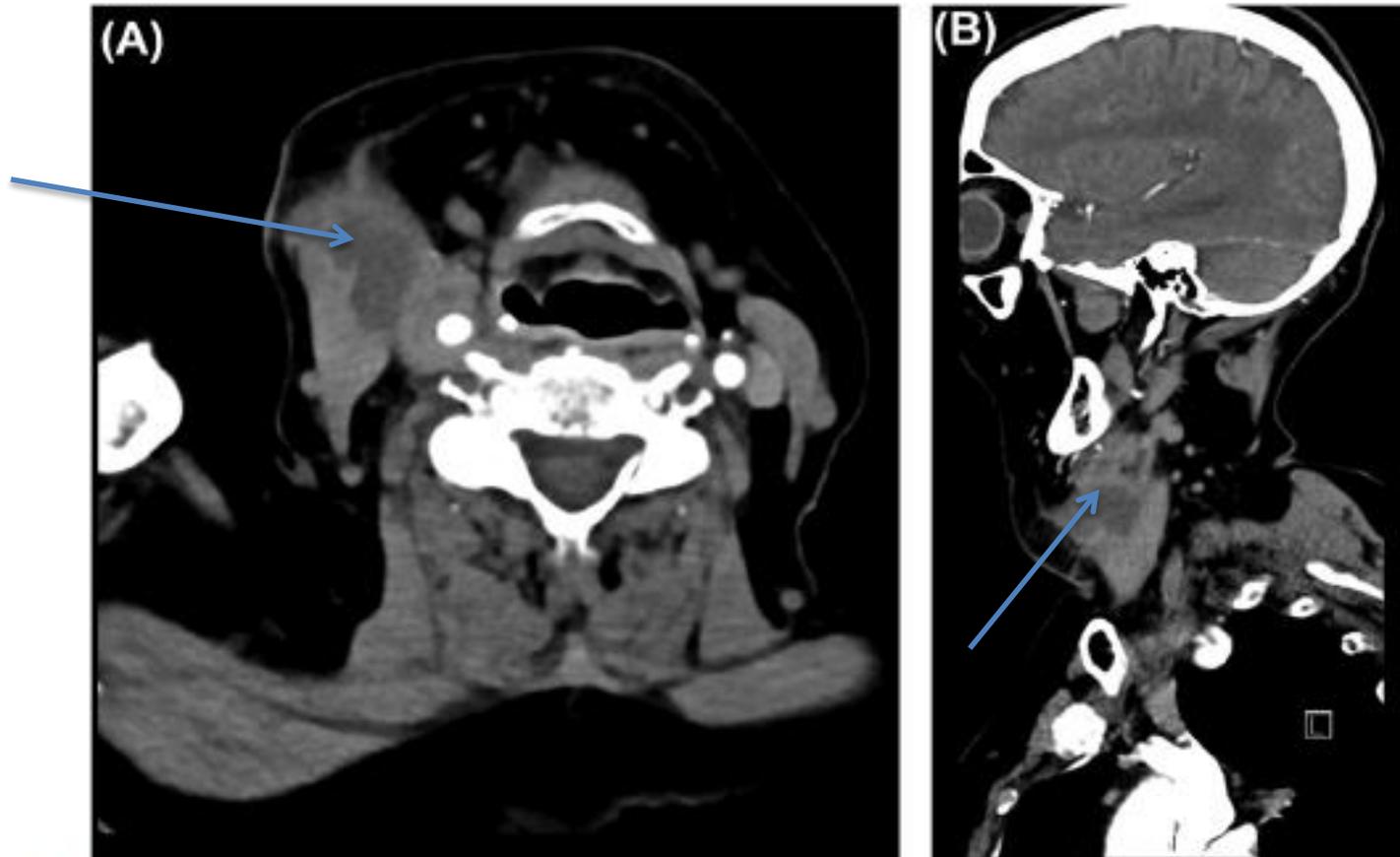
### Late Sterile Abscess Formation in Carotid Endarterectomy Following Use of BioGlue: A Word of Caution

A. Singh<sup>\*</sup>, M. Wyatt, M. Clarke, L. Wales

Northern Vascular Centre, Freeman Hospital, Newcastle, UK

- 88 year lady
- 9m post CEA – enlarging fluctuant neck mass
- Apyrexial and systemically well
- Normal WBC

# CT Scan – features suggestive of an abscess



**Figure 1.** Collection relating to the right internal carotid artery demonstrated in axial (A) and sagittal (B) CT images.

# Explored

- Subcutaneous abscess debrided and washed out
- BioGlue remnants removed
- No patch infection and surrounding tissues healthy
- All cultures sterile
- Patient well at 6 months

# Summary

- Patch infection usually prosthetic.
- Devastating complication and gold standard is patch excision, debridement and vein graft repair
- Hybrid techniques may help
- Remember Dacron/BioGlue late tissue inflammatory reactions

# Further Reading

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The online version of this article is located at <http://www.minervamedica.it>

The Journal of Cardiovascular Surgery 2016 April;57 (2):137-44

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## 20 YEARS EVC: MANAGEMENT OF ARTERIAL DISEASES CAROTID ARTERY

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### Management of prosthetic patch infection after CEA

Ross NAYLOR

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“Review of 130 patients reported in world literature”