

Early Canadian Experience with the Nexus Arch Graft

Thomas Lindsay MDCM FRCS FACS

Professor of Surgery

Chief, Division of Vascular Surgery

University Health Network

University of Toronto

Disclosure

Speaker name: Dr Thomas Lindsay

I have the following potential conflicts of interest to report:

Consulting

Endospan, Cook

Aortic Arch Pathology

- Arch and proximal descending aorta repair challenging by all methods
- Approaches
 - Open Surgery with elephant trunk (ET)
 - Arch debranching and EVAR
 - Grafts Cook, Endospan Nexus, others
- Pathology treated: aneurysm and dissection
- No approved grafts in Canada or USA

A systematic review and meta-analysis of hybrid aortic arch replacement

Konstantinos G. Moulakakis^{1,2}, Spyridon N. Mylonas³, Fotis Markatis¹, Thomas Kotsis³, John Kakisis¹, Christos D. Liapis¹

Ann Cardiothorac Surg 2013;2(3):247-260

Results: Forty-six studies were eligible for the present meta-analysis: 26 studies with a total of 956 patients reported aortic arch debranching procedures, and 20 studies with 1,316 patients performed either 'frozen' or stented elephant trunk technique. The pooled estimate for 30-day/in-hospital mortality was 11.9% for the arch debranching group and 9.5% for the elephant trunk group. Cerebrovascular events of any severity were found to have occurred postoperatively at a pooled rate of 7.6% and 6.2%, while irreversible spinal cord injury symptoms were present in a pooled estimate of 3.6% and 5.0% in the arch debranching and elephant trunk group, respectively. Renal failure requiring dialysis occurred at 5.7% and 3.8% in both groups, while cardiac complications rate was 6.0% in the arch debranching cohort and pulmonary complication was 19.7% in the elephant trunk cohort.

Conclusions: Hybrid arch techniques provide a safe alternative to open repair with acceptable short- and mid-term results. However, stroke and mortality rates remain noteworthy. Future prospective trials that compare open conventional techniques with the hybrid method or the entirely endovascular methods are needed.

Editor's Choice — Subsequent Results for Arch Aneurysm Repair with Inner Branched Endografts, ☆

R. Spear ^a, S. Haulon ^{a,*}, T. Ohki ^b, N. Tsilimparis ^c, Y. Kanaoka ^b, C.P.E. Milne ^a, S. Debus ^c, R. Takizawa ^b, T. Kölbel ^c

Eur J Vasc Endovasc Surg (2016) 51, 380–385

Results: Twenty-seven patients were included in the study. Technical success was achieved in all cases. No patients died during the 30 day post-operative period. Early neurologic events included two major strokes (7.4%) and one minor stroke (3.7%). Transient spinal cord ischemia with full recovery was observed in two patients (7.4%). Four patients (14.8%) underwent early (<30 day) re-interventions; these were for an access complication, an ischemic limb and exploration of the left ventricle through a sternotomy in two patients. During follow up (median 12 months), one patient (3.7%) died from a remote thoraco-abdominal aneurysm rupture. There were three Type 2 endoleaks (11.1%). Two re-interventions (7.4%) were performed, one to treat a Type 2 endoleak and one to treat a septic false aneurysm. A significant decrease in overall mortality was observed when comparing patients from the early experience with patients from the current report.

Conclusions: The early outcomes associated with this technology are favorable. Branched endografting of aortic arch aneurysms should be considered in patients unfit for open surgery.

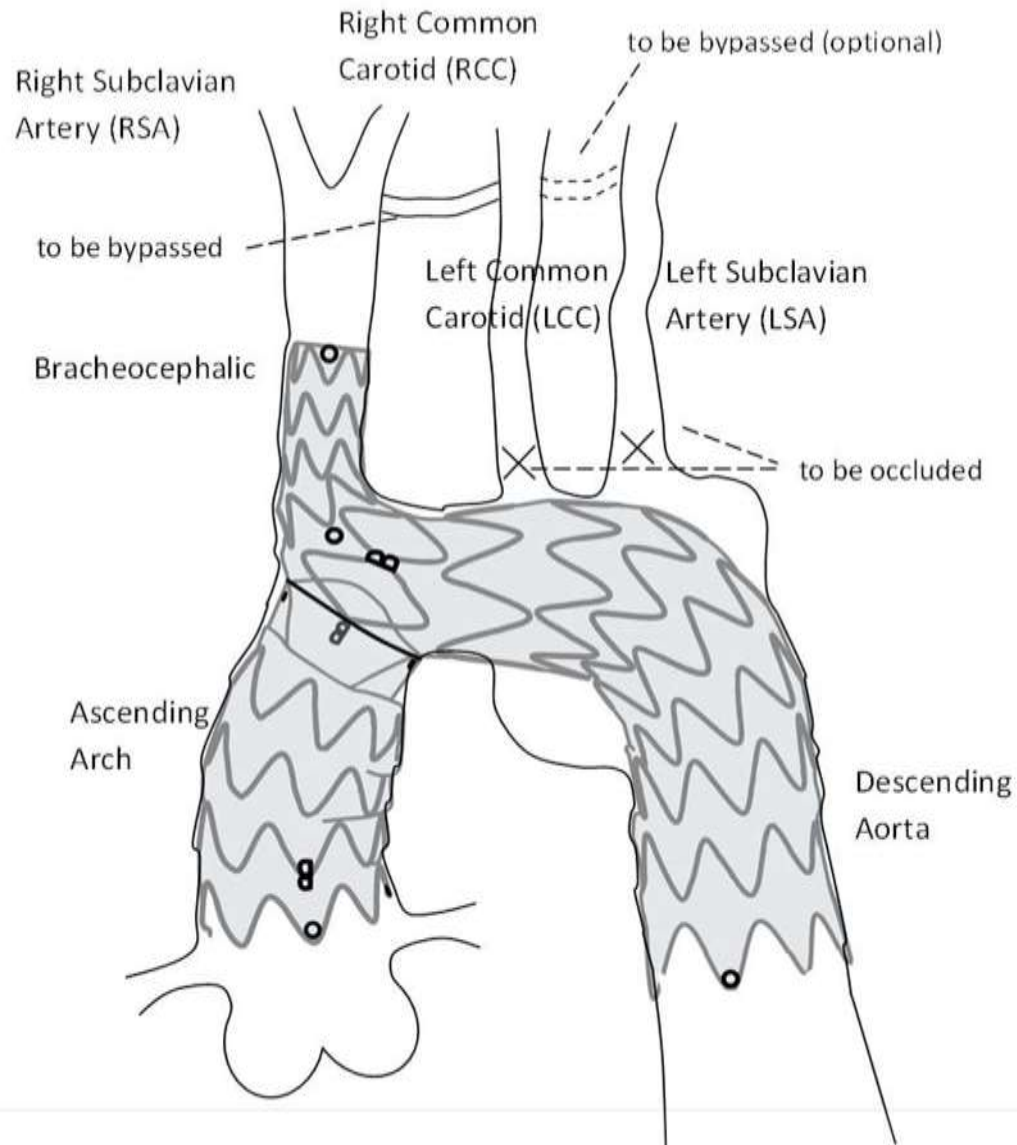
- Improved outcomes in evolving area
- Early Canadian experience at our center was not as favorable

Nexus Arch Endograft

- Modular off the shelf design
- Minimizes ischemia to brain and limbs
- Reduced arch manipulation
- Nitinol construction, MRI compatible, 20 Fr
- Requires arch debranching
- Pre-operative hands on training on the elastomeric model of the specific subject treated
- Through and through positioning and controlled deployment



Pre Deployment Arch Debranching



Nexus Arch Endograft

- Two graft implantation programs
 - The FIM study is conducted in 3 centers (initiated in August 2014):
 - Switzerland (Zurich), Prof. Lachat
 - Czech Republic (Hradec Kralove), Prof. Krajina
 - Italy (Rome), Prof. Mangialardi
 - 7 subjects were enrolled up to now
 - Compassionate usage
 - 18 Nexus cases were performed, up to now, in the Compassionate Pathway:
 - Switzerland (Zurich), Prof. Lachat – 6 subjects
 - Italy (Rome), Prof. Mangialardi – 3 subjects
 - Italy (Modena), Prof. Coppi – 1 subject
 - Italy (Milan), Prof. Nano – 1 subject
 - Canada (Montreal), Prof. Abraham – 1 subject
 - Canada (Toronto), Prof. Lindsay – 5 subject
 - India (Chennai), Prof. Goppi – 1 subject

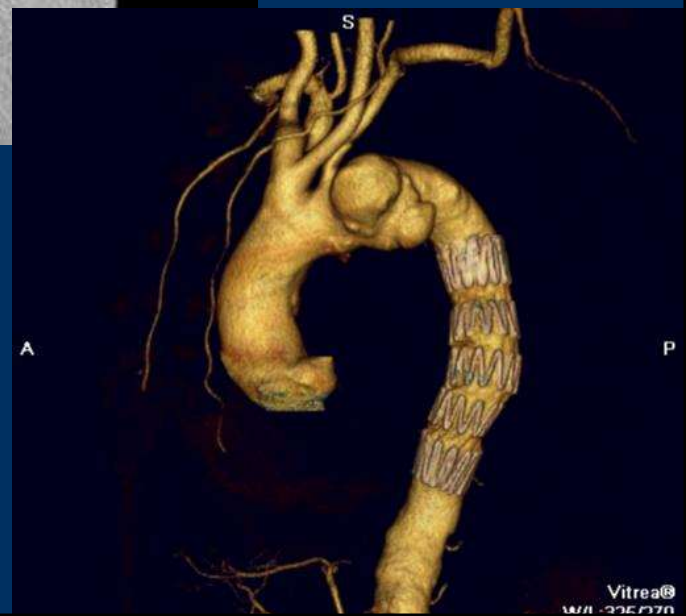
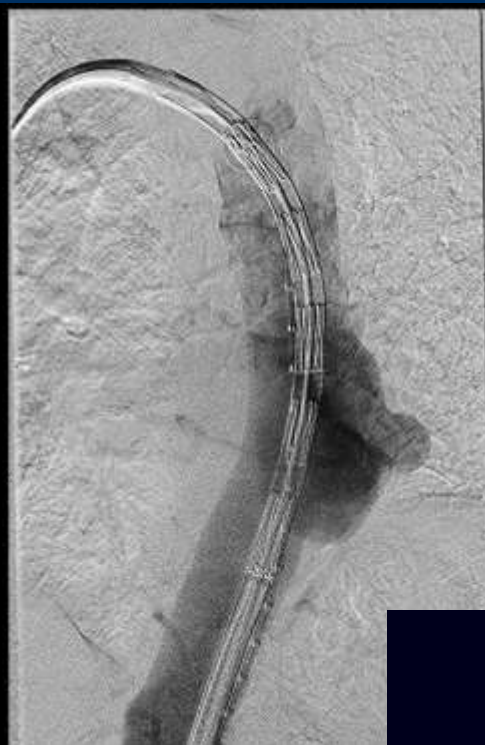
Toronto General Hospital Cases

- 5 cases to date
 - 3 Arch Aneurysms
 - 2 Dissections
 - Type B requiring proximal coverage
 - Previous Type A with enlarging descending false lumen
 - All had significant co-morbidities (Age, CHF, obesity, renal dysfunction)
- All cases had first stage
 - Carotid-Carotid Bypass
 - Carotid-Subclavian Bypass (1 carotid axillary bypass)

Toronto General Hospital Case 1

Clinical Details Case 1

- 81 yo male
- 2 saccular aneurysms
 - Mid Thoracic 8 cm
 - Distal arch 6.2 cm

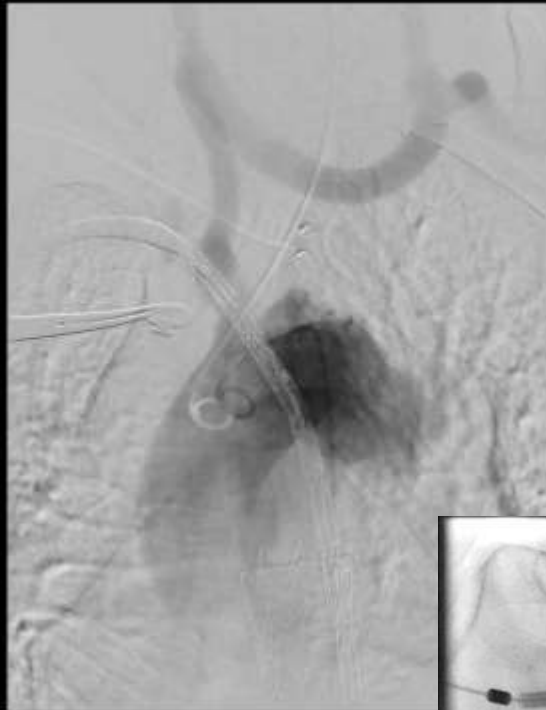


Toronto General Hospital Case 1

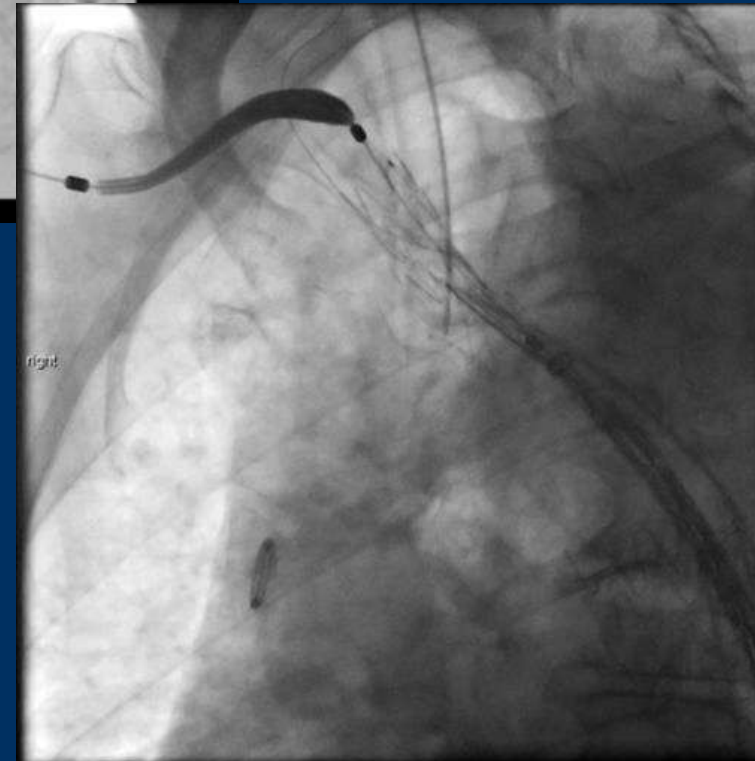
right



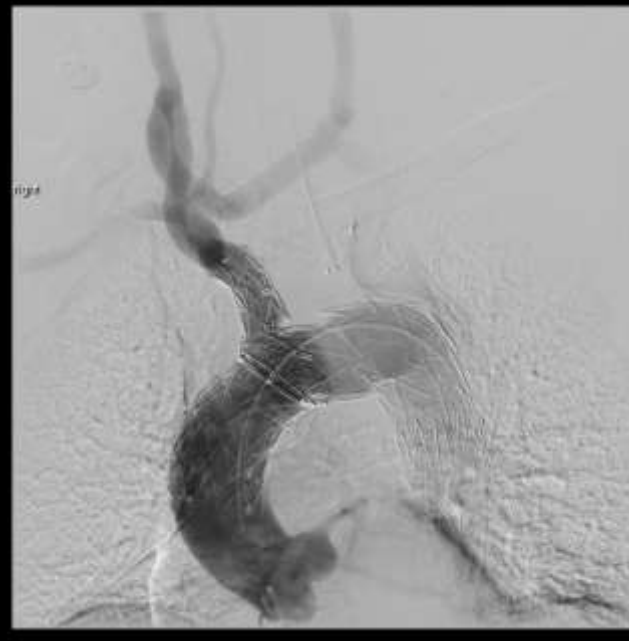
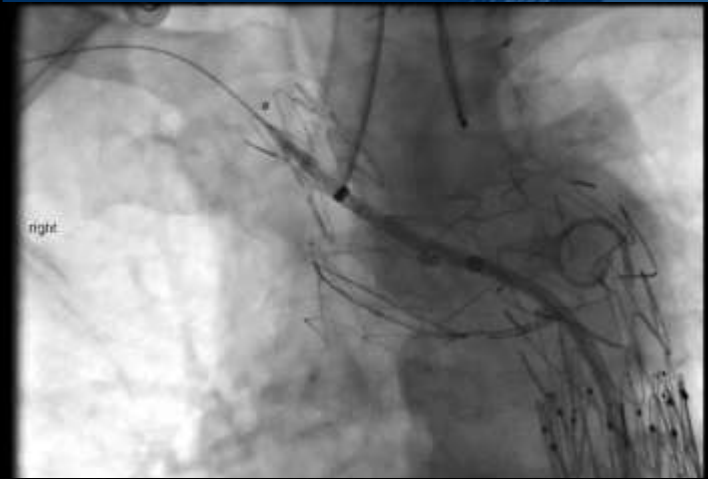
right



right



Toronto General Hospital Case 1



Summary of Cases

- Complications
 - 1 graft exposure requiring replacement with femoral vein
 - 1 ascending hematoma evolving into dissection requiring repair
 - No proximal endoleaks
 - No Strokes, renal failure, spinal ischemia or early deaths
- Documented sac shrinkage in one case

Age	mean 75 (65-81)
Contrast	136 ml
Flouro Time	37.4 minutes
Debranch LOS	9 days (5-12)
Arch graft LOS	8.2 days (5-12)
Total LOS	17.2 days (12-22)
Follow up Duration	1 yr, 3, 3, 0.5 0.5 months
CVA	0



Conclusions

- Novel modular design with minimal arch manipulation
- Arch debranching is still a major procedure
- Favorable early results with no mortality, spinal cord ischemia or strokes
- Applicable to arch aneurysms and type A dissections with ascending aortic grafts in place that require arch and descending aortic coverage

Early Canadian Experience with the Nexus Arch Graft

Thomas Lindsay MDCM FRCS FACS

Professor of Surgery

Chief, Division of Vascular Surgery

University Health Network

University of Toronto