Making the Case for MIS Mitral Valve Repair

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Mitrail regurgitation (MR) affects more than two million people in the United States. Care of patients with mitral valve disease has become standardized over the past decade. Enhanced diagnosis, appreciation of the natural history of MR, imaging refinement through the use of transesophageal echocardiography (TEE) and 3-D imaging, and advancements in minimal-incision valve repair have transformed our approach to patients with mitral valve disease.

Patients with MR typically have progressive and insidious symptom onset. Sometimes symptoms will occur decades after the initial diagnosis. Generally, patients with severe MR present with progressive dyspnea, fatigue, and exercise intolerance. If left uncorrected, patients eventually develop pulmonary hypertension, atrial fibrillation, and left ventricular (LV) dysfunction, and subsequently transition to a decompensated state. Because of their adverse clinical implications, the goal is to avoid these developments through disease recognition, diagnosis, and treatment.

Clinical decision making

Multiple factors influence the treatment approach and timing of surgical intervention, including presence of symptoms, MR severity, associated adverse findings, operative risk, and likelihood of surgical repair.

(continued on page 4)
A Cautious Approach to Knee Injuries

High-impact sports and activities with twisting motions are particularly hard on adult knees. The unpleasant truth is that it takes less force to tear the meniscus when we are in our 40s and 50s. Thirty years ago athletes and “weekend warriors” with knee injuries faced open surgery with all of the accompanying side effects – large incisions, risk of infection, pain and a lengthy recovery. Today orthopedic surgeons using non-surgical therapies and arthroscopic surgical techniques can get men and women with knee injuries back into action more quickly.

Surgeons at the Swedish Orthopedic Institute use a cautious approach with knee injuries, such as meniscus and ligament tears, cartilage defects and patella dislocations/stabilizations.

“We prefer pursuing non-surgical treatment options first,” says Camille Clinton, M.D., ProOrtho orthopedic surgeon at Swedish/Redmond. “Bracing, injections, rest and physical therapy often resolve minor injuries without surgery. If those fail, however, we typically turn to arthroscopic surgery.”

Arthroscopic surgery provides many benefits for the patient, including:
• No hospital stay
• Small incisions
• Minimal tissue disruption
• Faster recovery
• Less pain (many patients require pain medication for less than a day)
• Less risk of infection
• Less risk of stiffness
• No crutches
• Back to work quickly

“Arthroscopic knee surgery may often allow a patient to return to work and activities of daily living within days, or to full participation in sports within weeks of a simple procedure,” says Jason J. Wilcox, M.D., Orthopedic Physician Associates, Swedish/First Hill. “However, procedures that require tissue to heal more thoroughly, such as meniscal repair or ligament reconstruction, may require a slower and more step-wise return to full activity under the guidance of a surgeon and a physical therapist.”

For more information, or to consult on a specific patient or to seek a second opinion about surgical necessity, please call 425-823-4000.

Case Study: Arthroscopic Knee Surgery Following Skiing Accident

Camille Clinton, M.D., ProOrtho, Swedish/Redmond

A very active 53-year-old female presented to our clinic with a knee injury she suffered while skiing. She indicated she had gone over her skis and felt a pop in her knee. The mountain rescue team brought her down the hill in a toboggan. She was using a knee immobilizer and crutches when she arrived at our office a couple of days after the incident.

The exam was notable for effusion, limited range of motion and a positive Lachman test, which is used with a suspected anterior cruciate ligament (ACL) tear. Radiographs, which were acquired during a visit to urgent care, showed a Segond fracture (an avulsion fracture of the lateral aspect of the tibia plateau), consistent with ACL tear. An MRI confirmed the ACL tear, as well as a medial meniscus tear.

The patient’s goal was to continue her active lifestyle, so she opted for ACL reconstruction and partial medial meniscectomy using arthroscopic techniques. She was back to work as a teacher within three weeks, jogging at four months and skiing again the following winter with no pain or instability.

Figure 1. A radiograph obtained during an urgent care visit shows evidence of a Segond fracture.

Figure 2. An MRI (anterior view) confirmed the ACL tear. Medial meniscus tear is not visible on this image.

DocTalk Videos for Healthcare Professionals

Each month new video didactics are posted online at www.swedish.org/doctalk. Check out our latest videos:
• Proton Therapy: Where Are We Going?
• Transfemoral Aortic Valve Replacement Overview
• H. pylori Infection in Children
• Epilepsy Monitoring Unit and Video EEG Monitoring
• Obstructive Sleep Apnea: Strategies in Management When CPAP Fails
• Multiple Sclerosis Overview: When to Suspect and How to Treat
• Fussy Babies: Research and Updates for Treatment
A very active 33-year-old male presented to our clinic with an injury to his right knee sustained while playing soccer. More than a year prior to this injury, he had sustained an isolated injury to his posterior cruciate ligament (PCL) of his left knee while playing soccer. He had diligently rehabilitated his left knee to the point where he was able to play soccer once again without limitation. During a recent match, however, he came to a sudden stop and his right knee “gave out.” He had immediate pain and swelling, which prompted him to seek care in the emergency department. He presented with an acutely swollen knee, limited range of motion, and inability to bear weight without pain in his right knee.

Not all meniscal tears are repairable, but the role of the meniscus in weight distribution makes the repair, if possible, of paramount importance in the health of a patient’s knee, including return to sports and in reducing the risk of early onset arthritis.

“Patient care is shared between local primary-care and/or referring physicians and the network,” says Brian Louie, M.D., a thoracic surgeon at Swedish. “Although patients come here for their subspecialty treatment, they return to their regular physicians for ongoing care.”

The Digestive Health Network nurse navigator is crucial to making this type of inter-disciplinary network effective. The network’s navigator is a specially trained registered nurse who connects referring physicians, and patients who are self-referring, to the most appropriate specialist.

For more information about the Swedish Digestive Health Network, go to www.swedish.org/digestive. To consult or refer a patient, please contact Debra Cadiente, R.N., B.C., the network’s nurse navigator, at 1-855-411-MyGI (1-855-411-6944) or DigestiveHealth@swedish.org. The nurse navigator is available Monday through Friday, from 8 a.m. to 4:30 p.m. 📧
MIS Mitral Valve Repair

The evidence-based Guidelines for the Management of Patients with Valvular Heart Disease from the American College of Cardiology/American Heart Association (ACC/AHA) assist clinical decision making.

Transthoracic echocardiogram (TTE) is most commonly used to evaluate a patient with suspected MR. TTE is used to assess valve morphology, MR severity, left ventricular size and function, left atrial size, and presence and severity of pulmonary hypertension.

Close clinical follow up and serial echocardiograms is the accepted course for asymptomatic patients with no adverse TTE findings. Surgery is indicated in patients who become symptomatic or develop LV systolic dysfunction (LV ejection fraction <60% and/or LV end-systolic diameter <40 mm). Surgery is also highly recommended for patients who develop pulmonary HTN or new onset atrial fibrillation.

Even in the absence of symptoms, studies suggest surgical intervention should be considered if the patient has severe MR, the valve anatomy is suitable for repair (>90% chance of repair), and the surgery can be performed in an experienced surgical center, such as SHVI.

Case Study: Mitral Valve Repair

Glenn R. Barnhart, M.D., Chief and Executive Director for Cardiac Surgical Services, Swedish Heart & Vascular Institute

A 56-year-old male, with a known asymptomatic heart murmur since military discharge, experienced shortness of breath at higher inclines on the treadmill during his regular workout. Because he had temporarily curtailed his workout due to increased work responsibilities, he attributed the symptoms to being out of shape. Recently he noticed mild shortness of breath and slight chest heaviness while climbing stairs at home.

He reported his symptoms to his primary-care physician during his annual physical. Examination revealed a 3/6 holosystolic murmur heard best at the left axillary line. Transthoracic echocardiography (TTE) demonstrated a left ventricular ejection fraction of 50% and severe mitral regurgitation with at least one ruptured cord on the posterior leaflet, resulting in that segment being flail. Estimated pulmonary artery pressure by echo was 45/25.

The patient’s physician referred him to Swedish Cardiology. Transesophageal echocardiography (TEE) confirmed the TTE findings and also showed a prolapse at the posterior commissure. Coronary angiography via a radial approach showed no significant coronary artery disease.

The cardiologist referred the patient to Swedish Cardiac Surgery for mitral valve surgery, where he was evaluated for minimal incision port access surgery. A CT angiogram, which completed the assessment, showed no evidence of significant arterial disease in the aorto-iliac system.

MIS Procedure

The cardiac anesthesiologist placed the patient under general anesthesia and placed specialized lines to deliver retrograde cardioplegia. Using TEE, the surgeon again assessed the valve to confirm all previous findings and measured the antero-posterior length of the anterior leaflet to select the proper ring size.

A lateral 5 cm 4th intercostal space incision was made to expose the mitral valve, femoral arterial and venous cannulae were placed, and cardiopulmonary bypass was instituted. A 5 mm videoscope was inserted. (*) The surgeon evaluated the valve for repair, considering two options for posterior leaflet treatment: resection of the posterior leaflet with approximation or cordal replacement with gortex cords. Because there was redundancy of tissue, the surgeon chose resection therapy. After resecting the P2 segment, P1/P3 were approximated. The annular sutures were placed and the ring was inserted. The surgeon also performed a commissuoplasty to repair a moderate prolapse at the posterior commissure. Saline injection through the mitral valve into the left ventricle demonstrated the valve to be competent. The left atrium was closed, the heart was de-aired and the patient was separated from cardiopulmonary bypass, and the wound was closed. (see figure 2) Off bypass, TEE documented there was trace residual mitral regurgitation, the ring was well seated and there was no systolic motion of the anterior leaflet.

The patient was extubated in the operating room and transferred to the ICU, where he spent one night. He was discharged from the step-down unit on postoperative day three. He returned to work and resumed all preoperative activities, including his regular exercise routine, in three weeks.
Surgical intervention

The use of quantitative parameters in echocardiography and the associated findings provide a foundation for determining the best approach to surgical intervention. Echocardiography can help determine the feasibility of mitral valve repair and assist in planning surgery. Echo findings that are predictive of cardiovascular complications or mortality include flail mitral leaflet, severe MR (effective regurgitant orifice >40 mm², regurgitant volume >60 ml), and LV systolic dysfunction.

Transesophageal echocardiography (TEE) 2-D imaging offers more detail than TTE and allows for more accurate quantitative valve evaluation. Most recently, the addition of real-time 3-D echo with multiplanar reconstruction has provided the most accurate delineation of leaflet pathoanatomy, localization of prolapse and identification of flail segments. This technology allows the surgeon to better anticipate intra-operative findings and predict repair complexity.

Coronary angiography is recommended for patients who have or are suspected of having concomitant coronary disease. We also routinely use computed tomography angiography (CTa) to assess the patient’s arterial tree and the safety of using groin cannulation, retrograde arterial perfusion and endoballoon for ascending aortic occlusions, and cardioplegia delivery.

Among the successful surgeries we have performed at the SHVI are:

- Simple posterior leaflet repair
- Cord replacement for leaflet prolapse
- More complex bi-leaflet repair
- Ischemic mitral valve repair
- Mitral valve repair with other associated cardiac procedures.

Minimal-incision surgery

At the SHVI, we evaluate all patients with isolated mitral, aortic or tricuspid valve disease for minimal-incision surgery (MIS). Peer-reviewed literature demonstrates that MIS reduces complications and improves outcomes, such as:

- An equivalent repair success rate
- Decreased incidence of wound infection
- Less trauma to the patient
- Reduced need for blood transfusion
- Shorter length of stay and accelerated recovery
- Greater patient satisfaction

At the SHVI, we employ an “intention-to-treat” review of all mitral valve repair and replacement surgeries. This retrospective analysis of 657 mitral valve procedures (January 2008 thru June 2013) shows that we have successfully repaired 96 percent of the mitral valves we preoperatively anticipated could be repaired. The equivalent success rate, along with reduced risk of infection, shorter lengths of stay and greater patient satisfaction make MIS valve repair the clear choice when careful analysis deems it safe and effective.

It also enhances the existing relationship the practice has with the Swedish Cancer Institute (SCI) – a connection that ensures they have access to the latest technologies and treatment modalities, and their cancer patients have access to the SCI’s full scope of diagnostic, treatment, and patient education and support resources.

To consult or refer a patient to Seattle Urological Associates at Minor & James Medical, please call 206-215-2580.

Overactive bladder (OAB) is a common condition that is inconvenient, and may be embarrassing and potentially debilitating. Approximately 20 million Americans suffer from some degree of OAB. Although OAB is more common in older adults, it can affect men and women of all ages.

Generally, OAB can be diagnosed after a careful history, focused physical examination, urine analysis and determination of post-void residual. Urodynamic testing may also be part of the evaluation.

**Treatment options**

A combination of behavioral modification and drug therapy is often the initial recommendation.

A typical first-line drug therapy for OAB is anticholinergic medications, a class of drugs that block the actions of the neurotransmitter acetylcholine in the bladder, reducing spasms and contractions. Side effects include dry mouth and constipation, and these medications are contraindicated in patients with narrow angle glaucoma. Myrbetriq® is a recently introduced medication that selectively stimulates beta-3 adrenergic receptors in the bladder. It has been shown to significantly reduce bothersome OAB symptoms without the side effects commonly associated with anticholinergics.

Additional therapeutic options include, posterior tibial nerve stimulation (PTNS), intravesical injection of botulinum toxin, and InterStim® implantation.

**Overactive Bladder Symptoms**

- Urinary urgency
- Urinary frequency
- Urge incontinence
- Nocturia

**Risk Factors**

- Advancing age
- Declining estrogen levels
- Pregnancy and childbirth
- Multiple medications
- Diseases of the nervous system
- Prior pelvic surgery or radiation
- Benign prostate hyperplasia (BPH)
- Urinary tract infection (UTI)
- Bladder cancer
- Overweight

**PTNS:** Electrical stimulation of the posterior tibial nerve as it courses just above the medial malleolus, is a minimally invasive neuromodulation treatment to reduce OAB symptoms. Multiple studies have shown up to 80 percent reduction of symptoms and improvement in quality of life. The recommended regimen is a weekly treatment, which takes about 30 minutes, for 12 weeks. Maintenance treatments (three weekly stimulations every six months) are recommended for sustained efficacy.

**Intravesical injection of botulinum toxin:** Botox® is another efficacious therapeutic option. Approximately 100 to 200 units of Botox are injected into the detrusor muscle through a cystoscope. This is typically an office procedure that takes 30 minutes. For most patients, durability of efficacy lasts approximately four to six months.

**InterStim implantation:** Sacral neurostimulation is the final treatment option for refractory patients. Approved by the U.S. Food and Drug Administration for treating both urinary and fecal incontinence, InterStim is an implantable neuromodulation device that stimulates the sacral nerve to reduce bladder spasticity.

**Conclusion**

OAB is a common and potentially debilitating condition. Educating patients regarding the underlying pathophysiology of the condition and reviewing effective treatment options are critical to the successful management of OAB.

For additional information regarding OAB treatment, please call Seattle Urological Associates at Minor & James Medical at 206-215-2580.

When to Refer to Swedish

**Physicians**

- James P. Gasparich, M.D.
- Joel D. Lilly, M.D.
- John S. Mullen, M.D.
- Steven Han, M.D.

**Clinic Locations**

- **Swedish/First Hill**
  - Arnold Pavilion
  - 1221 Madison, Suite 1210
  - Seattle, WA 98104

- **Swedish/Issaquah**
  - Issaquah Medical Office Building
  - 715 N.E. Blakely Dr.
  - Issaquah, WA 98029

- **Swedish/Redmond**
  - 18100 N.E. Union Hill Road
  - Redmond, WA 98052

- **Swedish West Seattle**
  - Specialty Clinic
  - 3400 California Ave. S.W., Suite 210
  - Seattle, WA 98116

When to Refer to Swedish

**Minor & James Medical – Seattle Urological Associates**

- Phone: 206-215-2580
- Fax: 206-215-2581
- www.minorandjames.com/urology

**Clinic Locations**

- **Swedish/First Hill**
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- **Swedish/Issaquah**
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  - 715 N.E. Blakely Dr.
  - Issaquah, WA 98029
Case Study: The value of PSA screening

Joel D. Lilly, M.D., Seattle Urological Associates, a division of Minor & James Medical

A patient initially presented in April 2011 when he was 59 years old. His medical history showed a prostate specific antigen (PSA) of 1.5 in 2005. In January 2011, his PSA was 4.2. Following antibiotic therapy, a repeat PSA was 5.3, which triggered the referral to our clinic.

A clinical prostate exam showed induration on the left side. Results of a prostate ultrasound showed prostate volume of 38 ml and no visible suspicious lesions.

A biopsy in May 2011 showed bilateral small foci of low-grade prostate cancer (Gleason grade 3+3).

We discussed his treatment options, including robotic-assisted radical prostatectomy, radiotherapy, hormonal therapy (androgen deprivation), and active surveillance. The patient elected active surveillance with repeat PSAs and a planned repeat biopsy in a year.

In November 2011, his PSA was 5.4. Three months later (February 2012), his PSA was 6.6, with a repeat level of 6.3. A physical exam showed no suspicious abnormalities. A repeat ultrasound showed no suspicious lesions. Biopsies again showed bilateral small foci of primarily low-grade cancer, with a question of higher grade cancer on one side. Precancerous lesions (HGPIN) were seen bilaterally. He obtained second and third opinions, and elected to remain on active surveillance.

In August 2012, his PSA was 5.9, and in January 2013 it was 6.2. Repeat surveillance biopsies in May of this year (2013) showed bilateral Gleason grade 3+4 cancer. The Gleason pattern 4 is a significantly more aggressive type of cancer. At this time, he elected to proceed with a radical prostatectomy.

In June 2013, the patient underwent a robotic-assisted laparoscopic radical prostatectomy with pelvic lymphadenectomy and concomitant laparoscopic repair of bilateral inguinal hernias with mesh. His pathology report showed organ-confined cancer with negative surgical margins and negative nodes. He was discharged on postoperative day number one and had an uncomplicated recovery. His catheter was removed one week after surgery. Six weeks after surgery, he already had complete urinary continence and good erections using daily Cialis®. His PSA was undetectable. Three months postoperatively, he had perfect urinary control and was able to get excellent erections without medications.

Recently, there has been much discussion about the risks/benefits of the PSA screening, with some organizations, such as the U.S. Preventive Services Task Force (USPSTF), arguing against any screening, and others suggesting its value is questionable and PSA screening should be limited.

This case shows that PSA can be an effective surveillance tool to monitor and diagnose cancer when it is used judiciously and appropriately in conjunction with biopsy. Early diagnosis allows the best chance of success using the least invasive techniques, thereby reducing the risk of long-term debilitating side effects. Had this patient not been screened with PSA, it is likely that he would have eventually presented with locally advanced or metastatic disease and only been a candidate for hormonal therapy, a noncurative modality with many side effects.

We believe the guidelines of the American Urological Association (AUAnet) offer a more balanced and appropriate approach to the detection of prostate cancer than the recommendations of the USPSTF. For more information about the AUAnet guidelines, go to www.auanet.org/education/guidelines/prostate-cancer-detection.cfm.
CMS Approves Swedish Liver Transplant Program

The Centers for Medicare and Medicaid Services has approved the Swedish Liver Transplant Program for participation in the Medicare program. Approval came following an on-site evaluation, which the Liver Transplant team passed with 100 percent compliance.

Receiving CMS approval is one step in enhancing access to this life-saving service.

The Swedish Liver Center provides a comprehensive approach to liver disease, including disease management treatments and therapies, and surgical procedures, as well as transplantation.

For more information about the Swedish Liver Center, go to www.swedish.org/LiverCenter. To consult, refer a patient or request a second opinion, please call 206-386-3660. For information about the Swedish Organ Transplant Program, call 206-386-3660 or 1-800-99ORGAN (1-800-996-7426). For organ donation information, please go to www.donatelife.net.

The Newest Members of the Swedish Medical Staff

The following individuals joined Swedish during the fourth quarter of 2013. We invite you to view their online profiles at www.swedish.org/physicians.

- Alyssa Barto, M.D.
  Family Medicine with Obstetrics
- Gabriel Berson, M.D.
  Pediatrics
- Kyla Brydon, M.D.
  Family Medicine with Obstetrics
- Judy Chen, M.D.
  Bariatric Surgery
- Daniel Clayton, M.D.
  Neurosurgery
- Maria Rizza Collantes, M.D.
  Family Medicine
- Johnny Delashaw, M.D.
  Neurosurgery
- Katherine Estlin, M.D.
  Family Medicine with Obstetrics
- Emma Grabinski, M.D.
  Obstetrics & Gynecology
- Terri Graham, M.D.
  Pediatrics
- Genevieve Hann, M.D.
  Family Medicine with Obstetrics
- Eric Heineberg, M.D.
  General Surgery
- Joshua Hill, M.D.
  Internal Medicine/Hospitalist
- Paige Sakai, M.D.
  Family Medicine
- LuLu Iies-Shih, M.D.
  Gastroenterology
- Paul Lim, M.D.
  Physical Medicine & Rehabilitation
- Stanley Lue, M.D.
  Neurology
- Katherine Mandell, M.D.
  General Surgery
- Nimish Muni, M.D.
  Cardiology
- Tuan-Anh Nguyen, M.D.
  Family Medicine
- Leslie Price, M.D.
  Gastroenterology
- Sanjit Reddy, M.D.
  Transplant Nephrology
- Holly Sato, M.D.
  Obstetrics & Gynecology
- Rupin Thakkar, M.D.
  Pediatrics
- Kristy Thompson, D.O.
  Family Medicine
- Margaret Towolawi, M.D.
  Family Medicine
- Diem-Phuong Tran, D.O.
  Family Medicine
- Jayalakshmi Udayasankar, M.D.
  Endocrinology
- Theresa Willett, M.D., Ph.D.
  Pediatrics
- Agnes Wong, M.D.
  Pediatrics

CME Course Listing – November–December 2013

Physicians from across the region and around the world come to Swedish Medical Center’s Continuing Medical Education (CME) courses to learn about new research and innovative treatment techniques.

For times and locations, go to www.swedish.org/cme or call 206-386-2755.

Transradial Approach: A Case-based and Hands-on Training Course
Friday-Saturday, Nov. 8-9

Diabetes Management Update 2013
Friday, Nov. 15

Controversies in Neurological Restoration: Clinical Strategies and Case Presentations
Friday, Nov. 22

Otolaryngology for the Primary-Care Provider
Friday, Nov. 22

Save the Date!
Pediatric Specialty Updates for the Primary-Care Physician
Friday, January 31, 2014
Join our email list at swedish.org/CMEProfile

Swedish Medical Center is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.