Determining the Natural and “Unnatural” History of Anomalous Aortic Origin of a Coronary Artery (AAOCA) with Interarterial, Intracanal or Intramural Course: Establishing a Multi-Institutional Registry

**ENTER YOUR NAME AND POSITION**
Site Primary Investigator

**ENTER THE NAME OF YOUR INSTITUTION**

**ENTER THE DATE**

**INSERT YOUR INSTITUTIONAL LOGO HERE**
Anomalous aortic origin of a coronary artery with interarterial, intraconal or intramural course (AAOCA) is a rare congenital anomaly:

- Left main coronary arises from the right sinus (ALCA) OR
- Right coronary artery arises from the left sinus (ARCA)

- Prevalence ranges from 0.1%-0.3%.
- ARCA ~ 6 times more prevalent than ALCA
- ALCA has a higher risk of sudden cardiac death

Risk of Sudden Death

• In the United States, AAOCA is the 2\textsuperscript{nd} leading cause of sudden cardiac death in children after hypertrophic cardiomyopathy.

• Sudden death most commonly occurs during or just after exercise, notably among otherwise healthy, young athletes.

Presenting Symptoms

• The challenge is diagnosing AAOCA as patients often are asymptomatic
• Cardiovascular presenting symptoms, often occurring during or just after exertion, include:
  – Chest pain
  – Dizziness
  – Syncope
  – Ventricular arrhythmia
  – Myocardial infarction, aborted sudden death, or sudden death

Brothers JA et al., J Am Coll Cardiol 2007;50:2078-82
Diagnosis

• Most patients are initially diagnosed by transthoracic echocardiography.

• If the diagnosis is unclear further diagnostic evaluation is warranted:
  – CT
  – MRI
  – Cardiac catheterization with coronary angiography

• Further testing to evaluate for ischemia:
  – Exercise stress test, stress echocardiogram, stress myocardial perfusion scan
Anomalous LCA and RCA
Rationale for Study

• Current treatment guidelines are cardiologist- and institution-dependent

• Limited ability to risk stratify at diagnosis
  • Tests for ischemia can be falsely negative, especially with intermittent ischemia, as is often the case with AAOCA

• Not adequate patient numbers from any single institution to power a study
  – Need more data on larger numbers of children
Study Objectives

• To determine the natural (non-surgical) and “unnatural” (surgical) history of AAOCA through examination of a large multi-center registry.

• To develop clinically applicable predictive models of these natural and “unnatural” histories

• Obtain follow-up data to assess long-term clinical outcome over time
Registry Design

- Retrospectively enroll subjects who have been cared for by physicians in the Congenital Heart Surgeons Society (CHSS) participating institutions
- Prospectively enroll newly identified subjects into the registry upon diagnosis
- Information will be obtained from existing medical records from diagnostic tests and surgical and/or catheter interventions
- Annually, specially trained personnel from the CHSS will contact the family, checking on the child’s clinical progress and obtaining additional follow-up information and records
Inclusion Criteria

• Diagnosis and/or management of AAOCA at a CHSS member institution from January 1, 1998 forward
• Age 0-30 years at time of diagnosis
• Structurally normal heart or with small, hemodynamically insignificant lesion, including:
  – patent ductus arteriosus, atrial septal defect, ventricular septal defect, mild pulmonic valvar stenosis, or bicuspid aortic valve without aortic stenosis.
• Consent (verbal and written)
Exclusion Criteria

• Anomalous coronary from the pulmonary artery, coronary artery atresia, or other coronary artery anomalies (e.g., coronary-cameral fistula, coronary aneurysms, myocardial bridging)

• Hemodynamically significant structural heart disease, except as outlined above
Subject Identification

• Retrospectively identify subjects with AAOCA who have been cared for by physicians in the CHSS participating institutions.
  – The contact person at each hospital will query their hospital’s Cardiology and Cardiothoracic surgery databases (e.g., catheterization, echocardiography, exercise laboratory, surgical, and autopsy) and medical records from January 1, 1998 until January 20, 2009.

• Prospectively identify subjects upon new diagnosis from January 21, 2009 forward at the member institutions.
Data Collection I

• After consent is obtained, each subject’s record will be retrospectively reviewed for baseline data (i.e., at time of diagnosis and/or initial evaluation by the participation institution) and surgical (if applicable) data.

• This information will be sent confidentially to the CHSS Data Center at the Hospital for Sick Children in Toronto.

  – Maulik Baxi, MD, MPH, the CHSS Research Program Manager, will not be an investigator in this study and will be responsible for the data at the CHSS and for supplying only de-identified data to the investigators for future analysis.
Data Collection II

• For those subjects identified after study initiation (i.e., on or after January 20, 2009), compact discs of any echocardiograms, MRIs, CT scans, and cardiac catheterizations will also be sent, when possible, to the CHSS data center
• Trained dedicated personnel at the CHSS will perform all data extraction and entry into a secure computerized database
• Each study participant will be assigned a corresponding study number that is used for all further analysis
• These data files will be restricted to the study data center
• Each member institution utilizes a HIPAA data use agreement with the CHSS and the study data center to maintain the highest level of confidentiality for all participants
Data Collection Forms

• Demographic Information
• Baseline Diagnostic Tests
  • Echocardiogram
  • CT or MRI
  • Cardiac Catheterization
  • ECG
  • Holter Monitor
• Baseline Tests for Ischemia
  • Exercise Stress Test
  • Stress Echocardiogram
  • Perfusion Scan
• Hospitalization for AAOCA Surgery
• Atomization Form
Atomization of Features

- Other features: sinus of origin, slit-like takeoff, high ostial origin, interarterial course, intraconal/intraseptal/intramyocardial course
Follow-up Questionnaire

• In yearly intervals, a non-standardized questionnaire regarding the subject’s current health status will be mailed to the subject
• If it is not returned, specially trained personnel from the CHSS will contact the subject by phone
• Covers several broad aspects of quality of life issues:
  – Demographics
  – Health status
  – Activity level
  – Medical care
Consent/Assent

• RETROSPECTIVE COMPONENT
  – Verbal consent will be obtained by the PI or study coordinator at the individual CHSS member institutions for the chart review and phone questionnaire.
  – Once verbal consent is obtained, a written informed consent will be mailed to the parent(s) or legal guardian of any minor child or to subjects > 18 years of age.
  – Informed assent will also be obtained from a minor child prior to participation.

• PROSPECTIVE COMPONENT
  – For those subjects who are identified after the study has begun, written consent/assent will be obtained at the time of the clinic visit at the CHSS member institution.
  – The written consent will be to obtain authorization to have medical information securely and confidentially sent to the CHSS for data abstraction and entry into the registry.
Waiver of Consent/Assent

• We are requesting a waiver of consent to collect data on deceased subjects or subjects that are lost to follow up.
Enrollment Form I

Anomalous Aortic Origin of a Coronary Artery (AAOCA) Study

Patient Enrollment Form

OVERALL GOAL & OBJECTIVES:

- Develop a registry of children and young adults with Anomalous Aortic Origin of a Coronary Artery (AAOCA) with an interarterial, intramural or intramural course.
- Characterize the natural and usual course of AAOCA.
- Characterize outcomes after interventions for AAOCA.
- Develop models to identify patients in whom the risk of intervention is greater than the risk of observation and, conversely, patients in whom the risk of intervention is greater than the risk of observation.

INCLUSION CRITERIA:

- Diagnosis of AAOCA at a CHSS member institution from January 1, 1988 forward
- Age < 12 years at time of diagnosis
- Diagnosis includes:
  - From January 1, 1988 to study initiation for retrospective subjects
  - From January 1, 2008 forward for prospectively identified cases
- Structured normal heart or heart with small, hemodynamically insignificant lesions including: patent ductus arteriosus, atrial septal defect, patent foramen ovale, atrial septal defect, mild aortic stenosis, mild aortic valve disease, or isolated aortic valve without aortic stenosis.
- Parental or patient consent at subject consent > 16 years of age.

EXCLUSION CRITERIA:

- Anomalous coronary from the pulmonary artery, coronary artery aneurysm, or other coronary artery aneurysms (e.g., coronary-crowned bulbs, coronary artery aneurysms, myocardial bridging)
- Hemodynamically significant structural heart disease, except as outlined above.

To be completed by Enrollment Institution, for EACH patient being enrolled:

Patient Name (First Name-Last Name)
Address:
Phone Number (Home/Cell)
Email:
Institution:
Medical Record Number:
Cardiologist:
Cardiologist's Phone Number:

What needs to be sent for each patient?

- Copy of signed consent
- Admission Data or equivalent for demographics information
- Admission history and physical
- Operative report for coronary repair
- Perfusion record for coronary repair
- Anesthetic record for coronary repair
- Discharge summary
- Anesthesia report (Death report)
- For retrospective patients, CMR of all echocardiograms, catheterizations, CT scans, MRI's
- For retrospective patients, CMR of complete echocardiogram, catheterization, CT scan and MRI only at time of diagnosis
- ALL echocardiogram reports (including TEE, echo, stress-echo)
- ALL catheterization reports
- ALL CT scan reports
- ALL MRI reports
- ALL Electrophysiology reports
- ALL Nuclear medicine reports
- ALL Holter reports
- ALL Cardiac Catheterizations
- Initial ECG at time of diagnosis

For CHSS Data Center Use Only

Study Number:

Data entered by:

SickKids
Children's Hospital of Shriners Hospitals for Children
750: TEL: 416-813-6581
Website: www.choss.org

CHSS Data Center Staff

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Director

Anastasia Logothetis, M.D.
# Enrollment Form II

To be completed by Enrollment Institution, for EACH patient being enrolled

<table>
<thead>
<tr>
<th>Patient:</th>
<th>Date of Birth:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Name (if age&lt;18):</td>
<td>Death Date (if applicable):</td>
</tr>
<tr>
<td>Address:</td>
<td>Gender: Male</td>
</tr>
<tr>
<td>Phone Number (Home/Cell):</td>
<td>Date of diagnosis:</td>
</tr>
<tr>
<td>Email:</td>
<td>Name of Alternate Contact for Patient:</td>
</tr>
<tr>
<td>Institution:</td>
<td>Phone Number of Alternate Contact:</td>
</tr>
<tr>
<td>Medical Record Number:</td>
<td>Surgeon:</td>
</tr>
<tr>
<td>Cardiologist:</td>
<td>Surgeon's Phone Number:</td>
</tr>
<tr>
<td>Cardiologist's Phone Number:</td>
<td>Primary M.D.:</td>
</tr>
</tbody>
</table>

What needs to be sent for each patient?

- Copy of signed consent
- Admission Slip or equivalent for demographic information
- Admission history and physical
- Operative report for coronary repair
- Perfusion record for coronary repair
- Anesthetic record for coronary repair
- Discharge summary
- Autopsy report / Death report
  - For prospective patients: CD of all echocardiograms, catheterizations, CT scans, MRIs
  - For retrospective patients: CD of complete echocardiogram, catheterization, CT scan and MRI only at time of diagnosis
- ALL echocardiogram reports (including TEE, echo, stress echo)
- ALL catheterization reports
- ALL CT scan reports
- ALL MRI reports
- ALL Exercise Test reports
- ALL Nuclear medicine reports
- ALL Holter reports
- ALL Cardiac Clinic letters
- Initial ECG at time of diagnosis
Contact Person

• If you have a patient with AAOCA, please contact one of us listed below via phone or email:

• **ENTER THE NAMES OF THE PRIMARY SURGEON, PRIMARY CARDIOLOGIST, and RESEARCH COORDINATOR for your site, with their email and phone number**

• Dr. Maulik Baxi, CHSS Research Program Manager, maulik.baxi@sickkids.ca, (416) 813-8477
Commonly Asked Questions

1. I have a patient with a single right coronary from the left sinus of Valsalva. Does he qualify?
   Yes, if the vessel is interarterial, intramural, and/or intramural at any part of the course, then he qualifies for inclusion.

2. I have a patient with a high take-off of the right coronary artery from above the right sinus of Valsalva. Does she qualify?
   No, we are not including high take-off of a coronary artery from the correct sinus of Valsalva.

3. Do our patients need to have any additional testing done?
   No, we will be collecting available clinical information from medical records. We are not recommending any new or different tests than what you have already ordered.

4. How long will you be collecting data on patients?
   Ideally for the rest of their life. We will collect medical record data and the patient will participate in an annual questionnaire.
Questions/Comments