Valve Disease

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Saginaw, MI

These slides are to be used for quality improvement by the MSTCVS member surgeon champions and data managers. Each slide includes the MSTCVS confidentiality statement.

Disclosures

- I have nothing pertinent to disclose.

Presentation Outline

- Normal Valve Anatomy
- Aortic & Mitral Valve Etiologies
- Tricuspid & Pulmonic Valve Etiologies

Muskegon Mercy OR 2016

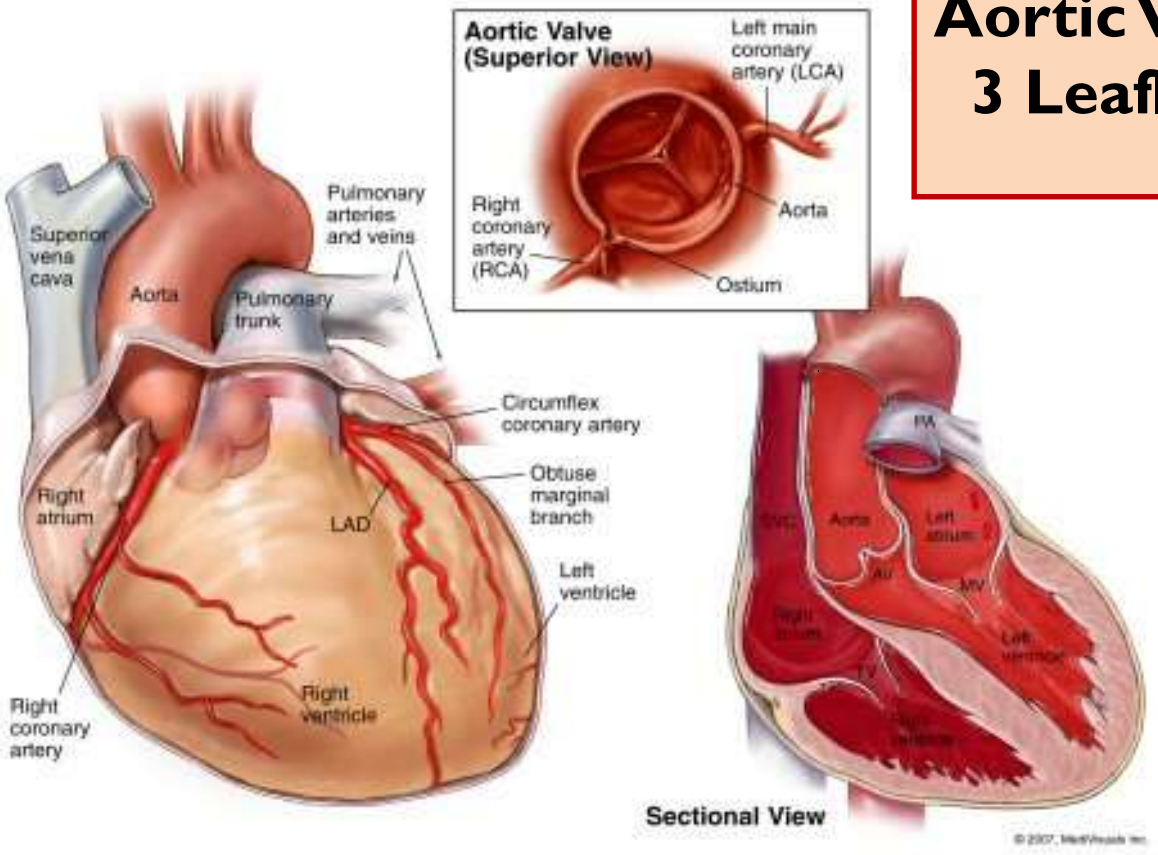
- Pictures/Diagrams of Diseased Valves
- Surgeons Will Help!

Spectrum Health Surgeons

Let's Start……..

Normal Aortic Valve

Aortic Valve
3 Leaflets

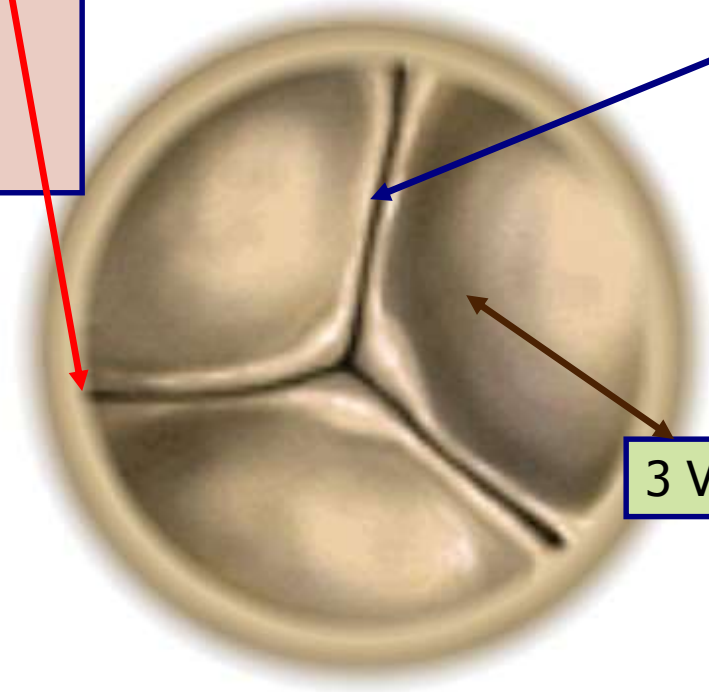


www.vcu.edu/hearts/aortic

Aortic Valve

Commissural Posts

- Site of Union
- Between Adjacent Valve Cusps



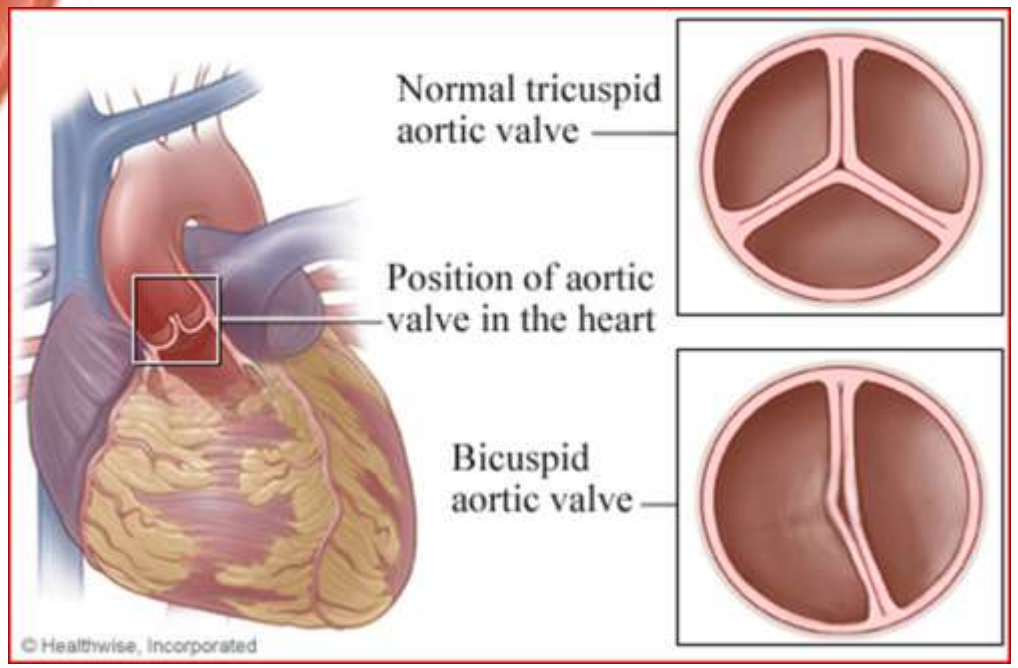
Valve Commissures

3 Valve Leaflets/Cusps

Normal Coaptation of Aortic Valve

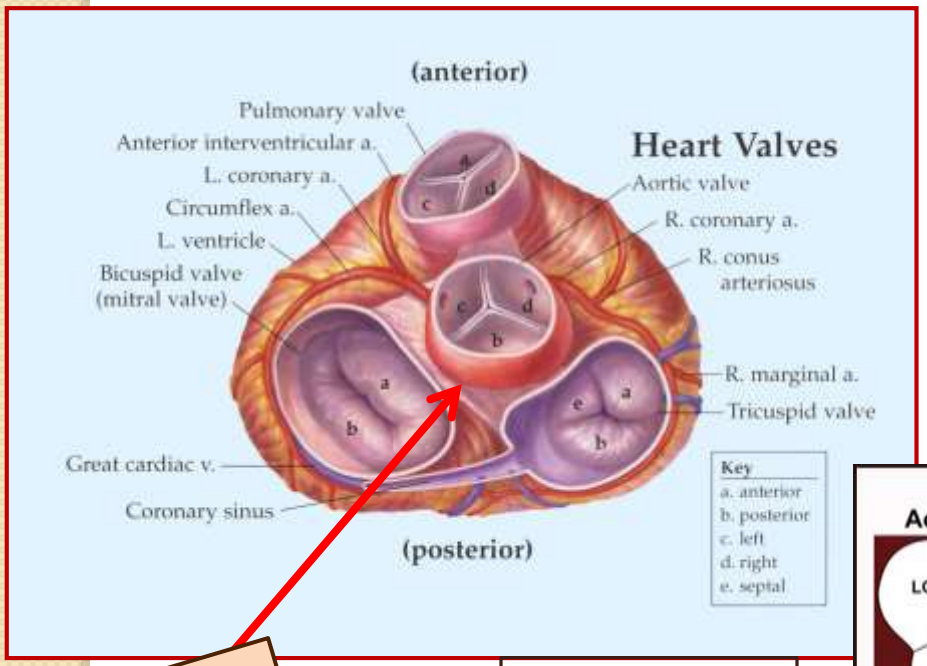
Deeb, M. Univ. of Michigan Valve Sparing Presentation. Boston, MA April 13 2009

Tricuspid & Biscuspid Aortic Valve



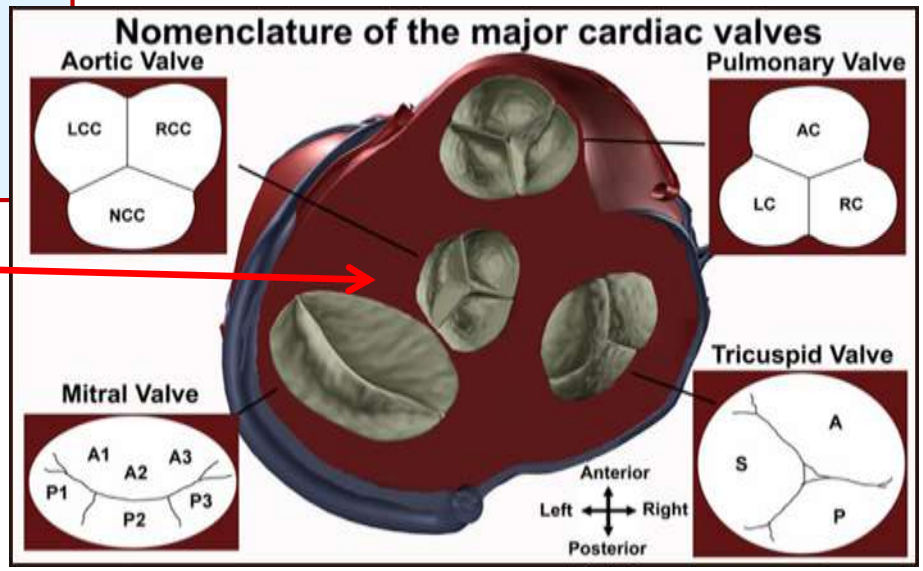
www.webmd.com

Cross Section View of Heart Valves & Their Relationship



www.edoctoronline.com

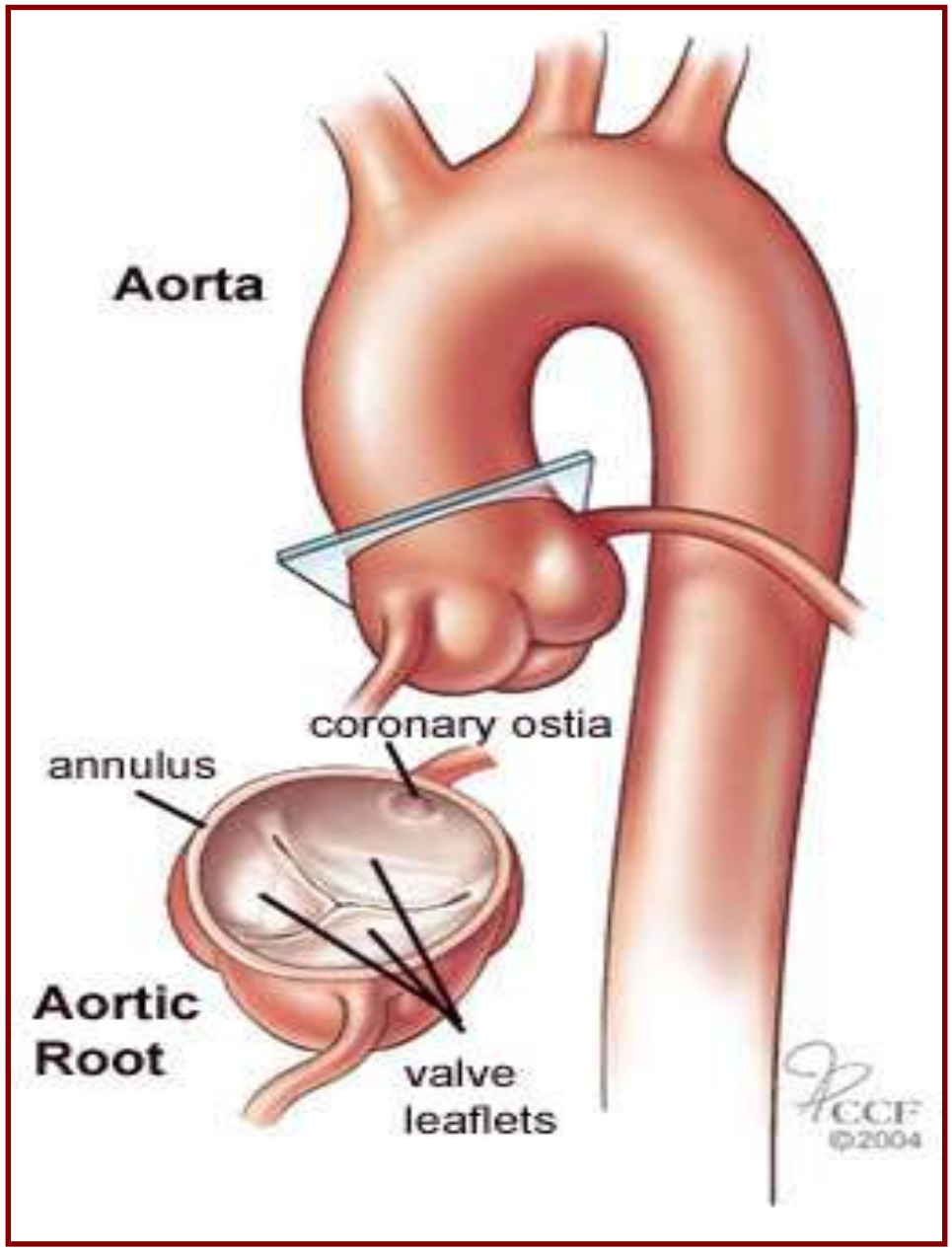
Very Close !!



Valleyheartlab/Univ.of MN

Aortic Valve:

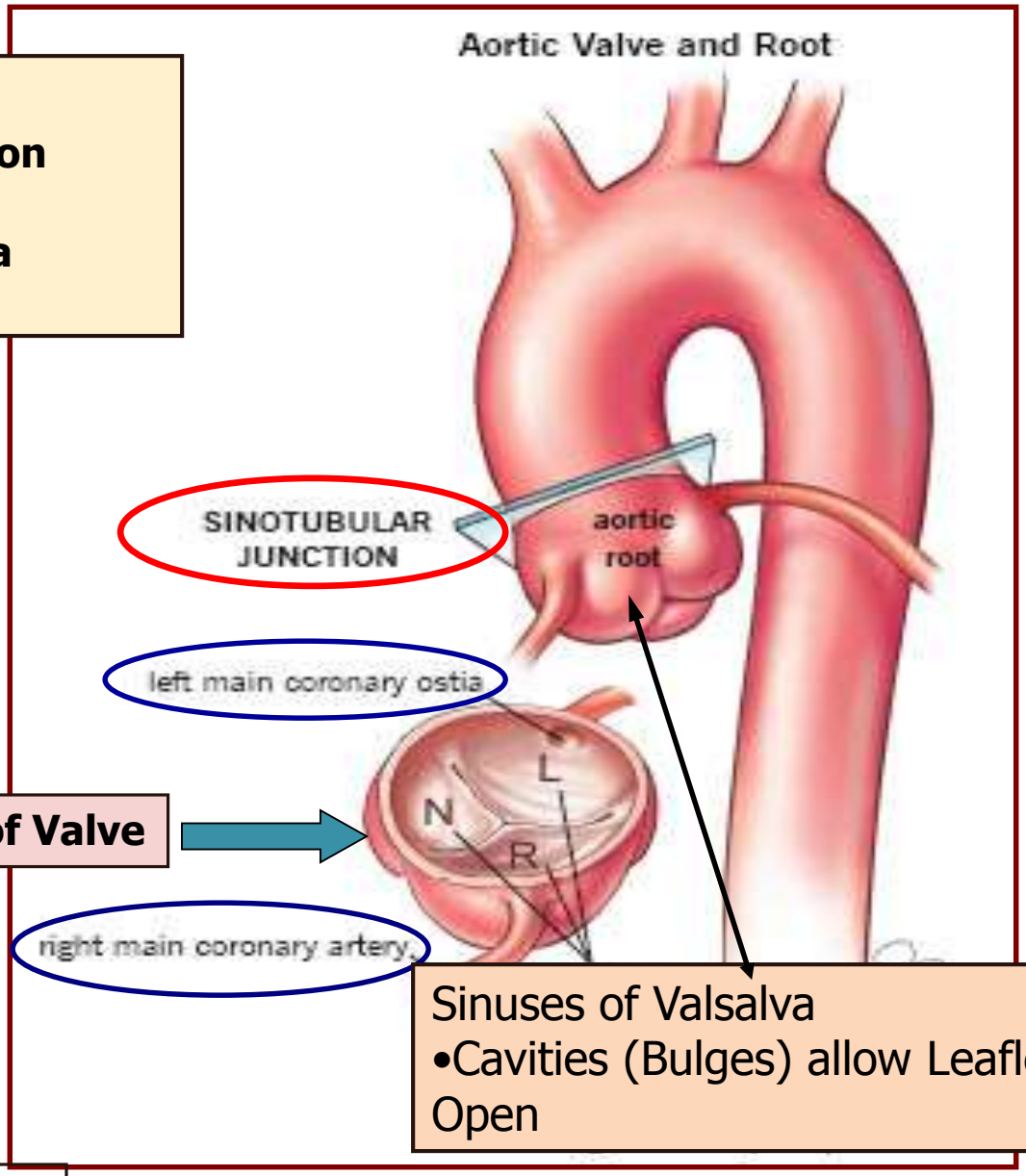
- Annulus
- Leaflets (Cusps)
- Coronary Ostia



http:// content.revolution.com Columbia University

Aortic Root

- Sinotubular Junction
- Annulus
- Sinuses of Valsalva
- Coronary Ostia



Annulus of Valve

Sinuses of Valsalva
- Cavities (Bulges) allow Leaflets to Open

clevelandclinic.org/heartcenter.images

Data Collection Form Information

- Common Valve Disease Etiologies
- Important for Data analysis
- Gaps in MSTCVS Audits 2015-2016
- 2.9 – Probably an Audited Data Element!

AORTIC VALVE DISEASES

2.81 Aortic Valve Etiology Section

Aortic Valve

Aortic Insufficiency: ☐ None ☐ Trivial/Trace ☐ Mild ☐ Moderate ☐ Severe ☐ Not Documented
VDInsufA (1590)

Aortic Valve Disease: VDAort (1595) ☐ Yes ☐ No

(If Yes→) Aortic Stenosis: ☐ Yes ☐ No (If Yes→) Hemodynamic/Echo data available: ☐ Yes ☐ No (If Yes ↓)
VDStenA (1600) AoHemoDatAvail (1605)

(If Yes↓)

Smallest Aortic Valve Area: VDAoVA (1610) _____ cm^2
Highest Mean Gradient: VDGradA (1615) _____ mmHg

Etiology: (Choose at least one and up to 5 etiologies)	#1 VDAoEt1 (1625)	#2 VDAoEt2 (1630)	#3 VDAoEt3 (1635)	#4 VDAoEt4 (1640)	#5 VDAoEt5 (1645)
Unknown					
No additional etiology					
Bicuspid valve disease					
Congenital (other than bicuspid)					
Degenerative- Calcified					
Degenerative- Leaflet prolapse with or without annular dilation					
Degenerative- Pure annular dilation without leaflet prolapse					
Endocarditis with root abscess					
Endocarditis without root abscess					
LV Outflow Tract Pathology, HOCM					
LV Outflow Tract Pathology, Sub-aortic membrane					
LV Outflow Tract Pathology, Sub-aortic Tunnel					
LV Outflow Tract Pathology, Other					
Primary Aortic Disease, Aortic Dissection					
Primary Aortic Disease, Atherosclerotic Aneurysm					
Primary Aortic Disease, Ehler-Danlos Syndrome					
Primary Aortic Disease, Hypertensive Aneurysm					
Primary Aortic Disease, Idiopathic Root Dilation					
Primary Aortic Disease, Inflammatory					
Primary Aortic Disease, Loeys-Dietz Syndrome					
Primary Aortic Disease, Marfan Syndrome					
Primary Aortic Disease, Other Connective tissue disorder					
Prior Aortic Intervention, Etiology Unknown					

Aortic Valve Disease 1.

- Bicuspid
- Congenital (Other than Bicuspid)
- Degenerative - Calcified
- Degenerative Leaflet Prolapse
- Degenerative – Pure Annular Dilatation without Leaflet Prolapse
- Endocarditis with Root Abscesses
- Endocarditis without Root Abscesses

Aortic Valve Disease 2.

- LV Outflow Tract pathology - HOCM
- LV Outflow Tract – Sub-aortic membrane/tunnel
- Primary Aortic Disease Aortic Dissection
- Primary Aortic Disease Hypertensive Aneurysm
- Primary Aortic Disease – Inflammatory
- Rheumatic
- Trauma
- Aortic Tumors: Myxoma, Carcnoid, Papillary Fibroelastoma

Tumors "Detour" Information

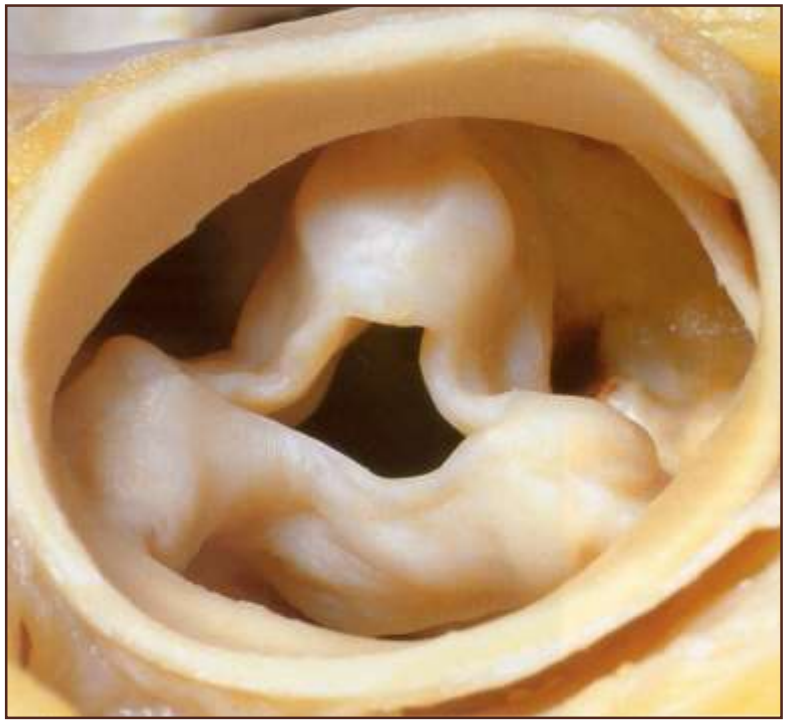
- Valve Disease Etiologies for 3 Valves have Tumors as Choices.
  - Aortic, Mitral and Tricuspid Valves (not Pulmonic)
- Will be Discussed at the End of Talk for Improved Understanding!

Aortic/Aorta Connective Tissue Disorders 3.

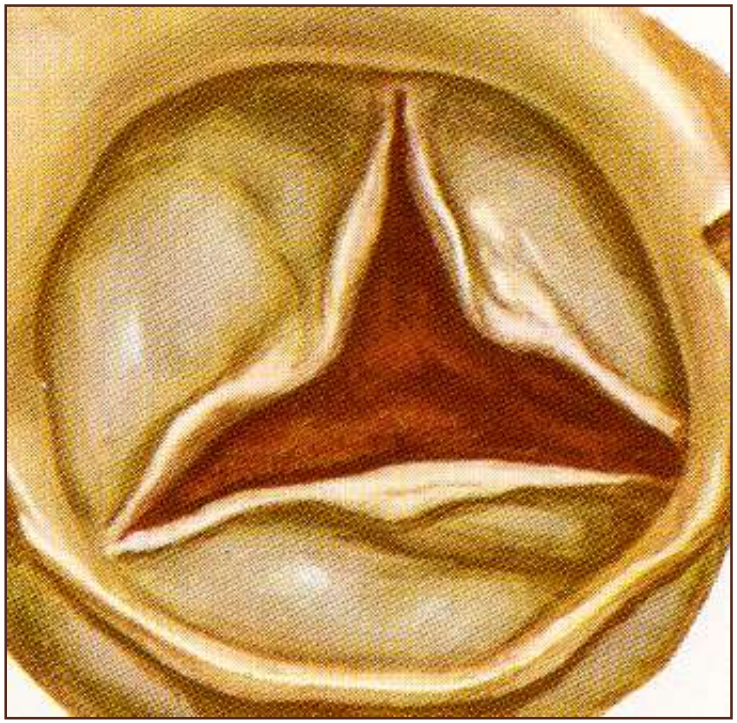
- Aorta Wall Weakness specific in:
- Ehlers-Danlos Syndrome
  - Easy Bruising, Marked Hyperflexibility in joints
- Loeys-Dietz Syndrome
  - Vascular Aneurysms, Twisting Arteries
- Marfan's Disease/Syndrome
  - Tall, Thin Long Limbed – (Abraham Lincoln)
- Collagen & Connective Tissue Synthesis Disorders
  - Improper Collagen, Elastin, Protein Formation
  - Aorta Wall Weakens
  - Usually Also Affects Other Body Systems

Aortic Valve Disease Pictures

Aortic Insufficiency/Regurgitation



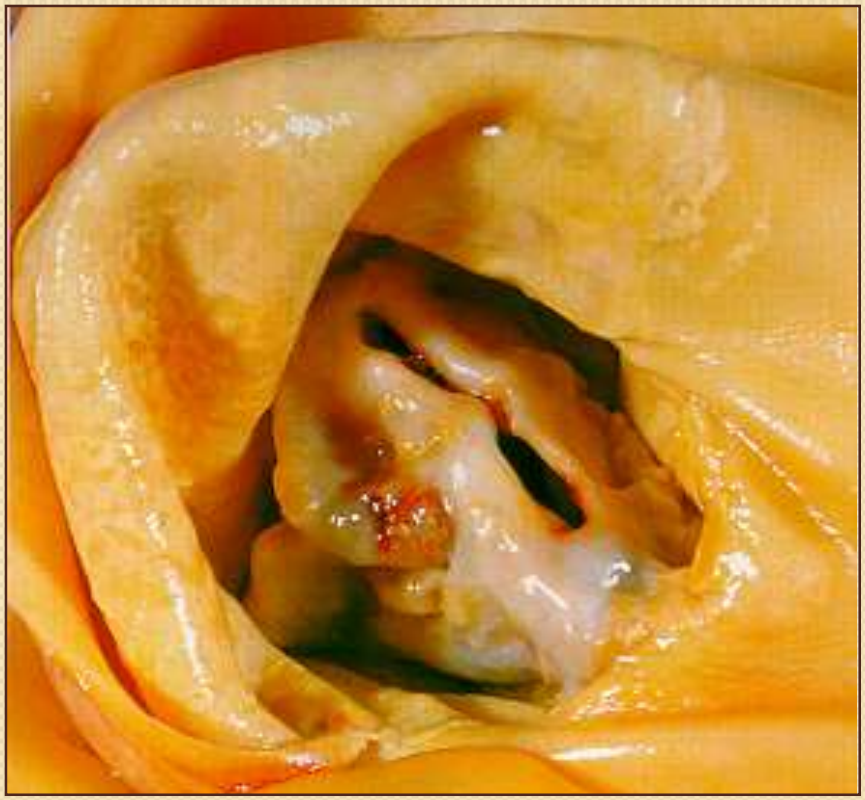
Manabe H, Yutani C (eds). Atlas of Valvular Heart Disease. New York: Churchill Livingstone, 1998;112

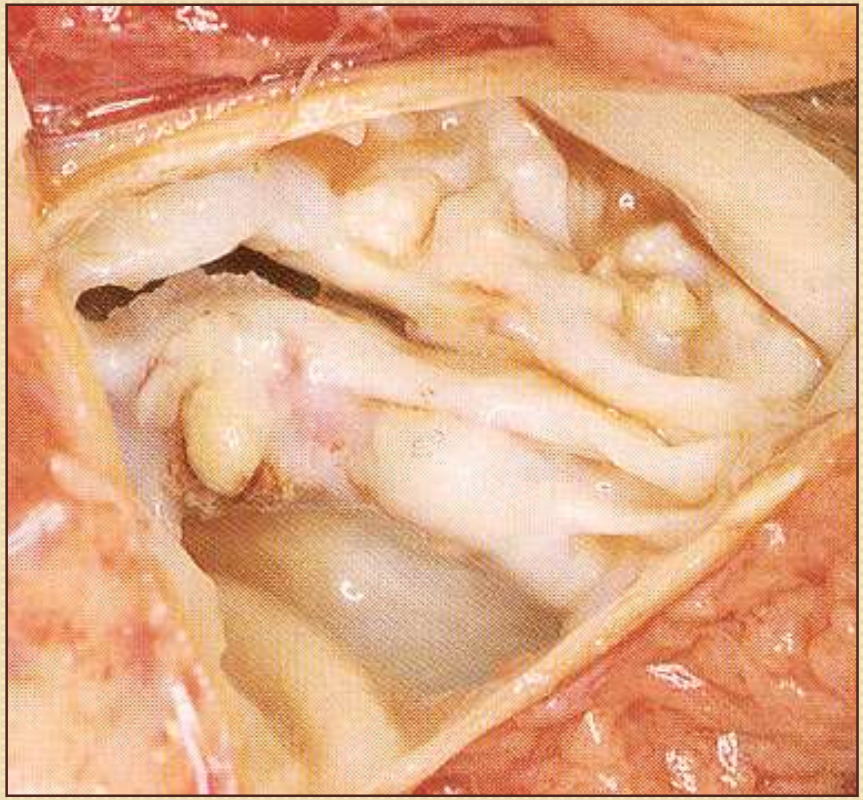


Netter FH: *Heart. Vol. 5, The CIBA Collection of Medical Illustrations.* CIBA-GEIGY Corp. 1978;189

Aortic Stenosis

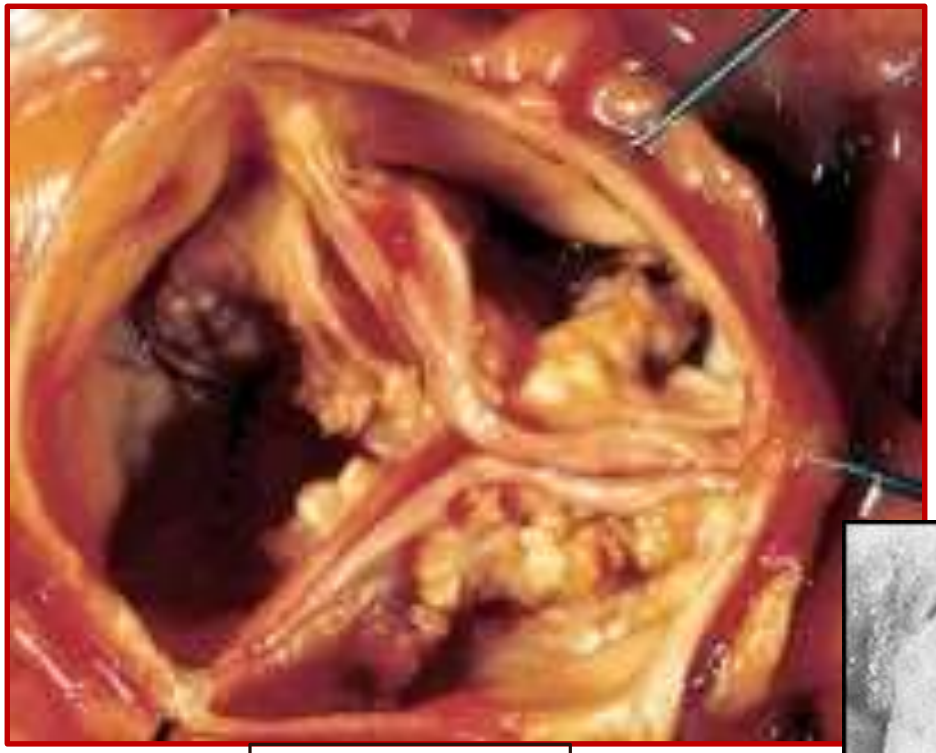
2.81: Degenerative - Calcified





Hurst JW (ed): *Atlas of the Heart.* New York: McGraw-Hill, 1988;4.2,11

Calcific Aortic Stenosis (Trileaflet Valve)



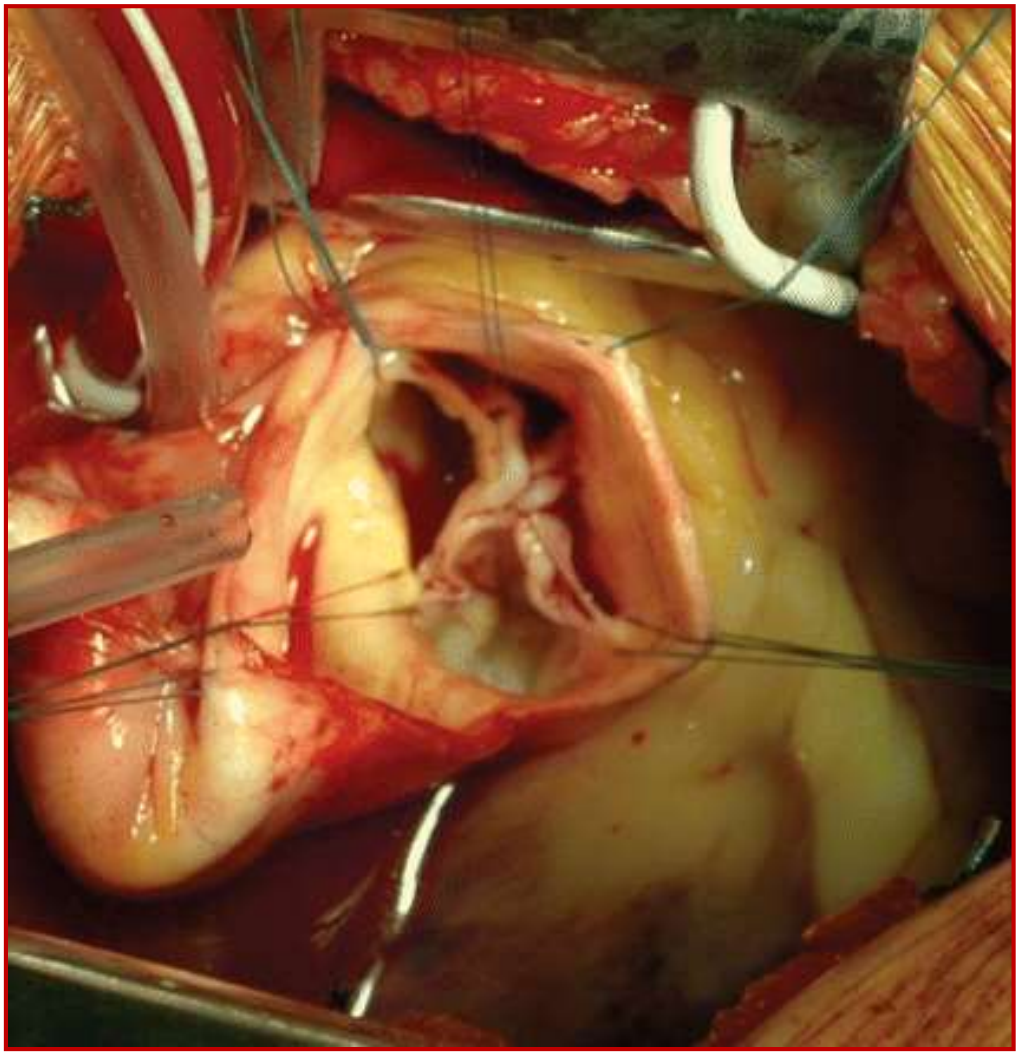
Cardiovascularbusiness.com

clevelandclinic.org

Stenotic Bicuspid Aortic Valve

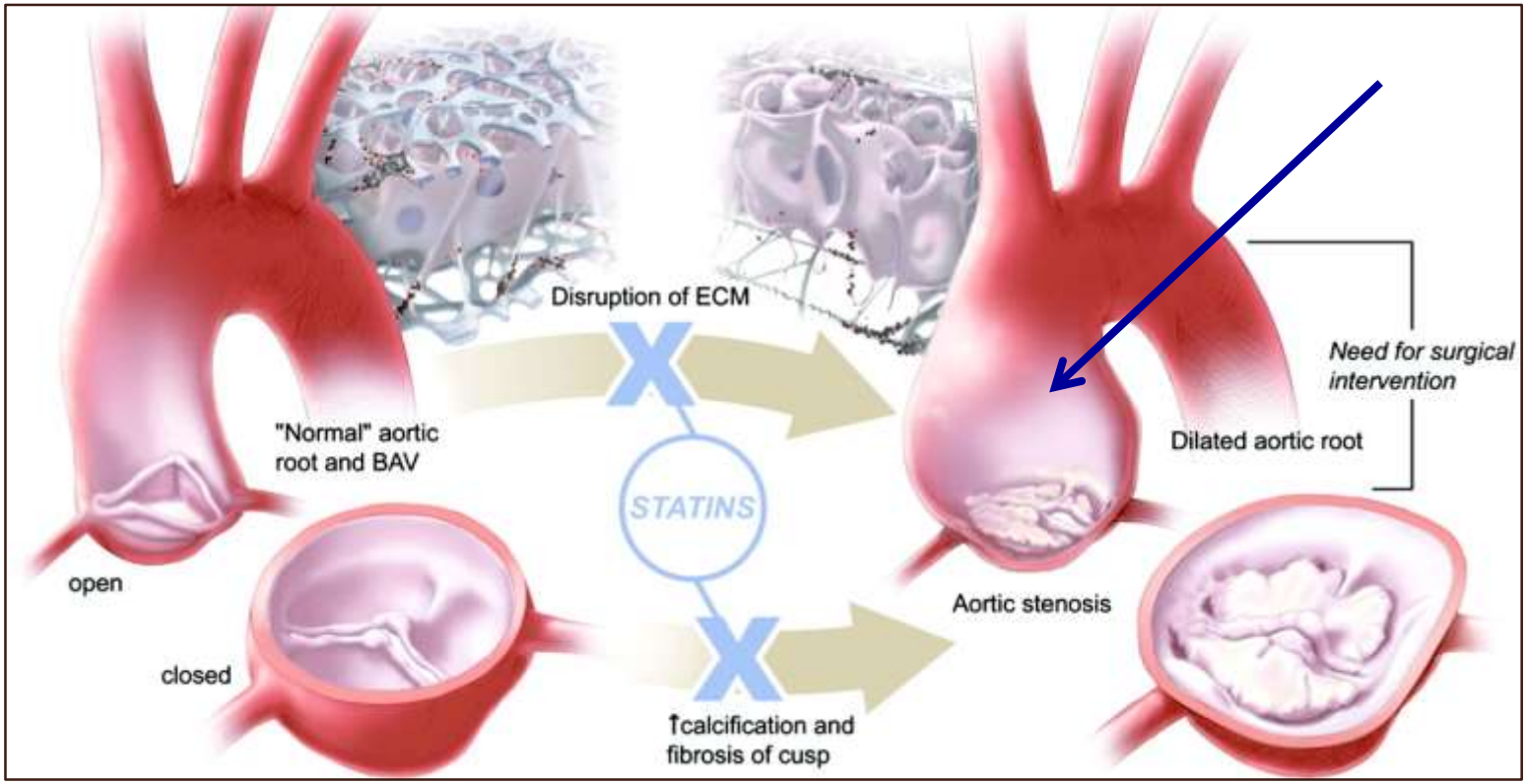
www.universityofalabama.org

Quadricuspid Aortic Valve !



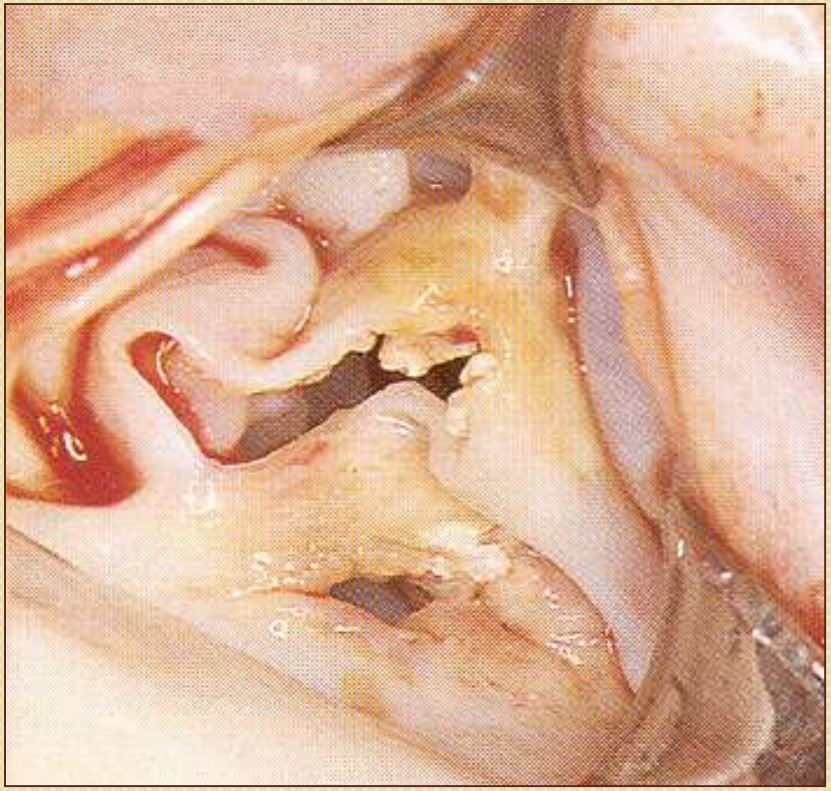
http://Ehjcimaging.oxfordjournals.org

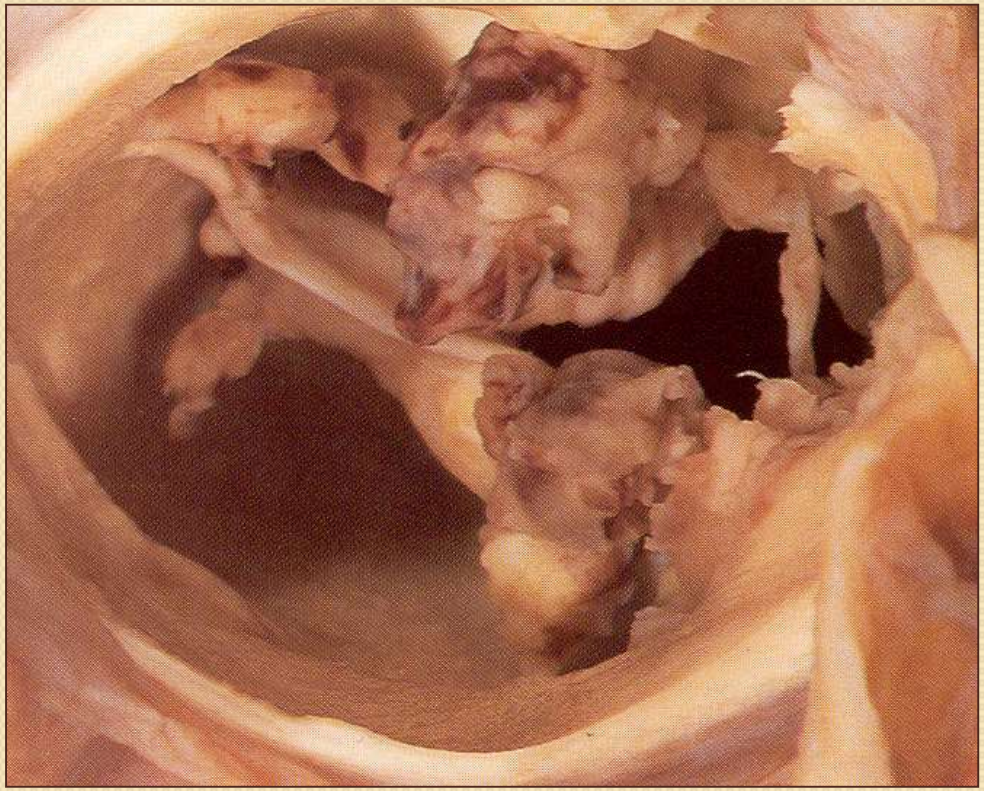
"Degenerative" – Pure Annular Dilation without Leaflet Prolapse



Apjheart.physiology.org

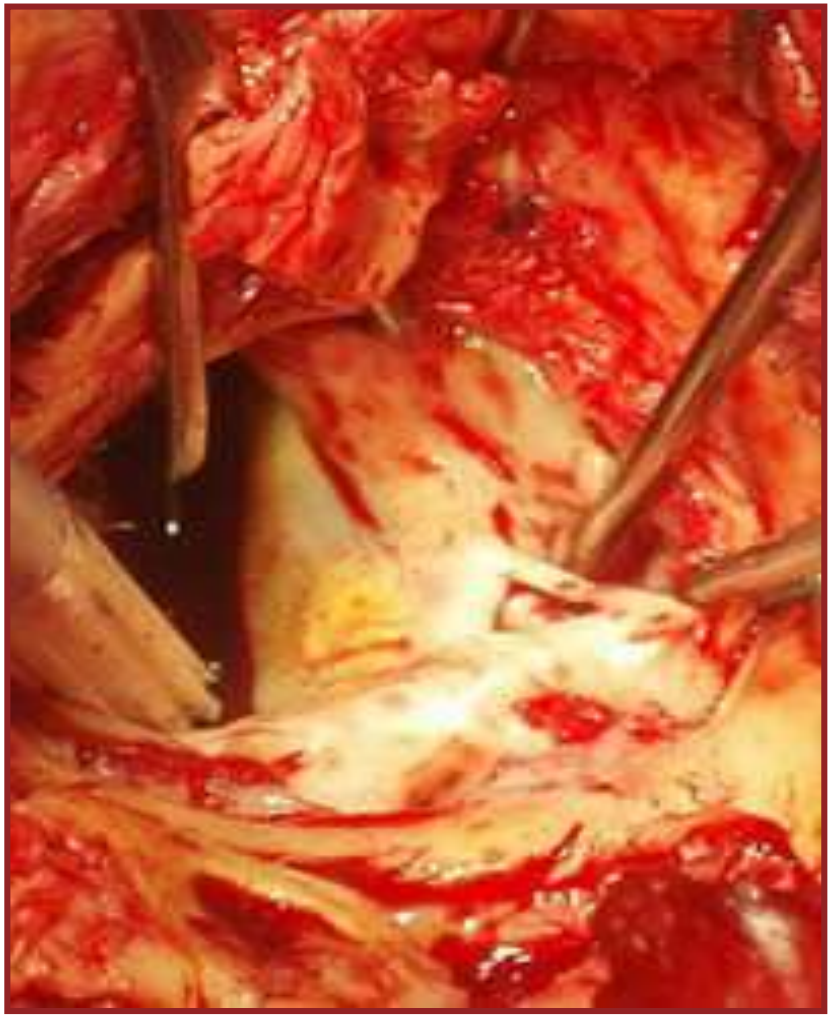
Aortic Endocarditis





Hurst JW (ed): Atlas of the Heart. New York: McGraw-Hill, 1988;4.18,25

Abscess of Aortic Annulus/Root



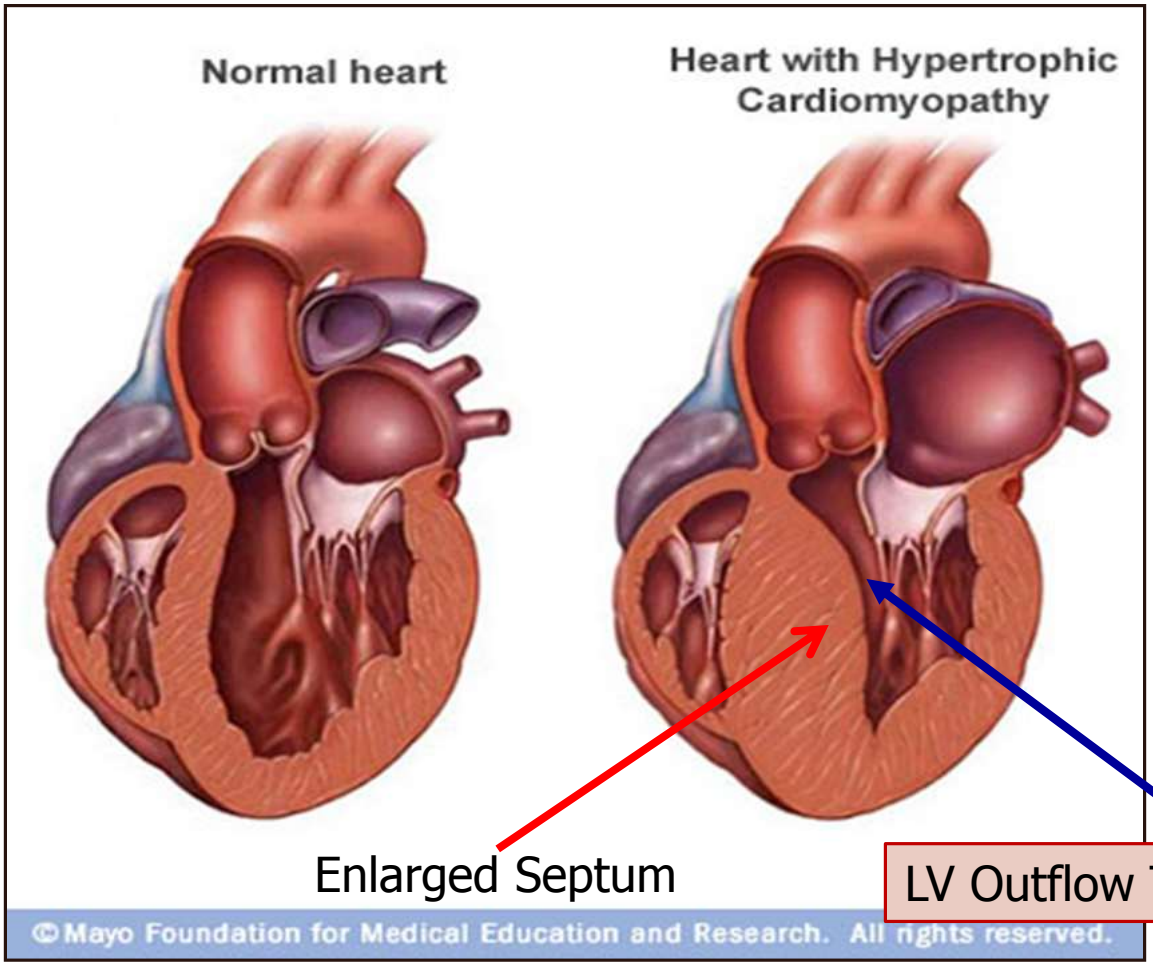
www.escardio.org

Aortic Valve & Aorta Root Combined Abnormalities

- LV Outflow Tract Pathology
  - HOCM
  - Sub-aortic Membrane (subaortic stenosis)
- Aortic Root Problems
  - Ascending /Arch/Descending
- Aorta Dissections &/or Aneursyms

LV Outflow Tract Pathology – HOCM

Hypertrophic **O**bstructive **C**ardio**M**yopathy



LVOT Subaortic Membrane:

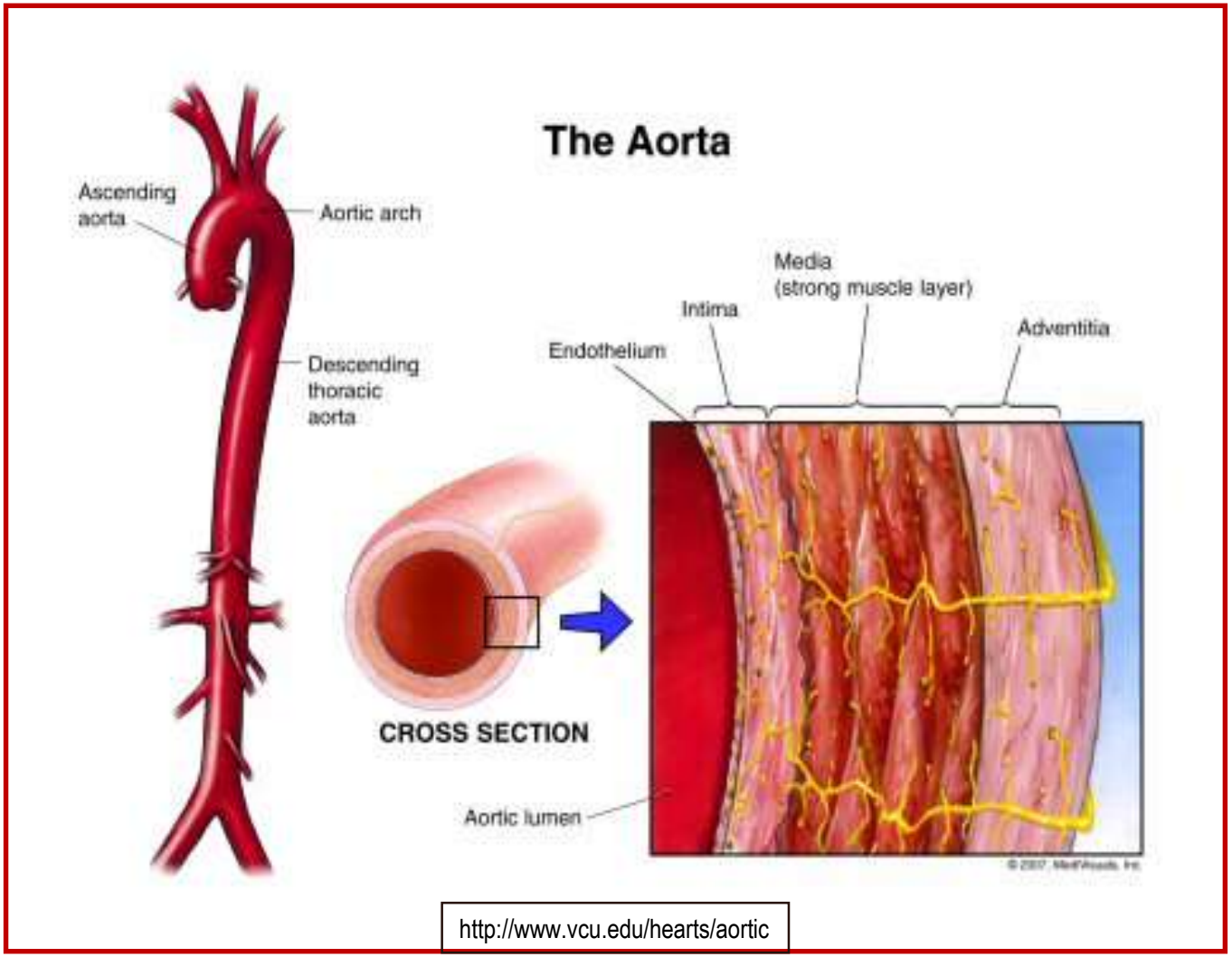
- Fibrous Membrane below the AV
- Subaortic Stenosis

Before Resection

After Surgical Resection

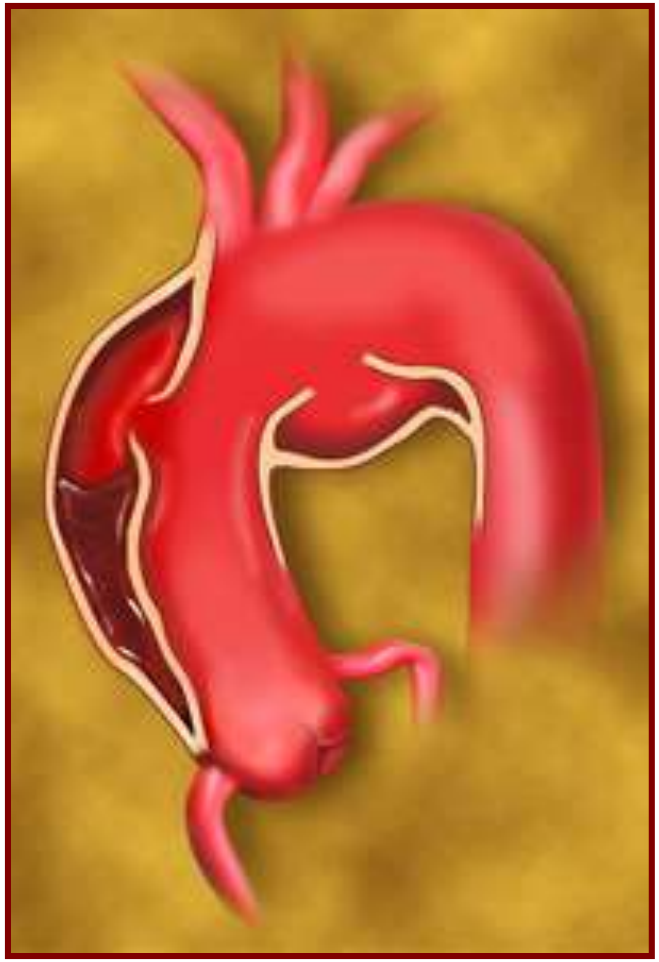
www.cardioaccess.com

Aorta: Anatomic Layers



http://www.vcu.edu/hearts/aortic

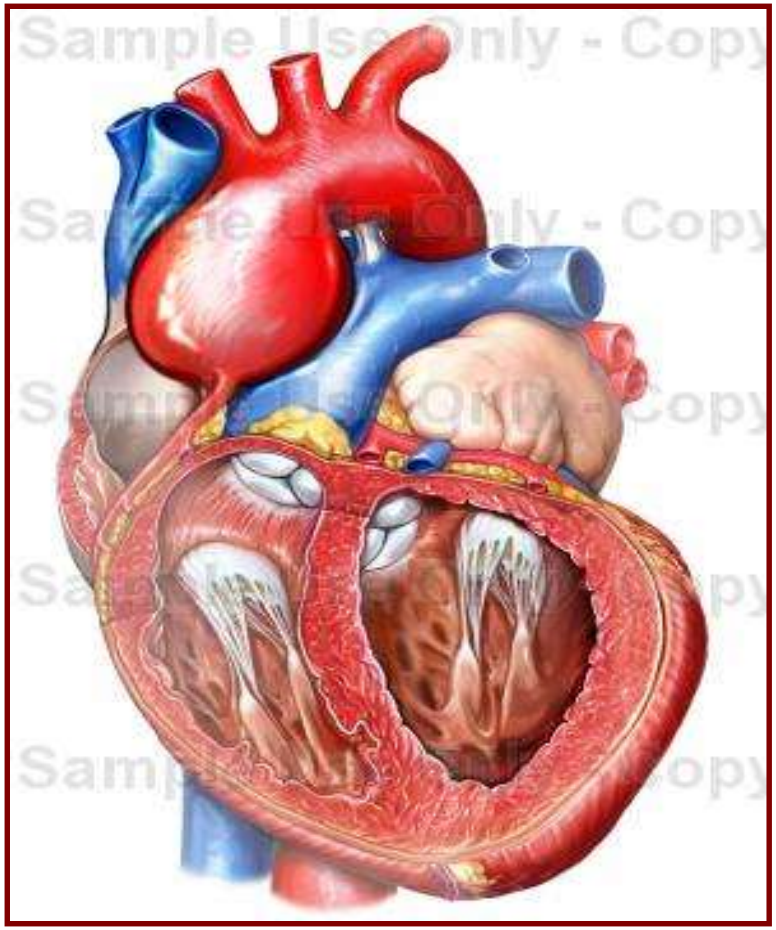
Aortic Dissection



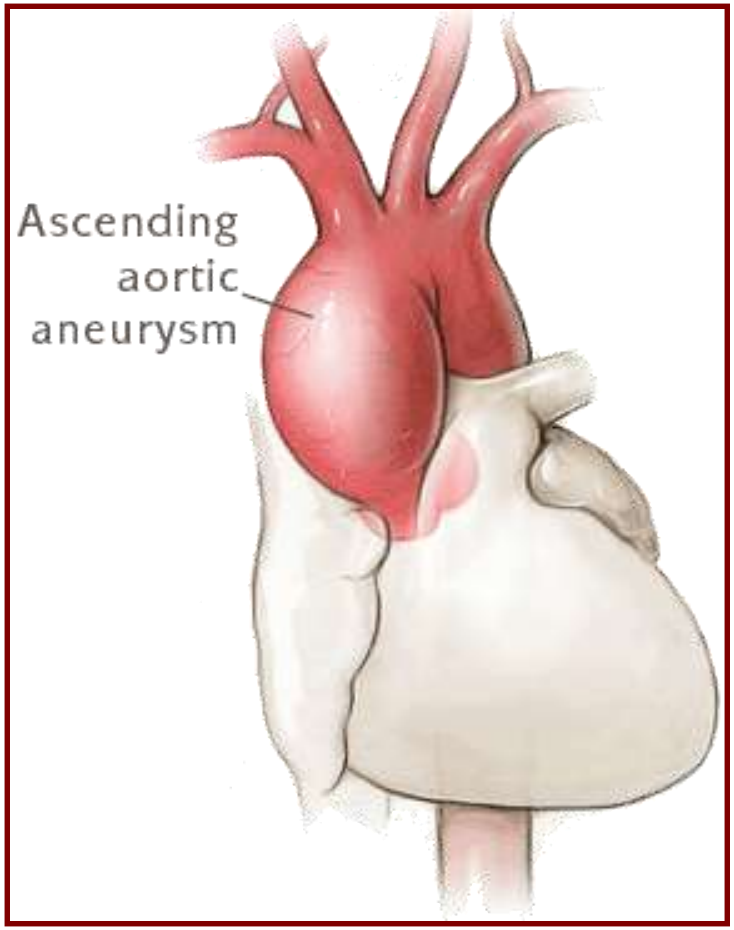
http://www.columbiasurgery/aortic

Dissection = Tear in inner lining of Aorta. Blood flows through Aortic walls & through Aorta Lumen.

Aortic Aneurysm

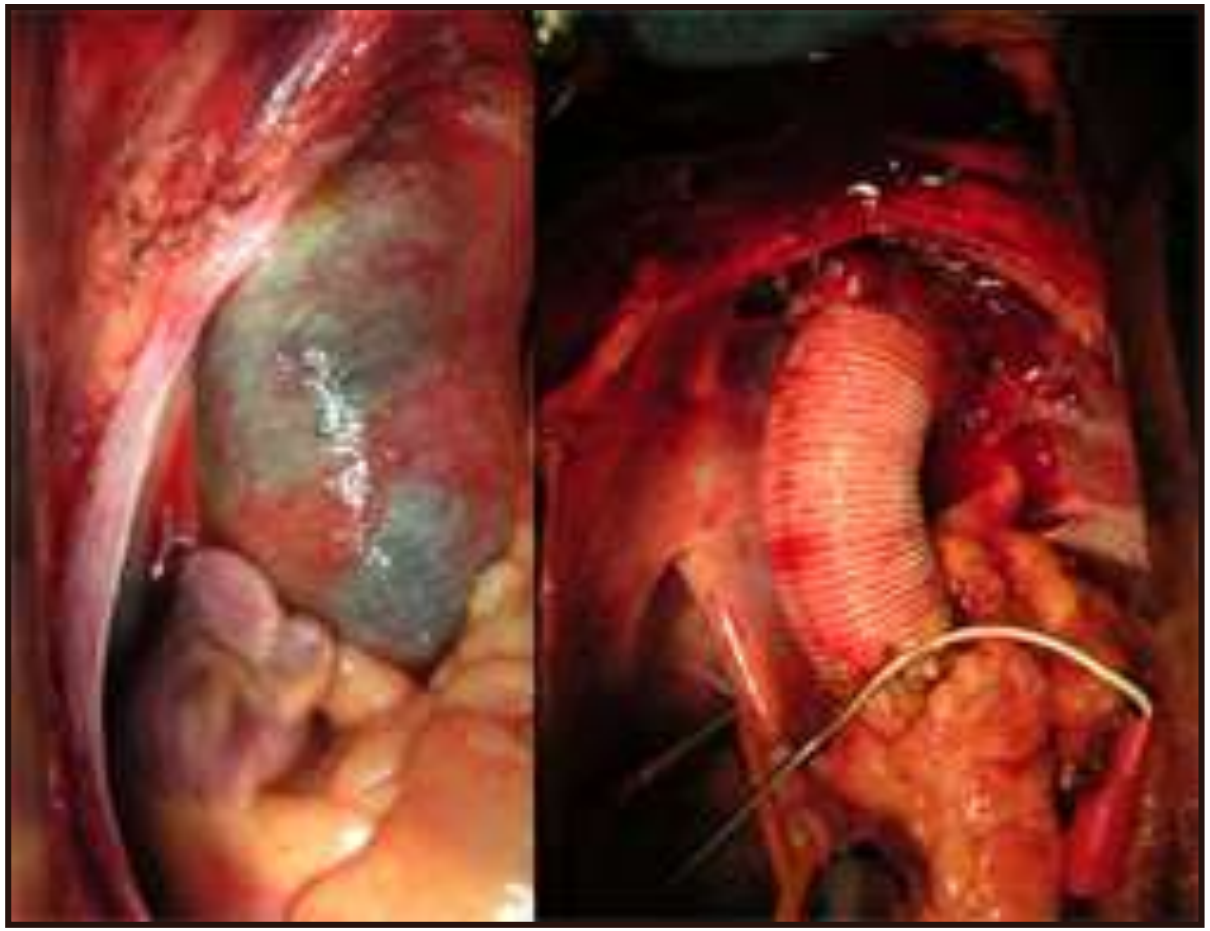


www.smartimagebase.nucleus medicalart.2009



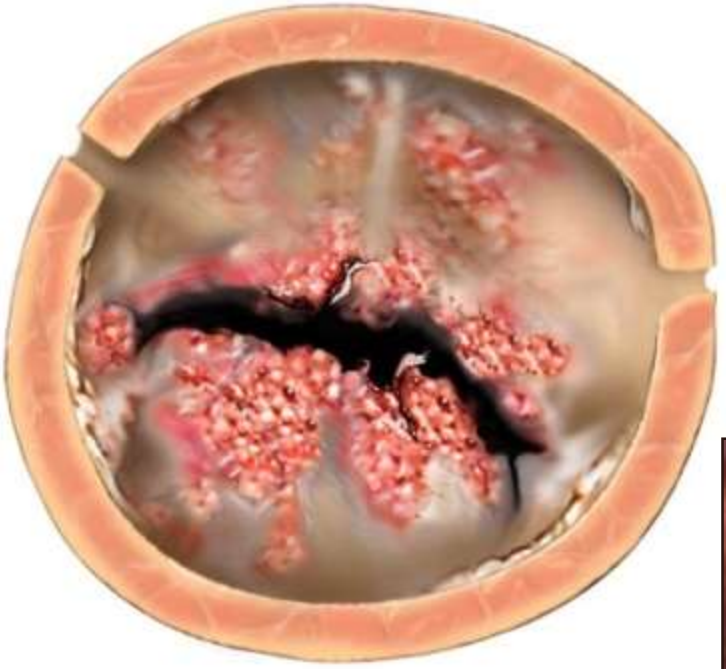
www.virginia.edu

Repair of Aortic Dissection with Hemashield/Dacron Graft Material



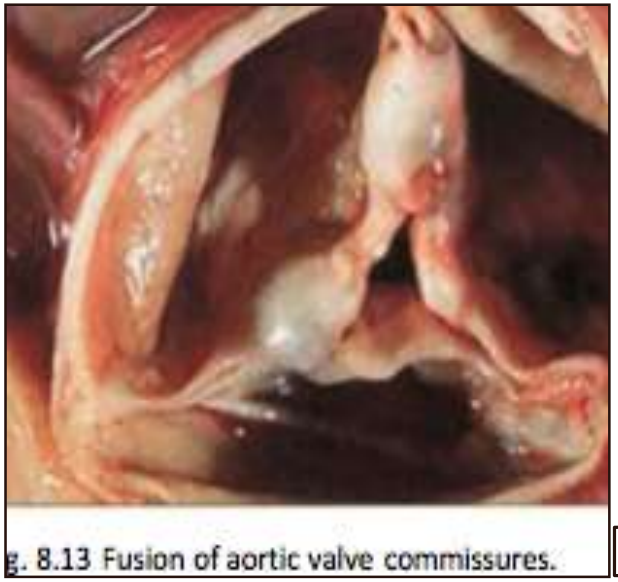
www.columbiasurgery.org

Rheumatic Valve Disease



www.uvahealth.com

www.wikipedia.com

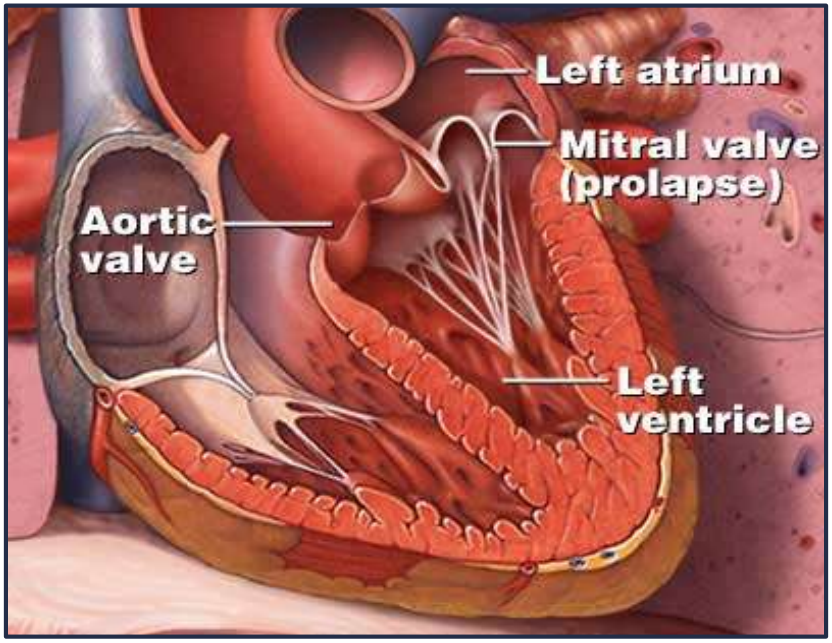


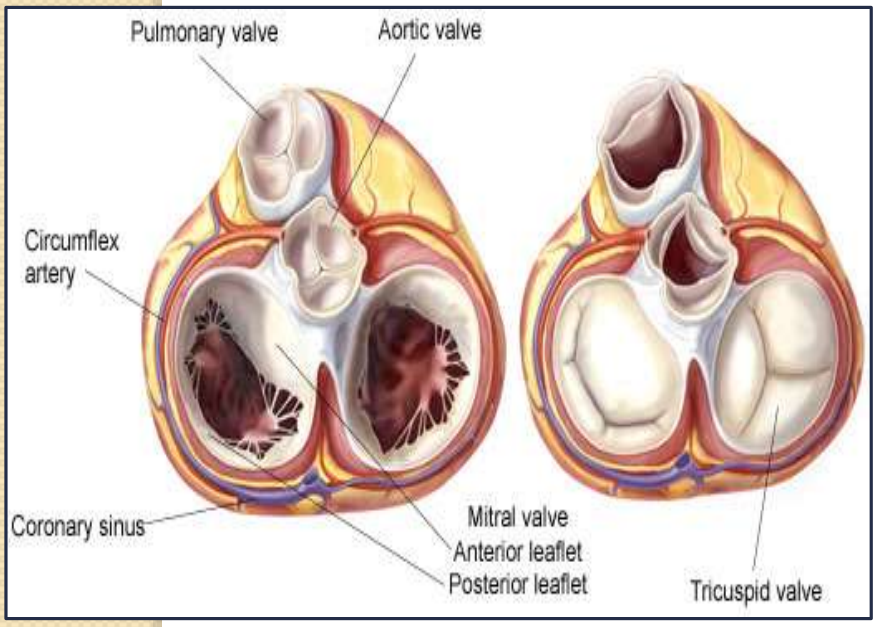
g. 8.13 Fusion of aortic valve commissures.

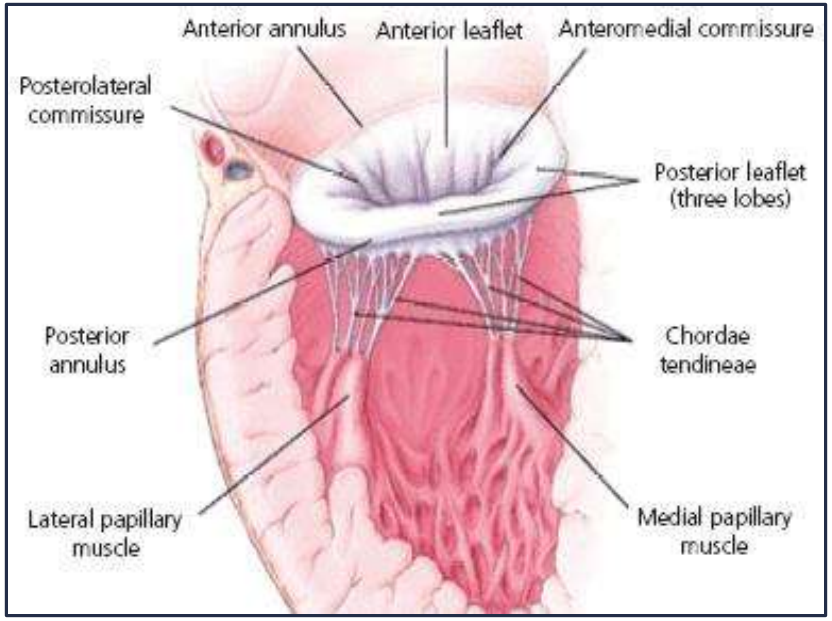
www.quizlet com

MITRAL VALVE DISEASES

First, The Basics….

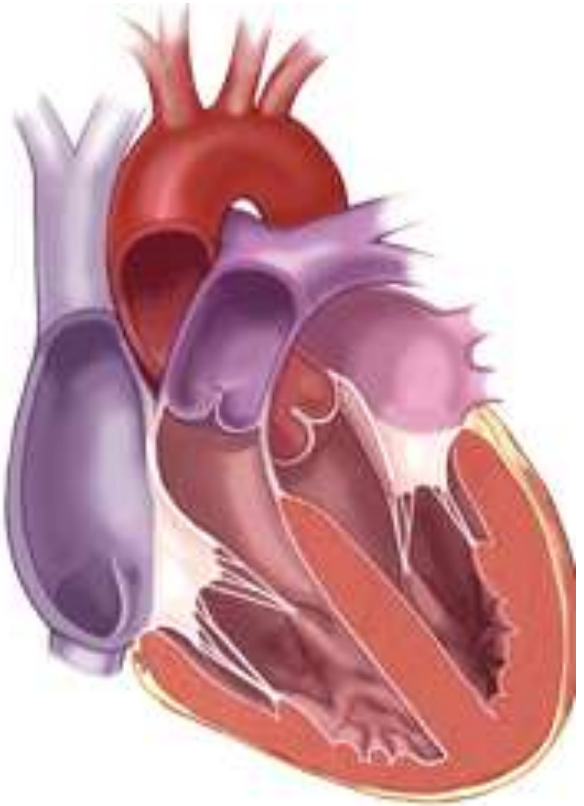




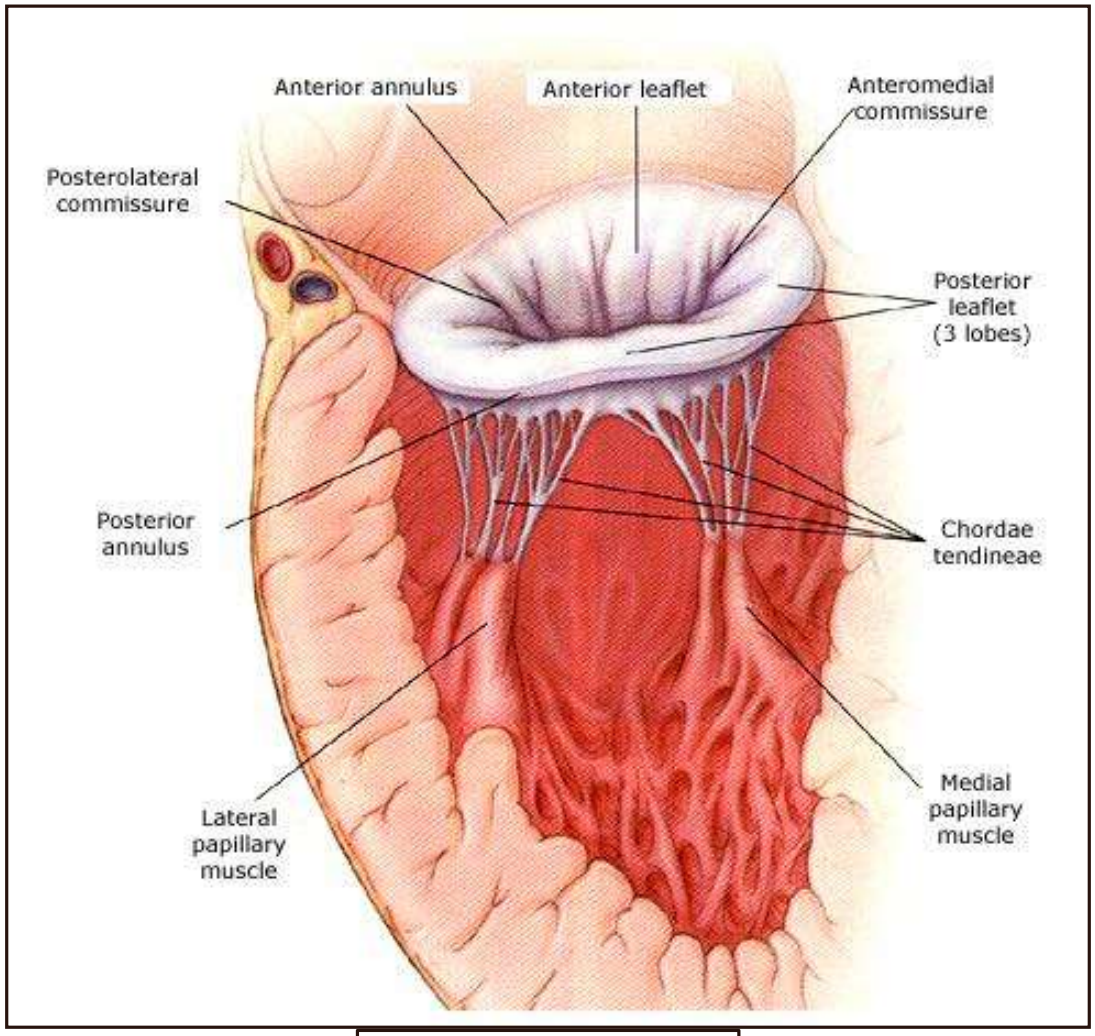


Mitral Valve Overview

- Mitral Valve is part of the Left Ventricle !
- Composed of:
  - Leaflets
  - Chordae
  - Papillary Muscles
  - Left Atrium
  - Left Ventricle

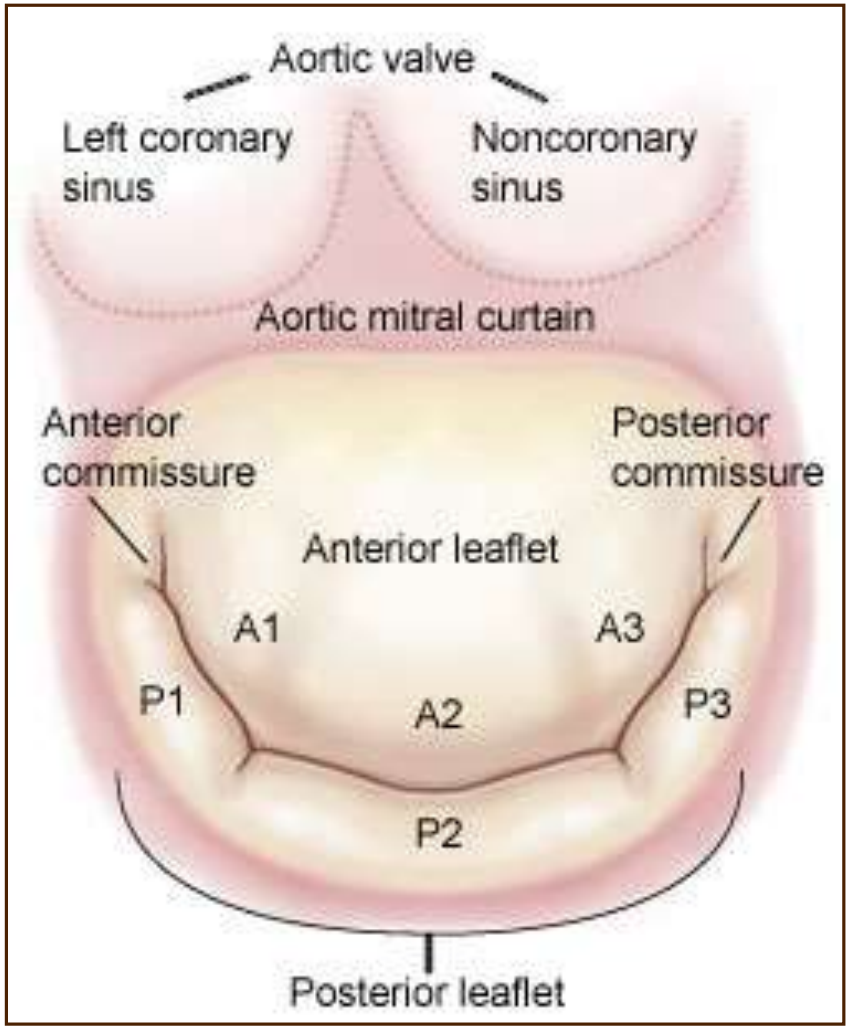


Mitral Valve Structures

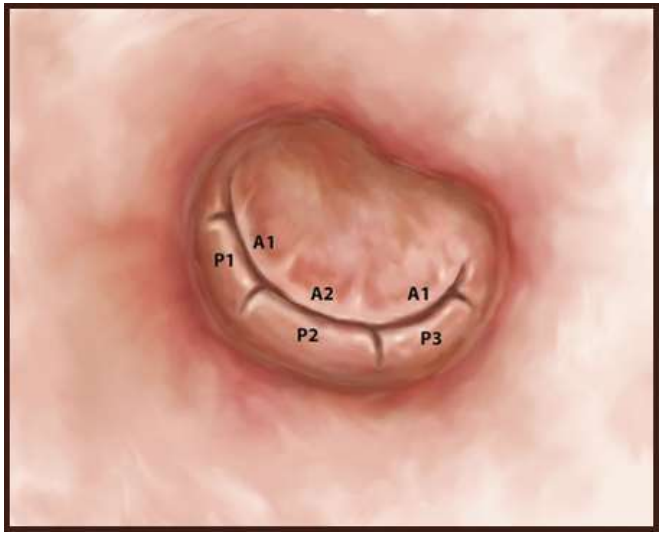


www.heart-valve-surgery.com

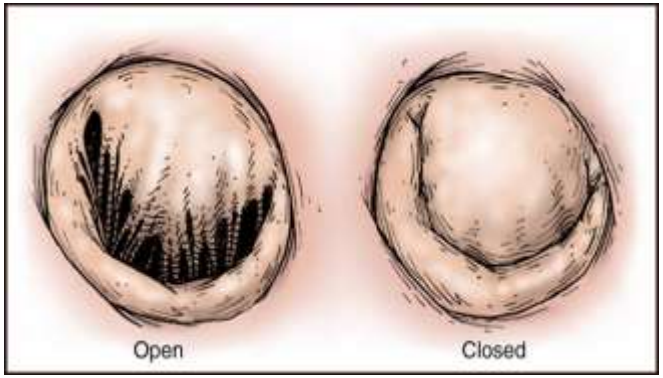
2 Mitral Valve Leaflets



www.mitralvalverepair.org

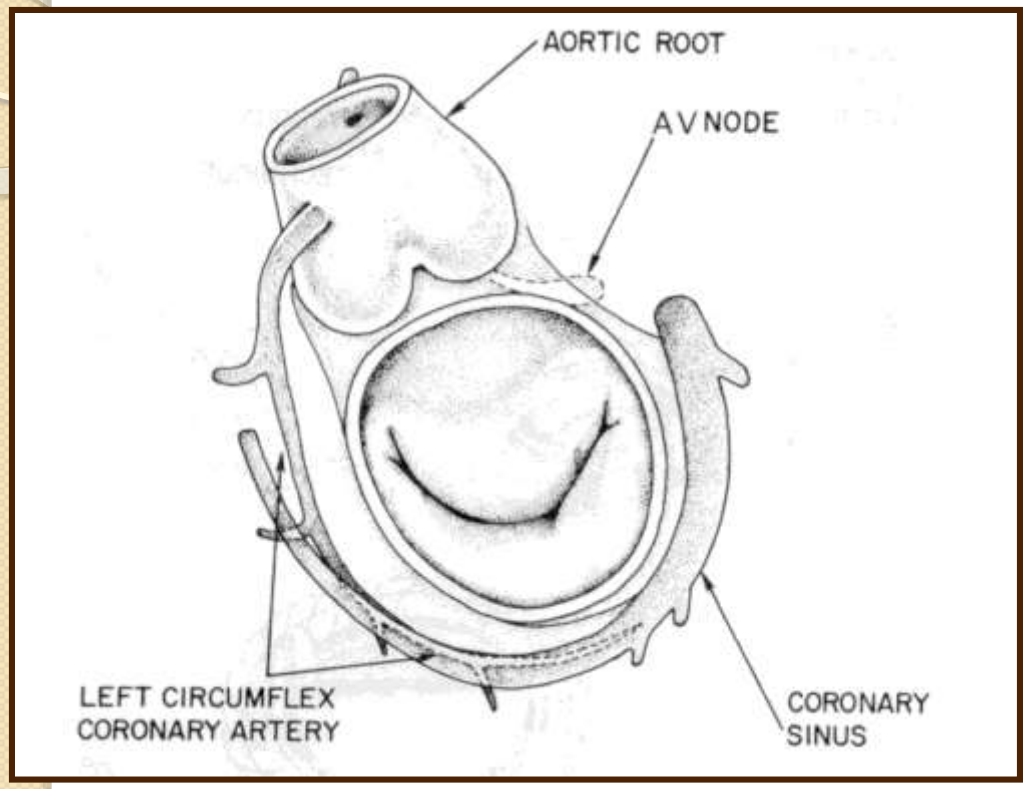


www.davincilear.com



www.sts.org

Mitral Anatomy



- Subaortic curtain
- Aortic leaflets
- AV node position
- Coronary Sinus
- Circumflex Artery

Preservation of "surrounding" anatomic integrity essential for successful mitral repair

Read It, See It, Code It: Prager, RL, Geltz, A. MSTCVS DM Meeting: May 2006

Normal Mitral Anatomy

Hurst JW (ed): Atlas of the Heart. New York: McGraw-Hill, 1988;4.18,25

2.81 Mitral Valve Etiology Section

VDGradM (1705)

(If Yes→) Carpentier Mitral leaflet motion classification: ☐ Type I ☐ Type II ☐ Type IIIa ☐ Type IIIb ☐ Not Documented

VDMitFC (1715)

(If Yes↓)

MV Disease Etiology: (Choose at least one and up to 3 etiologies↓)	#1 VDMiEt1 (1720)	#2 VDMiEt2 (1725)	#3 VDMiEt3 (1730)
Unknown			
No additional etiology			
Degenerative			
Rheumatic			
Ischemic- acute, post infarction			
Ischemic- chronic			
Non-ischemic Cardiomyopathy			
Endocarditis			
Hypertrophic Obstructive Cardiomyopathy (HOCM)			
Tumor, Carcinoid			
Tumor, Myxoma			
Tumor, Papillary fibroelastoma			
Tumor, Other			
Carcinoid			
Trauma			
Congenital			
Prior Mitral Valve Intervention, Etiology Unknown			
Other			

Mitral Valve Etiology Categories Expanded

Choose Up to 3 Choices Now

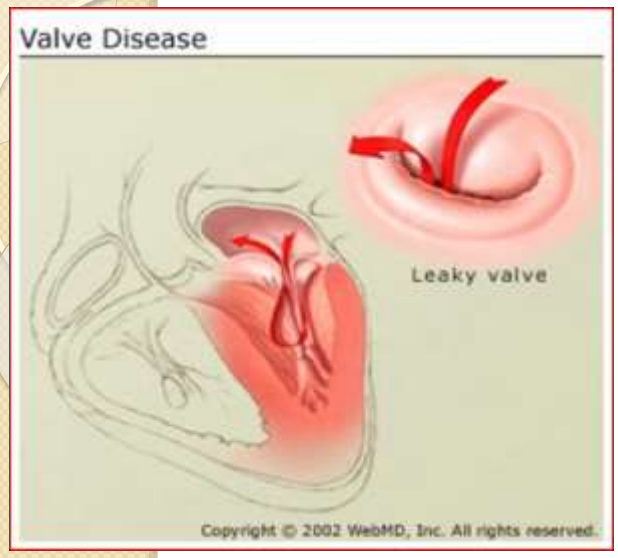
We Can Help !

MV Disease Etiology: (Choose at least one and up to 3 etiologies↓)	#1	#2	#3
Unknown			
No additional etiology			
Degenerative			
Rheumatic			
Ischemic- acute, post infarction			
Ischemic- chronic			
Non-ischemic Cardiomyopathy			
Endocarditis			
Hypertrophic Obstructive Cardiomyopathy (HOCM)			
Tumor, Carcinoid			
Tumor, Myxoma			
Tumor, Papillary fibroelastoma			
Tumor, Other			
Carcinoid			
Trauma			
Congenital			
Prior Mitral Valve Intervention, Etiology Unknown			
Other			
MV Lesion(s):(Choose at least one and up to 3 lesions↓)	#1	#2	#3
Unknown			
No additional lesions			
Leaflet prolapse, posterior			
Leaflet prolapse, bileaflet			
Leaflet prolapse, anterior			
Elongated/ruptured chord(s)			
Annular dilation			
Leaflet calcification			
Mitral annular calcification			
Papillary muscle elongation			
Papillary muscle rupture			
Leaflet thickening/retraction			
Chordal tethering			
Chordal thickening/retraction/fusion			
Commissural fusion			
Other			

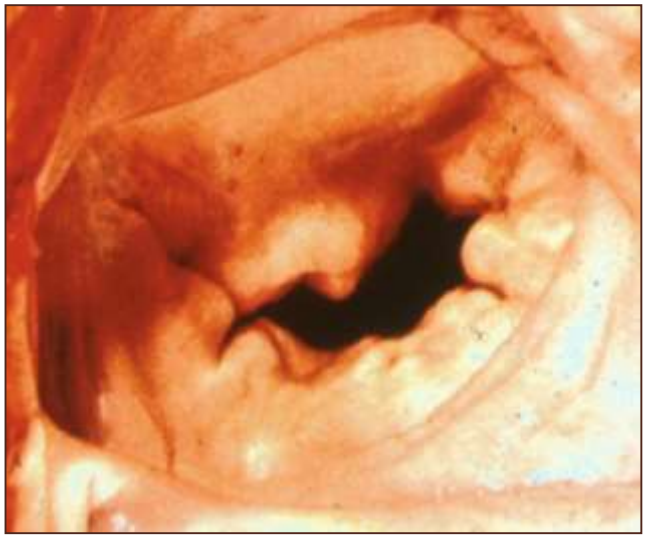
Mitral Valve Etiologies

- Degenerative
- Rheumatic
- Ischemic acute – Post infarction
- Ischemic chronic
- Non-Ischemic Cardiomyopathy
- Endocarditis
- HOCM (**H**ypertensive **O**bstructive **C**ardiomyopathy)
- Tumors
- Trauma
- Congenital
- Prior Mitral Valve Intervention (Etiology Unknown)

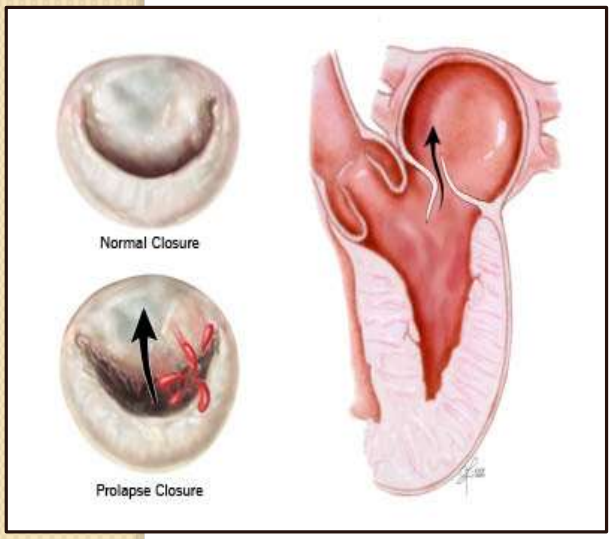
Mitral Valve Disease



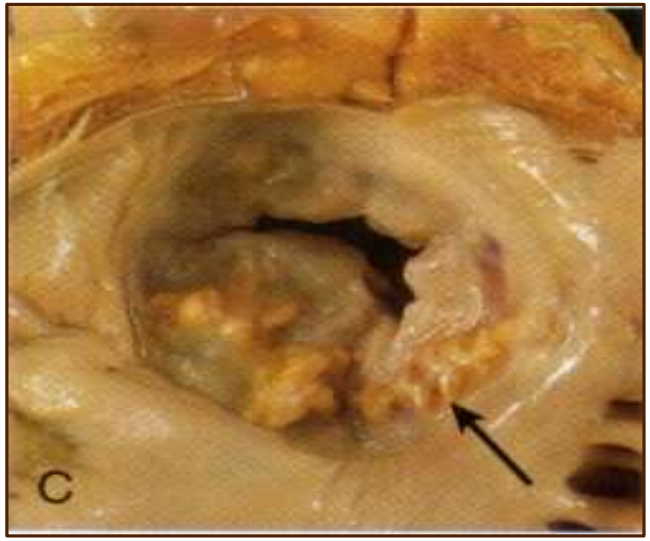
Mitral Regurgitation



Mitral Stenosis

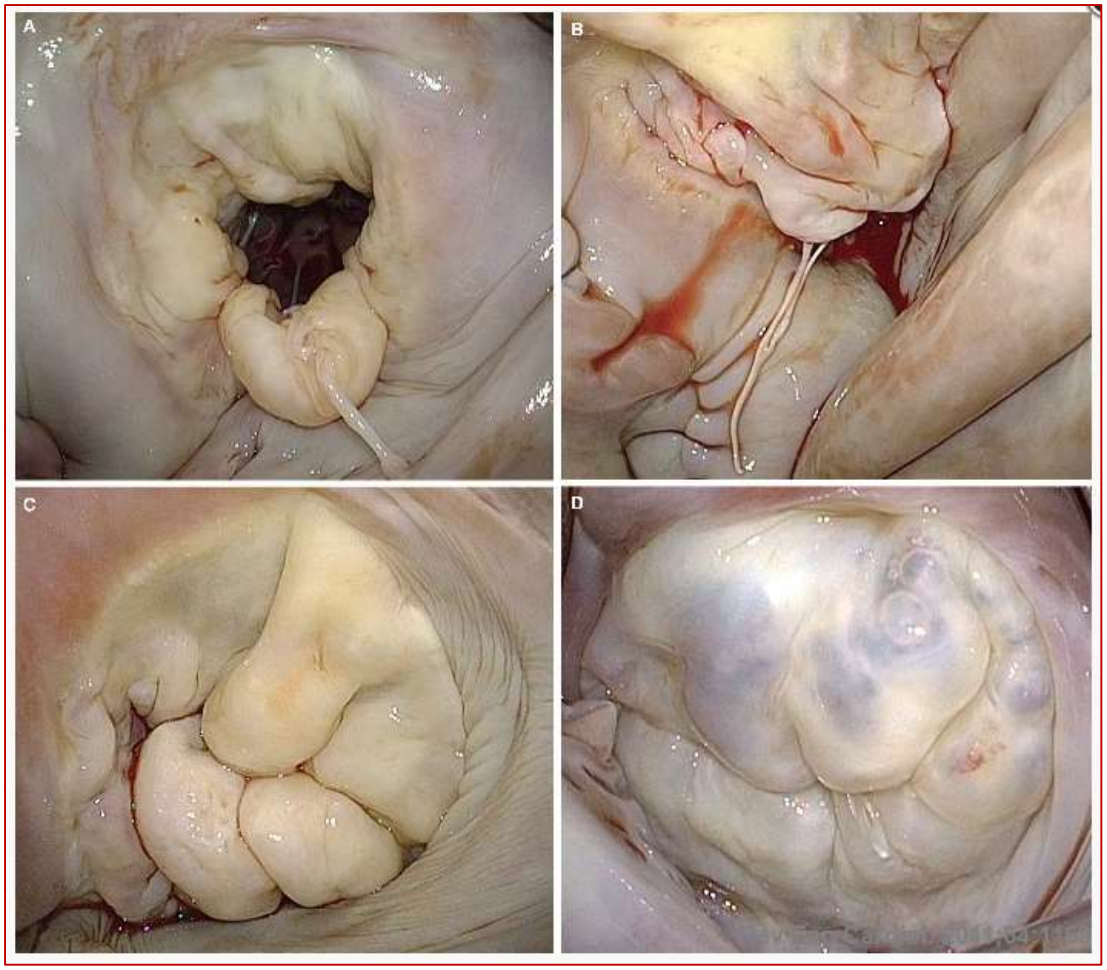


www.heart-valve-surgery.com



www.heart-valve-surgery.com

Mitral Valve Etiology: Degenerative

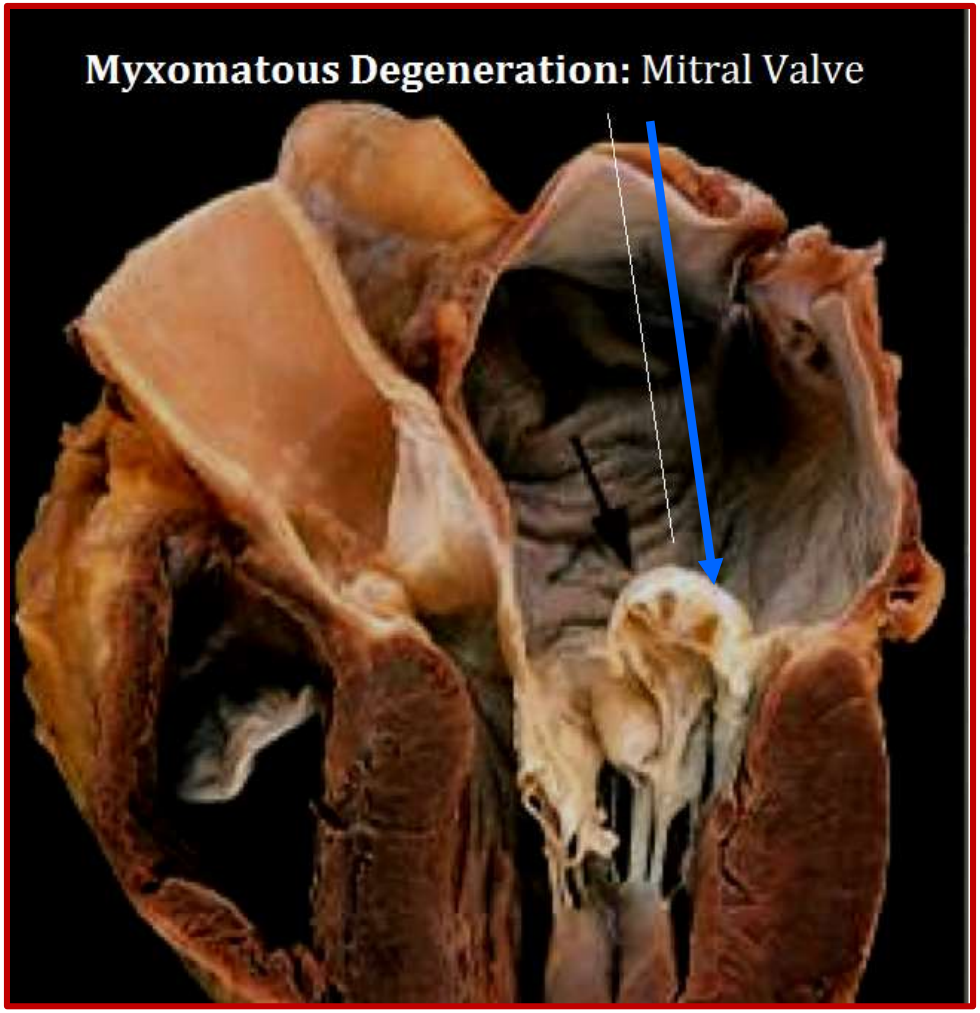


http://www.revespcardiol.org/en/surgical-echocardiography-of-the-mitral/articulo/90040447/#f0015

"Myomatous" Valve Disease

- Degenerative valve disease not from a Myxoma tumor.
- Myxomatous = Pathological Weakening of Connective tissue.
- Valve Leaflets become thickened and boggy, aneursymal leading to insufficiency.
- Most common with the Mitral Valve.

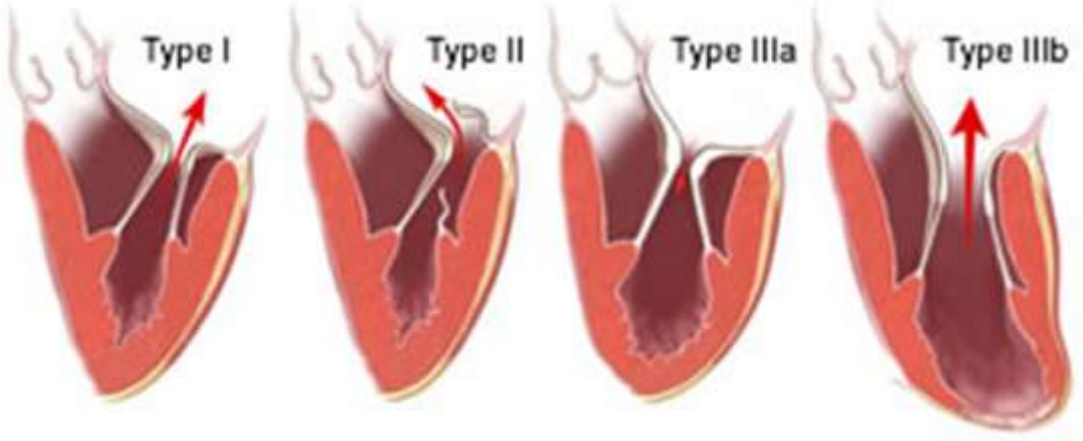
Myxomatous Degeneration



mypresource.com

Mitral Valve:
Carpentier Leaflet Motion Classification (#1715)

- Type I. - Leaflet motion is Normal
- Type II. – Excess leaflet motion
  - i.e. Prolapse & Flail motion
- Type IIIa. - Restricted leaflet motion systolic & diastolic
- Type IIIb. – Restricted leaflet motion systolic
- Code for Native Valves ONLY
  - (No Prosthetic Valves)

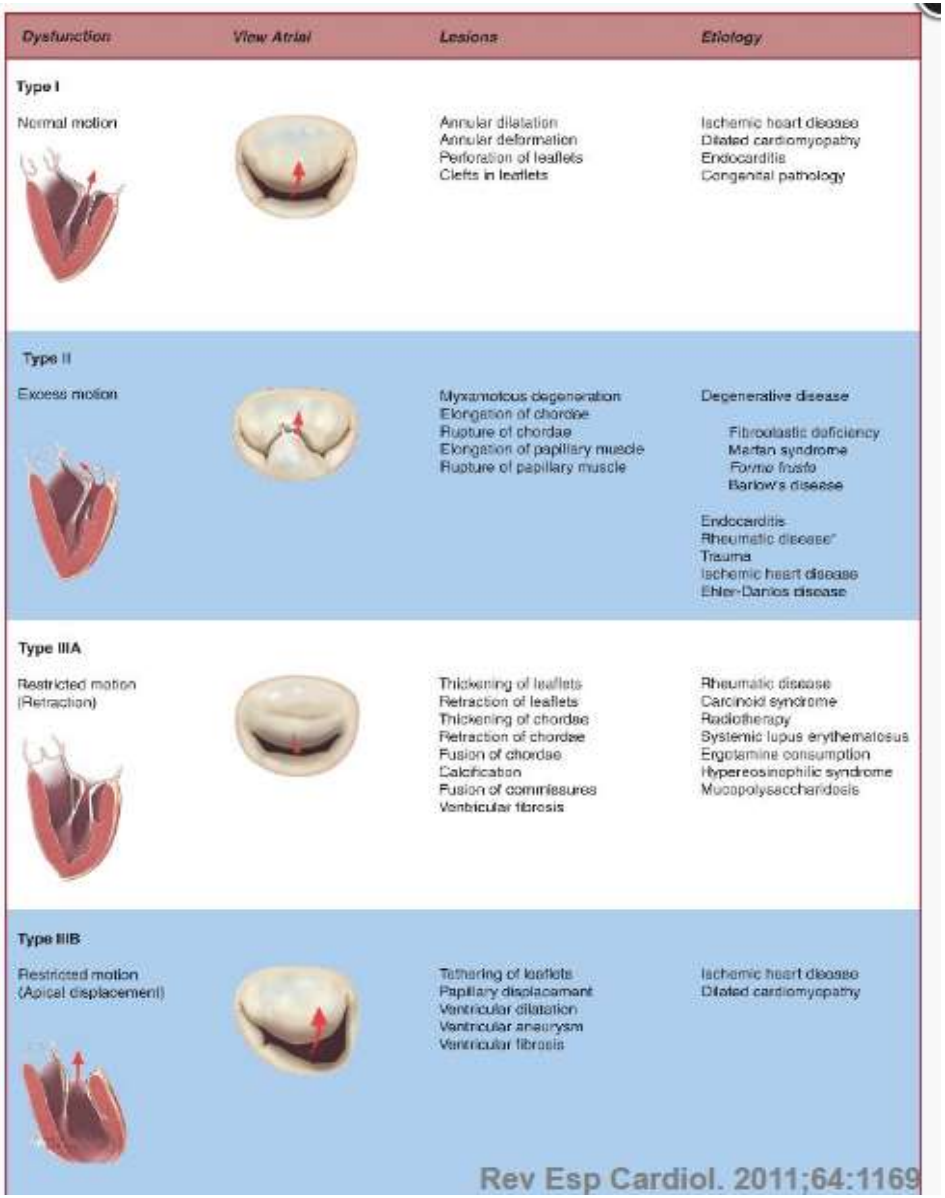


Mitralvalverepair.org

Mitral Valve Carpentier Leaflet Motion Classification

Handout in Packets

Data Element in Hemodynamics & Cath Section



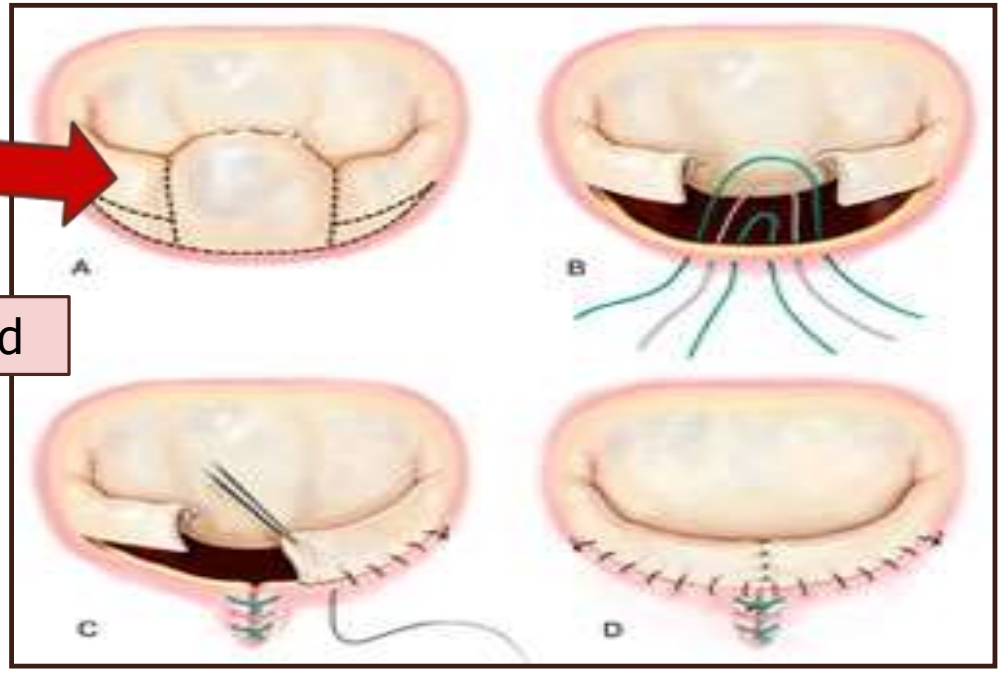
Dysfunction	View Atrial	Lesions	Etiology
Type I			
Normal motion		Annular dilatation Annular deformation Perforation of leaflets Clefts in leaflets	Ischemic heart disease Dilated cardiomyopathy Endocarditis Congenital pathology
Type II			
Excess motion		Myxomatous degeneration Elongation of chordae Rupture of chordae Elongation of papillary muscle Rupture of papillary muscle	Degenerative disease Fibroelastic deficiency Marfan syndrome *Forme fruste* Barlow's disease Endocarditis Rheumatic disease* Trauma Ischemic heart disease Ehler-Danlos disease
Type IIIA			
Restricted motion (Retraction)		Thickening of leaflets Retraction of leaflets Thickening of chordae Retraction of chordae Fusion of chordae Calcification Fusion of commissures Ventricular fibrosis	Rheumatic disease Carcinoid syndrome Radiotherapy Systemic lupus erythematosus Ergotamine consumption Hypereosinophilic syndrome Mucopolysaccharidosis
Type IIIB			
Restricted motion (Apical displacement)		Tethering of leaflets Papillary displacement Ventricular dilatation Ventricular aneurysm Ventricular fibrosis	Ischemic heart disease Dilated cardiomyopathy

Rev Esp Cardiol. 2011;64:1169

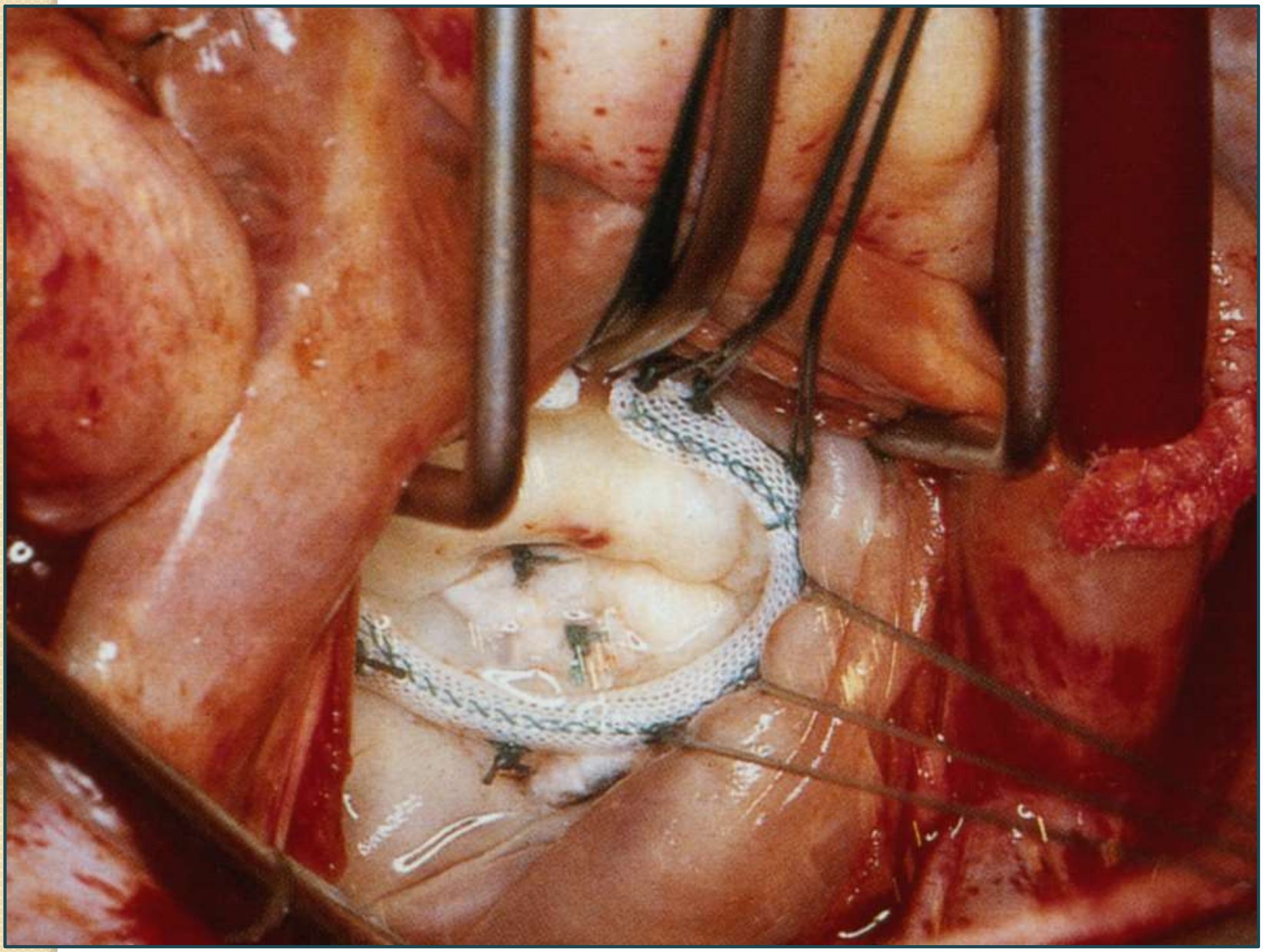
http://www.revespcardiol.org/en/surgical-echocardiography-of-the-mitral/articulo/90040447/#f0015

OR Correction Example: Annuloplasty & Leaflet Resection

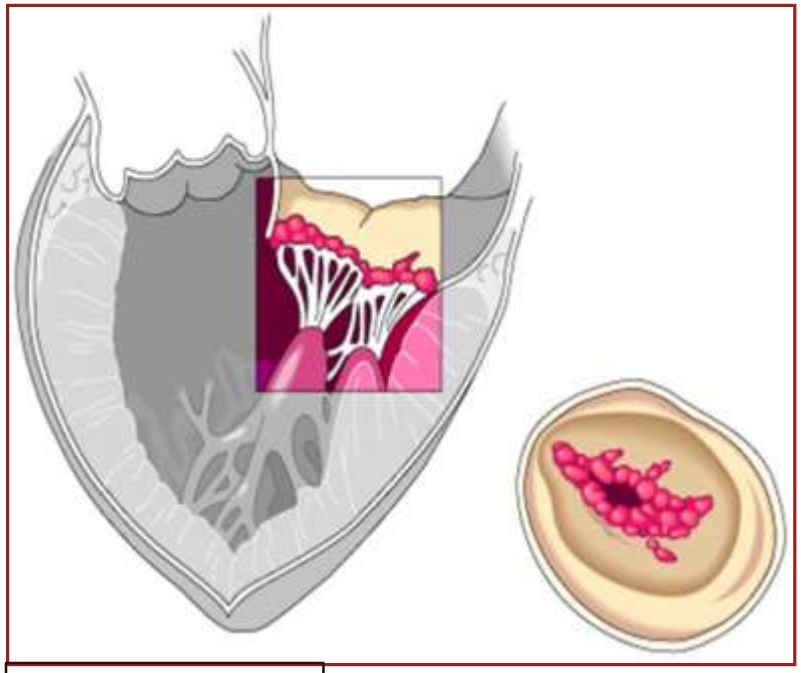
"Quad" Piece Removed



Mitral Valve Repair with Annuloplasty and Quadrangular Resection (Posterior)

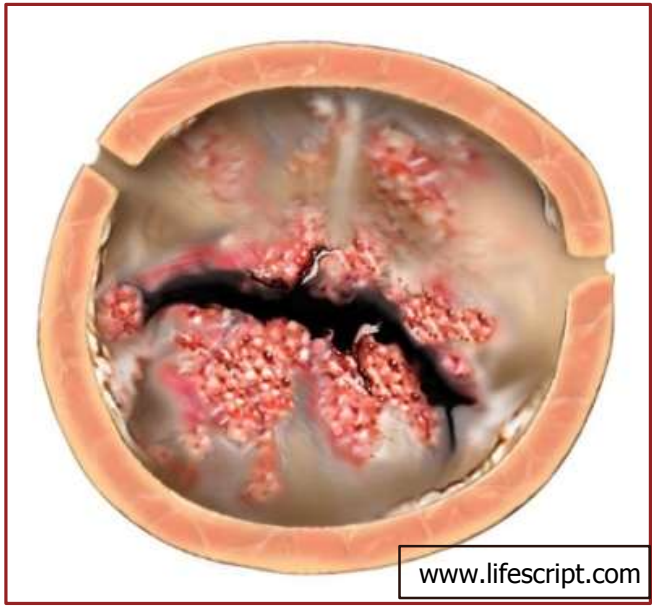


Rheumatic Mitral Disease



www.heartpoint.com

Studyblue.com



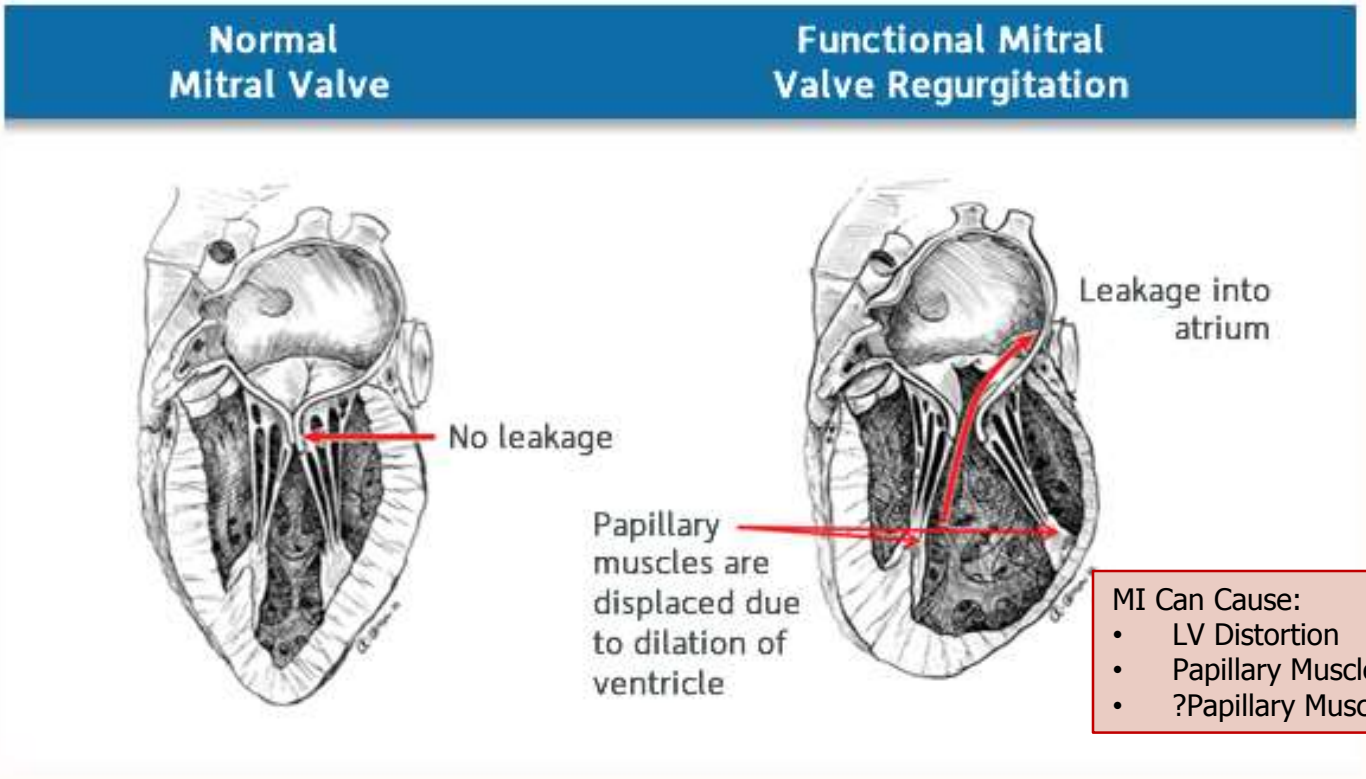
www.lifescript.com

Mitral Valve Disease Etiology

- ✓ Ischemic – Acute, Post Infarction
- ✓ Ischemic – Chronic
- ✓ Non-Ischemic Cardiomyopathy

MV Disease Etiology: (Choose at least one and up to 3 etiologies↓)	#1 VDMiEt1 (1720)	#2 VDMiEt2 (1725)	#3 VDMiEt3 (1730)
Unknown			
No additional etiology			
Degenerative			
Rheumatic			
Ischemic- acute, post infarction			
Ischemic- chronic			
Non-ischemic Cardiomyopathy			
Endocarditis			
Hypertrophic Obstructive Cardiomyopathy (HOCM)			
Tumor, Carcinoid			
Tumor, Myxoma			
Tumor, Papillary fibroelastoma			
Tumor, Other			
Carcinoid			
Trauma			
Congenital			
Prior Mitral Valve Intervention, Etiology Unknown			
Other			

Functional Ischemic Mitral Regurgitation Acute – Post Infarction (MI Occurred)



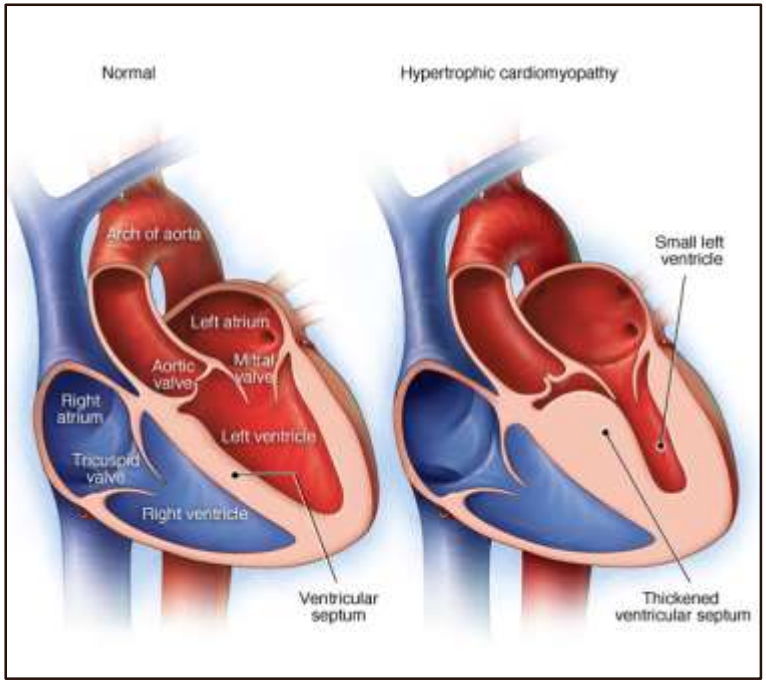
MI Can Cause:
- LV Distortion
- Papillary Muscle Ischemia
- ?Papillary Muscle Rupture

Functional mitral valve regurgitation (FMR) is considered a disease of the left ventricle, NOT of the mitral valve. FMR occurs when the left ventricle of the heart is distorted or dilated (enlarged).

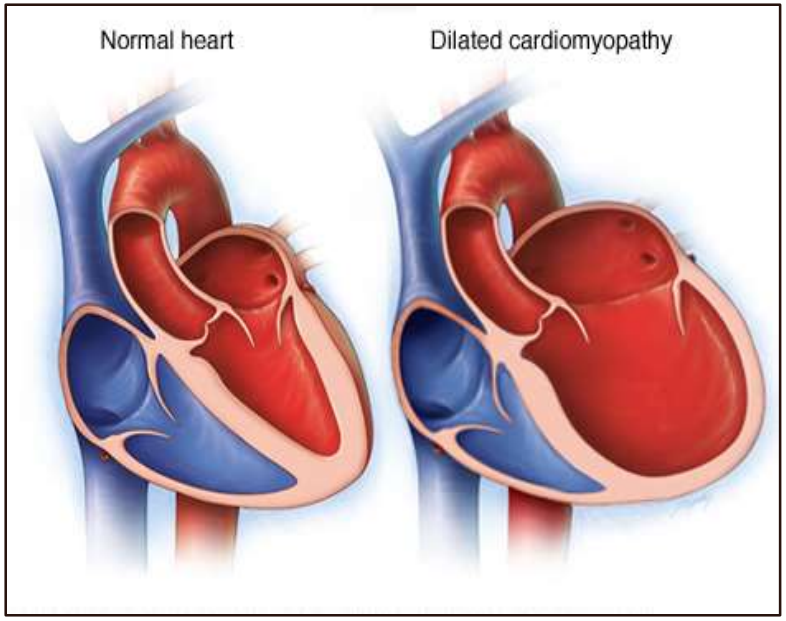
Functional MR – Non Ischemic Cardiomyopathy

- **Not from Coronary Artery Disease**
- Enlarged, Dilated, Weakened L. Ventricle
- <u>Some Causes:</u>
  - Hypertension
  - Heredity
  - Viruses
  - Peripartum Cardiomyopathy
  - Chemotherapy Induced Cardiomyopathy

Non-Ischemic Cardiomyopathy



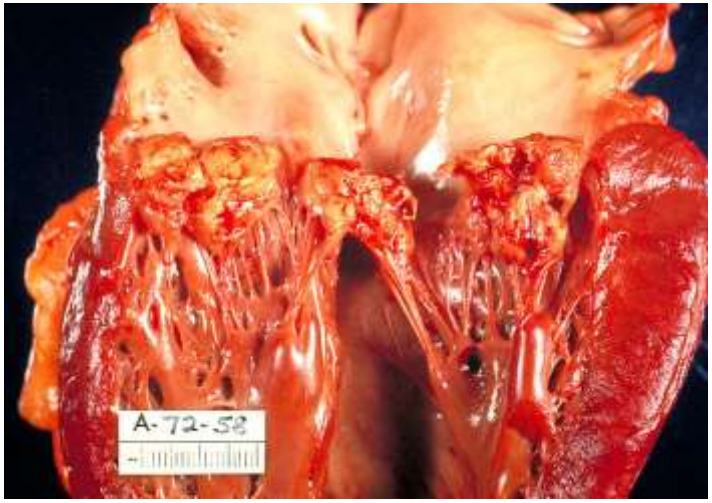
Hypertrophic Cardiomyopathy



Dilated Cardiomyopathy

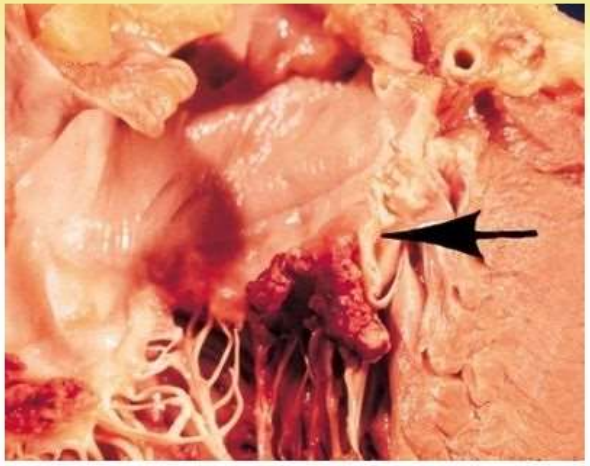
Mitral Valve Endocarditis

- Infection can cause holes in MV leaflets
- MV Repair in some cases
- MV Replacement if valve too destroyed



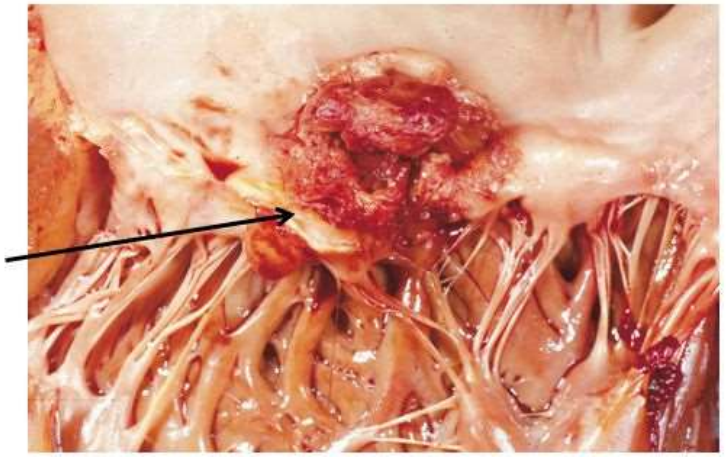
http://commons.wikimedia.org/wiki/File:Haemophilus_parainfluenzae_Endocarditis_PHIL_851_lores.jpg

Infective Mitral Valve Endocarditis



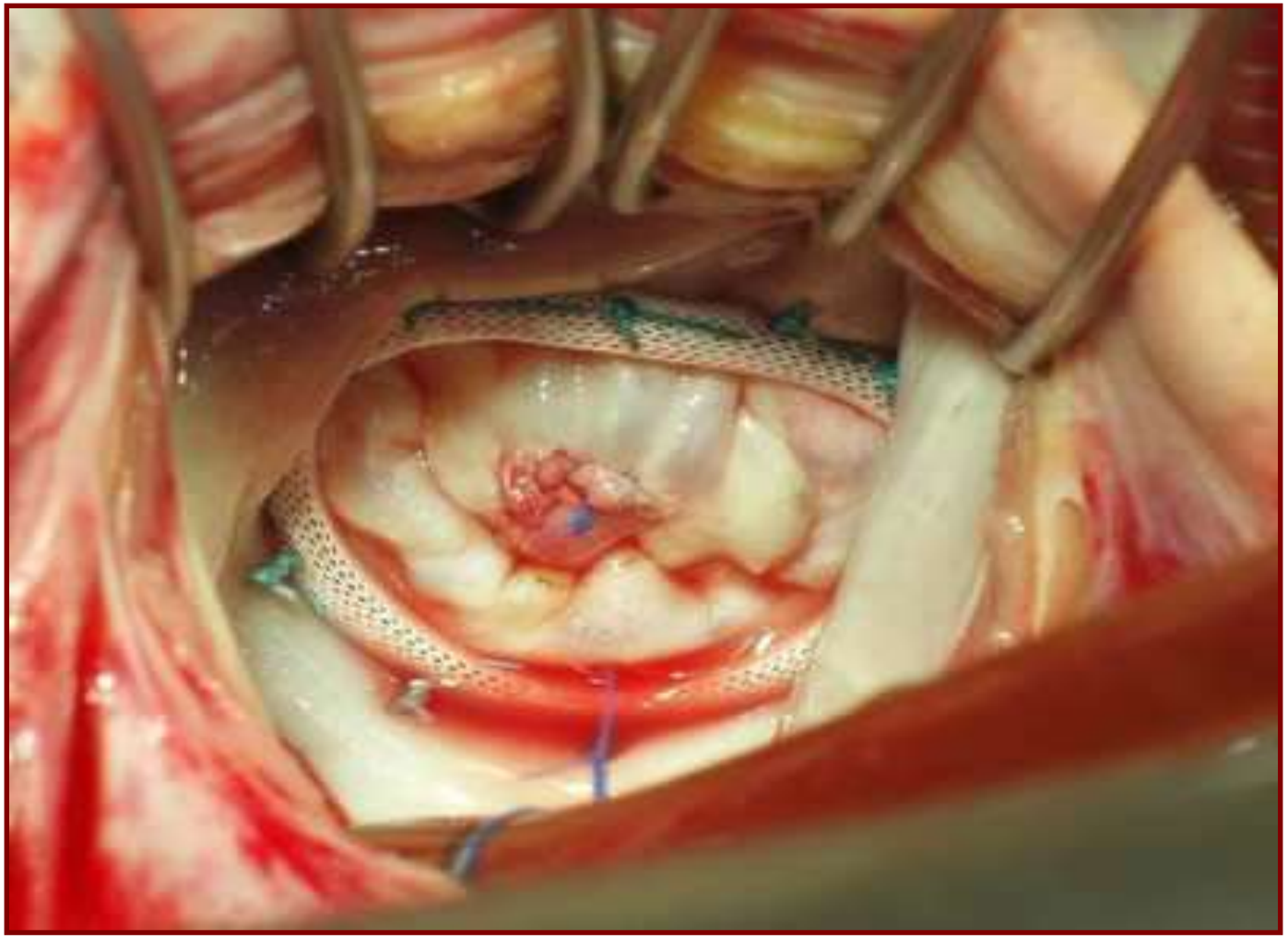
Bacterial Endocarditis, mitral valve

Severe Bacterial Endocarditis
Staphylococcal infection of normal mitral valve with leaflet destruction and perforation



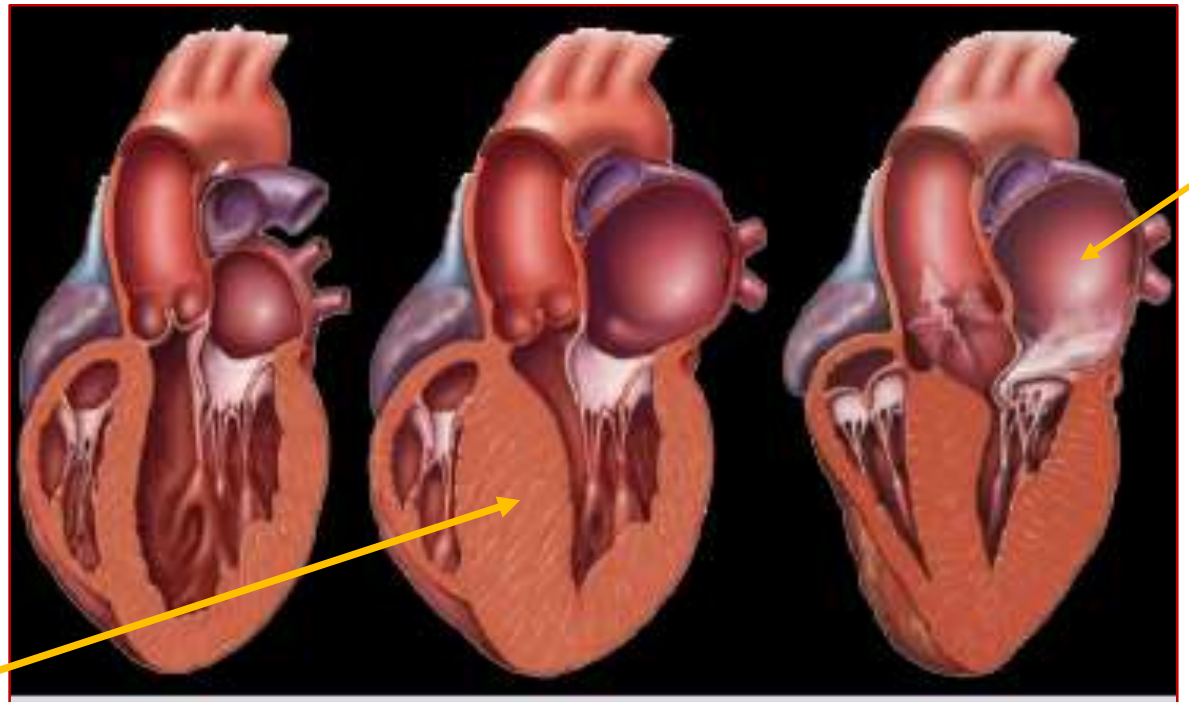
Google Images:
Essentials of Human Disease:
Leonard Crowley, Chapter 10, the Cardiovascular System.

Infective Endocarditis: Mitral Valve Repair



Googleimages.com/www.escardio.org/infective-endocarditis.aspx

HOCM for Mitral Valve Etiology



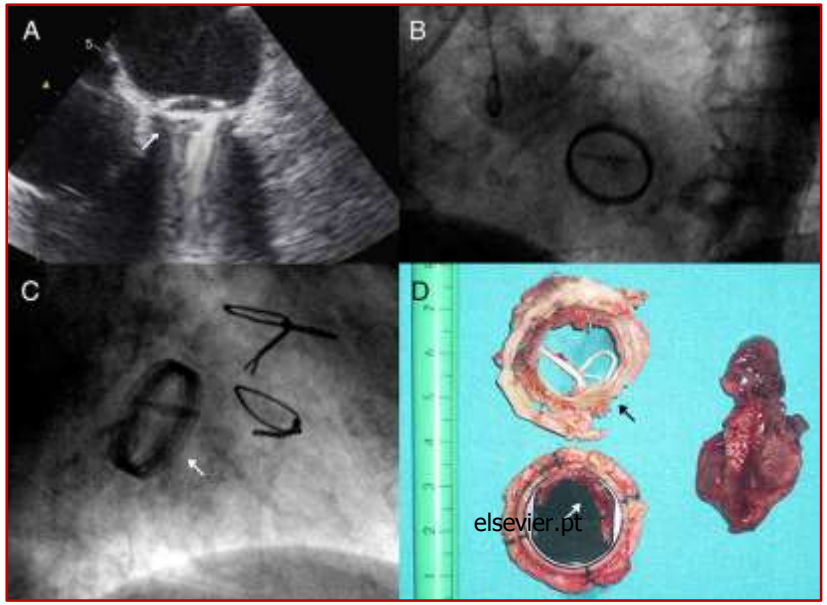
Note the increased left ventricular (LV) muscle wall thickness, decreased LV lumen size, and enlarged left atrium (LA) of the hearts with HCM.

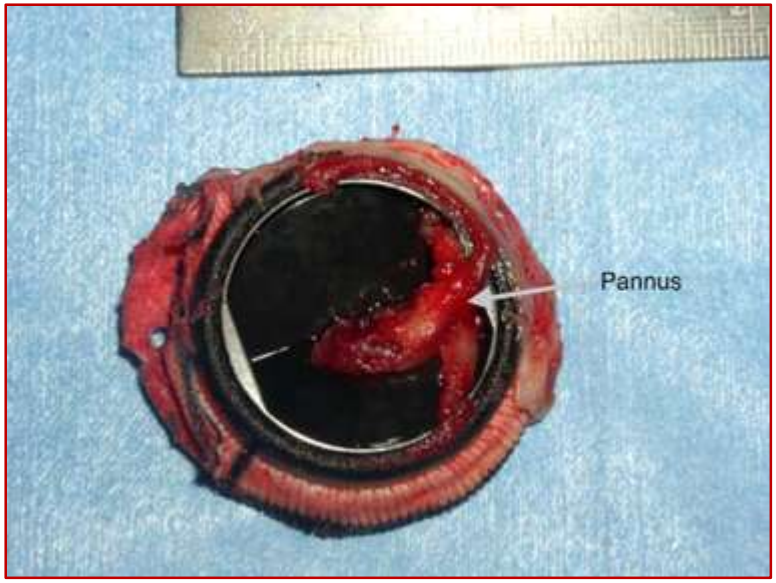
- Causes: Heredity, HTN, Aging process
- Symptoms: Unexplained Syncope, Arrhythmias, Sudden Death Arrhythmias, Family Hx. CHF, Hypotension with Exercise

cvcavets/com/hypertrophicardiomyopathy

Prior Mitral Valve Intervention

- Valve Stenosis
- Valve Thrombus



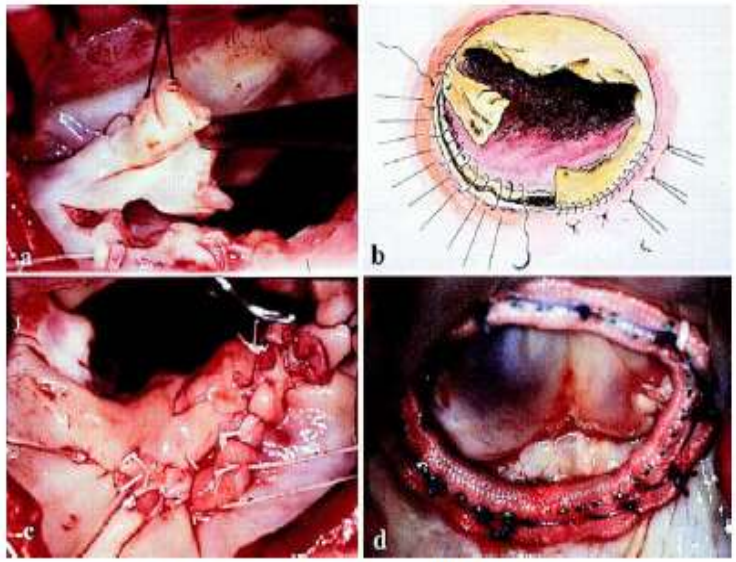


Casereports.bmj.com

Prior Mitral Valve Repair – Annular Decalcification/Debridement

STS Adult Cardiac Surgery Database Training Manual, v2.73

Mitral Valve Procedures:
Annular Decalcification

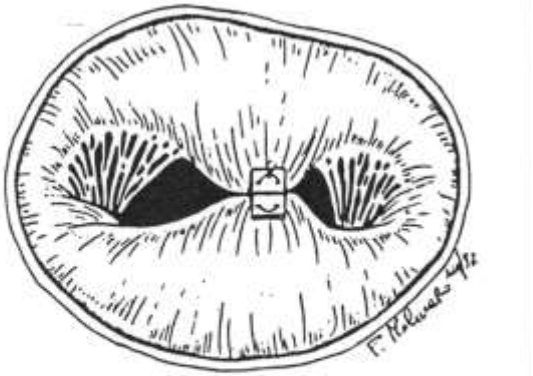


Ng C.-K. et al.; Ann Thorac Surg 2000;70:53-58
(a) Leaflet and atrial edge mobilized after decalcification process

THE ANNALS OF THORACIC SURGERY

Mitral Valve Transcatheter Approaches

- Similar to Alfieri Stitch Procedure
- Transcatheter Mitral Valve Repair
  - FDA Approved October 2013 for Patients at Prohibitive Risk for Open Intervention.
- Entered into TVT Registry
- Enter into STS if Surgeon Participates



www.cardiosource.com

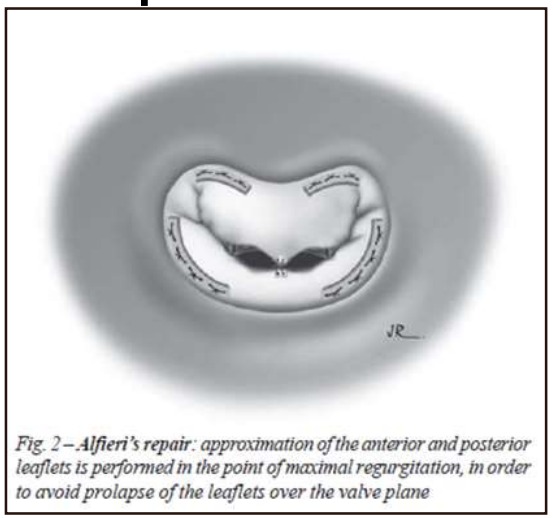


*Fig. 2 – **Alfieri's repair**: approximation of the anterior and posterior leaflets is performed in the point of maximal regurgitation, in order to avoid prolapse of the leaflets over the valve plane*

www.scielo.br

Mitral Valve Leaflet Clip: Evalve Company

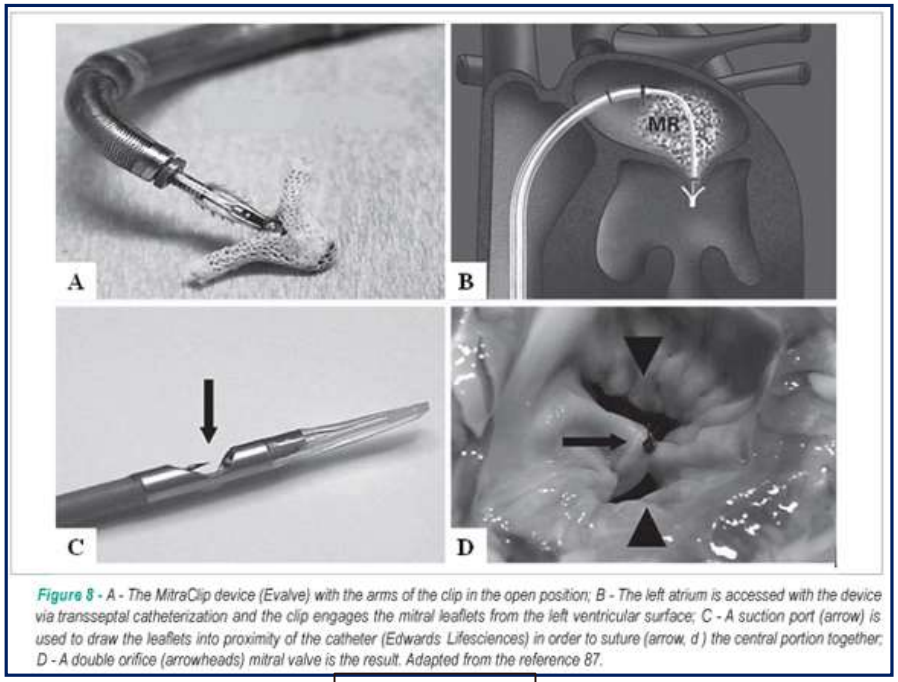
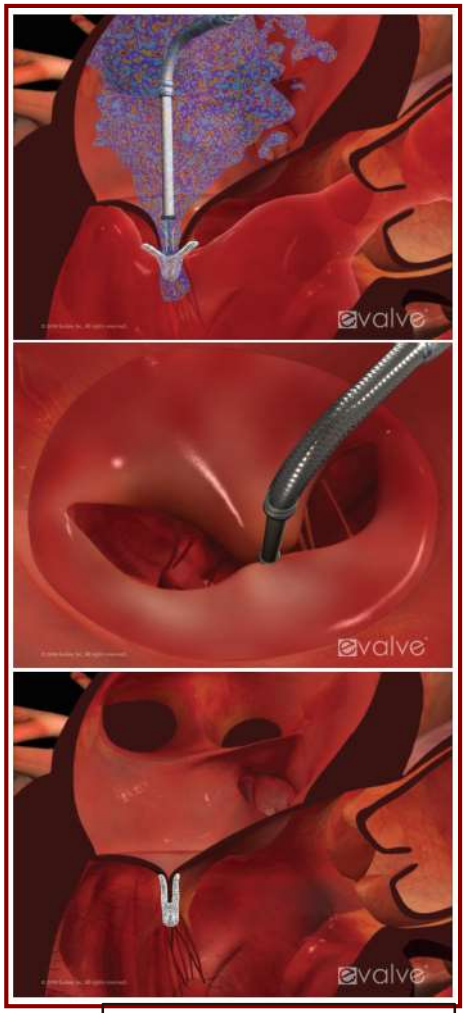


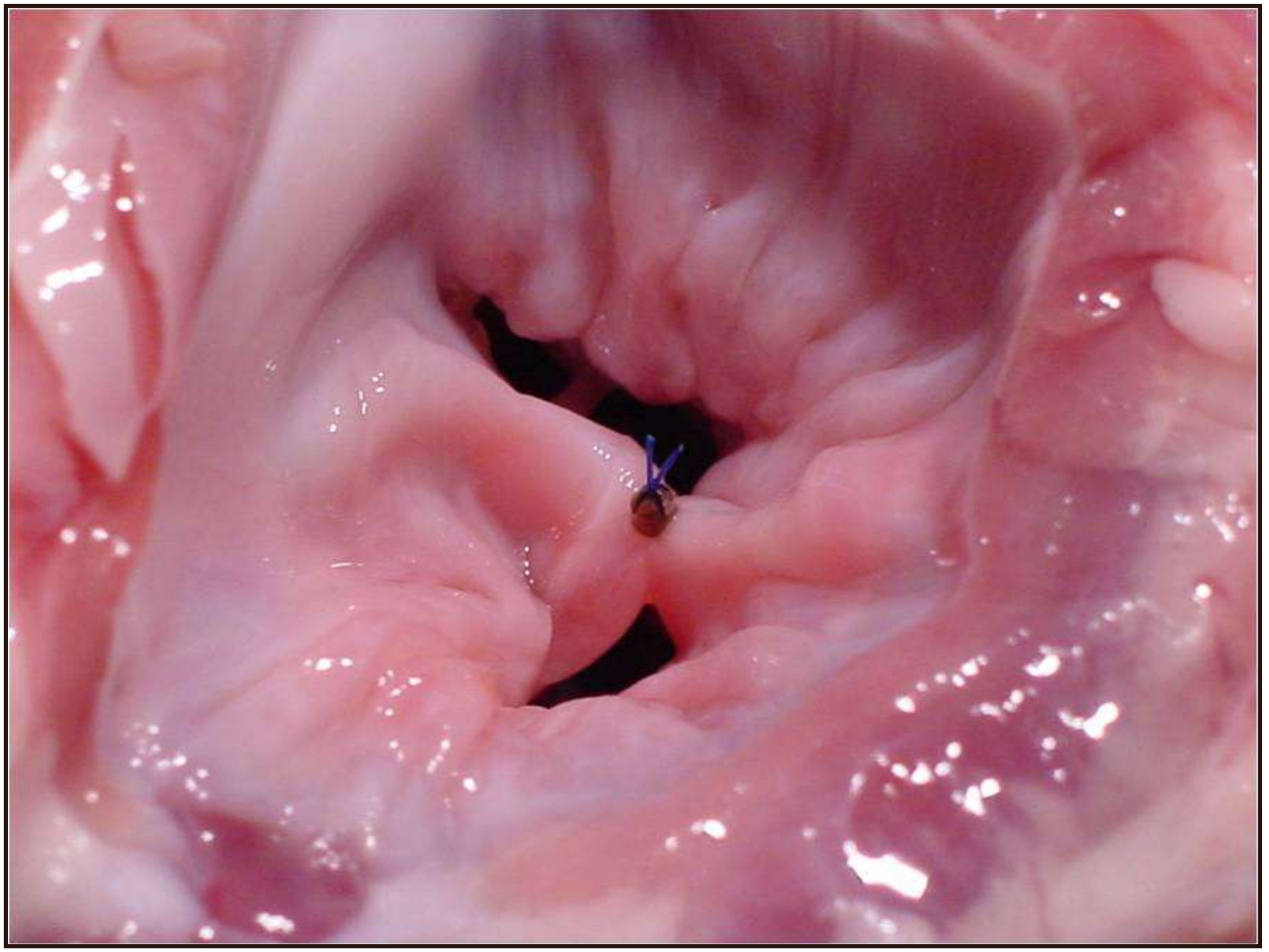
Figure 8 - A - The MitraClip device (Evalve) with the arms of the clip in the open position; B - The left atrium is accessed with the device via transseptal catheterization and the clip engages the mitral leaflets from the left ventricular surface; C - A suction port (arrow) is used to draw the leaflets into proximity of the catheter (Edwards Lifesciences) in order to suture (arrow, d) the central portion together; D - A double orifice (arrowheads) mitral valve is the result. Adapted from the reference 87.

www.scielo.br



www.Cathlabdigest.com

Excised Pig Valve with Nitinol Clip (MV Leaflet Repair Clip)



Echobio.com

TRICUSPID VALVE DISEASES

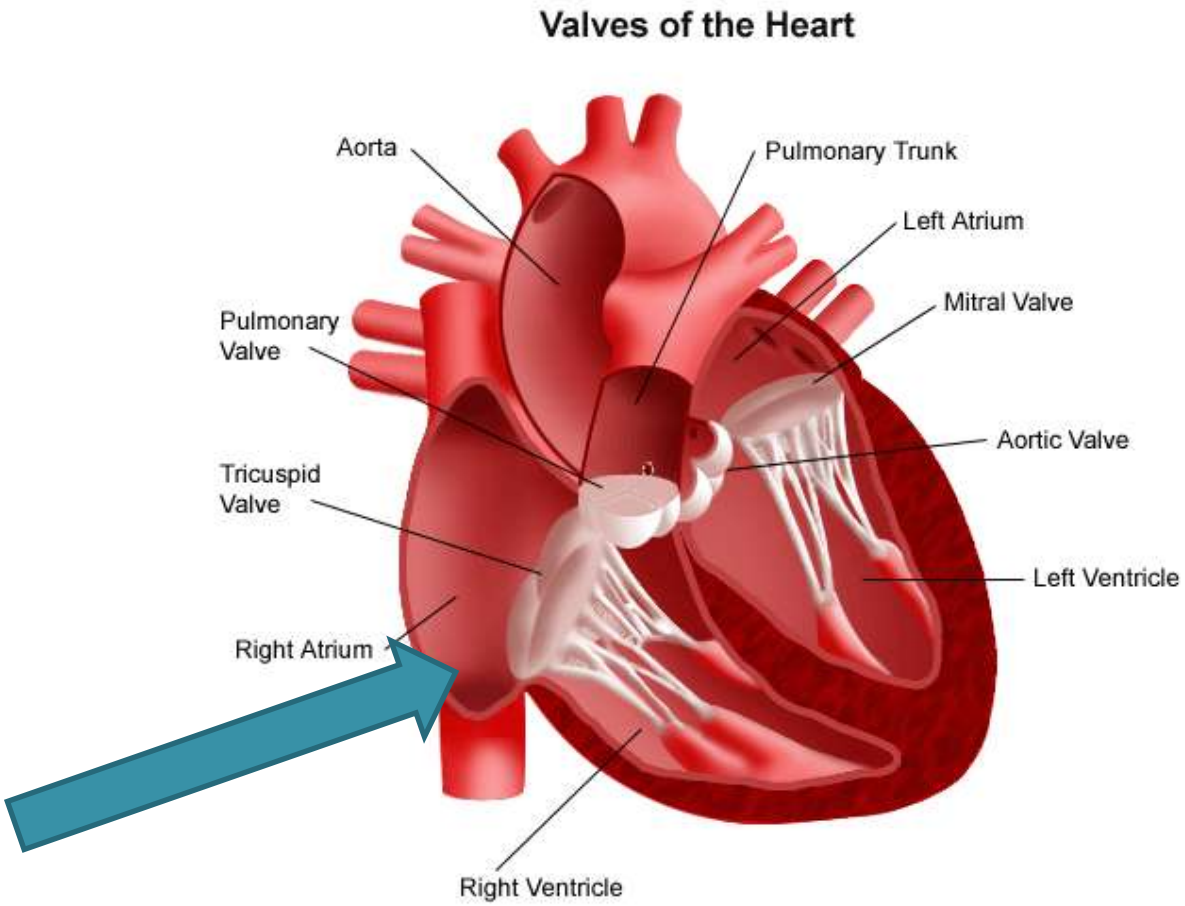
2.81 Tricuspid Valve Etiology

TV Etiology: (Choose at least one and up to 3 etiologies↓)	#1 VDTrEt1 (1800)	#2 VDTrEt2 (1805)	#3 VDTrEt3 (1810)
Unknown			
No additional etiology			
Functional			
Endocarditis			
Carcinoid			
Congenital			
Degenerative			
Pacing wire/catheter induced dysfunction			
Rheumatic			
Tumor			
Trauma			
Prior TV intervention, Etiology Unknown			
Other			

Tricuspid Valve Diseases

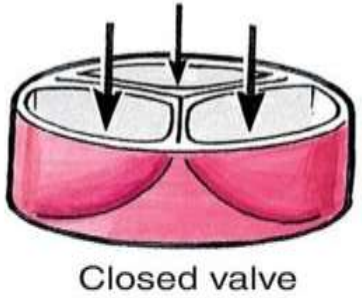
- Functional
- Endocarditis
- Carcinoid
- Degenerative
- Pacing Wire/Catheter induced dysfunction
- Rheumatic
- Tumor
- Trauma
- Prior TV Intervention, Etiology Unknown

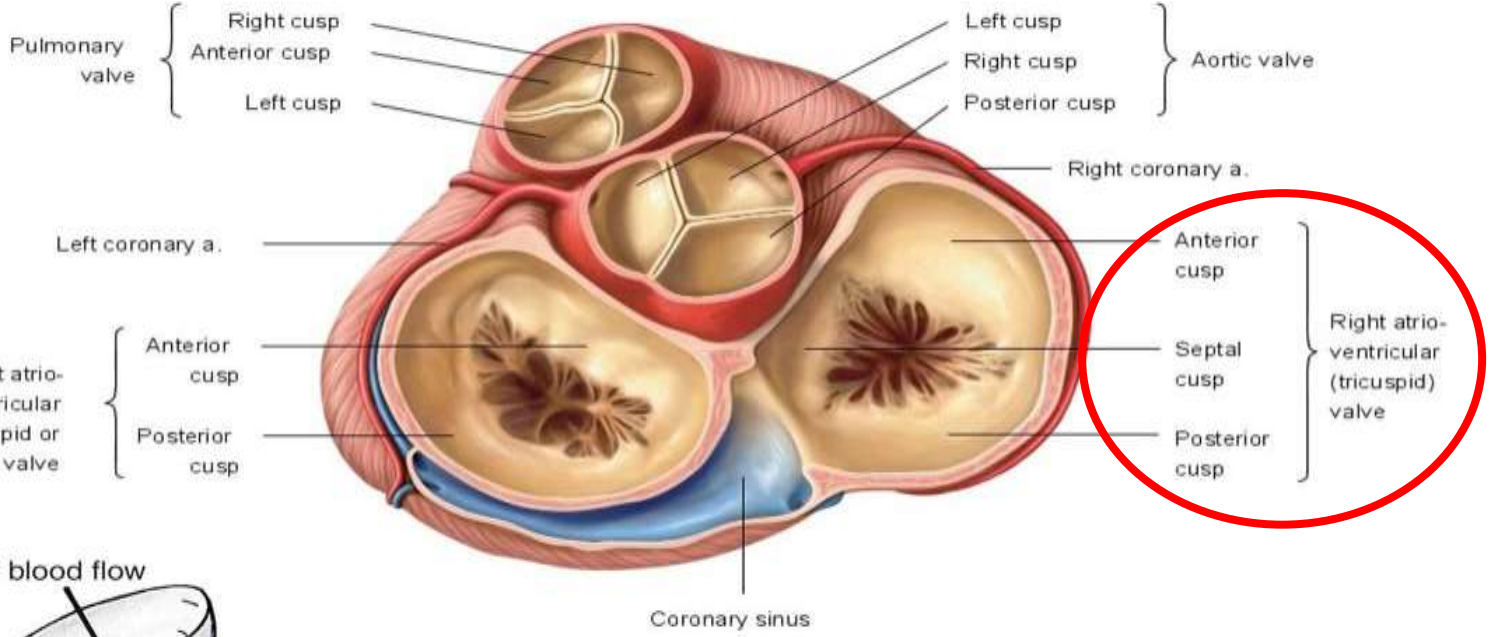
Tricuspid Valve Anatomy

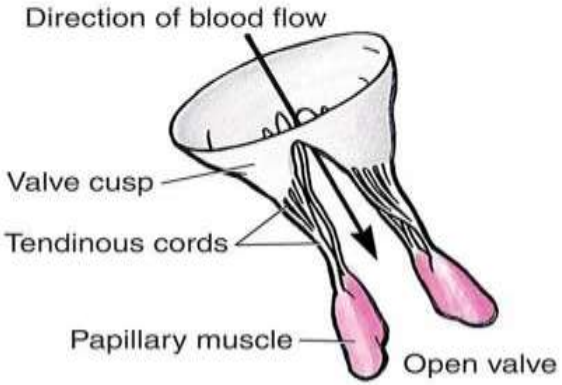


Valvedisease.org

Tricuspid Valve Anatomy

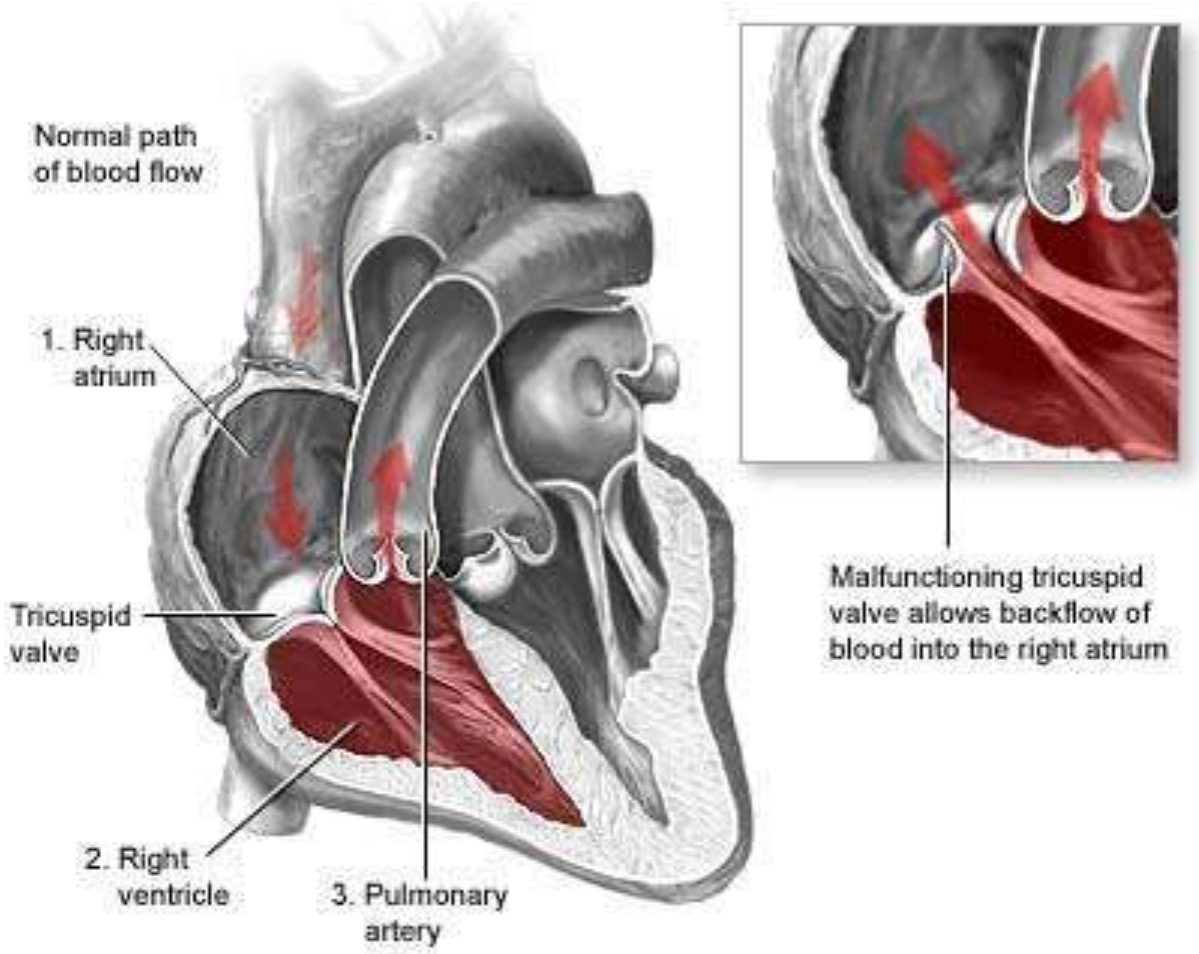






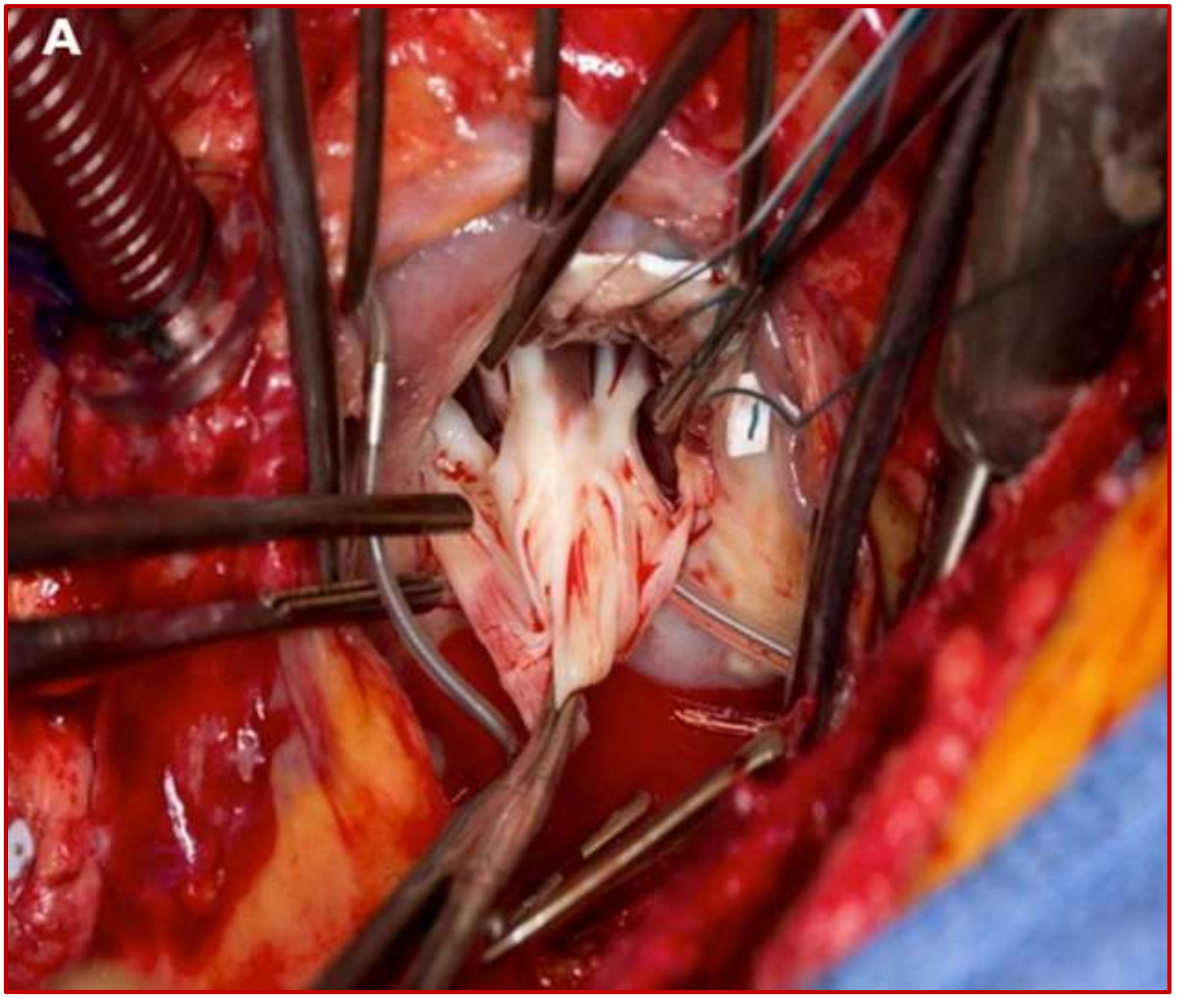
www.studyblue.com

Tricuspid Valve Insufficiency



mykentuckyheart.com

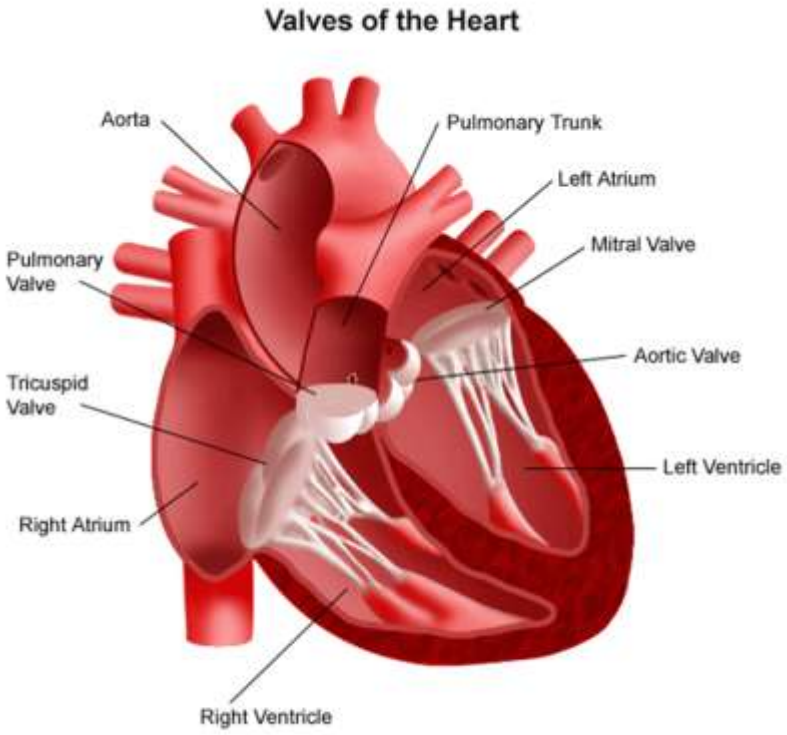
Gross image of excised thickened native tricuspid valve before replacement with a 33-mm Hancock Bioprosthesis.



American Heart Association

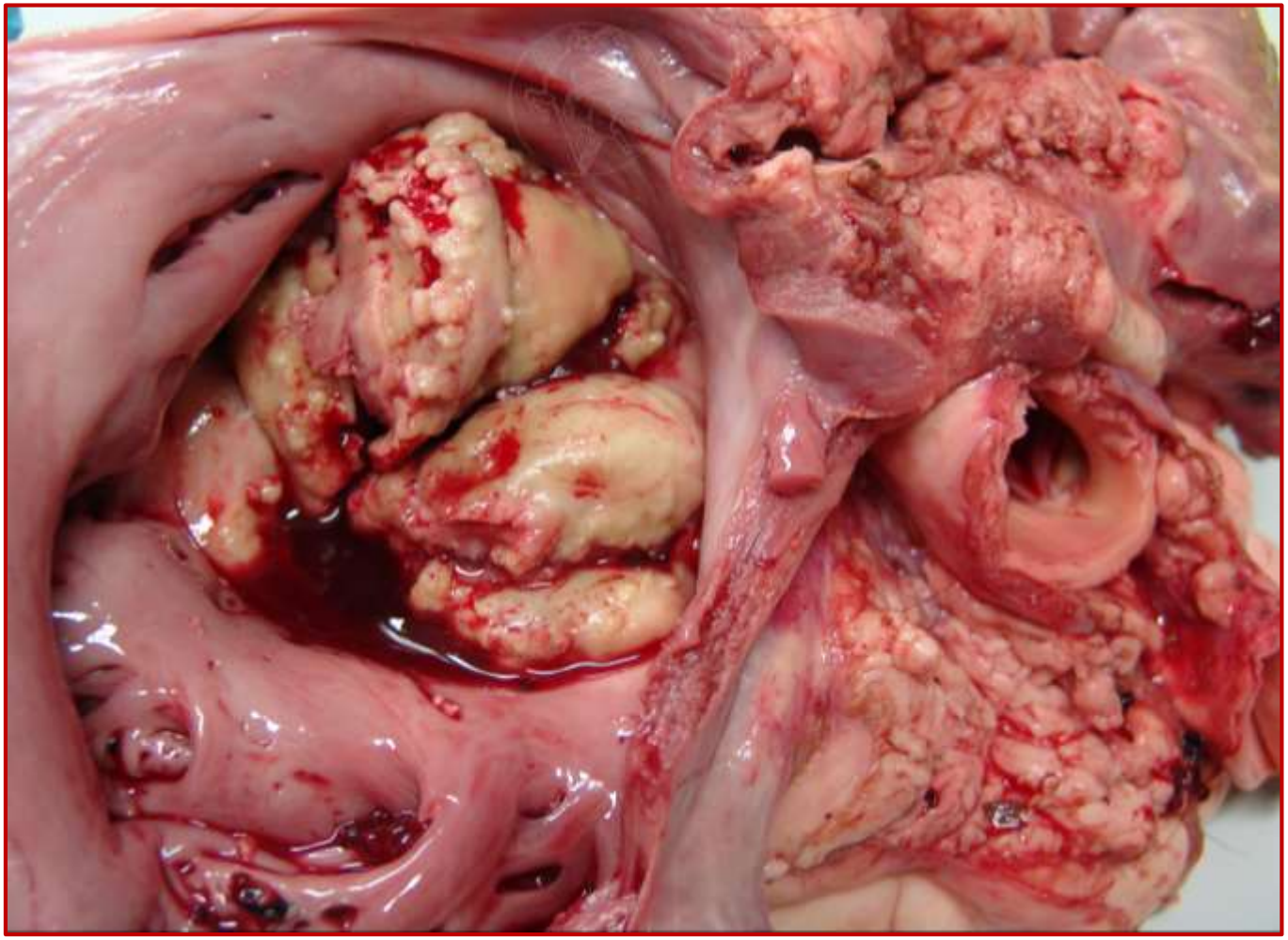
Mohammed Al-Hijji et al. Circulation. 2015;132:e123-e125

Tricuspid Functional Disease



- Normal Leaflets and Chords
- RV Annulus is Dilated
- Mitral Valve Disease can cause Tricuspid Insufficiency

Tricuspid Valve Endocarditis

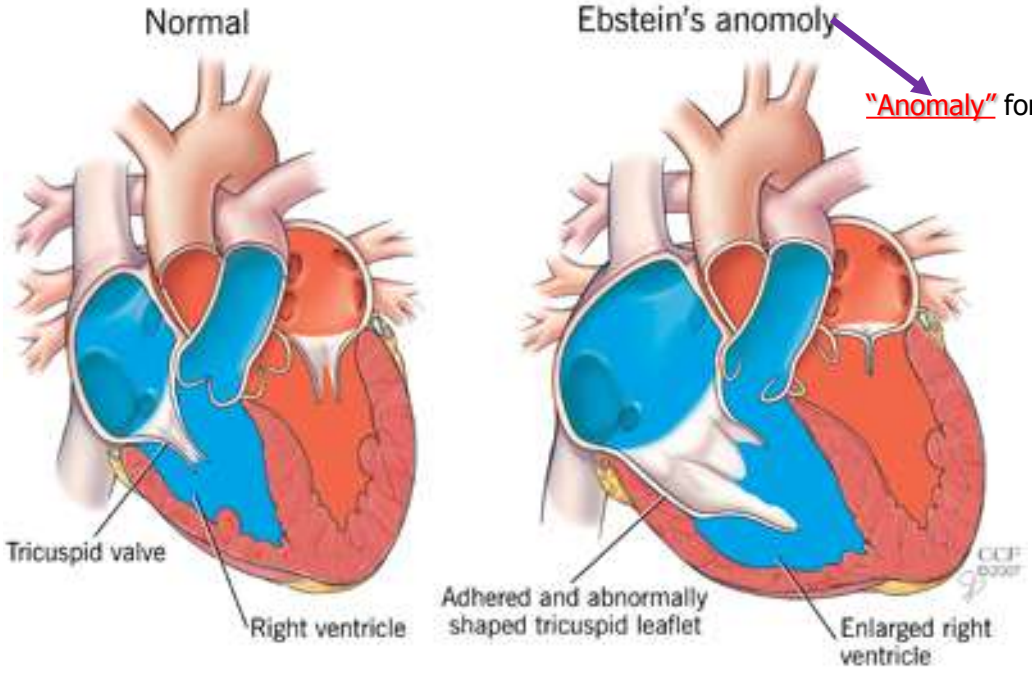


Autopsy Specimen

Imagekb.com

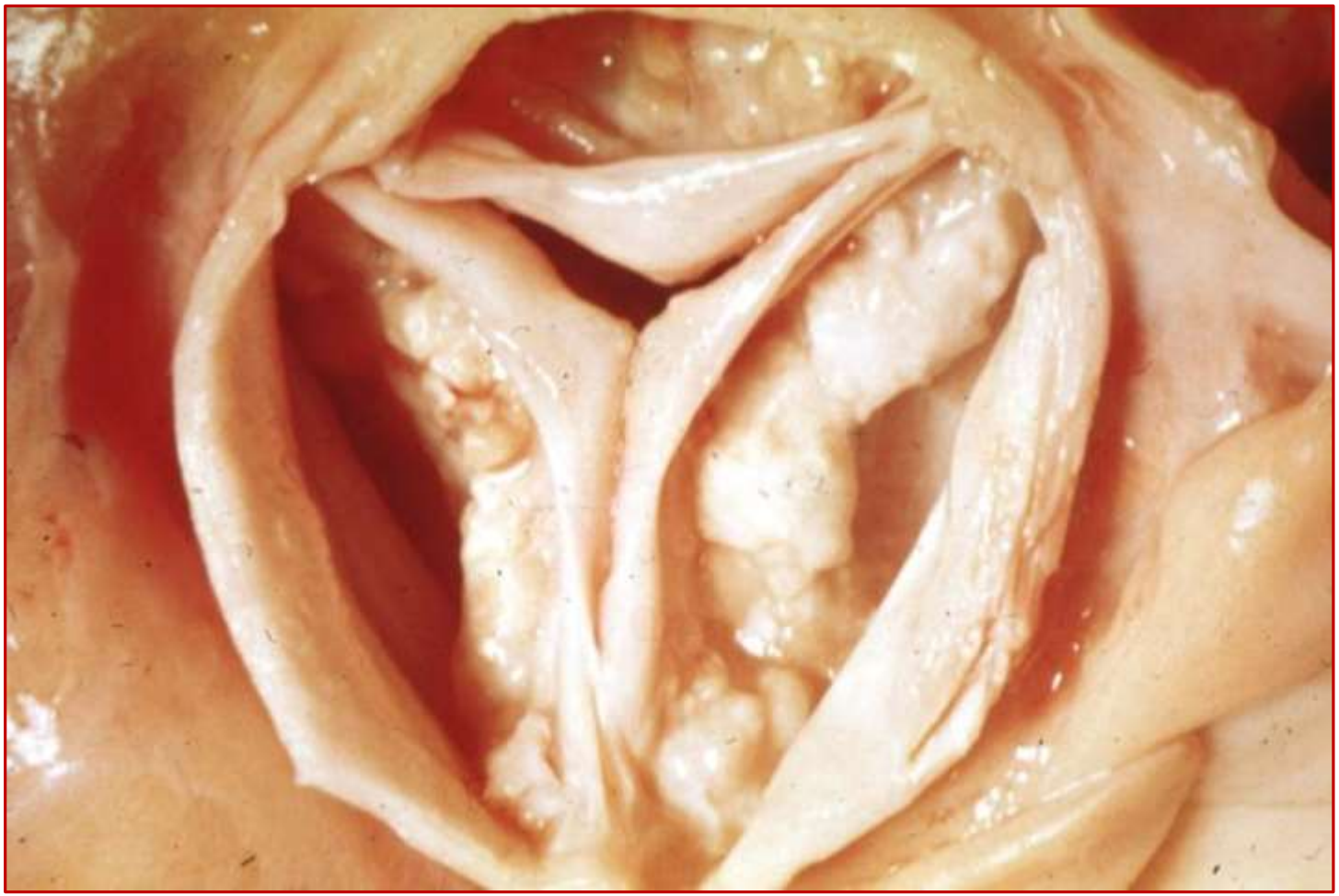
Tricuspid Valve Disease

- **Congenital**
  - Ebstein's Anomoly



my.clevelandclinic.org

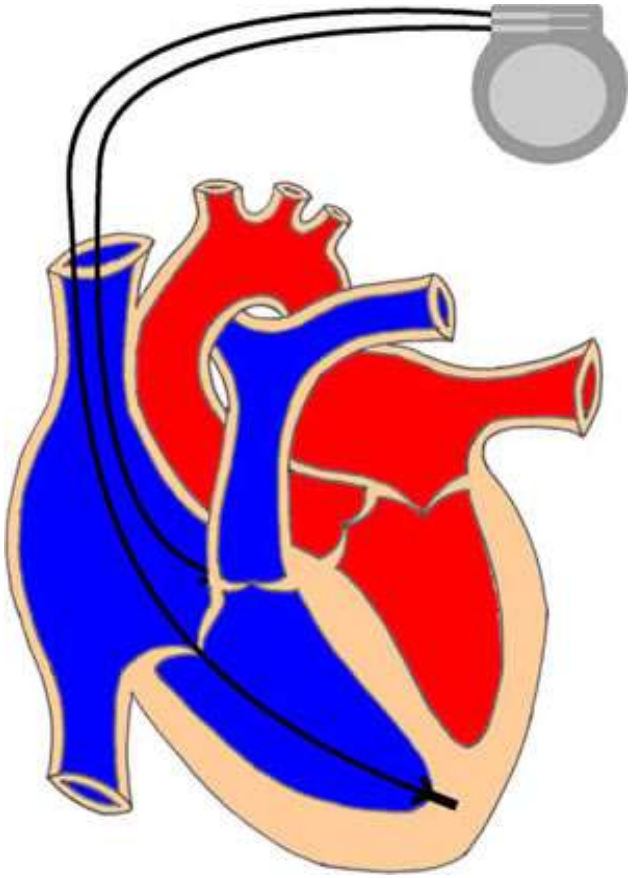
Tricuspid Degenerative Disease



wikidoc.org

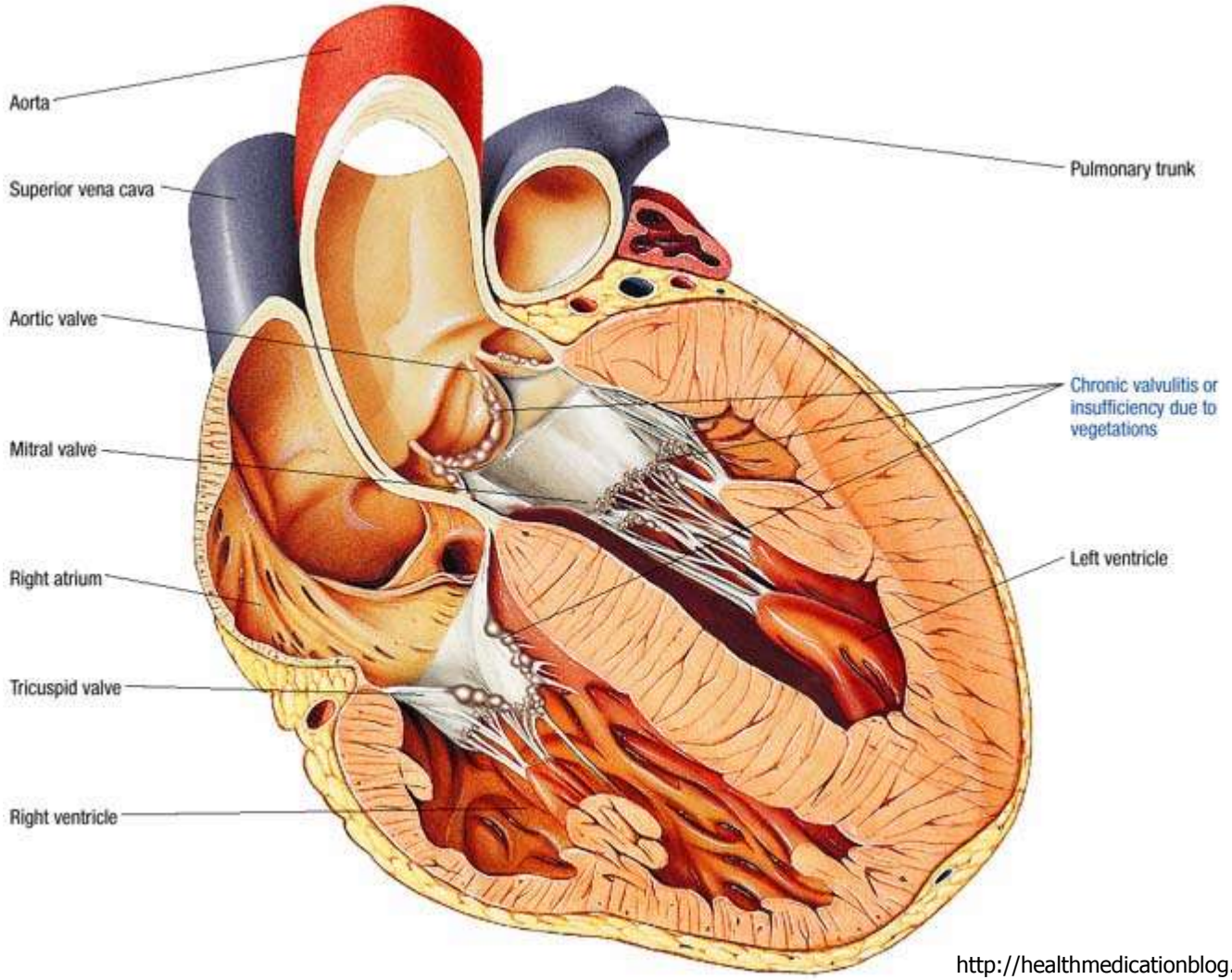
Tricuspid Valve Disease

- Pacing Wire Catheter Induced Dysfunction
  - Pacemaker Leads



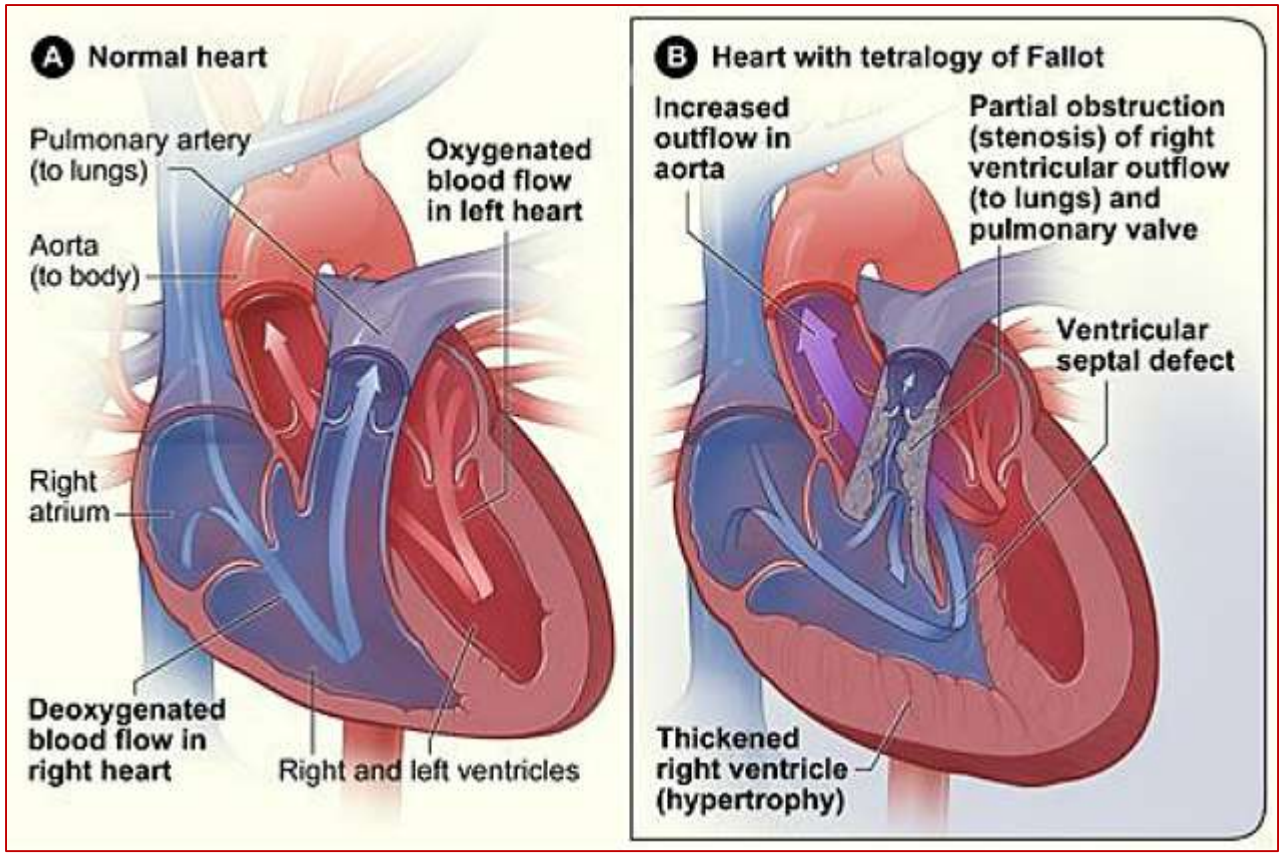
ucsf.edu

Tricuspid Valve Disease - Rheumatic



http://healthmedicationblog.blogspot.com/

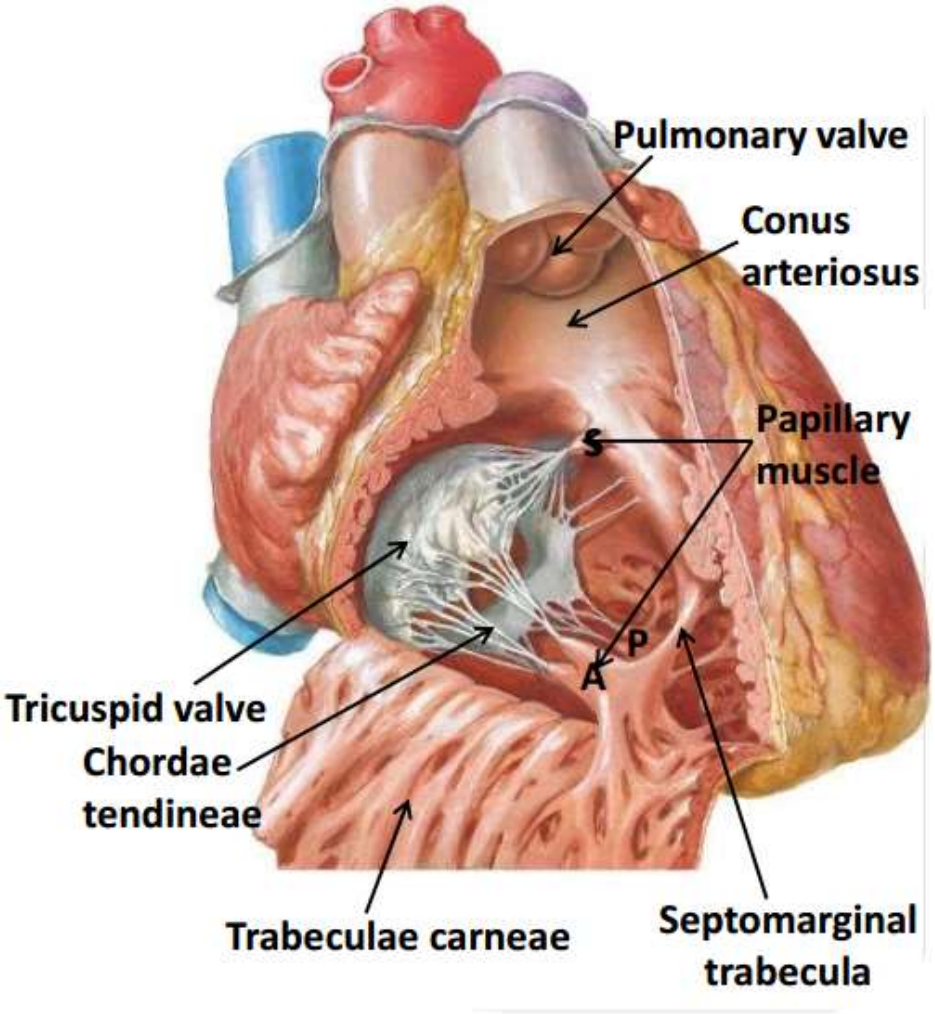
Prior Tricuspid Valve Intervention: Common = Congenital Tetralogy of Fallot



Zofranlegal.com

PULMONIC VALVE DISEASES

Pulmonic Valve Anatomy



2.81 Pulmonic Valve Etiology

Pulmonic Valve Disease: ☐ Yes ☐ No
VDPulm (1825)

(If Yes →) RVEDD Known: ☐ Yes ☐ No (If Yes →) RVEDD Indexed to BSA: _____ cm^2
RVEDDKnown (1830) RVEDD (1835)

(If Yes →) Pulmonic Stenosis: ☐ Yes ☐ No (If Yes→) Hemodynamic /Echo data available: ☐ Yes ☐ No (If Yes ↓)
VDStenP (1840) PuHemoDatAvail (1845)

Highest Mean Gradient : _____mmHg
VDGradP (1850)

(If Yes→) Etiology: VDPuEt (1855) (choose one)

- ☐ Acquired
- ☐ Congenital, s/p Tetralogy of Fallot (TOF) repair
- ☐ Congenital, no prior Tetralogy of Fallot (TOF) repair
- ☐ Prior Pulmonic Valve Intervention, Etiology Unknown
- ☐ Other
- ☐ Unknown

Pulmonic Valve Etiologies

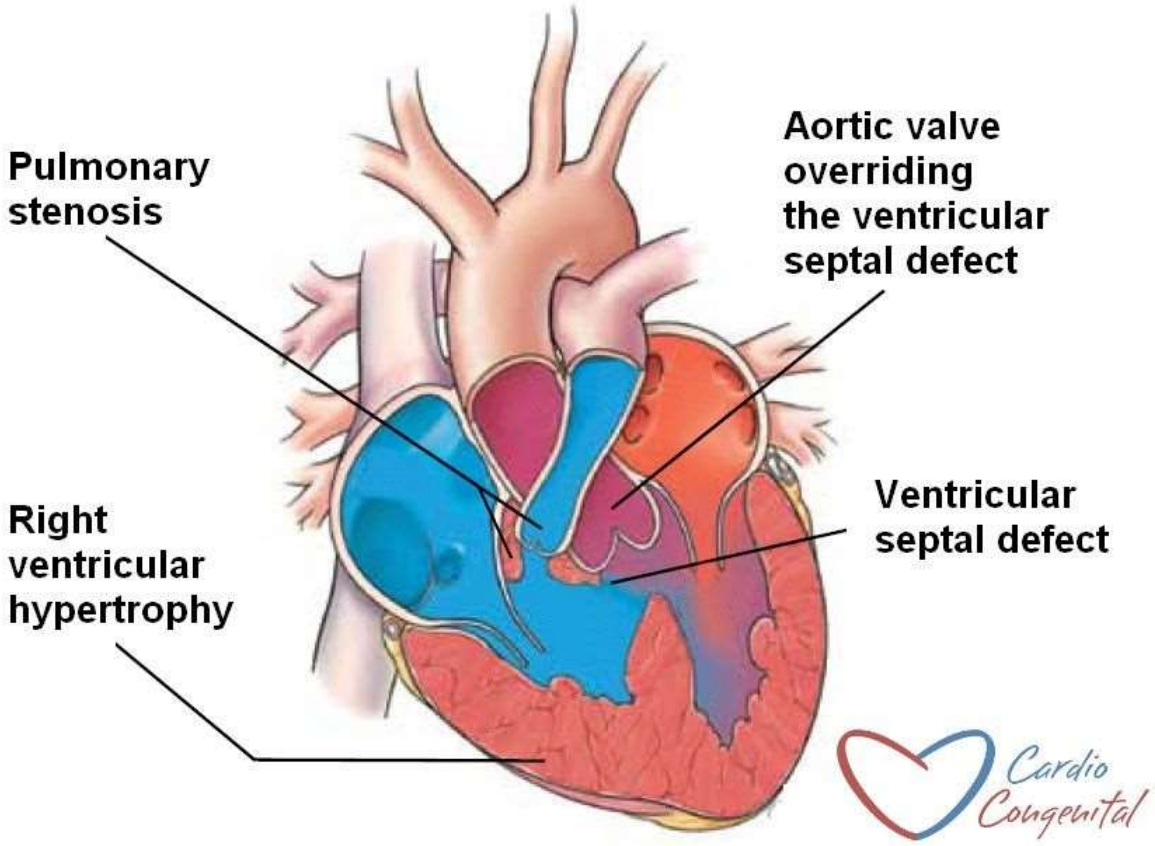
- Acquired
- Congenital, s/p Tetralogy of Fallot (TOF) Repair
- Congenital, (No Prior TOF) Repair
- Prior Pulmonic Valve Intervention, Etiology Unknown
- Other
  - ROSS Procedures

Acquired Pulmonic Valve Diseases

- Rheumatic Heart Disease
- Trauma from a Swan-Ganz Catheter
- Complications from TOF Operative Repair
- Syphillis Infection
- Carcinoid Heart Disease

http://emedicine.Medscape.com/article/157639-clinical

Tetralogy of Fallot



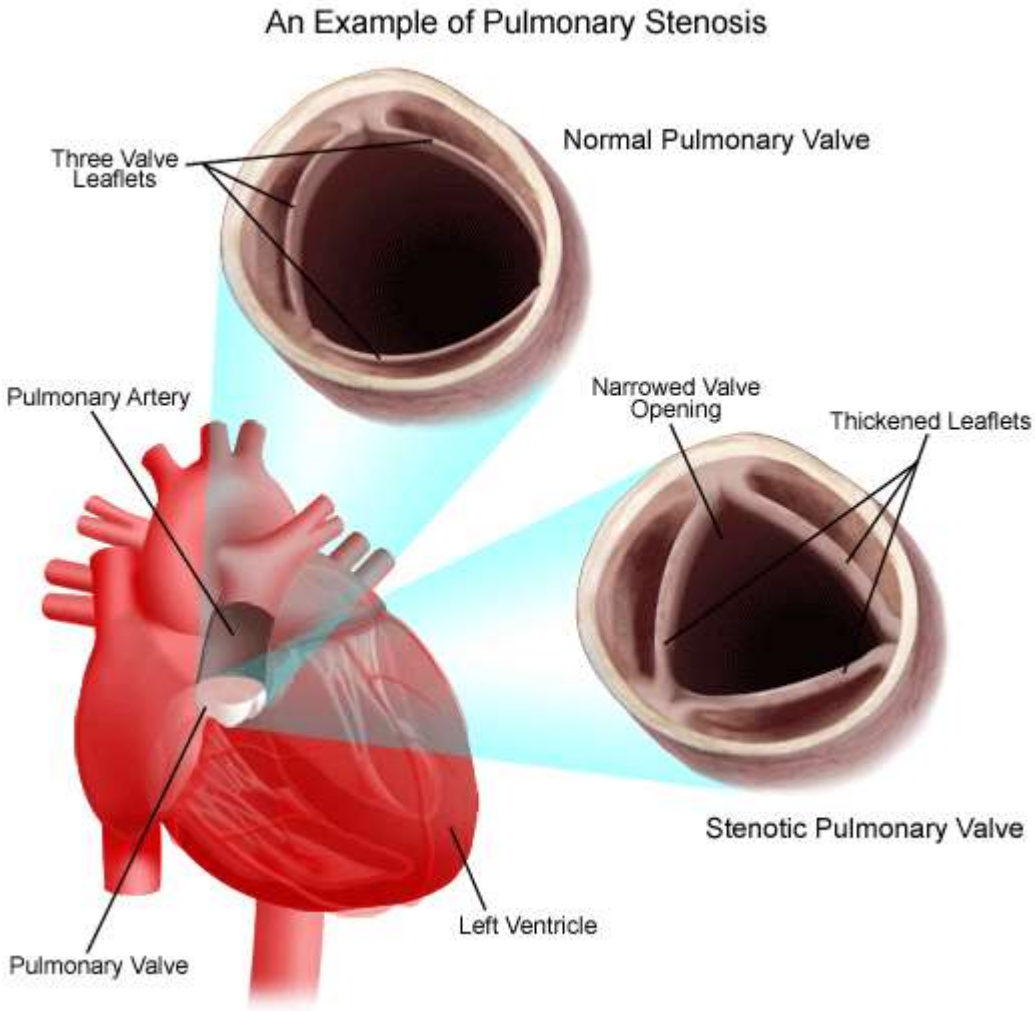
Tetralogy of Fallot involves four heart defects:

- A large ventricular septal defect (VSD)
- Pulmonary stenosis.
- Right ventricular hypertrophy
- An overriding aorta.

Mayoclinic.org

Cardiocongenital.com

Pulmonary Valve Stenosis

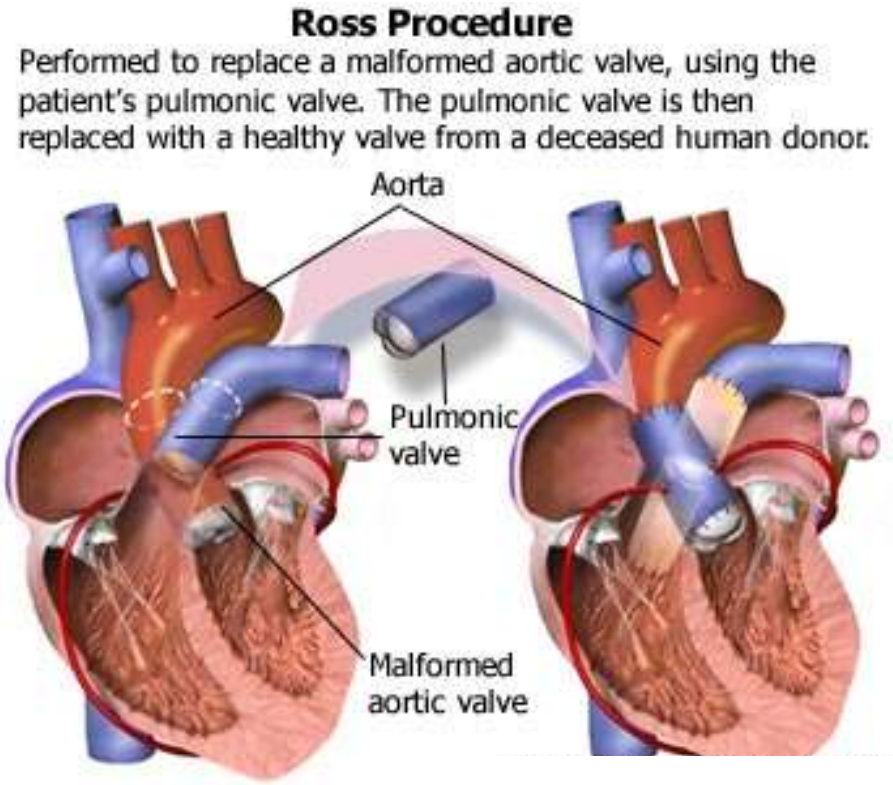


Standfordchildrens.org

Ross Procedure

Mr. Donald Ross, FRCS
British Thoracic Surgeon
uk.news.yahoo.com

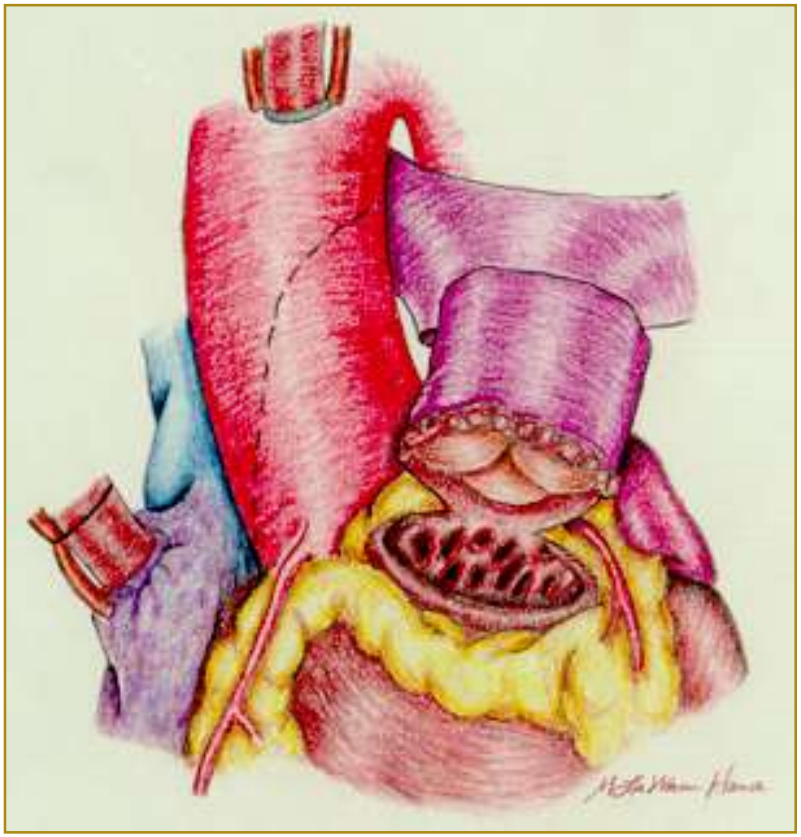
Autograft = (Pt's Pulmonic)Valve to Own Aortic Valve Position.

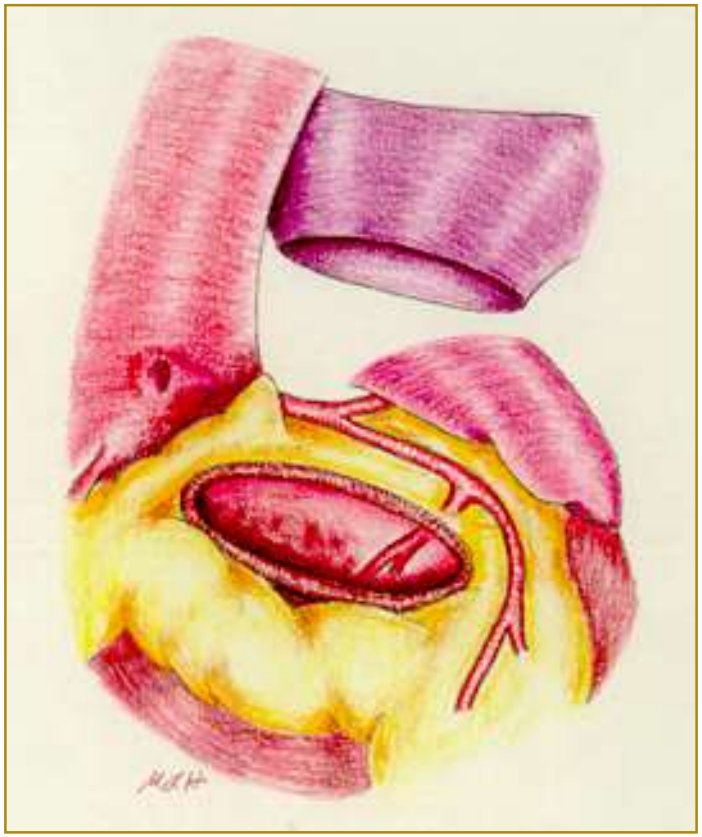


Allograft (Donated) Human Valve to Aortic Valve Spot. = a **Homograft**

www.archive.bebo.com

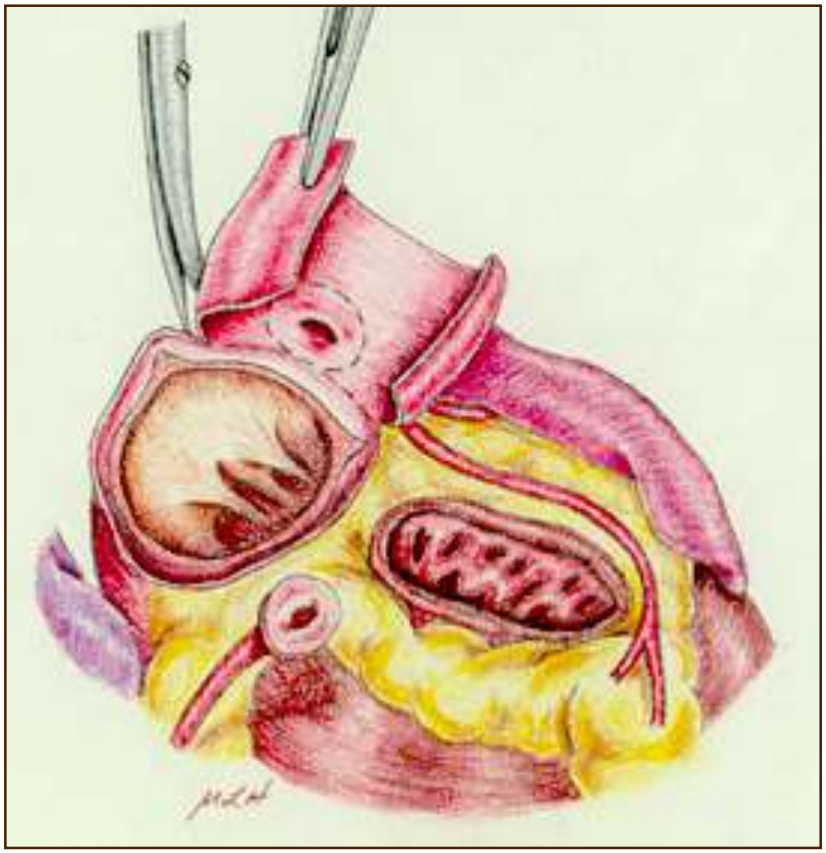
Ross Procedure: Pulmonary Harvest

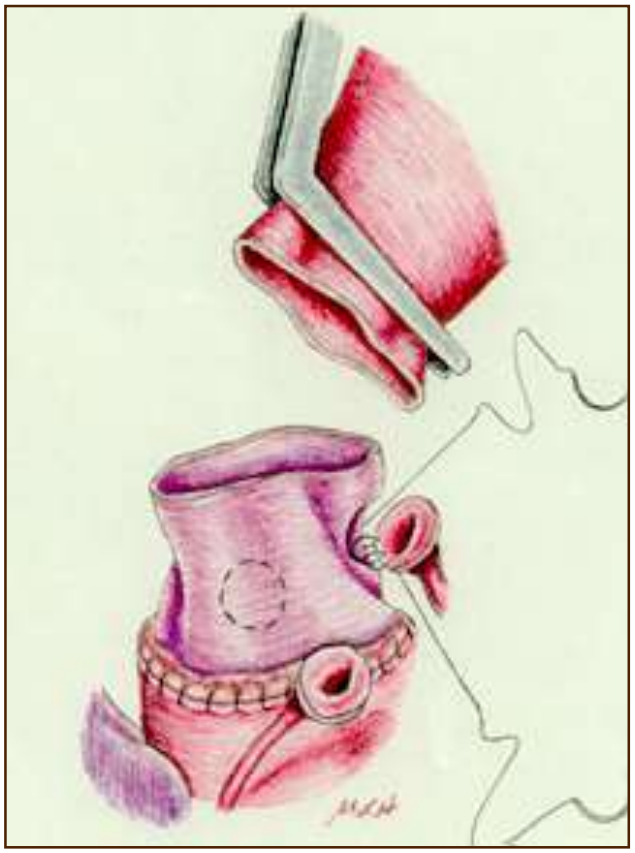




Hance, LaWaun PA-C St. Joseph Mercy Hospital, Ann Arbor MI 2009

Ross Procedure: Root Replacement

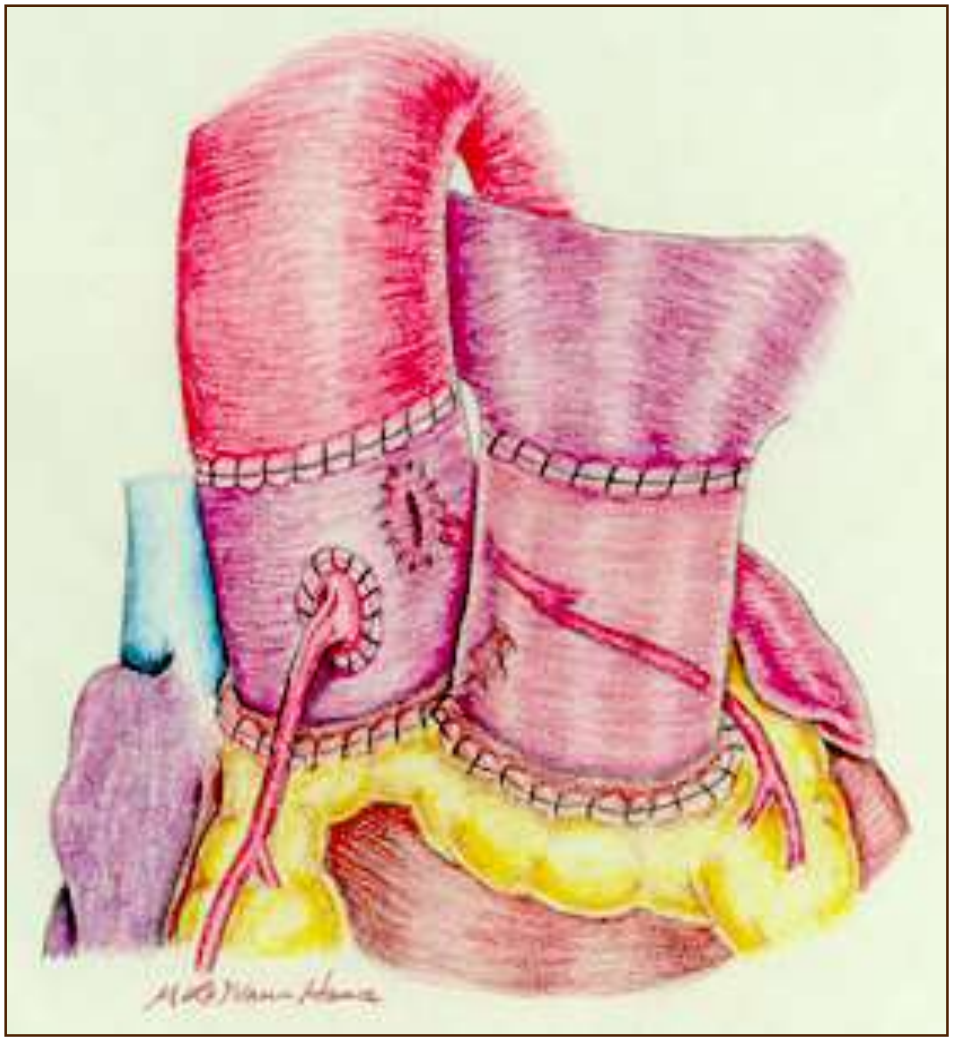




Hance, LaWaun PA-C St. Joseph Mercy Hospital, Ann Arbor 2009

Ross Procedure

Completed Root Replacement & RVOT Reconstruction



Hance, LaWaun PA-C St. Joseph Mercy Hospital, Ann Arbor 2009

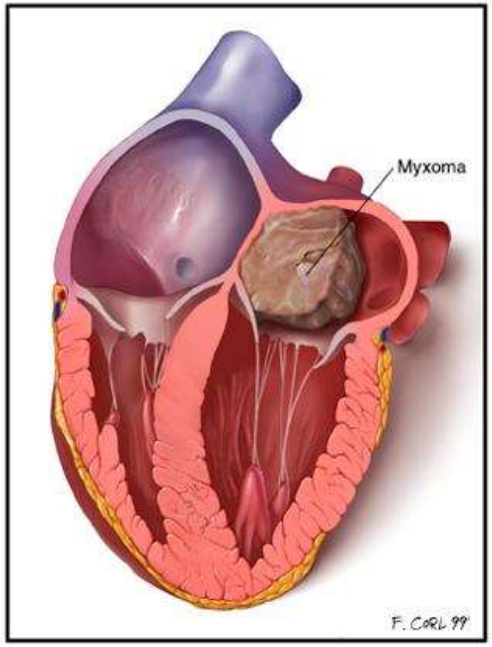
Detour Ends !

- Back to Valve Tumors

Aortic, Mitral & Tricuspid Tumors

- Rare Occurrence
- Myxoma = most Common
  - Benign Tumors
  - Most Common in Left Atrium, also seen in Right Atrium
- Tumors on the Valves:
- Papillary Fibroelastoma
- Sarcoma Tumors

Myxomas



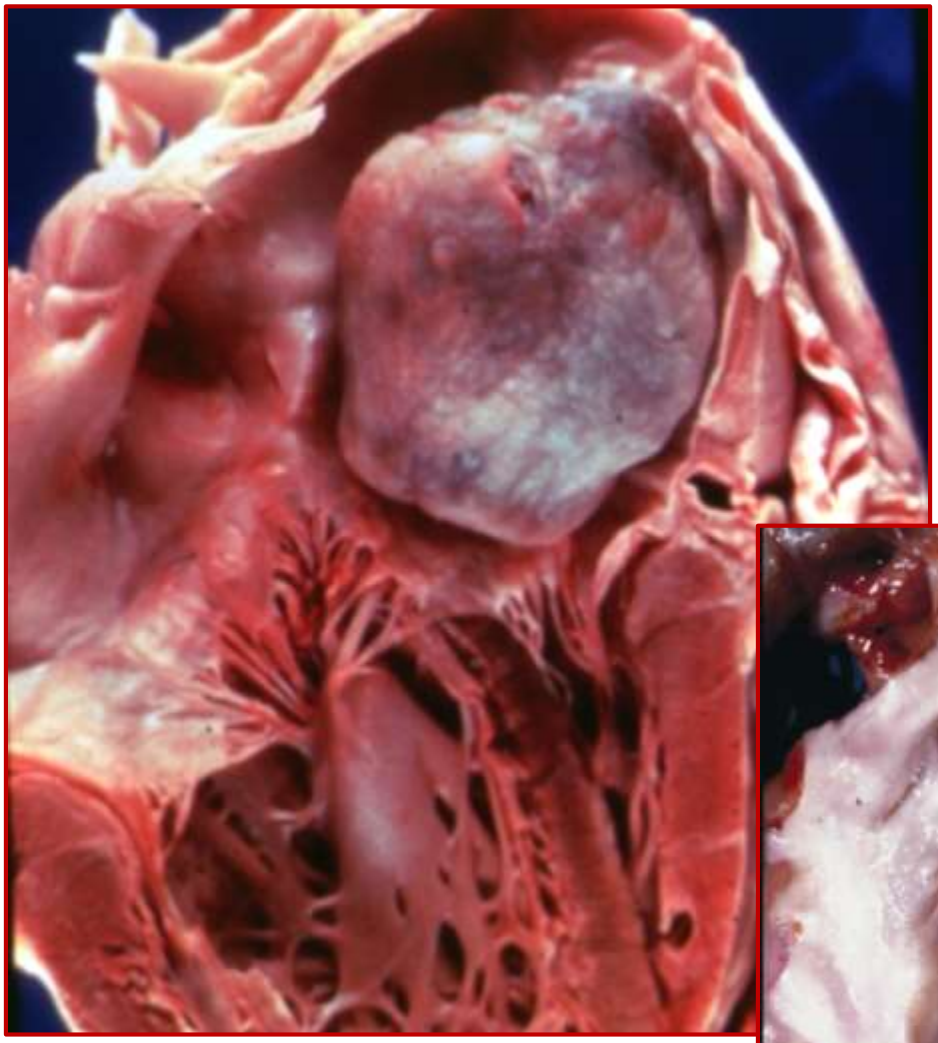
www.wiki.org

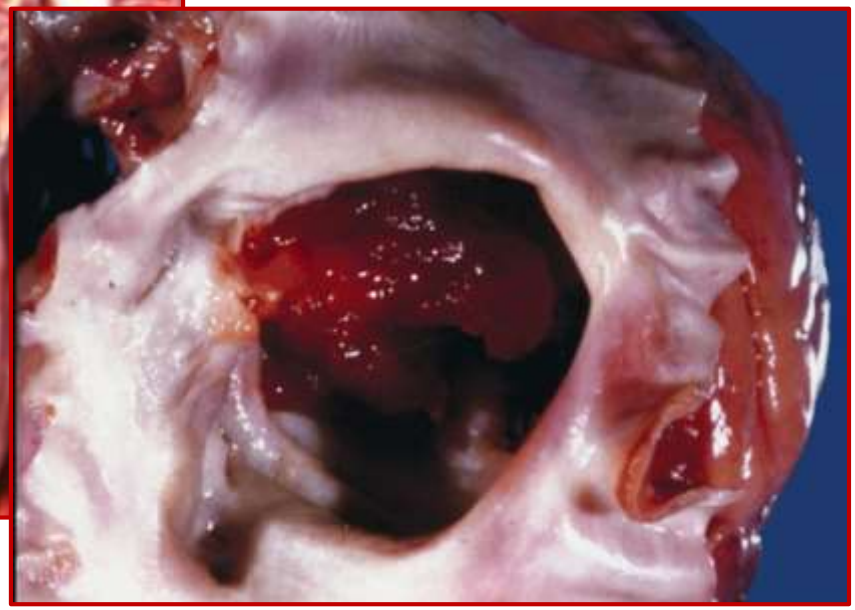
Left Myoxmas

www.tube.7-s.com

Right Myxomas

LA Myxomas – Benign



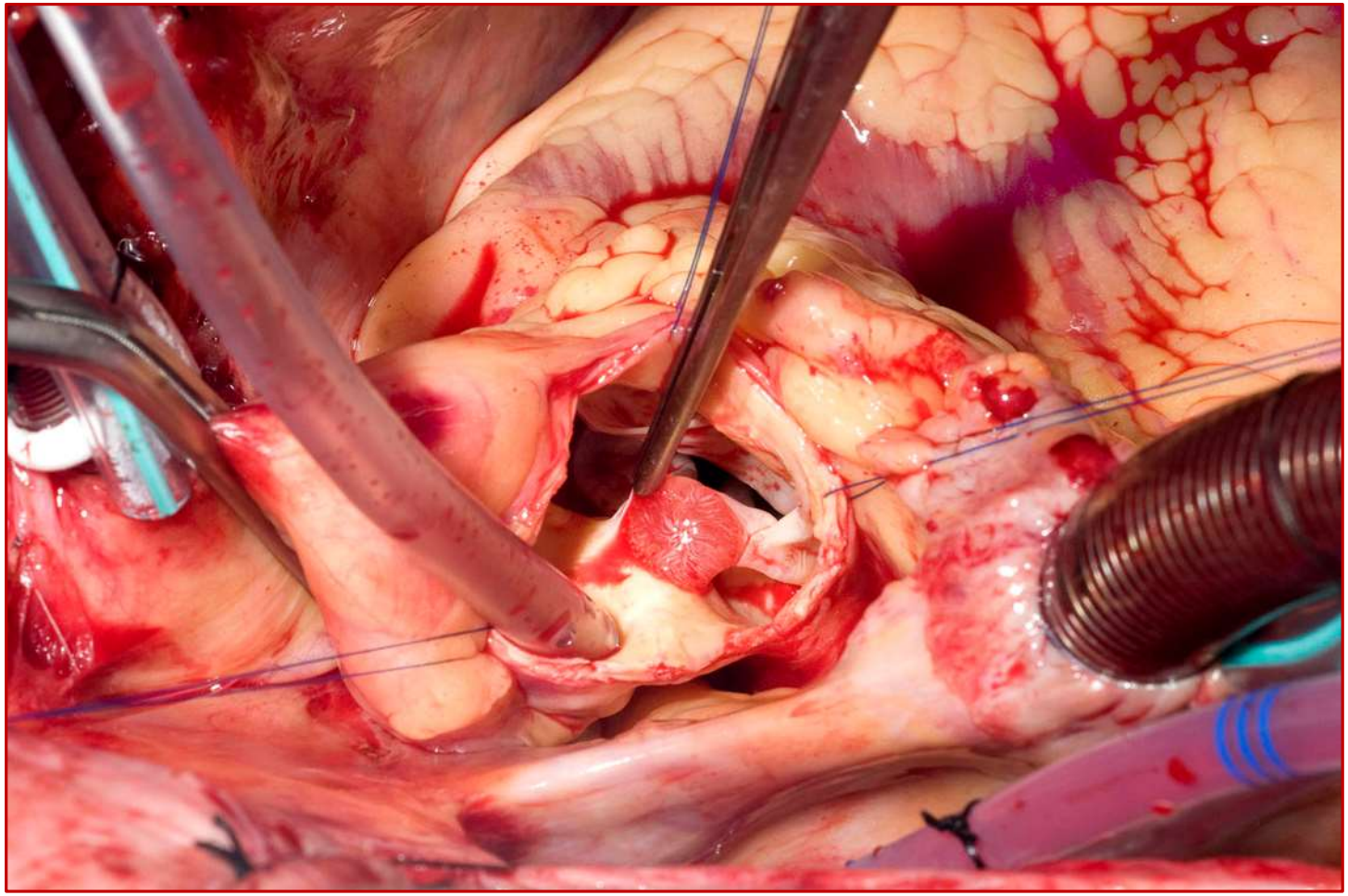


Wikidoc.org

Aortic Valve Fibroelastoma

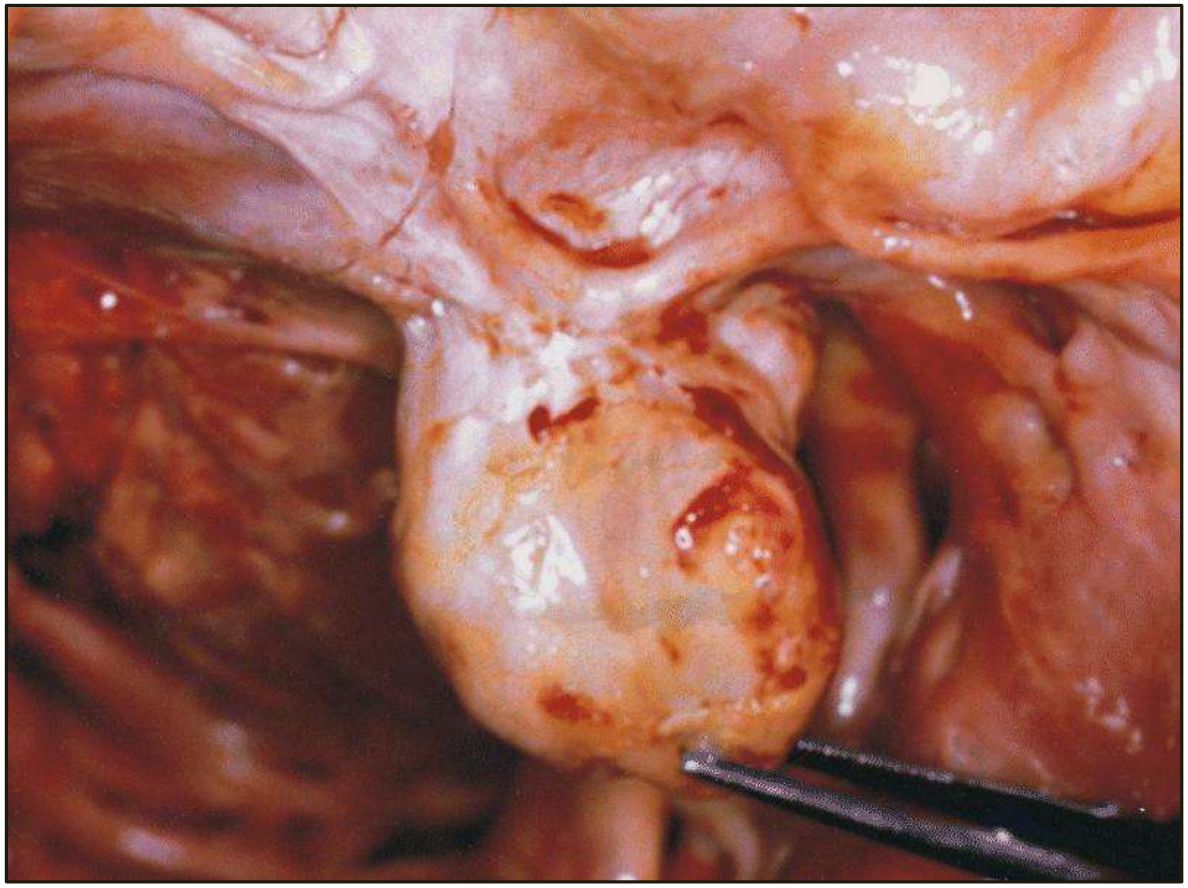
Circulation. 1999;100:2204.)

Aortic Papillary Fibroelastoma Tumor (Benign)



www.deadmaidens.com

Cardiac Sarcoma



Primary Cancerous Cardiac Tumor

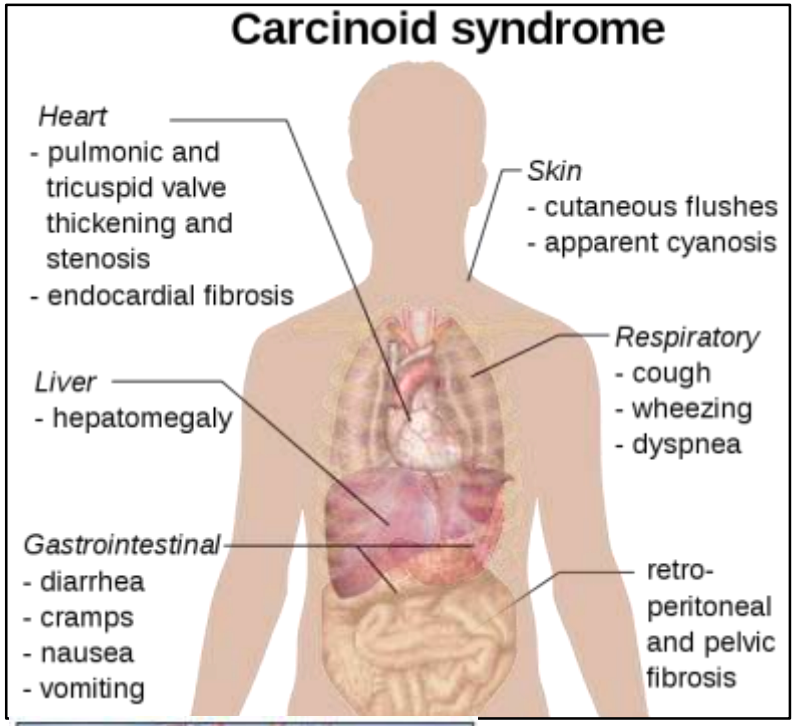
Pathologyoutlines.com

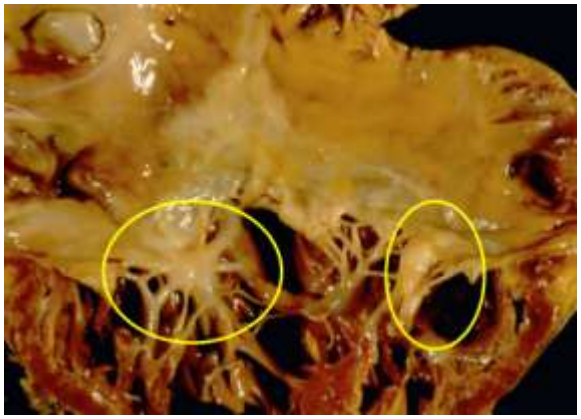
Carcinoid Valve Tumors

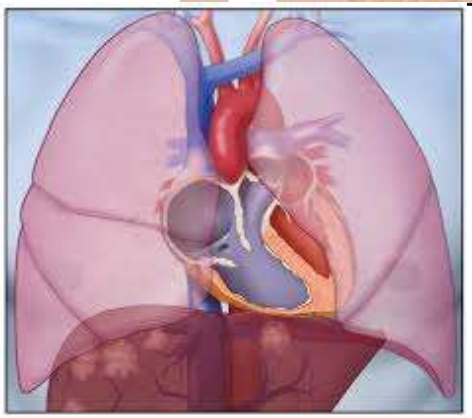
- Carcinoid Tumors:
- Slow-Growing, Rare Neuroendocrine Tumor
  - Can Metastasize
- Cardiac Involvement occurs in 50 – 66% of patients with Carcinoid Syndrome.
  - Manifested by Plaques on Right sided heart valves.
  - Leads to Valve Stenosis & Regurgitation
  - Left sided Heart valves in <10% of patients

Cardiol Rev. 2012 July-August;20 (4) 167-176

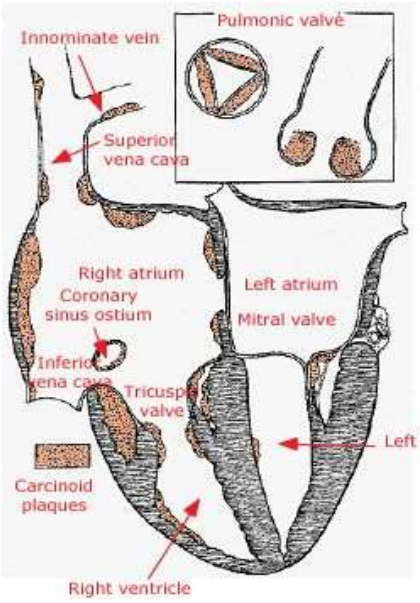
Carcinoid Syndrome Manifestations



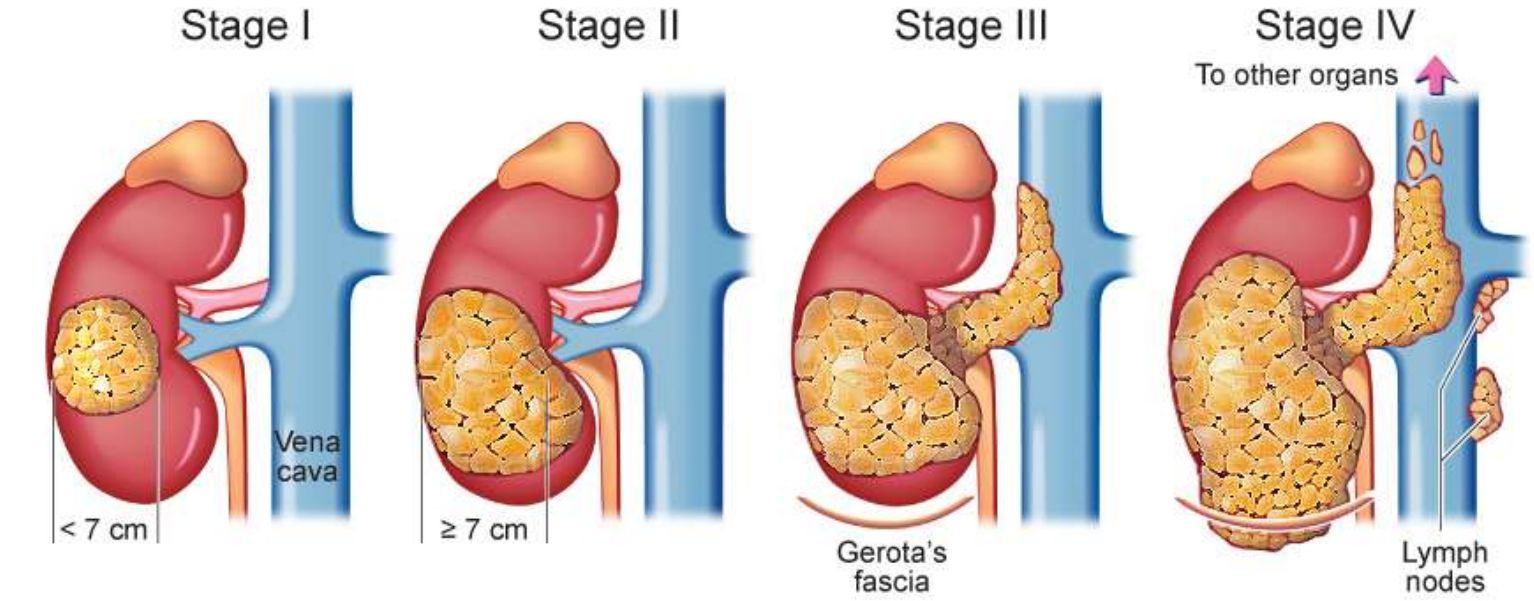




Carcinoid Issues



Hypernephromas



Newhealthadvisor.com

- Can Spread to Cardiac Organs requiring Operative Intervention

References & Credits

- R. Prager, MD Presentation: AQO Data Manager's Meeting October 9, 2014: Valve Disease & 2.81 Operative Procedures
- R. Prager, MD Presentation: Michigan Data Manager Meeting August 2010: Aortic & Mitral Valve Operations.
- Amy Geltz RN, MS & Jaelene Williams, RN, MS Aortic & Mitral Valve Anatomy & Procedures Presentation: Michigan Data Manager Meeting, August 2010.
- Patty Theurer RN, BSN – Michigan Data Manager Meetings: Mitral Valve Presentations: August 2009 & March 2010.
- Bobby Kong, MD, Andrew Pruitt, MD and Manak Sood, MD: Cardiac Surgery at St. Joseph Mercy Hospital Ann Arbor, MI. Mitral Valve Operative Presentations: 2009 & 2010.
- LaWaun Hance, PA-C, Clinical Cardiac Surgery Lead: St. Joseph Mercy Hospital Ann Arbor : Power Point Presentations & Graphic Designs.
- Texas Regional Data Manager Network Shared Slides, May 5, 2014.