Recent Insights on Kommerell’s and related Aortic Arch Anomalies

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DISCLOSURE
Medtronic: Consulting, Speaking, Sales Training

1735 – first description of aRSA (Hunauld, at autopsy)
1761 – extrinsic compression of esophagus (Bayford)

Lusus naturae (freak of nature)

Dysphagia lusoria (Autenrieth early 1800s)
Arteria lusoria (Arkin 1926)

1936 – Kommerell made first clinical diagnosis of esophageal compression by a posterior coursing lusorian artery with a diverticulum

Kommerell Diverticulum

Aberrant subclavian arteries course:
- behind the esophagus 80%
- between the trachea and esophagus 15%
- in front of the trachea 5%
Kommerell's diverticulum is a remnant of the embryonic dorsal aorta, and it is always associated with an aberrant subclavian artery.

Reported prevalence of “normal-anatomy” left side arch with aRSA: 0.7-2.0% of the population

K Type 1

Classification and incidence

The classification of aortic diverticula proposed by Habibovic et al. is most useful and deserving of universal adoption:

- Type I: Diverticulum occurring in left (so-called “normal”) aortic arch in association with an aberrant right subclavian artery (Figure 1).

- Type II: Right-sided aortic arch with mirror image branching, usually associated with cyanotic congenital heart disease (Tetralogy, Truncus Arteriosus, etc.)

- Type III: Right sided aortic arch with isolation of the left subclavian artery, most rare type: 0.8% can be rarely associated with congenital heart disease.

3 TYPES OF RIGHT-SIDED AORTIC ARCHES:

Type I: Right-sided aortic arch with mirror image branching, usually associated with cyanotic congenital heart disease (Tetralogy, Truncus Arteriosus, etc.)

Type II: Right-sided aortic arch with aberrant left subclavian artery, accounts for 40% of all right-sided arches associated with Kommerell's Diverticulum and right-sided DTA rarely produces symptoms and is usually incidental although it can infrequently cause esophageal and/or tracheal compression rarely associated with other cardiovascular abnormalities

Type III: Right sided aortic arch with isolation of the left subclavian artery most rare type: 0.8% can be rarely associated with congenital heart disease.
58y man referred for Rx of a large Kommerell's diverticulum associated with an aberrant LSA (aLSA) and right side arch (and right side descending). History of recent right posterolateral thoracotomy and aborted attempt at surgical exposure and repair.

Staged hybrid repair:
- Median sternotomy, aorta-based bypass to Rt+Lt CCAs
- Rt carotid-axillary bypass, trans-femoral endografting, vascular plug closure of aLSA

Trans-femoral endografting, vascular plug closure of aLSA

Modified from Idrees et al. 2014
Closure of the involved SA just beyond the diverticulum (Vascular Plug or Coils) is an important common component to all these techniques. BUT MUST keep plug away from the esophagus and the midline aligned with the spine!

Measuring Kommerell

Treatment indications for adults with asymptomatic Kommerell’s:

- >5.0cm
- >3.0cm

Kommerell patients presenting with mediastinal compression symptoms.

Type 3

Ductal or Non-Kommerell