

ENDOCARDITA BACTERIANA



Definitie

- Infectie bacteriana si inflamatie la nivelul endocardului, cu afectare valvulara.
- De obicei apare pe cord cu modificari structurale.



Epidemiologie

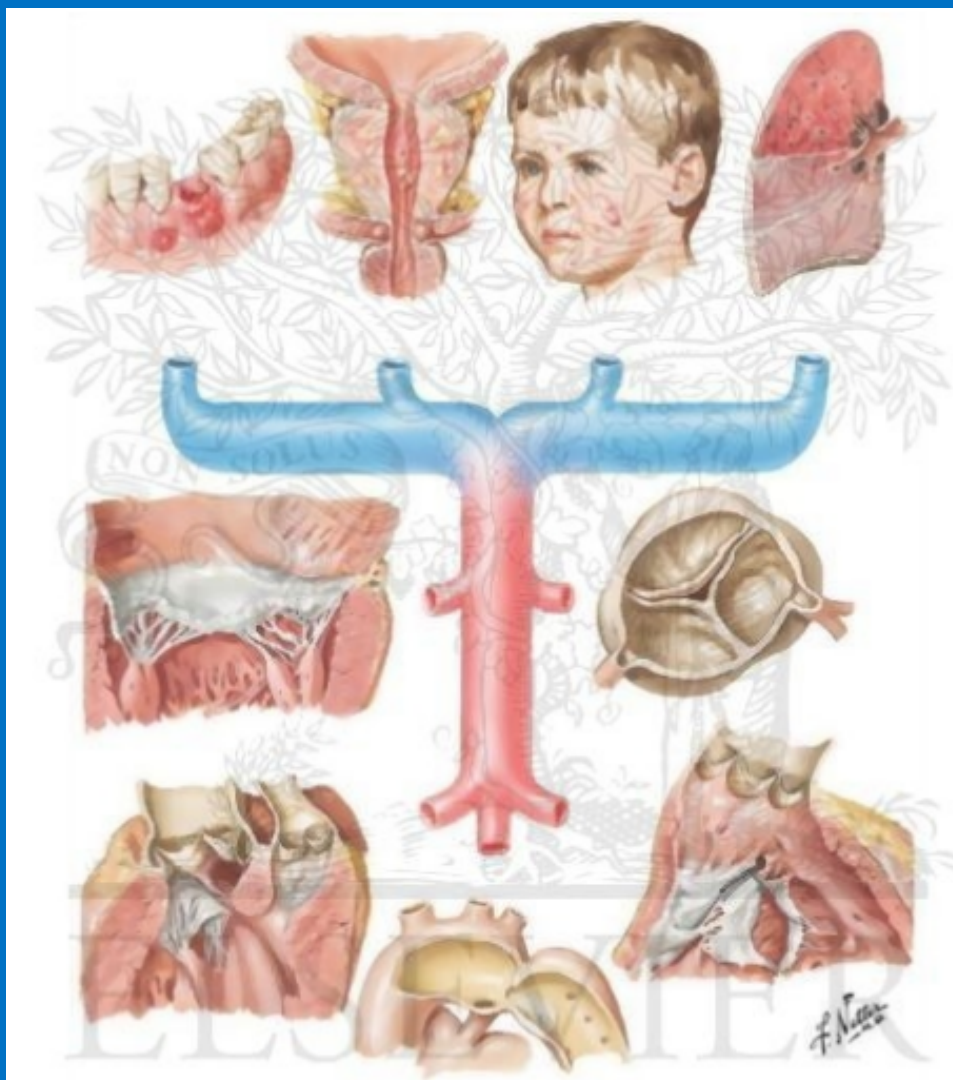
- Prevalenta: 1:1000-1200 internari
- Incidenta in crestere din anii '80s
 - Crestera numarului de interventii chirurgicale
 - Cresterea numarului de MCC complexe
 - Cresterea utilizarii materialelor protetice
 - Proceduri dentare multiple
 - Infectii extracardiace mai numeroase
 - Manevre exploratorii diagnostice, cu leziuni de mucoase

Factori de risc de endocardita

- MCC
- Operatii pe cord pt MCC
- Patologie valvulara cardiaca congenitala sau castigata
- Pacienti imunocompromisi cu cateter venos central



Poarta de intrare – factori favorizanti



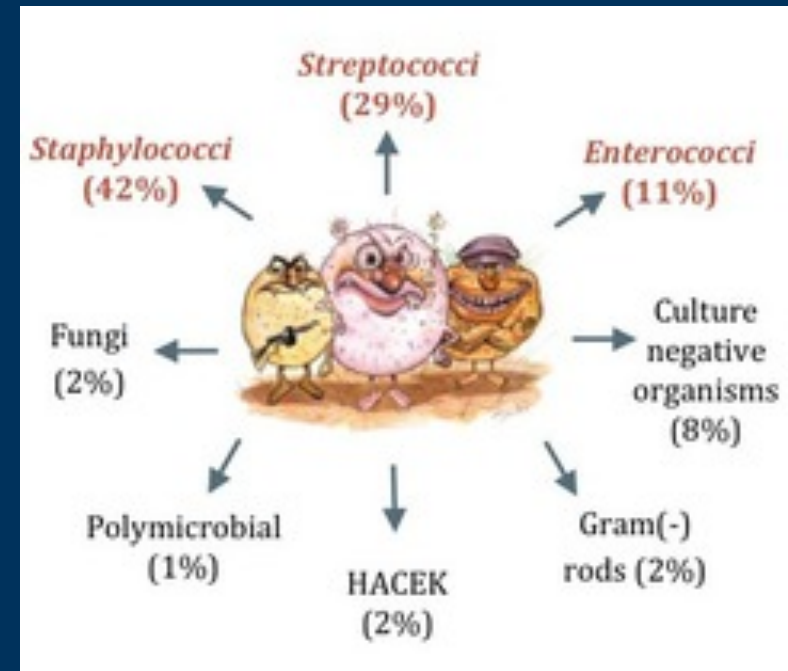
Leziuni predispozante

Patogeneza

- Patogenie: 2 factori
 - Endoteliul alterat
 - prin afectare cardiaca congenitala sau dobandita
 - Bacteriemie
 - prin infectie cu localizare diversa
- Vegetatia se formeaza in locul cu presiune scazuta:
 - fata atriala a VM,
 - in CAP
 - pe fata ventriculara a valvei AO

Etiologie

- 60 - 90%
 - Streptococ viridans,
 - Enterococ,
 - Staf. Aureu
- Fungi
- HACEK – nn, imunodeprimati
 - (HI, Actinobacillus, Cardiobacterium, Eickenela, Kingella)
- Streptococi alfa hemolitic – S. Viridans – stoma
- Culturi negative (clinic si echocardio +)



Endocardita bacteriana

acta **vs** subacuta

- | | | |
|--------------------|--|------------------------------|
| ➤ Tip | ➤ Acuta | ➤ Subacuta |
| ➤ Fond | ➤ Cord posibil indemn | ➤ MCC |
| ➤ Clinic | ➤ Stare toxica | ➤ Toxicitate usoara |
| | ➤ Distructie
valvulara
progresiva
Diseminari metastatice
zile/sapt | ➤ Tablou in sapt/luni |
| ➤ Etiologie | ➤ Staf aureus, | ➤ Streptococ viridans |
| | ➤ Pneumococ | ➤ Enterococ |
| | ➤ Enterococ | |

Tablou clinic

➤ Anamneza:

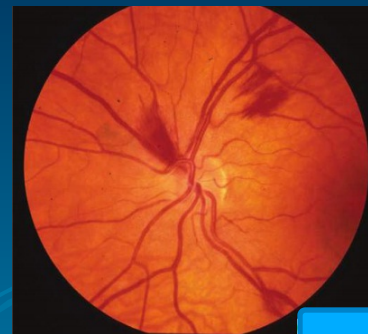
- MCC cunoscuta
- Bicuspidie AO necunoscuta
- Proceduri dentare
- Interventii chirurgicale pe cord

➤ Debut:

- insidios,
- subfebrilitate,
- astenie,
- inapetenta,
- paloare,
- artralгии,
- scadere ponderala

Examen obiectiv

- Febra mare 38-39 grade C
- **Suflu cardiac intens, nou sau vechi-accentuat**
- Splenomegalie
- Manifestari cutanate
- Embolii:
 - Pulmonare,
 - Cerebrale (hemipareza, convulsii)
 - Renale (hematurie si IR)
 - Spoturi Roth retiniene (hemoragii)
- Carii si focare dentare
- Semne de IC



➤ Manifestari cutanate:

- Petesii
- Noduli Osler la degete
- Leziuni Janeway – pe palme si plante
- Hemoragii Splinter – unghii

➤ Semne nespecifice la sugar:

- IC
- neurologice
- infectii-septicemie

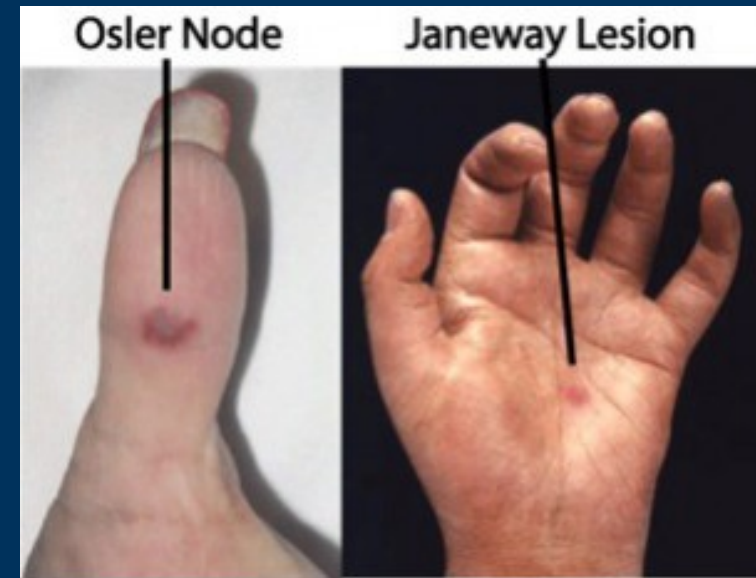


Figure 3: Subungual splinter hemorrhages in a patient treated with sunitinib.



Subconjunctival haemorrhages
(2–5%)



'Varying' murmurs
(90% new or changed murmur)

Conduction disorder
(10–20%)

Cardiac failure
(40–50%)

Haematuria
(60–70%)

Osler's nodes
(5%)

Petechial rash
(40–50%, may be transient)



Loss of pulses

Cerebral emboli
(15%)

Roth's spots in fundi
(rare, < 5%)

Petechial haemorrhages on mucous membranes and fundi
(20–30%)

Poor dentition

Splenomegaly
(30–40%, long-standing endocarditis only)

Systemic emboli
(7%)
Nail-fold infarct



Digital clubbing
(10%, long-standing endocarditis only)

Splinter haemorrhages
(10%)



Laborator

- Hemoculturi +
 - 90% (fara ATB anterior)
- Hemoculturi +
 - 50 – 60 % (cu ATB anterior)
- Anemie
- Leucocitoza cu neutrofilie
- Probe inflamatorii +
- Hematurie

Echocardiografie

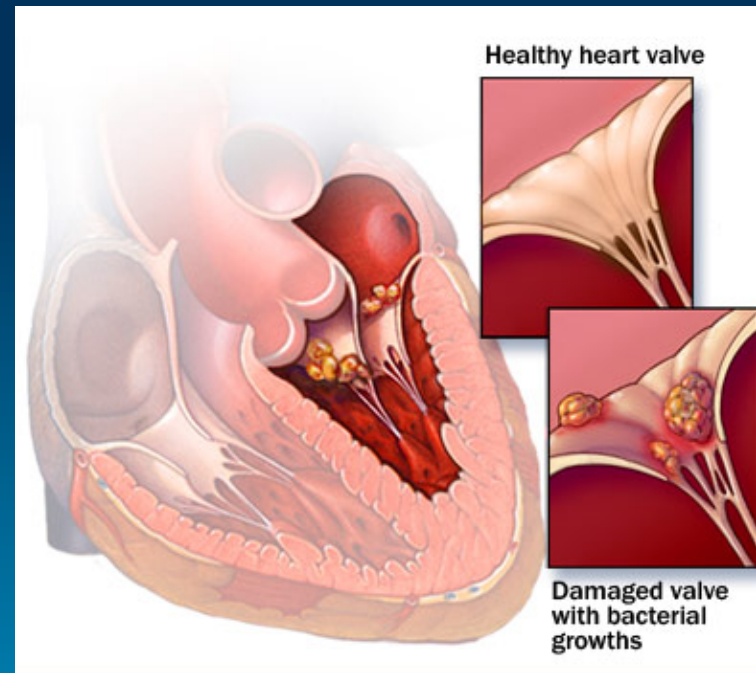
➤ Criterii majore Duke

- **Masa intracardiaca** oscilata pe valve/proteze, in calea jetului de regurgitare
- **Abcese**
- **Dehiscenta** unei valve protetice
- **Regurgitari** valvulare noi

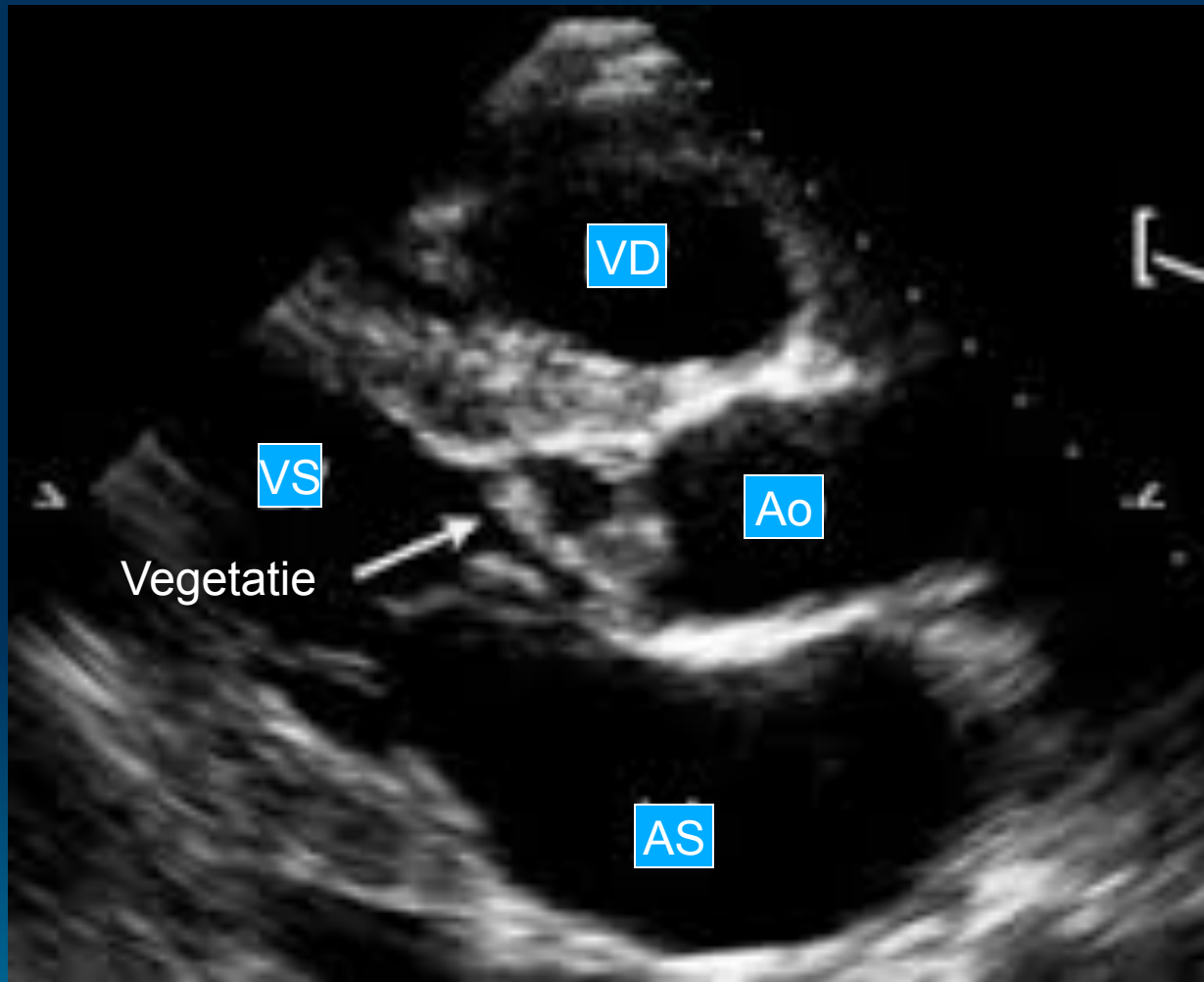
➤ Transesofagiana(TEE) la nevoie

➤ Cazuri High Risk sau chirurgicale:

- Vegetatii mari peste 1 cm
- Regurgitari valvulare severe
- Abcese
- Pseudoanevrisme
- Perforatii valvulare
- IC decompensata

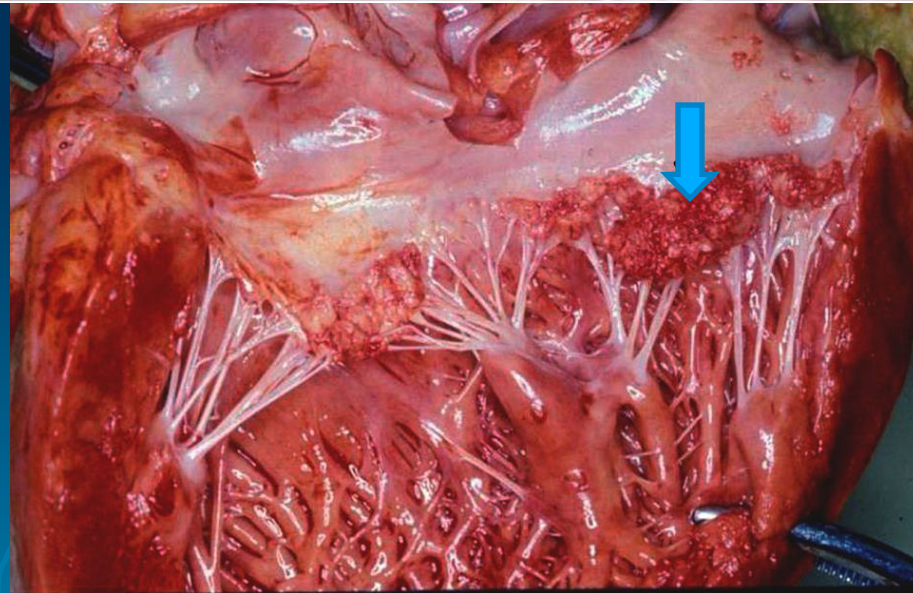
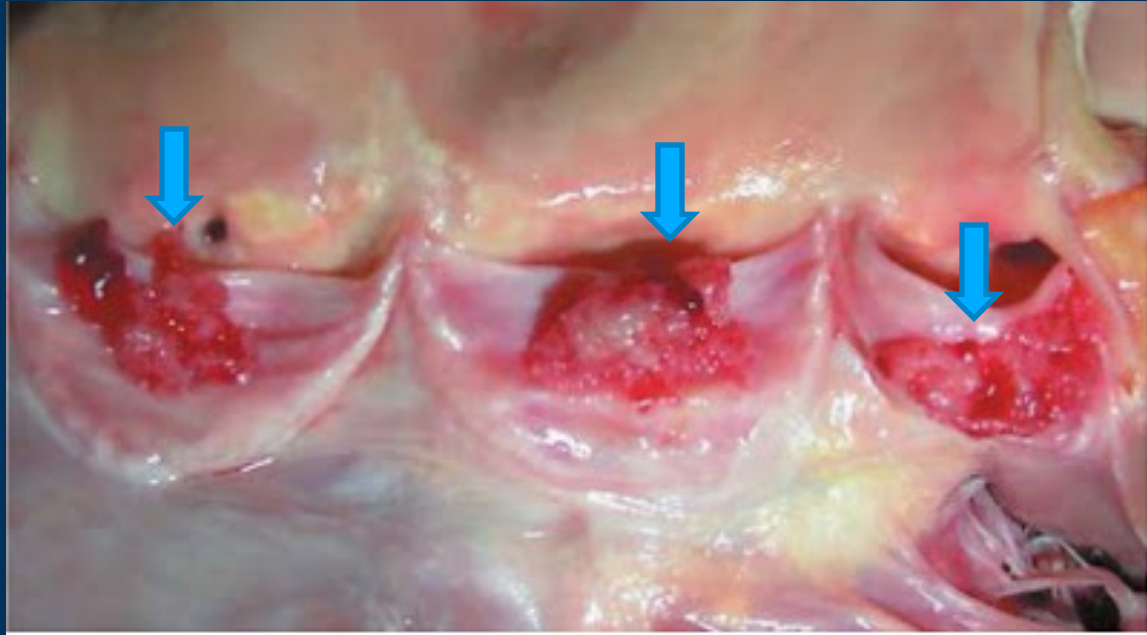


TTE

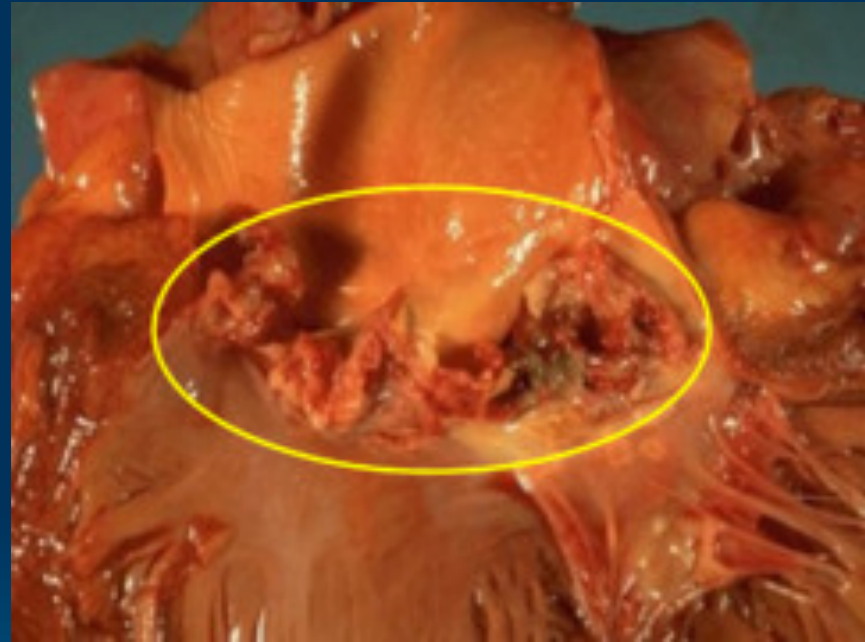
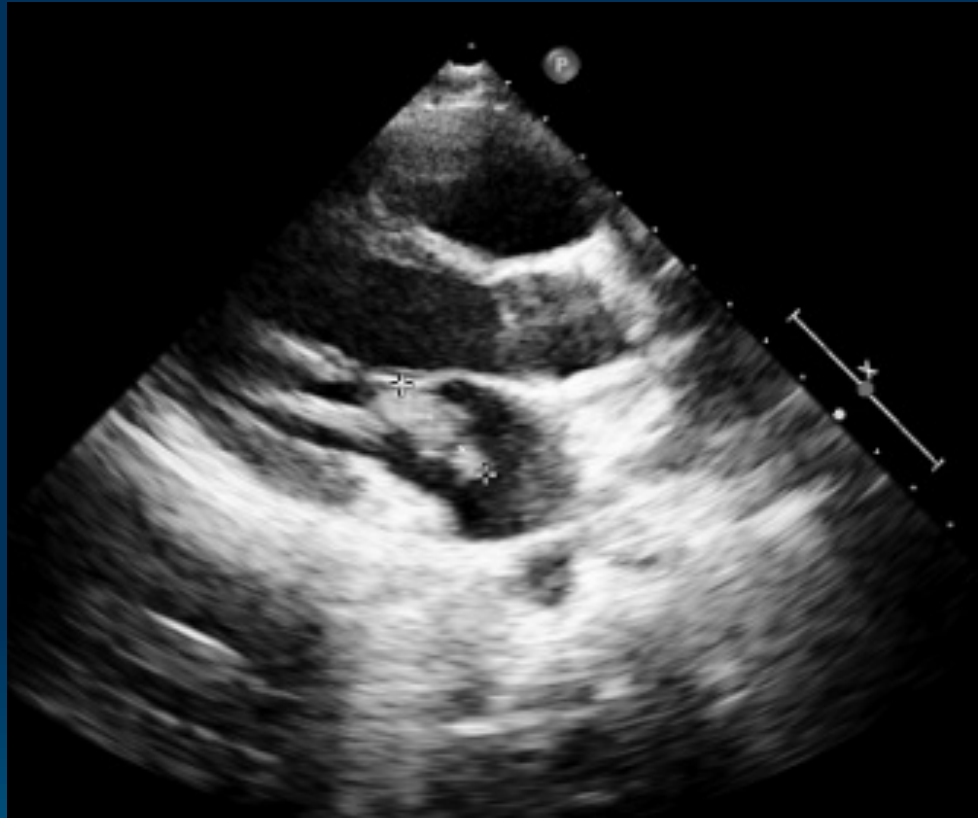


Vegetatie pe Valva Ao

Vegetatii



TTE



Vegetatie pe Valva mitrala

Diagnostic

Criteriile Duke modificate propuse de AHA

➤ EB definita – sigura

Criterii patogenice

Microorganisme depistate in culturi sau vegetatii embolizate

Vegetatii sau abcese confirmate histologic ca EB activa

Criterii clinice

2 criterii majore

1 criteriu major + 3 minore

5 criterii minore

➤ EB posibila

1 criteriu major + 1 criteriu minor

3 criterii minore

➤ EB infirmata

Diagnostic alternativ al EB

Rezolutia EB dupa 4 zile de tratament antibiotic

Neevidentierea EB la chirurgie sau necropsie, dupa 4 zile ATB

Nu intruneste deloc criteriile de EB

Criterii majore

Culturi pozitive pt EB

Microorganisme tipice + in 2 hemoculturi separate:

Streptococ viridans,
Streptococcus Bovis,
HACEK grup,
Staf. Aureus,
Enterococi

Microorganisme tipice din hemoculturi:

- Cel puțin 2 hemoculturi + la peste 12 h distanta
- 3 – 4 hemoculturi separate, din care prima si ultima la cel puțin 1 h distanta

Hemocultura pozitiva pt *Coxiella Burnetti*

- sau Ac IgG cu titru peste 1:800

Criterii majore

Evidenta implicarii endocardice

Echocardiografie + pt EB (TTE, TEE)

Vegetatie - masa cardiaca mobila pe valva sau structura cardiaca, in regiunea jetului regurgitanat, sau pe materiale implantate

Abces

Dehiscenta partiala a protezei valvulare, nou aparuta

Regurgitare valvulara nou aparuta

Criterii minore

Factori predispozanti cardiaci preexistenti, injectii iv

Febra peste 38 C

Fenomene vasculare:

- emboli arteriali,
- infarcte pulmonare septice,
- anevrisme micotice,

Hemoragii: intracraniana, conjunctivala, leziuni Janeway

Imunologic:

- glomerulonefrita,
- noduli Osler,
- spoturi Roth,
- FR

Microbiologic:

- culturi pozitive sau evidentiarea unei infectii acute cu organisme care nu indeplinesc un criteriu major de EB

Hemocultura

Toti pacientii cu febra neexplicata si suflu cardiac, MCC sau EB anterioara necesita hemocultura.

- 3 hemoculturi se recolteaza intr-o zi (90% + in primele 2)
- Daca nu creste nimic a doua zi, se mai recolteaza inca 2 (5 hemoculturi in 2 zile = suficient)
- Nu e necesar un moment particular al febrei pentru recoltare.
- Volumul de sange recoltat:
 - 1 – 3 ml la sugari si copii mici
 - 5 – 7 ml la copii mari
- Incubatie aeroba e suficienta.

Tratament empiric initial

- Pana la rezultat hemocultura.
- In caz de hemoculturi negative.

Antibiotic	Dosage & route	Duration	Comments
Native valves			
Ampicillin-Sulbactam	12 g/day i.v. in 4 doses	4-6 weeks	Patients with blood-culture negative should be treated in consultation with an infectious disease specialist
or			
Amoxicillin-Clavulanate	12 g/day i.v. in 4 doses	4-6 weeks	
with			
Gentamicin	3 mg/kg/day i.v. or i.m. in 2 or 3 doses	4-6 weeks	
Vancomycin	30 mg/kg/day i.v. in 2 doses	4-6 weeks	For patients unable to tolerate β -lactams
with			
Gentamicin	3 mg/kg/day i.v. or i.m. in 2 or 3 doses	4-6 weeks	
with			
Ciprofloxacin	1000 mg/day orally in 2 doses or 800 mg/day i.v. in 2 doses	4-6 weeks	Ciprofloxacin is not uniformly active on <i>Bartonella</i> spp.. Addition of Doxycycline is an option if <i>Bartonella</i> spp. is likely
Prosthetic valves (early < 12 months post surgery)			
Vancomycin	30 mg/kg/day i.v. in 2 doses	6 weeks	If no clinical response, surgery and perhaps extension of the antibiotic spectrum to gram-negative pathogens must be considered
with			
Gentamicin	3 mg/kg/day i.v. or i.m. in 2 or 3 doses	2 weeks	
with			
Rifampin	1200 mg/day i.v. or orally in 2 doses		
Prosthetic valves (late > 12 months post surgery)			
Same as Native valves			

Tratament tintit (germene)

Endocardita **STREPTOCOCICA**

Antibiotic	Dosage & route	Duration
Penicilline susceptible (MIC < 0.125 mg/L) oral & group <i>D strepto</i>		
Standard treatment		
Penicilline G or	12-18 millions U/day in IV in 6 doses	4 weeks
Amoxicilline or	100-200 mg/kg/day in 4-6 doses	4 weeks
Ceftriaxone	2 g/day i.v or i.m. in 1 dose <i>Paediatric doses</i> – Penicillin G 200,000 U/kg/day i.v. in 4-6 divided doses – Amoxicilline 300 mg/kg/day i.v. in 4-6 equally divided doses – Ceftriaxone 100 mg/kg/day i.v. or i.m. in one dose	4 weeks

Antibiotic	Dosage & route	Duration
Penicilline susceptible (MIC < 0.125 mg/L) oral & group <i>D strepto</i>		
Two-week treatment		
Penicilline G or	12-18 millions U/day in IV in 6 doses	2 weeks
Amoxicilline or	100-200 mg/kg/day in 4-6 doses	2 weeks
Ceftriaxone with	2 g/day i.v or i.m. in 1 dose	2 weeks
Gentamycin or Netilmicin	3 mg/kg/day i.v. or i.m. in 1 dose 4-5 mg/day <i>Pediatric doses:</i> – Penicillin, Amoxicillin and Ceftriaxone as above – Gentamycin 3 mg/kg/day i.v. or i.m. in one dose or 3 equally divided doses	2 weeks 2 weeks
In-beta-lactam allergic patients		
Vancomycin	30 mg/kg/day i.v. in 2 doses <i>Paediatric doses:</i> – 40 mg/kg/day i.v. in 2-3 equally divided doses	4 weeks

Antibiotic	Dosage & route	Duration
Strains relatively resistant to Penicillin (MIC 0.125-2 mg/L)		
Standard treatment		
Penicilline G or	24 million U/day in IV in 6 doses	4 weeks
Amoxicilline or	200 mg/kg/day in 4-6 doses	4 weeks
<i>with</i> Gentamycin	3 mg/kg/day i.v. or i.m. in 1 dose	2 weeks
In-beta-lactam allergic patients		
Vancomycin <i>with</i>	30 mg/kg/day i.v. in 2 doses (same for pediatric doses)	4 weeks
Gentamycin	3 mg/kg/day i.v. or i.m. in 1 dose	2 weeks

Tratament tintit (germene)

Endocardita **STAFILOCOCICA**

Antibiotic	Dosage & route	Duration
Native valves		
<i>Methicillin susceptible Staphylococci</i>		
(Flu) cloxacillin or	12 g/day i.v. in 4-6 doses	4-6 weeks
Oxacillin <i>with</i> Gentamicin	3 mg/kg/day i.v. or i.m. in 2 or 3 doses <i>Pediatric doses</i> – Oxacillin or (Flu)cloxacillin 200 mg/kg/day i.v. in 4-6 equally divided doses – Gentamicin 3mg/kg/day i.v. or i.m. in 3 equally divided doses	4-6 weeks 3-5 days
Penicillin-allergic patients or Methicillin-resistant Staphylococci		
Vancomycin <i>with</i> Gentamicin	30 mg/kg/day i.v. in 2 doses 3 mg/kg/day i.v. or i.m. in 2 or 3 doses	4-6 weeks 3-5 days

Tratament tintit (germene)

Endocardita cu ENTEROCOC

Antibiotic	Dosage & route	Duration
Beta-lactam and Gentamicin susceptible strain		
Amoxicillin <i>with</i> Gentamicin	200 mg/kg/day i.v. in 4-6 doses 3 mg/kg/day i.v. in 2 or 3 doses	4-6 weeks
OR		
Ampicillin <i>with</i> Gentamicin	200 mg/kg/day i.v. in 4-6 doses 3 mg/kg/day i.v. in 2 or 3 doses	4-6 weeks
OR		
Vancomycin ^a <i>with</i> Gentamicin	30 mg/kg/day i.v. in 2 doses 3 mg/kg/day i.v. or i.m. in 2 or 3 doses	6 weeks

^a = for patients unable to tolerate beta-lactams

Tratament tintit (germene)

HACEK grup au devenit rezistenti la Ampicilina

- Ceftriaxona sau Cefalosporina III = 4 sapt
sau
- Ampicilina + Gentamicina = 4 sapt

Alti Gram (-): E. Coli, Pseudomonas, Serratia

- Piperacilin sau Ceftazidim + Genta = 6 sapt

Tratament tintit (germene)

FUNGI

- Amfotericina B



Tratament

- Endocardita pe proteza valvulara – 6 sapt trat.
- Schimbarea chirurgicala a valvei se poate face sub tratament – dupa 2 sapt, daca apare IC, daca nu, dupa stingerea infectiei.

Prognostic

Vindecare:

- 80% - 85% totala
- 90% in caz de Streptococ Viridans si Enterococi
- 50% in caz de Stafilococi
- Foarte slaba in caz de fungi

Preventie

- **Profilaxia EB** se face la pacientii cu risc inalt, cand se efectueaza manevre sangerande sau potential infectante.
- Igiena riguroasa a gurii si a dintilor.
- Asanarea focarelor dentare sub protectie ATB.

Categorii de risc inalt:

- Proteze valvulare, homograft, bioproteze
- EB anterioara
- MCC:
 - Cianogene, operate sau nu
 - Operate, 6 luni postcorectie chirurgicala
 - Defecte restante postoperator

Profilaxia EB - recomandari

- **Proceduri dentare cu risc**, care perforeaza mucoasa, manipuleaza gingia sau regiunea periapicala
- **Tract respirator**
 - Amigdalectomie si adenoidectomie
 - Operatii pe mucoasa respiratorie
 - Bronhoscopie rigida
- **Tract gastrointestinal**
 - Sclerozare de varice esofagiene
 - Dilatari esofagiene
 - Colangiografie retrograda
 - Colecistectomie
 - Interventii chirurgicale pe colon
- **Tract genitourinar**
 - Dilatari uretrale

Recomadari de profilaxie pentru EB, in caz de proceduri dentare cu risc

- Doza unica de antibiotic, administrata cu 30-60 min. inainte de procedura:
- Daca nu e alergic la Penicilina sau Ampicilina:
 - Amoxicilina sau Ampicilina - 50 mg/kg po sau iv, pa maxim 2 g po sau iv (adult)
- Daca e alergic la Penicilina sau Ampicilina:
 - Clindamicina 20 mg/kg po sau iv, pa. maxim 600 mg po/iv (adult)

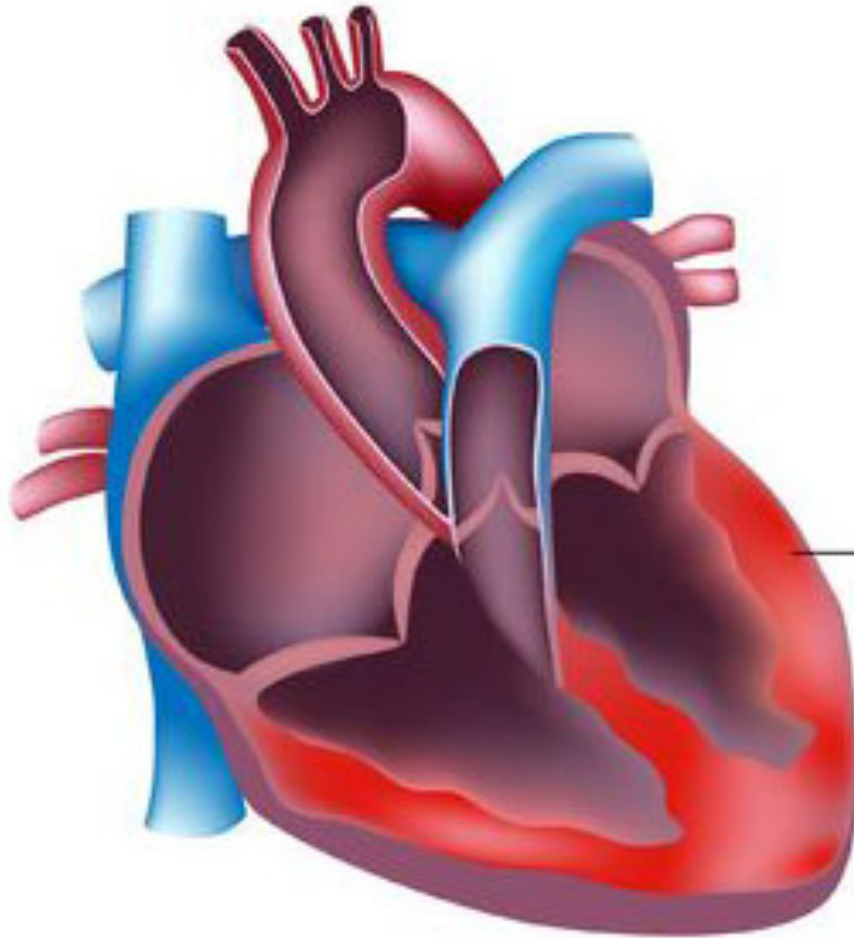
Nu se recomanda profilaxia EB

- In caz de:
- Proceduri la nivelul tractului respirator:
 - Bronhoscopie flexibila, laringoscopie, IOT
- Proceduri la nivelul tractului gastrointestinal:
 - Gastroscopie, colonoscopie, cistoscopie, echografie treansesofagiana
- Proceduri la nivelul pielii.

MIOCARDITA



Myocarditis



Inflammation of
heart muscle

Etiologie

➤ Prevalenta

- Miocardita acuta severa, rara
- Miocardita subacuta mai frecventa

➤ Etiologie:

- Adenovirus, Coxsackie, Echovirus
- Rujeolic, Rubeolic, Polio, CMV, HIV, Influenza
- Rar: bacterii, ricketsii, fungi, protozoare, paraziti
- Boli imun mediate: RAA, Kawasaki(vasculita)
- Boli de collagen
- Toxice: medicamente, exotoxine difterica

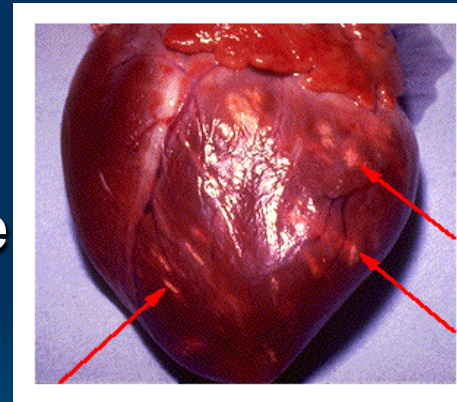
Patogenie

➤ Patogenie:

- Reactie imunologica mediata celular la contactul cu virusul

➤ Macroscopic:

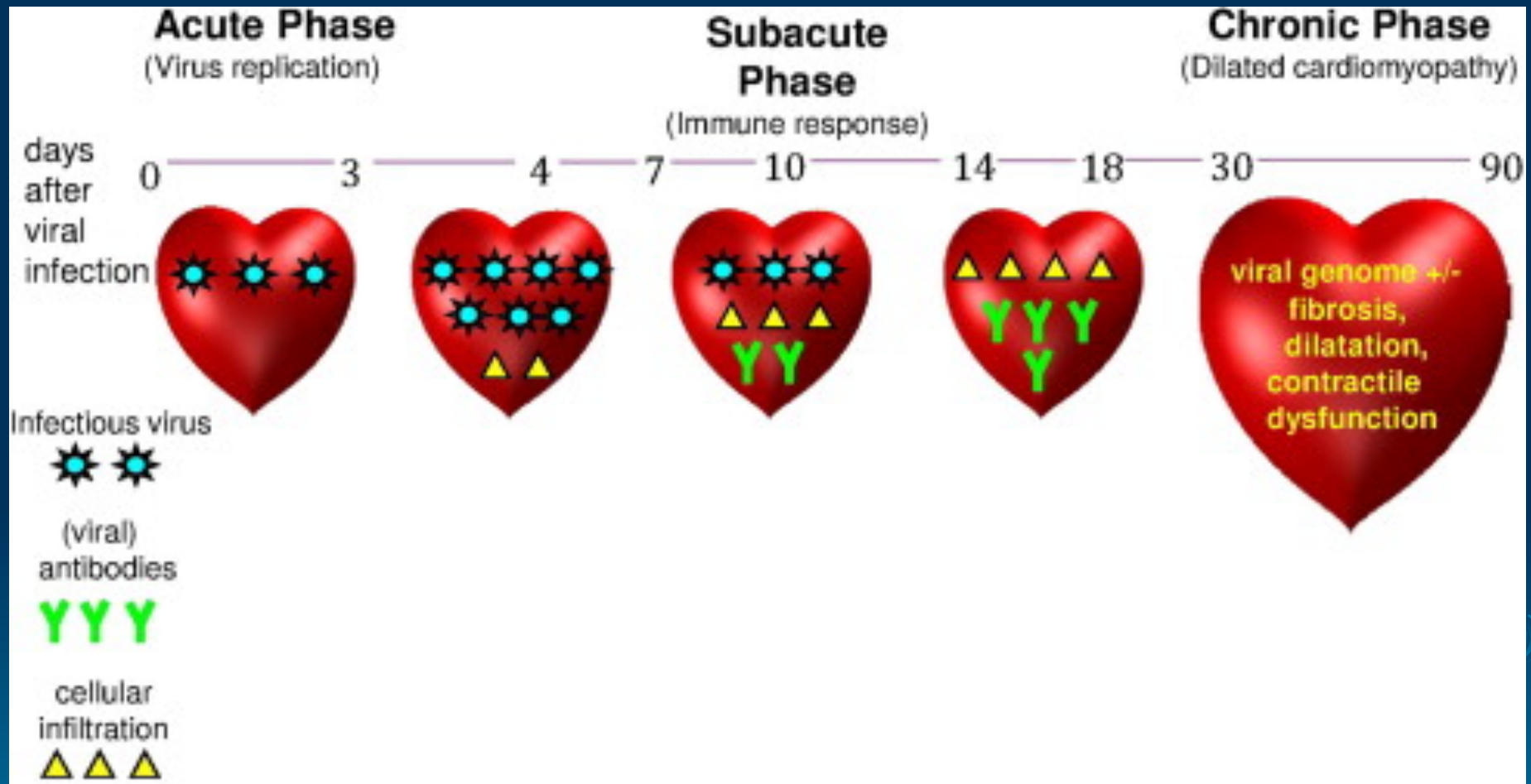
- Miocardul este pal, cu zone de cicatrizare



➤ Microscopic:

- Infiltrat de mononucleare si eozinofile in faza acuta
- Infiltrat cu celule gigante in faza tardiva

Patogenie

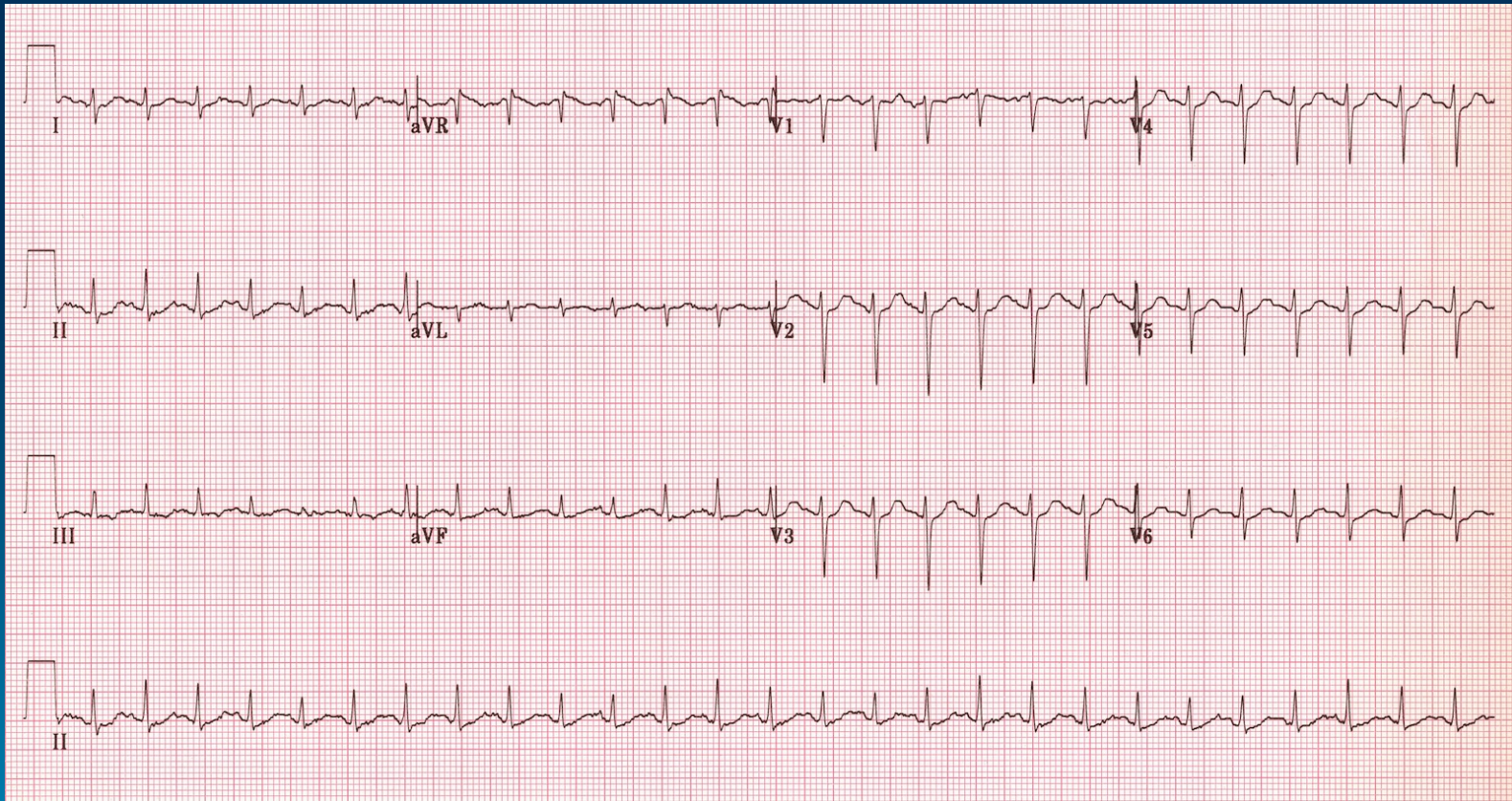


Tablou clinic

- Istoric de IACRS
- Debut acut la sugar si nn cu semne IC:
 - Varsaturi, anorexie, letargie, soc circulator
 - Tahicardie, galop, tahipnee, aritmii
 - Suflu sistolic nespecific
 - Hepatomegalie

ECG

- Hipovoltaj QRS
- Modificari ST-T
- Alungire PR si QT
- Aritmii: ESA, ESV, tahicardie



ECG



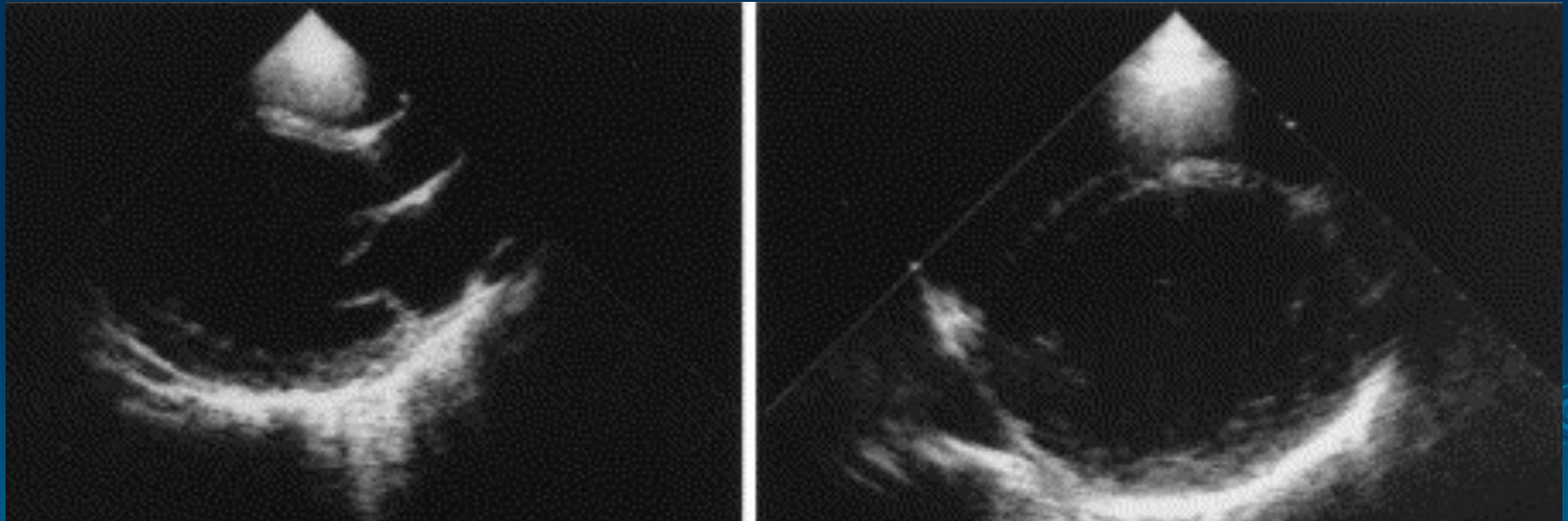
Rx cp

- Cardiomegalie de diverse grade
- Unghi cord-diafragm obtuz, “cord flasc”



ECHOCARDIAC

- Dilatare de cavitati
- FE scazuta
- Trombi



Dilatare

Paraclinic

- Laborator:
 - Troponina T si I crescute (peste 2 ng/ml)
 - CPK si CK-MB crescute
 - Identificare virala

- Scintigrafie cu Galiu 67 sau Tc 99
 - Zone de inflamatie si necroza

- RMN

- Biopsie endomiocardica
 - Confirma dg

Tratament

- Repaus la pat, fara efort fizic
- Medicamentos - anticongestiv:
 - Diuretic: **Furosemid** 1 mg/kg, 1 - 3 X/zi
 - Soc: **Dobutamina, Dopamina**
 - Digoxinul se evita – miocard hipersenzitiv
 - Daca e necesar se adm. in doze mici, fara atac
 - Inhibitor ACE – **Captopril**
 - Aritmii – **Amiodarona IV**, tratament agresiv
 - **IGIV** 2 g/Kg in 24 ore
 - **Corticoterapia** – de evitat, favorizeaza replicarea virala
 - **Terapie specifica**: antitoxina – miocardita difterica

Active myocarditis

Follow-up

**Virus \ominus
Inflammation \ominus**

**Virus \ominus
Inflammation \oplus**

**Virus \oplus
Inflammation \ominus/\oplus**

**Healed myocarditis/
dilated cardiomyopathy**

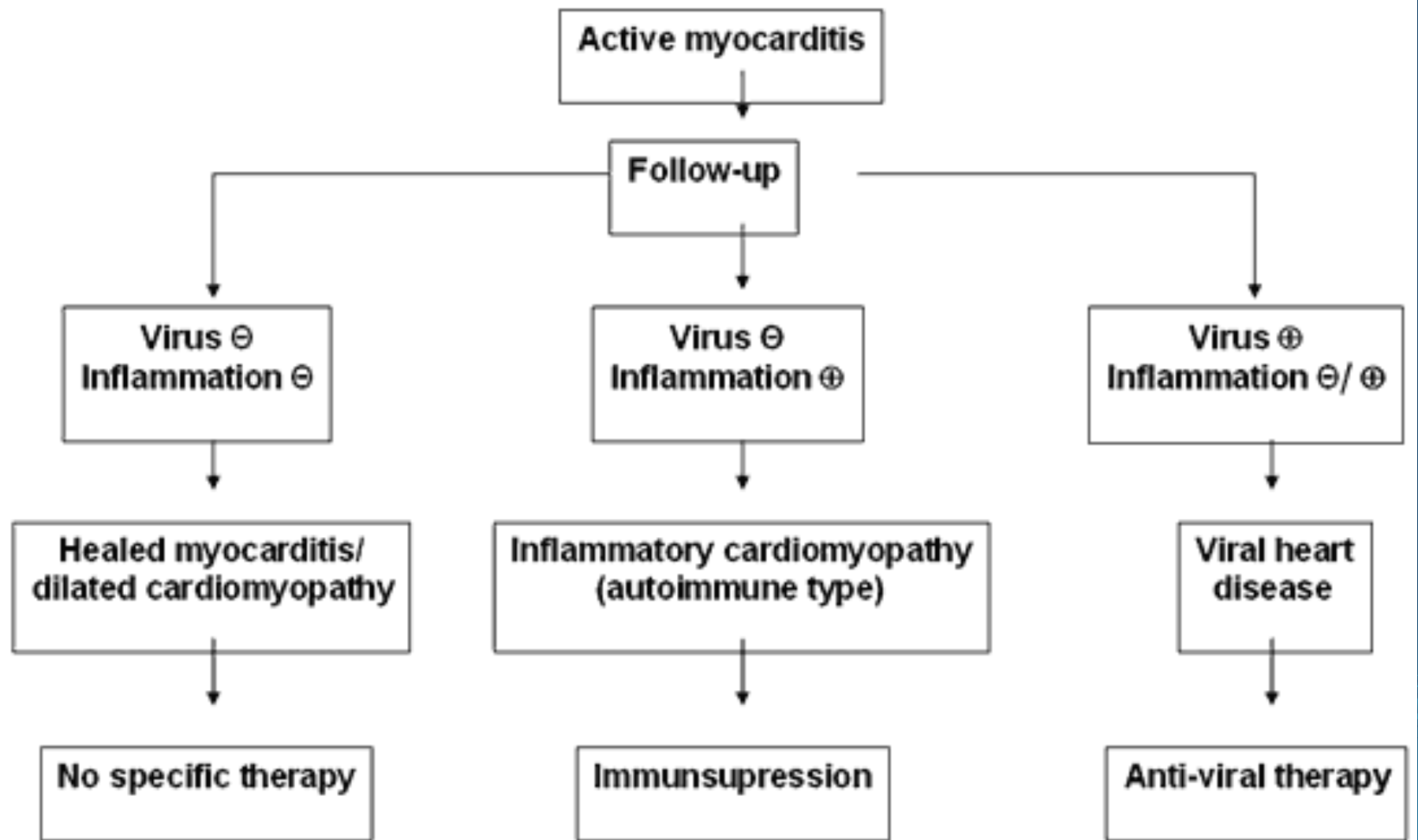
**Inflammatory cardiomyopathy
(autoimmune type)**

**Viral heart
disease**

No specific therapy

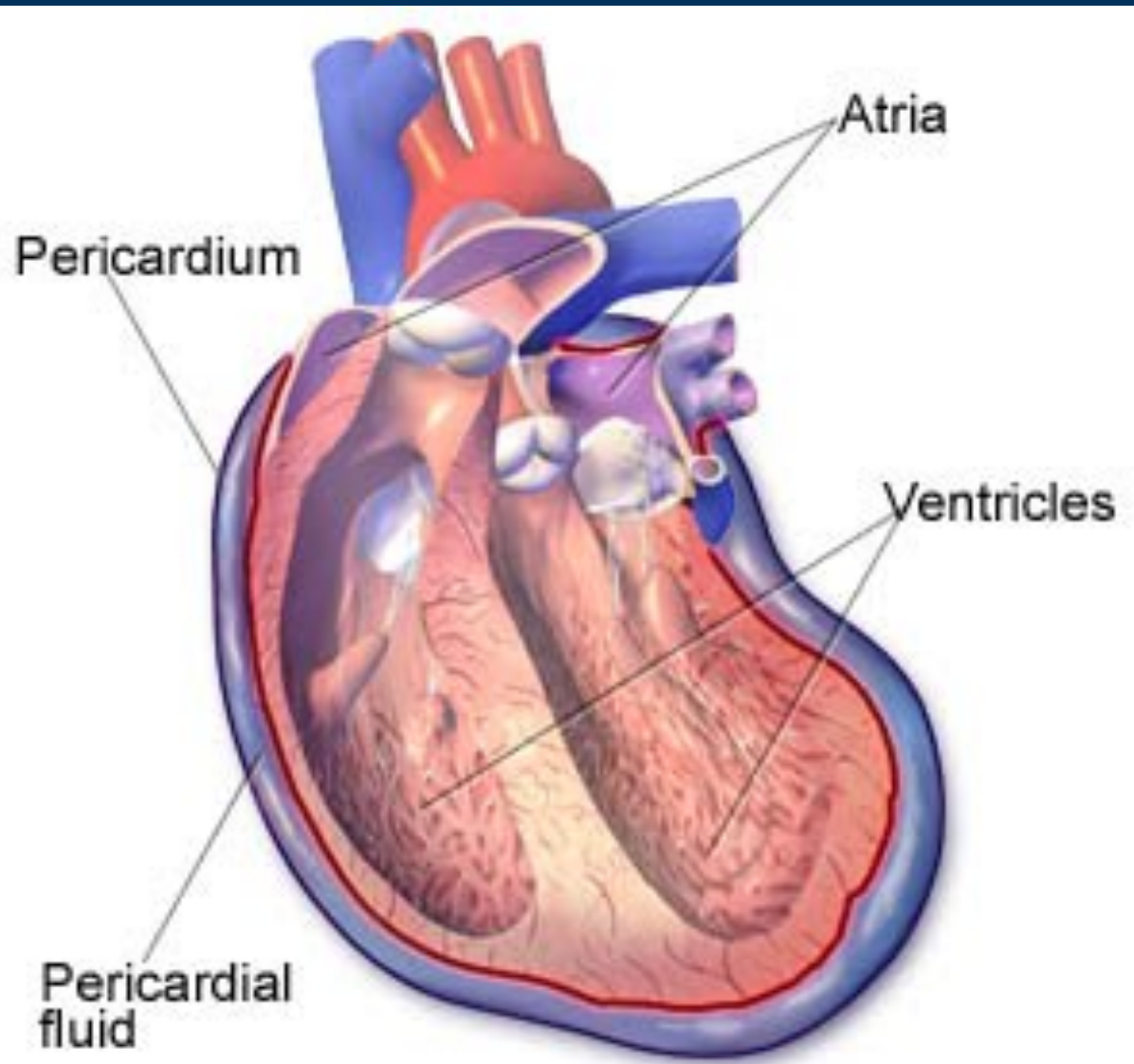
Immunosuppression

Anti-viral therapy



PERICARDITA





Inflammation of the Pericardium in the Heart

Etiologie

- Infectii virale
- RAA
- Infectii bacteriene:
 - Stafilococul Aureus,
 - Streptococcus Pneumonie,
 - Haemophilus Influenzae,
 - Neisseria Meningitidis,
 - Streptococul
- Tuberculoza
- Chirurgia cardiaca: Sindromul postpericardiotomie
- Boli de collagen
- Afectiuni oncologice
- Uremia

Fiziopatologie

- Pericardita uscata
 - Inflamatie foitelor pericardice
- Pericardita lichidiană
 - Acumulare de lichid între foitele pericardului



Fiziopatologie

Depinde de:

- **acumularea de lichid**
 - **Rapida** - modificari circulatorii severe
 - **Lenta in cantitate mica** – adaptare miocardica
 - **Lenta in cantitate mare - tamponada**
- **competenta miocardului**

Mecanisme compensatorii in tamponada:

- ***Constrictie venoasa si pulmonara***
 - Imbunatateste umplerea diastolica
- ***Creste rezistenta vasculara sistemica***
 - Nu permite scaderea TA
- ***Tahicardie***
 - Imbunatateste cardiac output

Morfopatologie

- Pericardul visceral si parietal e inflammat, cu foitele ingrosate.
- Lichidul pericardic e:
 - Serofibrinos
 - Hemoragic
 - Purulent
- Lichidul:
 - Se rezoarbe complet
 - Se ingroase foitele si determina constrictie cronica = pericardita constrictiva

Tablou clinic

- Istoric de IACRS
- Precordialgii accentuate la aplecare in fata
- Febra peste 38.5 grade C

- **EO**
 - Frecatura pericardica in pericardita uscata
 - Zgomote cardiace asurzite in pericardita lichidiana
 - Tahicardie
- Tamponada - se mai adauga:
 - Hepatomegalie
 - Distensie jugulara
 - hipoTA

Paraclinic

➤ ECG:

- Hipovoltaj QRS, cu modificari pe stadii
- **Stadiul I** - Supradenivelare ST – cu exceptia aVR, V1, DIII
- **Stadiul II** - Pseudonormalizare
- **Stadiul III** - Revenire segment ST cu inversare unda T
- **Stadiul IV** - Normalizare, dupa 2-4 saptamani de la debut

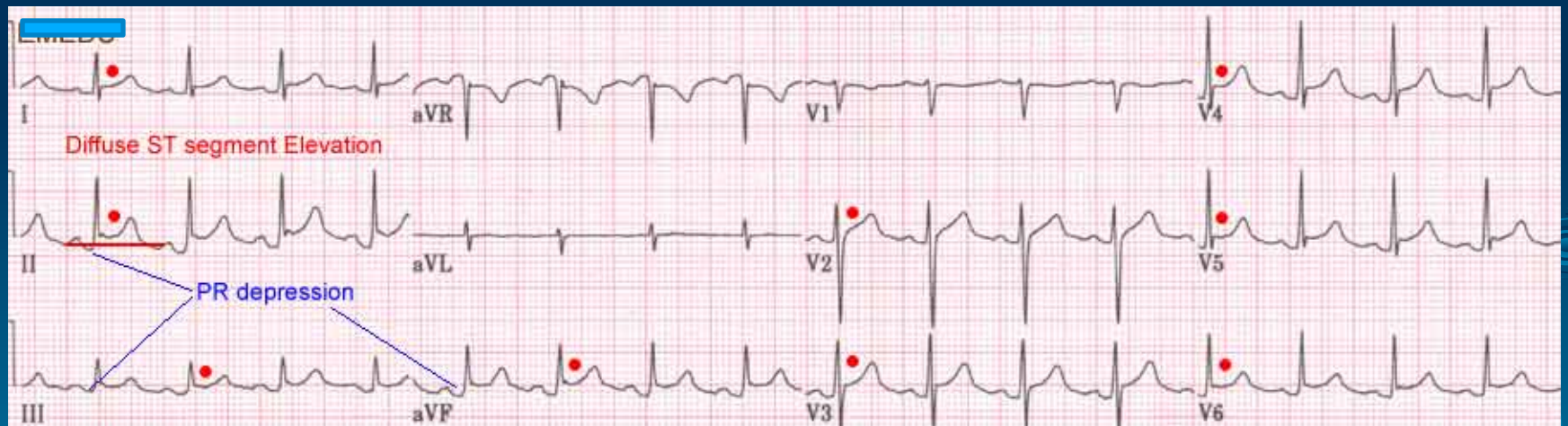


I

II

III

IV

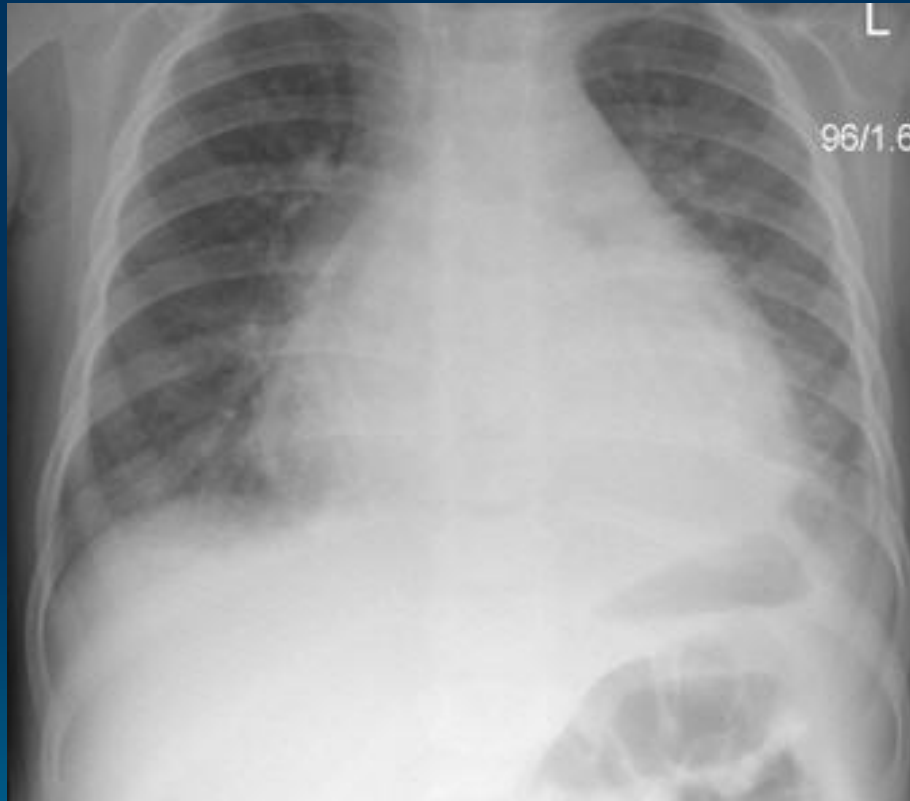


Rx cardiopulmonar

- Cardiomegalie
- Unghi intre cord si diafragm **ascutit**
- “cord in carafa”



Rx cardiopulmonar



Cardiomegalie

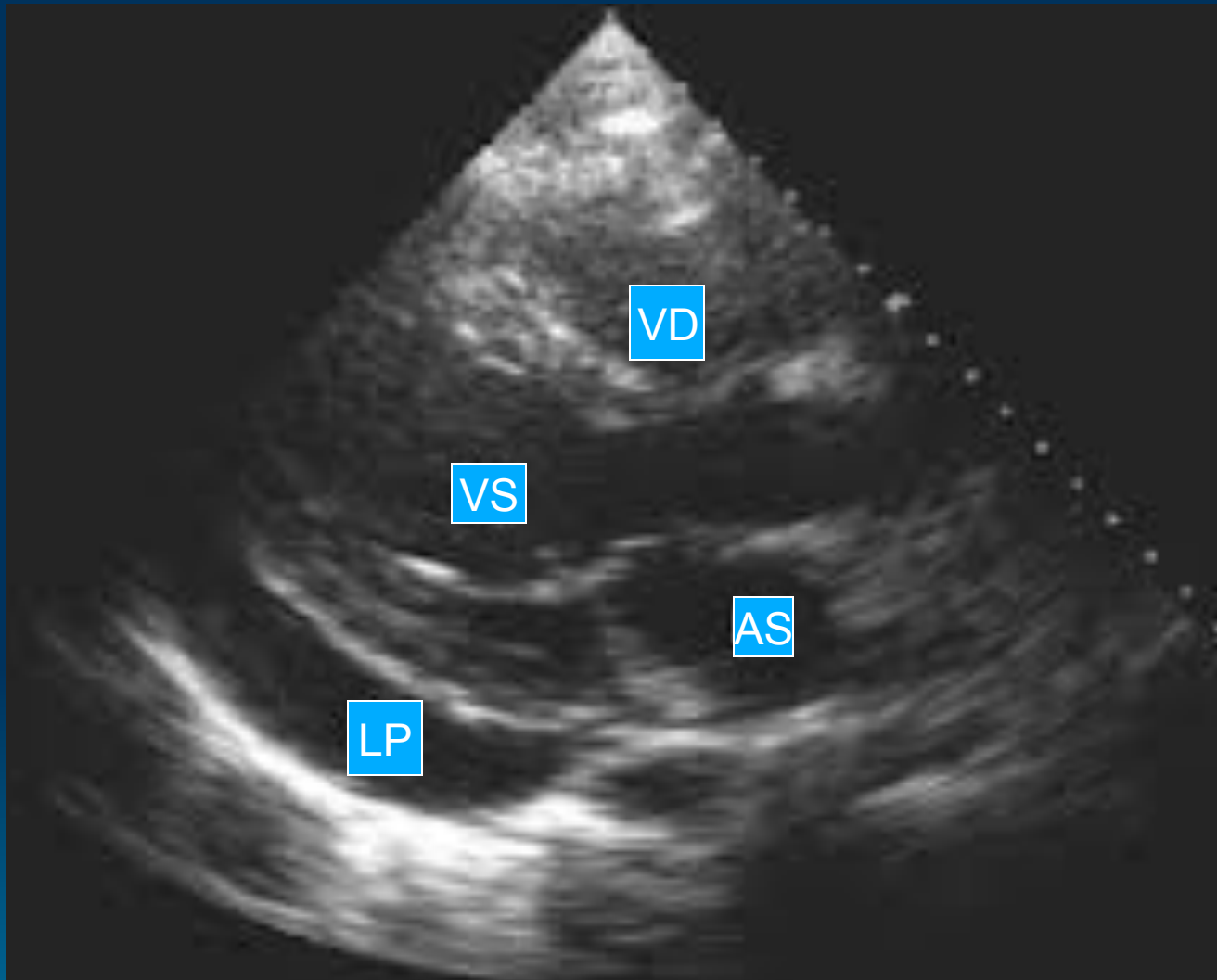


Cord in “carafa”

Paraclinic

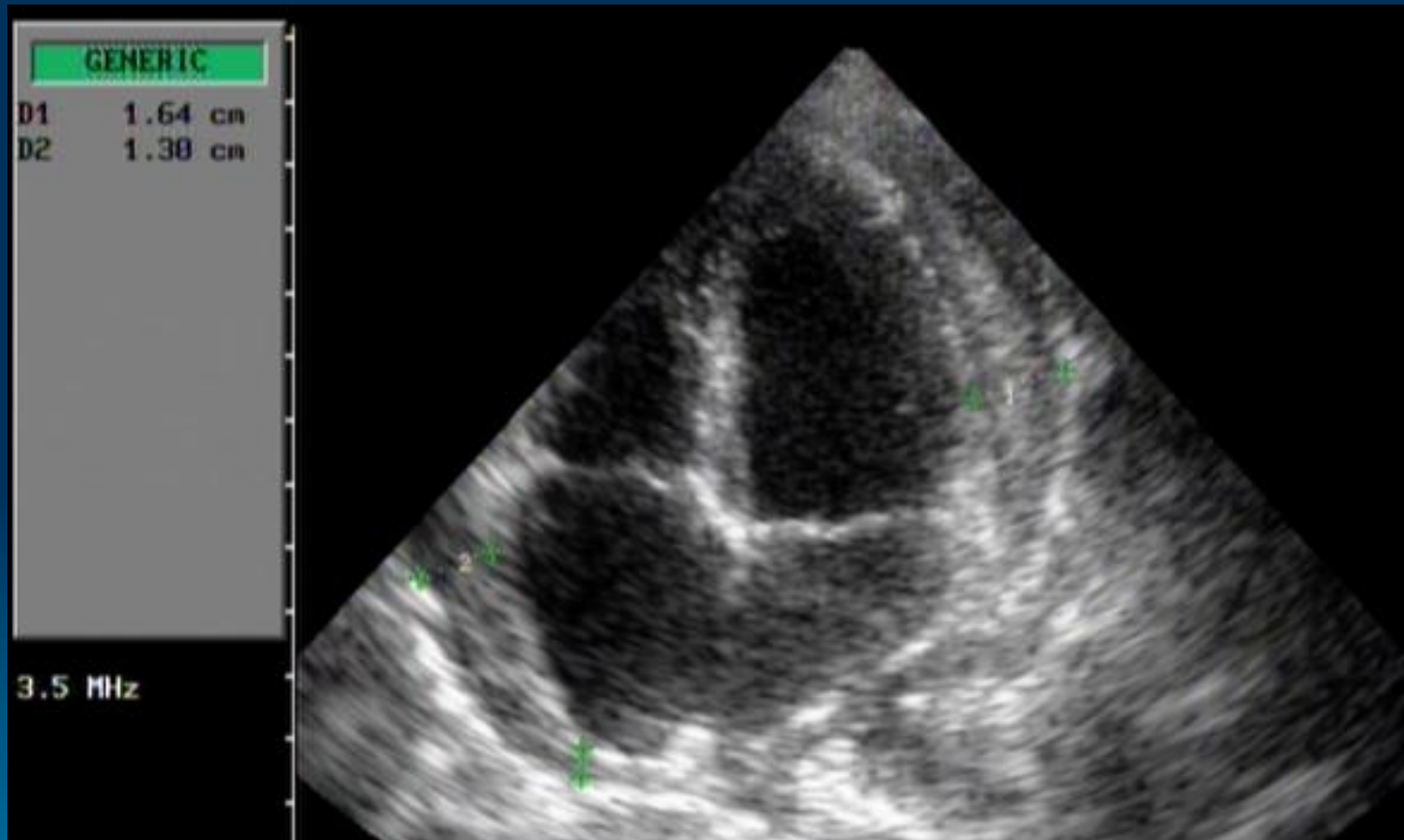
Echocardiografie:

- Lichid pericardic doar in sistola = normal
- LP in cantitate mai mare - apare anterior si posterior
- Daca LP este vechi, apar benzi de fibrina
- Tamponada pericardica:
 - LP inconjoara cordul
 - Colabare AD in diastola
 - Colabare VD
 - “Swinging heart”

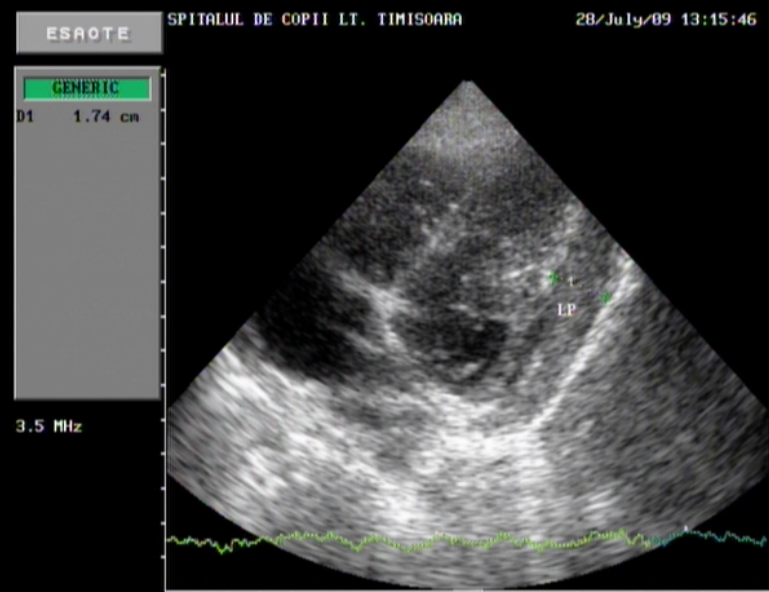
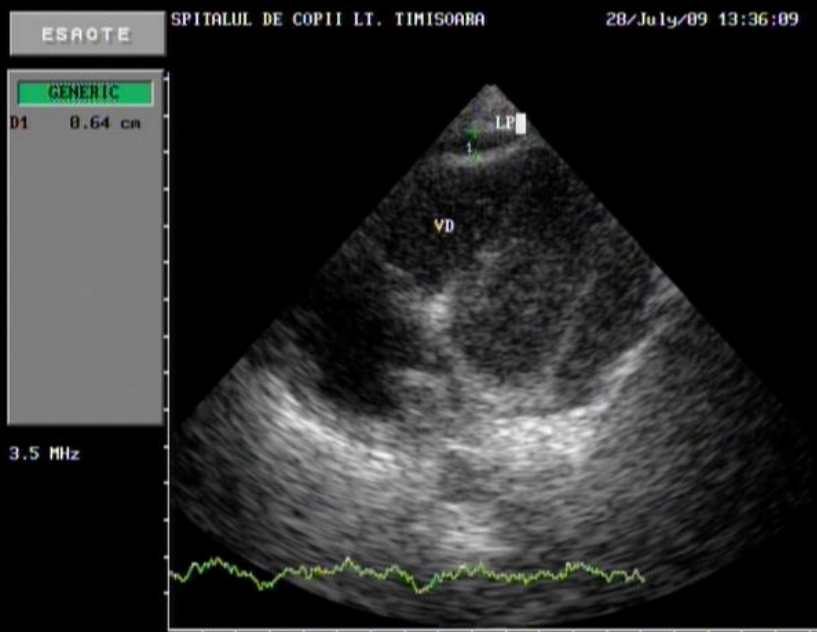
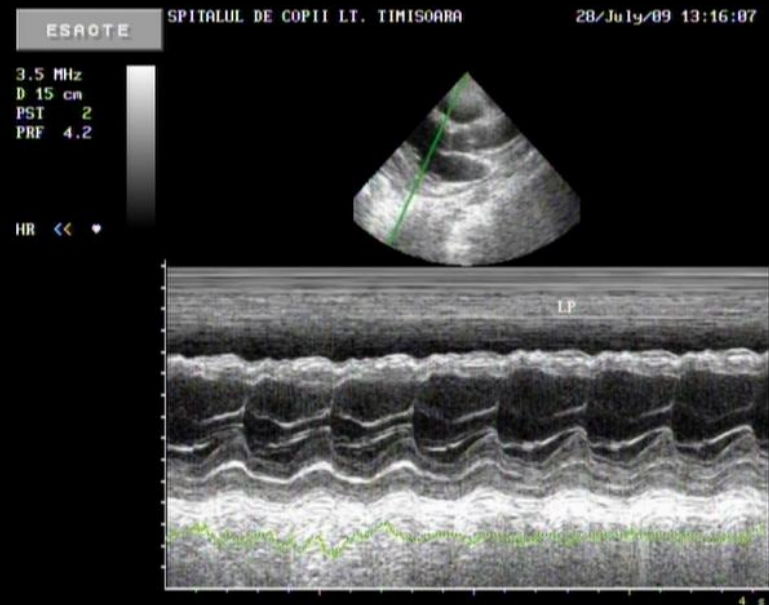
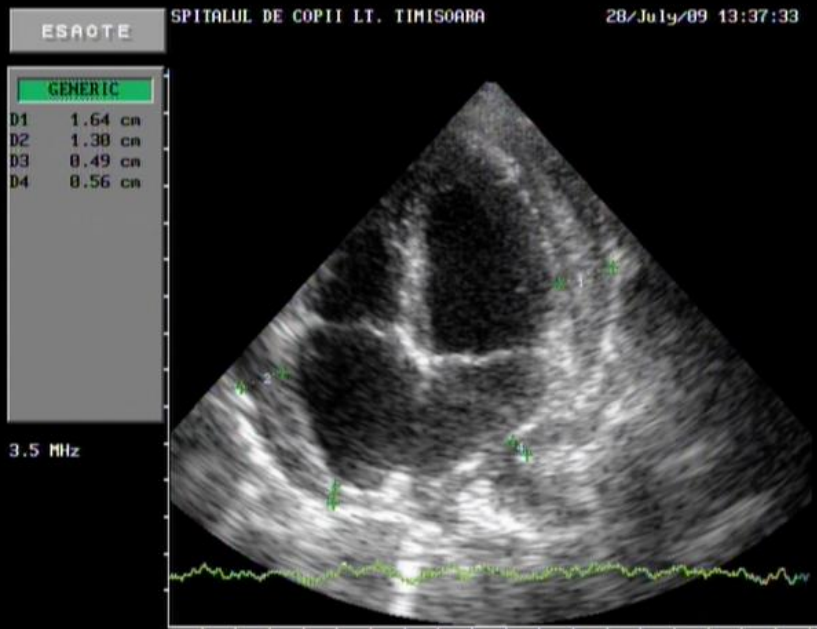


LP = lichid pericardic

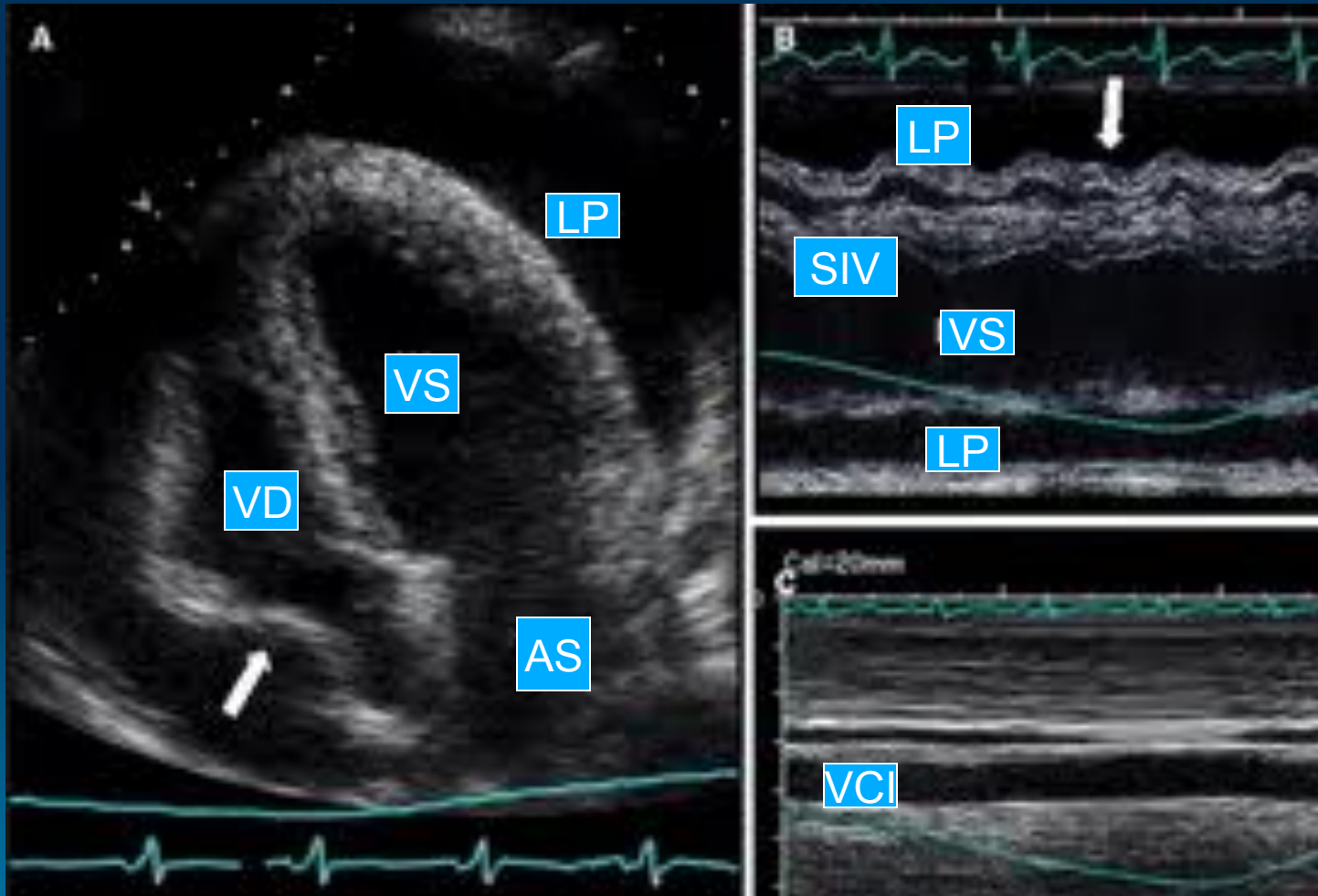
Pericardita lichidiana



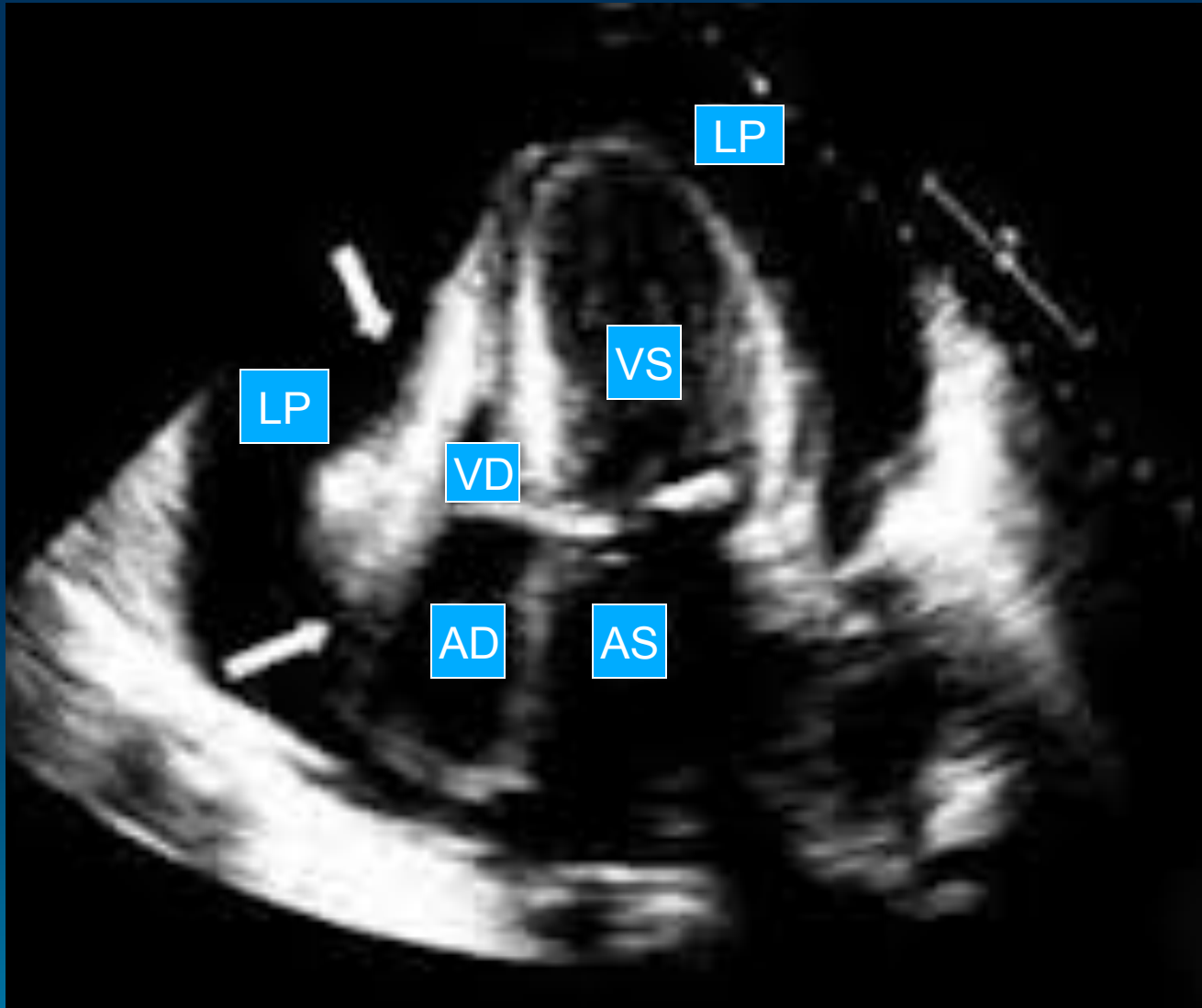
Anterior si posterior, LP vechi, cu fibrina

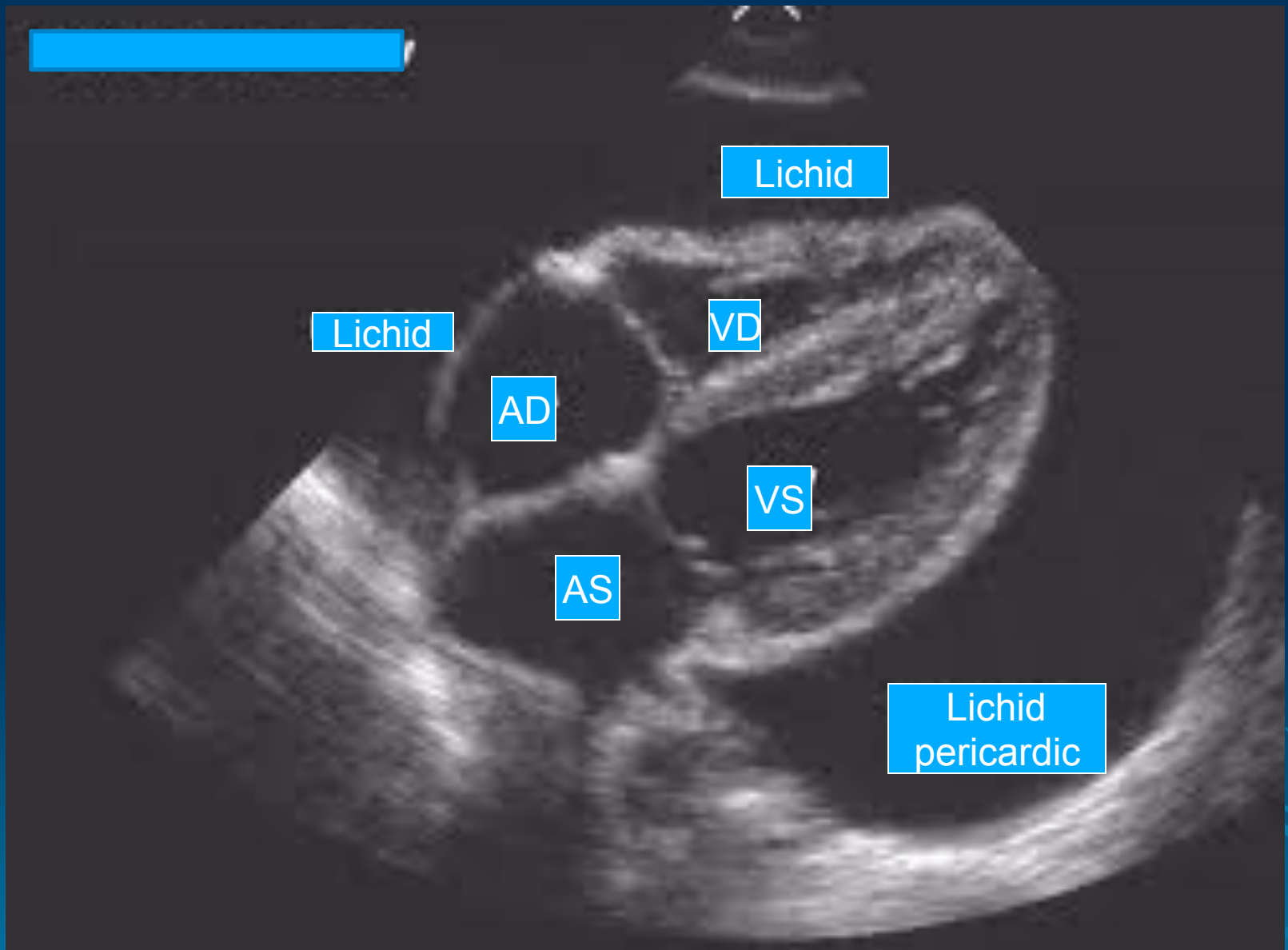


Tamponada pericardica cu colabare de AD si VD



Tamponada





Tamponada pericardica

Tratament

- Nu este tratament specific pt cea virală - AINS.
- Pt precordialgii: salicilati
- Tratament specific in TBC, uremie, HIV, etc.
- Corticoterapie post chirurgie cardiaca sau in RAA.
- Digitala e contraindicata in tamponada pentru ca blocheaza tahicardia, care e mecanism compensator.
- Pericardiocenteza si drenaj LP in tamponada.
- Examinare lichid:
 - frotiu direct pt celularitate
 - Cultura, BK, fungi
 - Glucoza si proteine
 - Daca e purulent: antibiotice 4-6 sapt IV

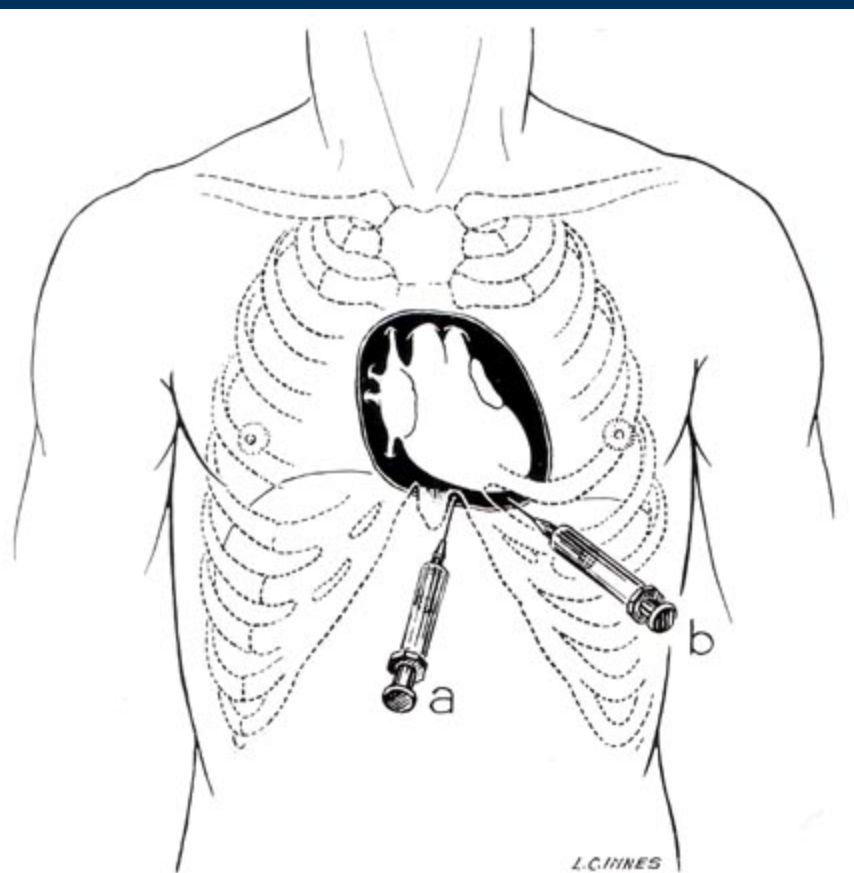
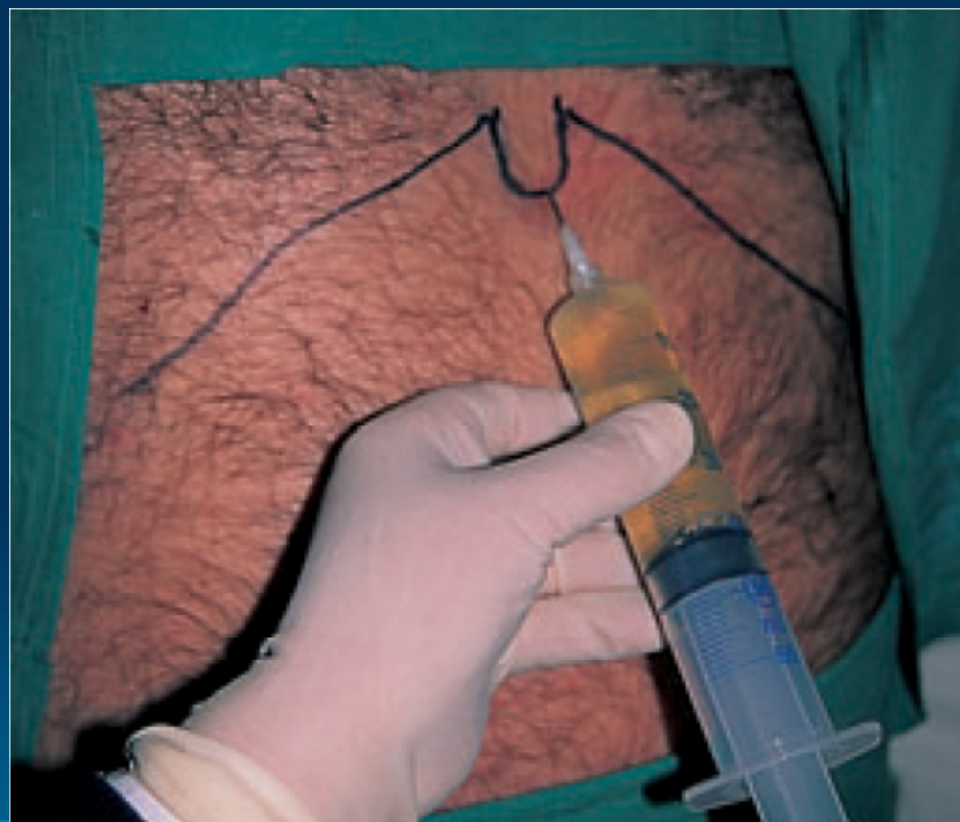


FIGURE 20.—Management of cardiac tamponade by aspiration: Substernal transdiaphragmatic aspiration (a), and left lateral aspiration (b).



PERICARDITA CONSTRICTIVA

