Myocardial Bridge Unroofing
A myocardial bridge is a heart condition involving a segment of coronary artery trapped by a band of muscle (myocardium). Your coronary arteries carry blood to your heart muscle. These arteries typically lie on the surface of the heart muscle.

In this condition, when the heart beats and contracts, a muscle overlying the coronary artery also contracts. The contracting myocardial bridge can limit the flow of blood to the artery, causing chest pain.

What causes chest pain
Approximately 1 in 5 people have a myocardial bridge. Many people do not have any symptoms when they have a myocardial bridge. A small subset, however, can have a wide range of symptoms including debilitating chest pain. The chest pain can be mild, and last only seconds, or severe and last several minutes.
Evaluation of who needs myocardial unroofing?
Some people aren't helped by standard medicine for angina—including medications like beta blockers, calcium channel blockers, statins, and aspirin. The first step in treatment options include long term medical management and use, under the care of your cardiologist.

One advanced option is “surgical myocardial bridge unroofing.” Doctors perform tests to identify if the myocardial bridge is affecting blood flow. The tests include stress echocardiograms, ultrasounds and angiograms.

Treating the problem directly
Previously, patients whose angina didn't respond to medicine had few options. Many people with a myocardial bridge have lived with chest pain for many years by the time Stanford doctors see them.

Some other treatments that have been unsuccessfully tried for treatment of bridges include percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery. These procedures are not designed to treat structural abnormalities in the heart like myocardial bridges.

Studies have shown that these other procedures fail to provide lasting relief for people with myocardial bridges. The squeezing of the muscle in the bridge damages the stents used in PCI over time, and bypass grafts tend to close, due to competitive flow.

Surgical myocardial bridge unroofing is safe and effective. Stanford doctors use new imaging techniques to map the muscle bridge very precisely before surgery is considered.
Surgical Treatment Options:
At Stanford, doctors can offer multiple options if you have chest pain from a myocardial bridge. When medical therapy is ineffective, a surgical procedure called a myocardial bridge unroofing can be considered.

During this procedure, the surgeon divides the band of the muscle that covers the artery.

Pre-Operative:
• The imaging studies previously completed for diagnosis are used as a detailed road map for your surgical plan and approach.
• Nerve blocks can be placed to reduce pain after surgery.

Intra-Operative:
• Surgical approach options will be discussed with you and your surgeon. The type of incision for this surgery depends on the length and location of the myocardial bridge. It also depends on the patient’s body type and preferences.
  – A “minimally invasive” approach, also called a “mini-thoracotomy,” uses a smaller incision in your chest. This incision is roughly 3–4 inches, on the left front side of the chest, between the ribs.
  – A “median sternotomy” approach, uses an incision through the breastbone to reach the heart.
• Stanford doctors perform the surgery “off-pump,” or without the heart-lung machine. The surgery is done on a beating heart. A stabilizer allows the surgeons to work on the bridge safely.
• Bridge muscle is divided in 1–2 millimeter increments.
• Surgery takes approximately 2 hours.

“Numerous myocardial bridge patients, before they found care at Stanford, feel tired and hopeless from their search. Many of these patients have sought care all over the country, in an effort to find relief from their pain. It is deeply rewarding to have the opportunity to finally offer these patients the care and relief from pain that they have been seeking.”—Jack Boyd, MD
Post-Operative / Recovery:
If you have myocardial unroofing surgery, you will likely have a very short stay in the hospital intensive-care unit.

Minimally invasive mini-thoracotomy approach recovery:
• You may expect to go home 2 to 3 days after surgery.
• Many people return to normal levels of activity in several weeks.

Sternotomy approach recovery:
• You may expect to go home 3 days after surgery.
• It may take 1–2 months for you to return to normal activity. You are restricted from lifting heavy objects. Restrictions last for 3 months, until the breast bone completely heals. However, you should be able to take care of yourself and walk independently.

Most patients have significant improvement in the quality of their lives. Stanford is one of just a handful of hospitals in the nation with a program for this surgery. Our cardiologists have pioneered the diagnosis of myocardial bridges and our cardiac surgeons are among the most experienced with myocardial bridge unroofing.

Seattle Angina Questionnaire scores before (preoperative [blue bars]) and after (postoperative [red bars]) surgical unroofing of a myocardial bridge. Data available for 38 patients; higher scores represent better outcome. The p value was less than 0.001 for all five categories.
**Glossary**

**Angina**: Chest pain that occurs when the heart doesn’t get enough blood

**Coronary arteries**: Arteries that carry blood to the heart

**CT angiography or angiogram**: An imaging test that looks at the arteries supplying blood to your heart, often done to diagnose chest pain

**Diastole and systole**: Two parts of a heartbeat
  - **Diastole** is the relaxation period when your heart muscle is relaxed.
  - **Systole** is the contraction period when heart muscle tightens.

**Echocardiogram**: A test that uses sound waves to produce images of your heart beating and pumping blood

**Invasive hemodynamic test**: A test that measures the movement of blood and its pressure in the veins, arteries, and chambers of the heart

**Intravascular ultrasound**: A test that uses sound waves to see inside blood vessels, often used to evaluate coronary arteries that supply blood to the heart

**LAD artery**: Left anterior descending artery, a major artery bringing blood to the heart

**Median sternotomy**: Surgery that makes an incision in the breastbone to reach your heart

**Minimally invasive surgery**: Surgery that makes a small incision

**Mini-thoracotomy**: Surgery that makes a small incision in your chest

**Myocardium**: Heart muscle

**Myocardial bridge**: A band of heart muscle that lies on top of a coronary artery, instead of underneath it

**Off-pump surgery**: Done without a heart-lung machine, while the heart is beating

**Unroofing**: Surgery that splits the myocardial bridge so it no longer presses on (and squeezes) a coronary artery

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Stanford Hospital named one of the top hospitals in the nation

Stanford Hospital Named to U.S. News & World Report’s 2017–18 Honor Roll—one of only 20 hospitals in the nation to earn top honors for exceptional performance in specialized, complex patient care.
Risks and Complications

All procedures carry risks. Your doctor will carefully review the potential risks and complications with you as you consider the procedure.