



QUEEN'S PULSE

FALL 2020

QUEEN'S HEART INSTITUTE



The Queen's Program for Aortic Disease

Multidisciplinary Hybrid Approach to Aortic Dissection



Acute aortic dissection is a fatal complication arising from a sudden tear between the layers of the aortic wall. This allows blood to flow outside the true lumen of the aorta separating the inner and outer layers resulting in rupture, occlusion of major arteries downstream, "malperfusion syndrome" and even death within hours to days of occurrence. First discovered by Michael E. DeBakey in 1955, the disease remains a challenge for cardiology specialists and surgeons to provide a specialized approach in the care of this catastrophic disease process.

Common causes such as cystic medial necrosis, Marfan's syndrome, and other connective tissue disorders historically provided the pathologic process for this disease. Predisposing conditions include hypertension, pregnancy, iatrogenic events from cardiac operations and traumatic aortic injuries. Also, bicuspid aortic valves with their inherent aortopathy are more prone to dissection.

95% of aortic dissections occur in two locations, giving rise to the different classifications: (1) the ascending aorta in proximity to the aortic valve: Stanford Type A or DeBakey Type I and II, (2) in the descending thoracic aorta: Stanford Type B or DeBakey, Type III. Although small tears occurring in the arch have now been classified in the Stanford Type B family, ascending dissection can extend antegrade down to the iliac and femoral arteries and descending dissection may extend retrograde to the aortic valve. With the onset of the dissection, aortic wall necrosis occurs with time and rupture results in instant death.

Acute dissection usually occurs in males to female 3:1, characterized by chest, extremity, or abdominal pain

Continued on next page.



The Queen's Heart Aortic Team (left to right): Benjamin Plank MD, Mark Lebehn MD, Michael Tanoue MD, Eric Chung MD, Peter Tsai MD, Dean Nakamura MD, Jeffrey Lau, MD, Nicole Tobin APRN, Brittany Khotmanivong APRN, Kristin Cootey APRN, Arvin Cardenas RN

The Aortic Program now provides:

- Open and percutaneous options for aortic valve replacement
- Open and percutaneous options for aortic dissection
- Open and percutaneous options for aortic aneurysms
- Open and percutaneous options for Marfan's Disease and various forms of aortopathy
- Endovascular procedures for aortic penetrating ulcers
- Endovascular procedures for aortic mycotic aneurysm

The Aortic Program will provide genetic testing and tracing for patients and family members. In addition dietary and nutritional assistance and life long follow-up for the disease will be provided.



The Queens Program for Aortic Disease Multidisciplinary Hybrid Approach to Aortic Dissection



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depending on specific organ occlusion. Intestinal compromise can cause bowel ischemia and neurologic complications such as paraplegia and stroke can occur with dissection of the arch vessels and descending thoracic aorta. Renal failure may occur when the renal arteries are dissected. Sudden death occurs with aortic wall rupture.

Diagnosis is made with CT scan with intravenous contrast. TEE and MRI can potentially determine the location of the tear if the CT scan images are not available or questionable. Lactic acid and hepatic enzymes can also provide information of prognosis of visceral ischemia. EKG is performed to exclude myocardial infarction.

Overall prognosis for most aortic dissections are predictive due to its inherent location and origin. Clearly ascending dissections are uniformly fatal up to 90% with only 8% surviving after one month. Descending dissections have a better prognosis of over 75% surviving at one year. Rapid onset of chest pain, and distal malperfusion syndrome will often dictate surgical interventions.

Treatment for Stanford Type A or DeBakey Type I and II dissection requires urgent surgical intervention to prevent coronary dissection, aortic valve insufficiency and rupture into the pericardial sac leading to fatal tamponade. Uncomplicated Stanford Type B or DeBakey Type III dissection are usually treated with beta-blockade blood pressure management.

The Queen's Structural Heart and Aortic team, created the Aortic Center, first of its kind in Hawaii. The center is comprised of surgeons Jeff Lau and Peter Tsai, supported by Dean Nakamura, and Eric Chung, and interventional structural cardiologist Benjamin Plank who have developed a multidisciplinary hybrid approach to treating this type of aortic pathology. With the use of Thoracic Endovascular Stent Grafting, acute and chronic cases of aortic dissection can be done in a minimally invasive manner in stable patients.

For acute ascending aortic dissections, the ideal operation incorporates a “sandwich” technique bringing the true and false channels and graft replacement together to restore natural antegrade flow. See slides 1 and 2.



Slide 1



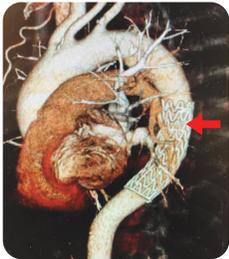
Slide 2

Despite the initial success of surgical repair, which deals with primarily the ascending aorta, dissected aortas distal to surgical repair that are not addressed surgically often and unfortunately continue to further enlarge and rupture or cause malperfusion syndrome involving visceral vessels. Having to re-operate on these patients a second time carries a larger operative risk. These patients can now be treated with a hybrid procedure called **debranching and Thoracic EndoVascular Aortic Repair (TEVAR) with stenting**. Debranching is a surgical technique to eliminate dissected arch vessels and restore flow

by creating extra-anatomic bypass grafts from normal to dissected arteries. This can be done with artificial grafts or laser stented original arteries.

Now with hybrid surgical debranching and aortic stenting; all major types of type B dissections, regardless of site of origin can now be treated. Examples include

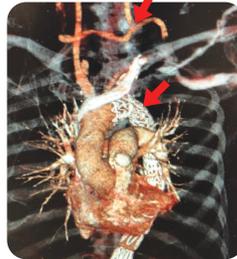
- No Debranching. Stent in descending thoracic aorta. (Slide 3)
- Debranching the left subclavian artery (slide 4)
- Debranching the left subclavian and left carotid artery (slide 5)
- Debranching the right carotid, left carotid, left subclavian arteries (slide 6)



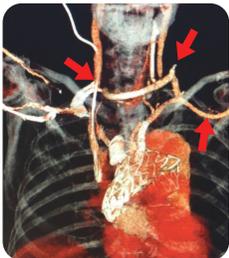
Slide 3



Slide 4



Slide 5



Slide 6



Slide 7

With the advent of newer grafts from Industries, aortic dissection of the chronic Type A ascending can often be treated. Recently, The Queen's Structural Heart and Aortic Team successfully treated a patient with a chronic Type A dissection plus transcatheter aortic valve replacement (TAVR). (slide 7)

These procedures require a specialized multidisciplinary team of CV surgeons and Interventional Cardiologists working together in the OR, Cath Lab, or hybrid suite.



Dr Jeffrey Lau provides expert consultation for a patient living with aortic disease.

The Queens Program for Aortic Disease

The Queen's Aortic Program offers comprehensive evaluation and treatments for patients living with diseases of the aorta. We use a collaborative multidisciplinary approach to provide every patient early and long-term solutions to the disease process. Whether the patient needs emergent surgery, percutaneous procedures or medical management to treat the disease, our team of experts will offer every patient an individualized approach to care.



Refer a Patient Today

Call the Queen's Aortic Clinic for more information:

808-691-8808

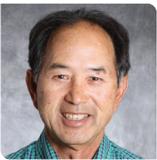
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LOOK
INSIDE
AND SEE
WHAT'S
NEW



MEET THE EXPERTS:



Dr. Jeffrey Lau is a cardiovascular surgeon who leads the Aortic Program at Queens Medical Center. Dr. Lau trained in Houston, Texas at Baylor College and Texas Heart under Dr. Michael E. DeBakey who originally described the classification of aortic dissection. Dr. Lau specializes in endovascular treatment and approaches for aortic disease, valvular heart disease,

coronary artery disease, lung disease and peripheral artery disease. To date, he has done over 200 cases of endovascular stenting of the aorta. He is a fellow of the American College of Surgeons, a member of the Society of Thoracic Surgeons and a member of the Western Thoracic Surgical Association.



Dr Peter I. Tsai is a cardiothoracic surgeon who trained at Baylor College of Medicine/Texas Heart Institute and specializes in surgical treatment of heart diseases involving the coronaries, valves and aorta, as well as general thoracic diseases involving the lung, mediastinum and esophagus. Dr. Tsai is Professor of Surgery, Division Chief of Cardiothoracic Surgery at

John A. Burns School of Medicine, and Medical Director of Cardiothoracic Surgery at Queen's Heart. He is passionate about teaching, research and clinical outcomes. He advocates for an integrated cardiology-cardiac surgery service line, to provide open, minimally invasive and endovascular treatment options for structural heart, coronary, arrhythmia and aortic diseases. He is a Fellow of the American College of Surgeons, American College of Cardiology and College of Chest Physicians.



Dr Eric Chung is a cardiothoracic surgeon who has been caring for patients in the State of Hawaii since 2001. He practiced as a General Surgeon in the United States Army before starting his Thoracic Surgery training at University of California at Davis. He specializes in the treatment of valvular heart disease, coronary artery disease and aortic disease.

He is a graduate of the University of Hawaii, John A. Burns School of Medicine and is Board Certified in General and Thoracic Surgery. He is a Fellow of the American College of Surgeons. Dr Chung was born and raised in Hawaii.



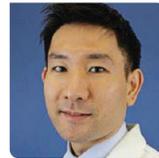
Dean Nakamura is a cardiothoracic surgeon and Medical Director of Valvular Heart Surgery at the Queens Medical Center. His practice includes surgery for coronary artery disease, valvular heart disease and diseases of the aorta. Dr. Nakamura has an ongoing interest in valve repair operations for mitral regurgitation. Dr. Nakamura is a graduate

of the University of Hawaii, John A. Burns School of Medicine where he is currently an Assistant Clinical Professor of Surgery. He did his general surgery residency at the University of Hawaii Integrated Surgical Residency Program and his fellowship in thoracic surgery at the University of Illinois at Chicago.



Dr. Benjamin Plank is an Interventional and Structural Cardiologist who specializes in interventional therapies for coronary artery disease and catheter-based replacement and repair of heart valves. He is a Fellow of the American College of Cardiology. Dr Plank's special interests include transcatheter aortic valve replacement (TAVR),

percutaneous mitral valve repair and structural heart imaging. Originally from New York, he helped build Montana's largest and most successful structural heart program before moving to Hawaii in 2018.



Dr Michael Tanoue is a General Cardiologist and an Assistant Clinical Professor at the University of Hawai'i. After completing his studies at Creighton University School of Medicine, he went on to complete his Internal Medicine residency at the New York Presbyterian Hospital – Weill Cornell Medical Center, and Cardiology fellowship at the University

of California Los Angeles. Dr. Tanoue specializes in the prevention and treatment of cardiovascular disease with a focus in vascular disease, echocardiography, and interventional echocardiography for transcatheter interventions for structural heart disease.



Dr. Mark Lebehn is a Noninvasive Cardiologist with a primary clinical focus on outpatient consultative cardiology and echocardiography. After completing a Cardiovascular Disease Fellowship at the University of Hawaii, he underwent additional cardiovascular imaging training including: Advanced Cardiac Imaging Fellowship at the Medical

College of Wisconsin and Advanced Structural Echocardiography Imaging Fellowship at Columbia University of College Physicians and Surgeons. He is currently an Assistant Clinical Professor of Medicine at the University of Hawai'i John A. Burns School of Medicine. He is board certified in Internal Medicine, Cardiovascular Disease, and Adult Echocardiography.



Dr Anne Kemble is a General Cardiologist who specializes in adult congenital heart disease and echocardiography. She grew up in Honolulu, went to Brown Medical School, then returned to Hawaii for Internal Medicine Residency and Cardiology Fellowship training at the University of Hawaii. She trained in adult congenital heart disease at UCLA.

She is passionate about making high quality adult congenital heart disease care accessible to our local community.