Twinning: Coronary Artery Disease in Monozygous Twins

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INTRODUCTION

Coronary artery disease (CAD) is one of the leading causes of death in the US. When obtaining a detailed history from a patient with suspected CAD, family history is an important part. There have been multiple studies showing a correlation between family history of CAD, however there is little known about angiographic findings in twin pairs with CAD.1

CASE REPORT

TC is a 42 year old male with a history of chronic pancreatitis, type 1 DM, HTN former ETOH and cocaine abuse that presents with uncontrolled blood pressure despite medical compliance and worsening lower extremity edema.

Family history significant for a twin brother who passed away from an MI at 40. Decision was made for ischemic evaluation.

- LHC Findings:
  - LCX: 50% stenosis in proximal segment. Distal segment with 80% focal stenosis
  - PDA: 90% mid segment stenosis
  - LAD: ostial and proximal 40% stenosis, 90% midsegment, diffuse distal disease
  - RCA: 100% midsegment occlusion

- Twin Brother’s LHC Findings 2 years ago (Age 40):
  - LCX: 99% stenosis in LPDA
  - LAD: previous stent now occluded with thrombus
  - RCA: 90% midsegment stenosis

SIMILAR CASE STUDIES

- Frings et al (2000) compared coronary anatomy and location of lesions in monozygotic and dizygotic twins (total 6 twin pairs)
  - Luminal diameters and length of the LM were similar in all twin pairs
  - 2/3 of the monozygotic twins had differing dominance pattern or coronary blood supply
  - 3/3 dizygotic twins had the same dominance pattern
  - Concordant and discordant locations of stenoses were found with similar frequency in mono- and dizygotic twin pairs2

- Turley et al (2007) presented studies showing simultaneous presentation of CAD in identical twins
  - Two identical twins separated by over 12000 miles showed near identical angiographic lesions in LCX, LAD, and RCA within 3 months of each other3

- Marenberg et al (1994)
  - Swedish study with over 21000 twins and estimated that the probability of dying due to CAD in the next decade is 50% for a 55 yo male if his twin has suffered a fatal MI4

- Fischer et al (2005)
  - Retrospective study of coronary angiograms of 882 siblings with CAD from 401 families with presentation <60 years of age had significant heritability for proximal stenosis
    - 9/12 twin pairs displayed concordance for proximal lesions
    - 3/12 were concordant for distal lesions5

- Grabowicz et al (2019) published a study correlating similar angiographic findings between monozygous twin
  - Twin A (53yo) Risk Factor: HLD
    - LCX: significant stenosis in proximal and medial LAD
    - LAD: ostial 90% proximal marginal branch, 80% distal LCX
  - Twin B (53yo) Risk Factor: HLD
    - 95% stenosis in medial LAD6

REFERENCES


OUR PATIENT

PATIENT’S BROTHER

Figure 1. RAO CAU
Figure 2. RAO CRA
Figure 3. LAD
Figure 4. LAO CRA
Figure 5. RAO CRA
Figure 6. LAO CRA