TRICUSPIC STENOSIS

ETIOLOGIES

- Almost always **rheumatic** (15% patients with rheumatic heart disease – 5% symptomatic)
  - Associated with TR
  - Mitral valve involvement
  - India, Pakistan, Equator
  - Fusion and shortening of chordae tendineae and fusion of leaflet at their edges – valve calcifications are rare
  - Women >> men
- Obstruction to RA emptying
  - Congenital tricuspid atresia
  - RA tumor
  - Carcinoid – TR
- Obstruction of RV inflow
  - Endomyocardial fibrosis
  - Vegetation on tricuspid valve
  - PMP lead
  - Extracardiac tumor
- **RA dilated and wall thickened, passive congestion, enlargement of liver and spleen**

PATHOPHYSIOLOGY

- Diastolic pressure gradient between RA and RV is augmented in inspiration or exercise
- Mean gradient 5 mmHg is sufficient to elevation RA pressure = systemic venous congestion (ascites, edema, JVP elevated)
- ↑ *a* wave
- ↓ CO
- Gradient of **2 mmHg** = diagnostic of TS
  - ↑ Inspiration, exercise or rapid infusion on fluids

CLINICAL PRESENTATIONS

- ↓ CO: fatigue, discomfort by hepatomegaly, ascites, anasarca
- Discomfort in the neck (PVC)
- Left HF (dyspnea, orthopnea, PND) **rarely present** even with presence of MS because of TS that prevents blood to go in pulmonary circulation

Diagnosis of TS is commonly missed because of presence MS

***Suspicious if elevated PVC in MS/TS without pulmonary hypertension**

PHYSICAL EXAM

- Jugular veins
  - Tall *a* wave (sinus rhythm)
  - Y descent is slow
- Presystolic hepatic pulsation
- Anasarca, ascites

- Diastolic thrill is palpable LLSB - é inspiration
- Auscultation:
    - OS
        - **AFTER** mitral OS
        - LLSB
    - Diastolic murmur LLSB 4th space, soft, high pitch, Presystolic component more scratchy, crescendo-decrescendo before S1
    - *Maneuvers*
        - ↑: Inspiration, leg raising, NO, squatting, isotonic exercise, Mueller (forced inspiration against a closed glottis)
        - ↓: Expiration, Valsalva

ECHOCARDIOGRAPHY

Defines the anatomy of the valve, the severity of the stenosis, concomitant TR, left-sided disease.

- Diastolic doming of the leaflets, especially the **anterior leaflet**
- Thickening and restricted motion of other leaflets
- "***Frozen appearance***" in carcinoid syndrome
- Reduced separation of tips of leaflets
- Reduced diameter of tricuspid orifice

	Severe
Mean pressure gradient (mmHg)	≥ 5
Inflow time-velocity integral	> 60 cm
Time to half pressure	≥ 190 ms
Valve area by continuity equation	≤ 1 cm^2
Suggestive of severe TS	Moderate to severe enlarged RA
	Dilation IVC

★ **Suggested reference:**
Baumgartner H. et al. Echocardiographic assessment of valve stenosis: EAE/ASE recommendations for clinical practice. 2009 J Am Society Echocardiography;22:1-23.
Nishimura R. A. et al. 2014 ACC/AHA guidelines for the management of patients with valvular heart disease. J Am Coll Cardiol 2014;63:e57-185 – **Table 20**

ELECTROCARDIOGRAPHY

- RA enlargement
- Biatrial enlargement if MS
- **NO RV hypertrophy**

CHEST X-RAY

- Cardiomegaly
- RA enlargement
- Dilated superior vena cava and azygos vein
- Vascular changes in lung if MS

CATHETERIZATION

Useful in patients with severe TS when symptoms and noninvasive imaging data are discordant.

MANAGEMENT

Medical

- Water and sodium restriction
- Diuretics (diminish hepatic congestion)

Surgical

- Criteria
  - Mean diastolic pressure gradient > 5 mmHg
  - Tricuspid orifice < 2,0 cm^2
- Valvotomy – may induce TR
  - Convert tricuspid valve into bicuspid by opening 2 commissures = less TR
- Bioprosthesis over mechanical prosthesis because of high risk of thrombosis and longer durability of bioprosthesis in RV

Content of this summary from these references:

- Otto C & Bonow R. Valvular Heart Disease. (2012) In Bonow R. *et al*. Braunwald's Heart Disease, 9th edition, pp. 1468-1539. Philadelphia, PA: Elsevier.
- Nishimura R. A. et al. 2014 ACC/AHA guidelines for the management of patients with valvular heart disease. J Am Coll Cardiol 2014;63:e57-185.
- Baumgartner H. et al. Echocardiographic assessment of valve stenosis: EAE/ASE recommendations for clinical practice. 2009 J Am Society Echocardiography;22:1-23.