

Isabella Rosa Nanini

Mr. Speice

Independent Study and Mentorship II 3B

1 November 2017

### Observation Assessment

Type of Observation: Observed mitral valve replacement, maze procedure through cryoablation, and re-do sternotomy

Mentor: Dr. Timothy Pirolli

Location: Children's Health Medical Center- Dallas 1935 Medical District Drive Dallas, Texas 75235

Date: Monday, October 30 2017

Time: 8:30am to 4:30pm

### Valve Replacement

In this observation I had the opportunity to observe a mitral valve replacement on an adult. From my study in Independent Study and Mentorship last year I knew that pediatric cardiothoracic surgeons treat congenital heart defects on adult as well since they have a more broadened understanding of malformations within the heart, but this was my first time observing an operation on an adult heart. This patient specifically is a 45 year old woman with down syndrome who was about to experience her third open-heart surgery. Often mitral valve repairs need constant reoperation to ensure it is working properly. This patient also has a pacemaker placed a couple years back, and I got to see first hand the wiring within the heart for a pacemaker; however, this pacemaker was unrelated to this specific mitral valve replacement

surgery, and required a specific professional to work with the OR team during surgery. Coming into surgery I was excited to see the process of mitral valve replacement I have been studying for our research, and although this patient is not an infant less than one year old I am now able to better visualize the medical procedures I am reviewing. Another goal for this observation assessment was to continue to review my research with Dr. Pirolli after surgery.

This surgery required a lot of precaution coming in and led to an extensive case. Coming into the surgery Dr. Pirolli reviewed the patient's CT scans with me. Before opening her chest to begin the re-do sternotomy Dr. Pirolli wanted to know what he was coming into and showed me the location of her pacemaker wires, the metal rings placed along her sternum, and the scar tissue left within her pericardium and sternum. He also showed me the overall anatomy of her thoracic cavity area through the CT scan, and taught me how to review and read these. Her CT scan revealed that her pericardium was located very near her sternum and required very careful dissection as to not puncture the heart and cause bleeding. Often sternotomies are fairly quick in pediatric cardiothoracic surgery, so it was my first experience observing a re-do sternotomy. This patient sternotomy required careful dissection of scar tissue formed from her previous surgery 15 years ago; however after about an hour of scar tissue dissection Dr. Pirolli was ready to begin the cannulation/cardiopulmonary bypass machine process which requires aortic and venous cannulas and the initiation of the cardiopulmonary bypass machine. When on the cardiopulmonary bypass machine the heart no longer pumps blood and that is when the actual operation begins. The first step to this case was a maze procedure through cryoablation. Due to this patient's life with moderate mitral valve regurgitation a maze procedure was required to repair atrial fibrillation. A professional came to observe the maze procedure and control the cryoablation machine, and Dr.

Pirolli used this machine to destroy tissue by freezing it. Once the heart heals scar tissue will form within the right atrial wall and this scar tissue will not conduct any electricity and will keep electrical impulses on course fixing this patient's atrial fibrillation. The next step of this operation was to dissect a mitral ring used in this patient's previous mitral valve repair surgery, and once this ring has been dissected Dr. Pirolli can begin to dissect the mitral valve leaflet and attach a mechanical mitral valve. To assist Dr. Pirolli with this replacement pediatric cardiothoracic surgeon Dr. Davies came in. They both worked together to attach the mechanical valve that will now replace this patient's sick mitral valve. They then test out the mitral valve's functionality to ensure that the patient will leave with a functional valve. This process although lengthy I found to look incredibly innovative and creative, requiring perfect precision and careful surgical work. Again, this type of challenge is what attracted me to pediatric cardiothoracic surgery in the first place. It is a career where I would leave my own impact in the work with the creative work of my hands.

After the mechanical valve attachment and testing Dr. Pirolli worked to get the patient off of the cardiopulmonary bypass machine, which again took a lot longer than expected due to a patient's allergy to a medication usually required for restarting the heart. After the lengthy process of decannulation and restarting the heart the chest was finally closed and the patient began the postoperative phase of surgery. This completed my observation time and this is when Dr. Pirolli had some time to review our research. Since we are only in the reviewing phase of our prospective research Dr. Pirolli gave me some research homework that will give me a foundation of understanding the charts that we will be reviewing. Overall, this assignment will strengthen

my ability to effectively participate in this research and will challenge me to go above and beyond to expand my understanding of my ISM topic.

Dr. Pirroli, Dr. Davies other observer: nicole  
nurses: kensy, margaret

Observation day 10/30/17 Regurgitation

45 yrs old (3rd surgery) moderate

mitral valve replacement → mechanical valve

maze procedure through cryoablation  
for atrial fibrillation

re-do sternotomy

### 1. re-do sternotomy

→ showed CT scans → count rings

→ had to be careful where metal rings  
were located and where pericardium  
wall was located with sternum

→ longer b/c had to be careful

→ a lot of scar tissue to dissect

→ removal of sternum metal rings and  
pericardium stitching

### 2. cardio pulmonary bypass machine cannulation

→ aortic cannula

→ venous cannulas

→ vents

→ initiation of CPB

### 3. maze procedure

→ for chronic atrial fibrillation

caused by moderate regurgitation  
from mitral valve anomaly

→ cryoablation device destroys tissue by  
freezing it.

→ after heart heals scar tissue forms  
and scar tissue cannot carry electrical  
impulses, keeps electrical impulses on  
course

4. Removal of mitral ring from previous mitral valve replacement  
→ ring is sent to pathology along w/ dissected mitral leaflets

5. mitral valve replacement  
→ dissection of mitral valve  
→ attachment of mechanical valve

6. Testing of mechanical valve

7. decannulation and removal of the cardiopulmonary bypass machine  
→ took a long time

130 patients in review

TO-DO from Dr. Firrolli

1. mitral preop left ventricular fraction annulus
  - what is the left ventricular ejection fraction? normal range?
  - How do you calculate?
  - what is the annulus.
2. z score of mitral
  - what is it?
3. cardiopulmonary bypass time
  - bars
4. gestational age
  - what is it?
5. preop mitral valve gradient
  - what is it?
6. preop left atrial diameter
  - what is it?
7. preop mean left ventricular ed diastolic
  - diastolic v. systolic
  - what is the mean LV&D diameter

Cross  
 Clamp  
 Time  
 Blood  
 products  
 LA line  
 placement  
 LA  
 pressure  
 Echo  
 Intraop  
 Open Chest survival  
 Early

Operations  
 Performed  
 technique  
 CPB time  
 Cardiac  
 pump  
 bypass

Mitral  
 annulus  
 Z score of  
 mitral  
 valve  
 an  
 annulus

Left  
 Ventricular  
 Ejection  
 fraction

what is it?  
 what does it

mean  
 normal range?  
 how do  
 you calculate

230

Left  
Ventricular  
diameter

Preop  
Mean LVED  
diameter

Preop LA  
diameter

PreOp MV  
gradient

Weight at  
operation

Age at  
operation  
(days)

Other  
cardiac dx

Syndromes

Mitral  
diagnosis

Gestational  
Age

Gender

Date of  
Surgery

Name

MRN

Medical  
Record  
Number

Mitral  
Valve  
gradient

Left  
atrial  
diameter

diastolic vs  
systolic

reintervent  
ion/  
reoperatio  
n  
Late survival

time to  
extubation  
gradient

Post op  
diameter

Post Op LA  
diameter

Post op  
mean LVED  
diameter

Post Op  
LVEF

arrhythmia  
s

post op  
anticoag

interval on  
echo  
(months)