PERICARDITI E MIOCARDITI: FRATELLI O CUGINI?
VENERDÌ 17 APRILE 2015

'TAMPONAMENTO ECOCARDIOGRAFICO O CLINICO? QUANDO LA PERICARDIOCENTESI'

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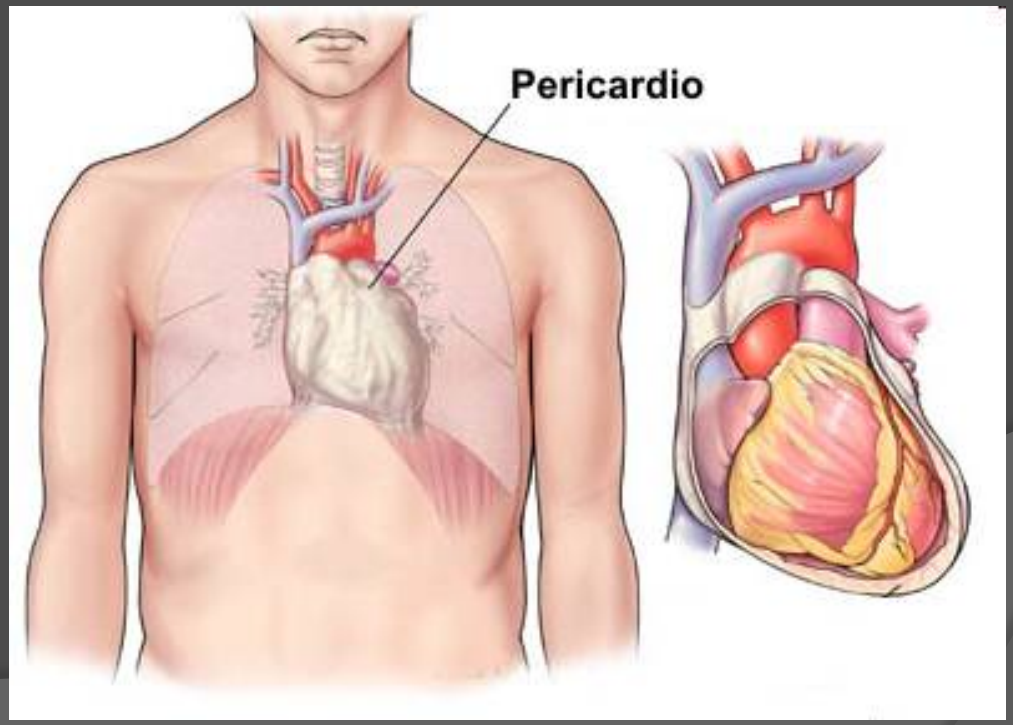
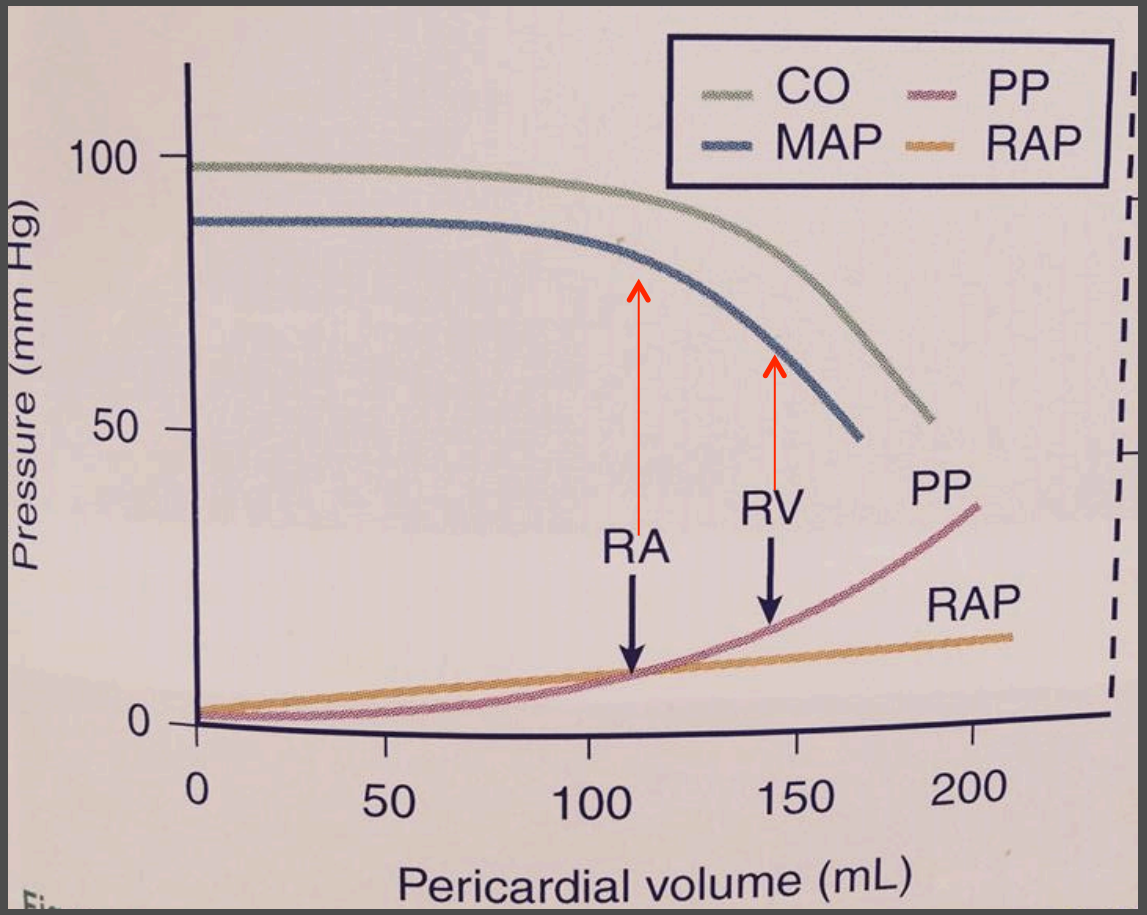
OSPEDALI DEI COLLI
MONALDI - COTUGNO - C.T.O.

- Normalmente la pressione all'interno della cavità pericardica è subatmosferica (negativa) generando un gradiente transmurale positivo che tende a mantenere aperte le cavità cardiache.



Il tamponamento cardiaco
è un'emergenza determinata dalla compressione del cuore da parte di liquido presente nello spazio pericardico, con conseguente difetto di riempimento ventricolare, riduzione della gittata cardiaca, e quindi shock.



Relazione tra PP (pericardial pressure), RAP (pressione atriale dx), MAP (pressione media, CO (gittata cardiaca).

- Il tamponamento cardiaco fu individuato come causa di alterata funzione cardiaca nel 19 ^ sec.

Chevers N: Diseases of the orifice and valves of the aorta. Guy's Hospital Report (1st series) **7:** 387, 1842
West S: Purulent pericarditis treated by paracentesis and by free incisions with recovery. Br Med J **1:** 814, 1883

- Negli anni ‘70 del 20^ secolo l’ecocardiografia si dimostra utilissima nella valutazione del versamento pericardico e in 2 lavori del 1977 viene definito il ruolo diagnostico nel tamponamento cardiaco

Greene DA, Kleid JJ, Naidu S: Unusual echocardiographic manifestation of pericardial effusion. Am J Cardiol **39:** 112, 1977

Settle HP, Adolph RJ, Fowler NO, Engle P, Agruss NS, Levenson NI: Echocardiographic study of cardiac tamponade. Circulation **56:** 951, 1977

Clinical tamponade is the most severe manifestation of hemodynamic compromise caused by a tense pericardial effusion.

The picture is easily recognized through the presence of the typical findings of dyspnea, tachycardia, jugular venous distension, pulsus paradoxus, and in the more severe cases arterial hypotension and even shock.

The echocardiogram shows findings suggestive of hemodynamic compromise (chamber collapses, characteristic alterations in mitral and tricuspid flows) in patients with moderate and severe pericardial effusion that, on the other hand, do not exhibit any clinical sign of tamponade.

Diagnosis and management of pericardial effusion

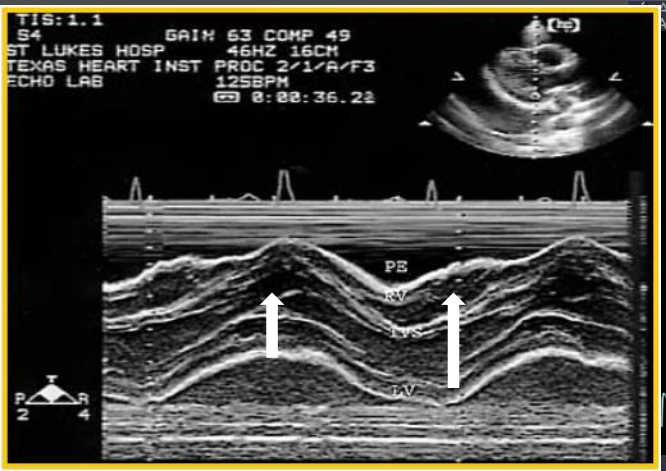
World J Cardiol 2011 May 26; 3(5): 135-143

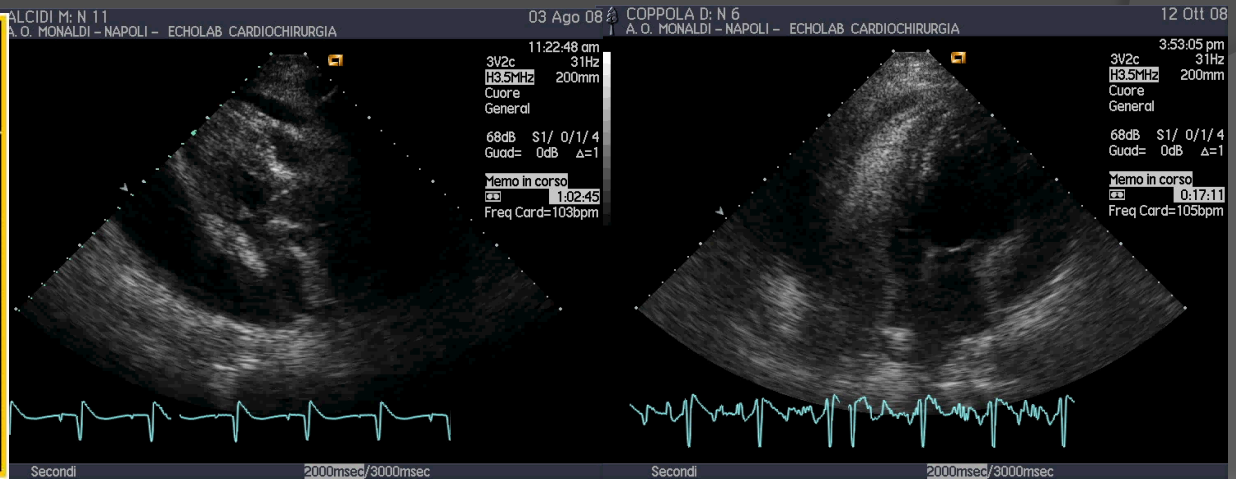
Sintomi e segni clinici di tamponamento cardiaco

- Dispnea
- Tachipnea
- Tachicardia
- Ipotensione
- Pressione venosa sistemica elevata
- Polso paradosso

Segni ecocardiografici di tamponamento cardiaco

- Collasso diastolico del ventricolo destro
- Collasso telediastolico dell'atrio destro (durata superiore a 1/3 del ciclo cardiaco)
- Aspetto ondeggiante del cuore all'interno del versamento pericardico (swinging heart)?!
- Vena cava inferiore dilatata e senza escursioni respiratorie





'Tamponamento ecocardiografico o clinico? Quando la pericardiocentesi'

- Il versamento pericardico è un comune reperto nella pratica cardiologica.
- L'eziologia e la compromissione emodinamica sono le valutazioni indifferibili.
- Spesso sono strettamente legate e influenzano la scelta terapeutica.

Esperienza di circa 29 anni
Ecocardiografia Intraoperatoria Cch

1985-1999: A. Caruso, G. Dialetto, F.E. Covino
1999-2005: G. Dialetto, F.E. Covino
2005-2015: G. Dialetto, F.E. Covino, S. Manduca

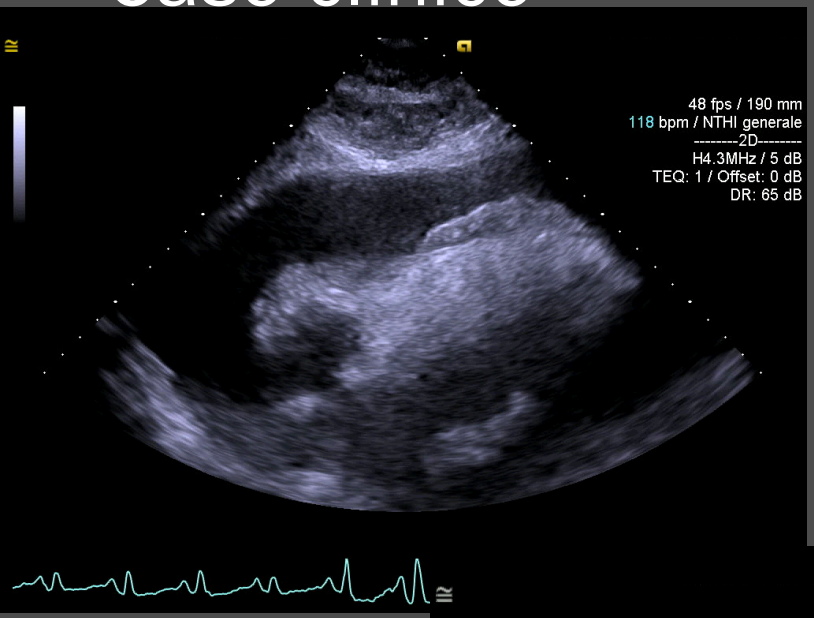
- Una media di 40 pericardiocentesi/anno
- Totale circa 1100 procedure

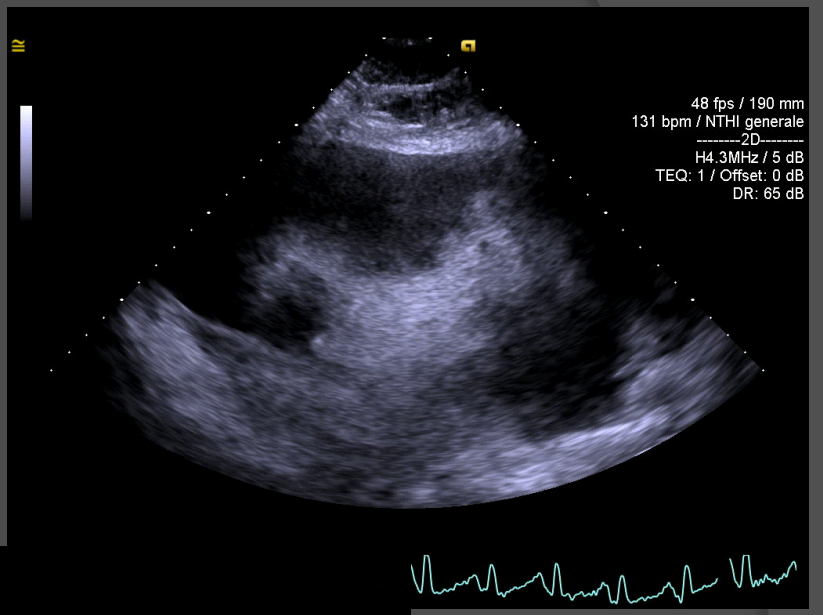
- A volte un paziente con versamento pericardico dimostra evidenza ecocardiografica di tamponamento cardiaco senza alcun particolare segno clinico (nè tachicardia, nè elevata pressione venosa giugulare, nè ipotensione arteriosa nè polso paradosso).

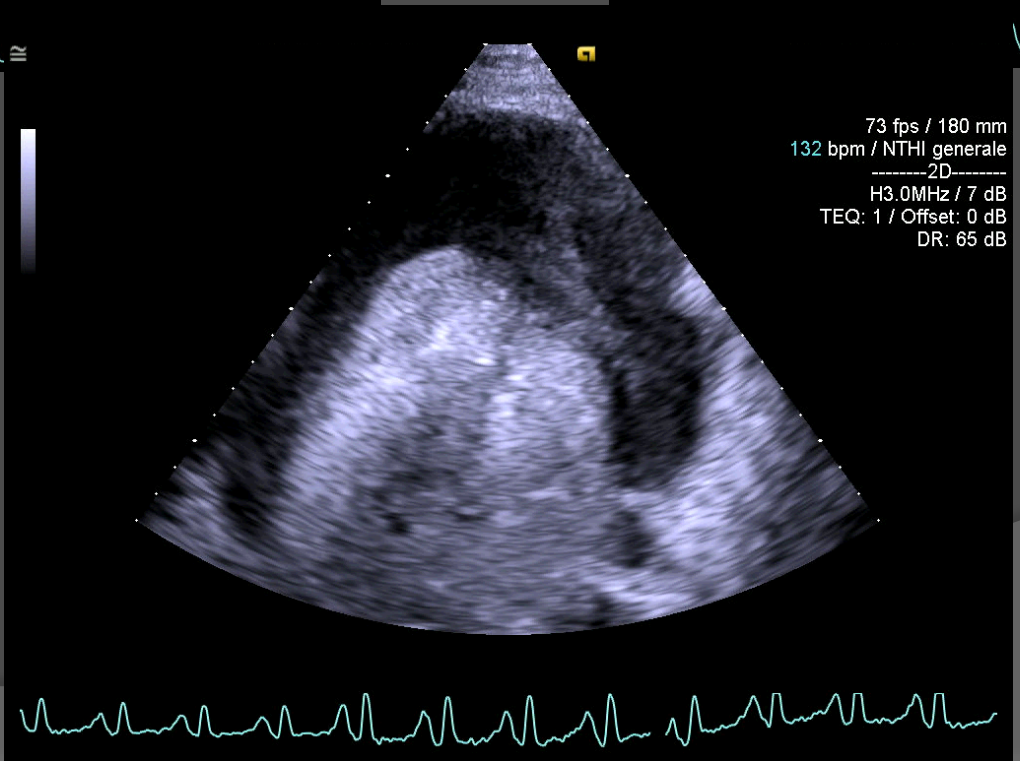
- Cosa fare?
  - Pericardiocentesi? Drenaggio a permanenza? Pericardiocentesi chirurgica? Vigile attesa?

- Presentiamo alcuni casi clinici dai ns archivi. Nel referto riportiamo sempre la presentazione clinica del paziente e ovviamente il quadro eco.

Caso clinico



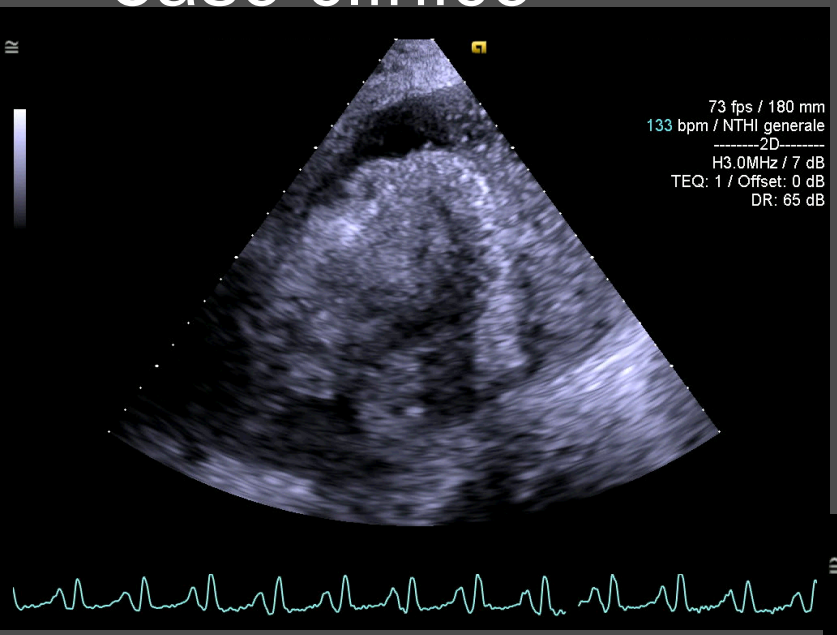


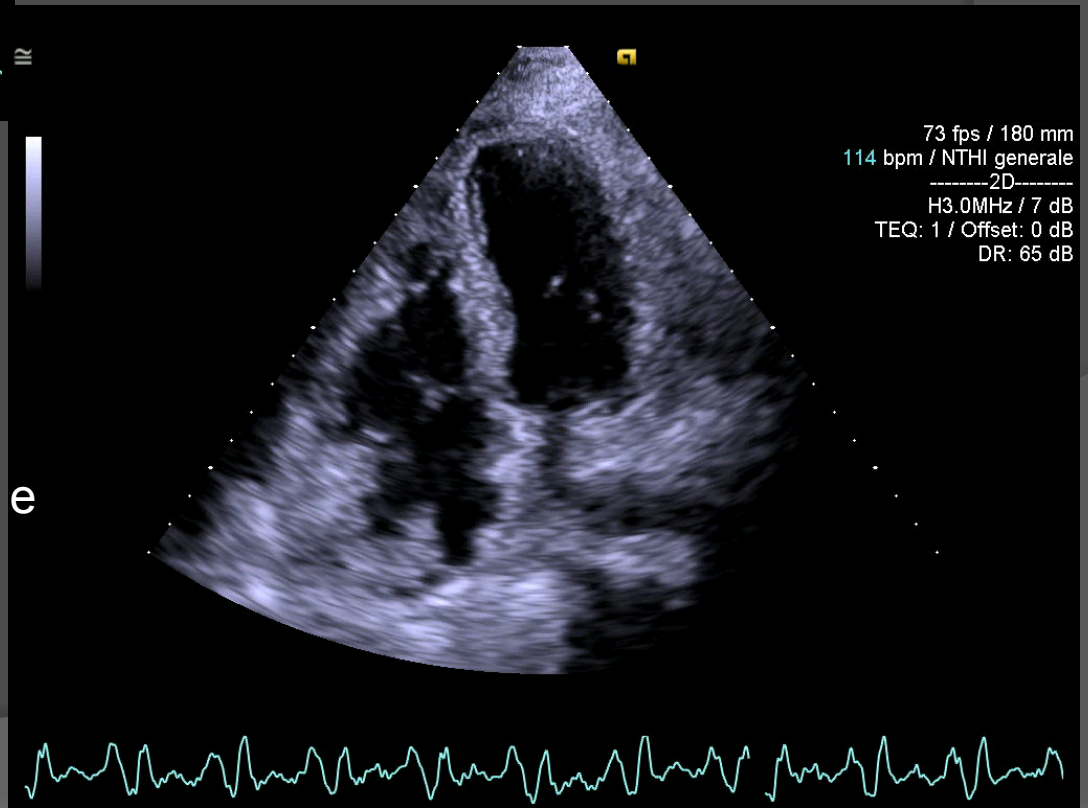


CA 153
CEA

C.P. Donna
2007 quadrantectomia
Mamm dx e diss asc.
E/O dispnea per sforzi
lievi
polso frequente e
piccolo
ECG R.S. fc 120/m'

Caso clinico



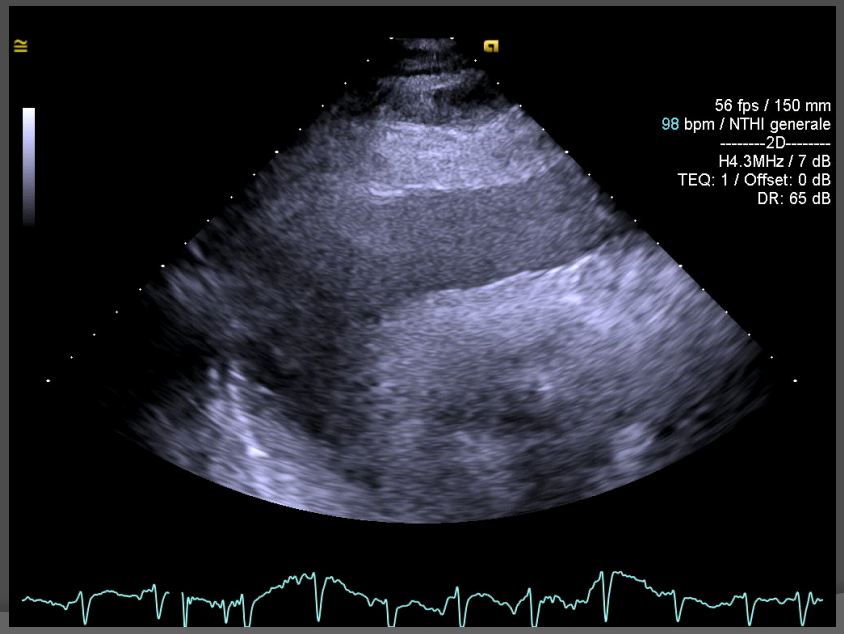


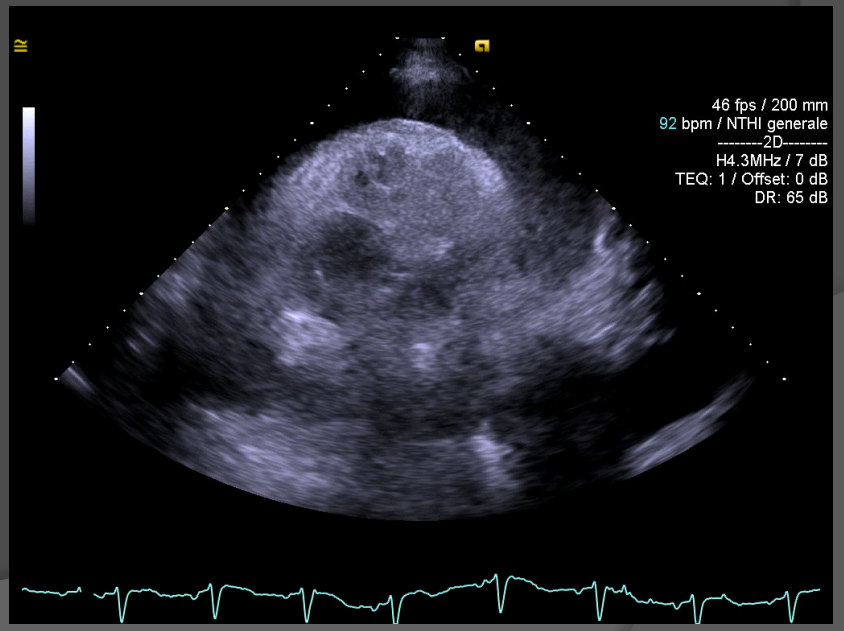
Estratti ca 1200 cc di liquido siero – ematico. HT 27%.

Dopo 36 ore il quadro resta immutato e Viene rimosso il drenaggio

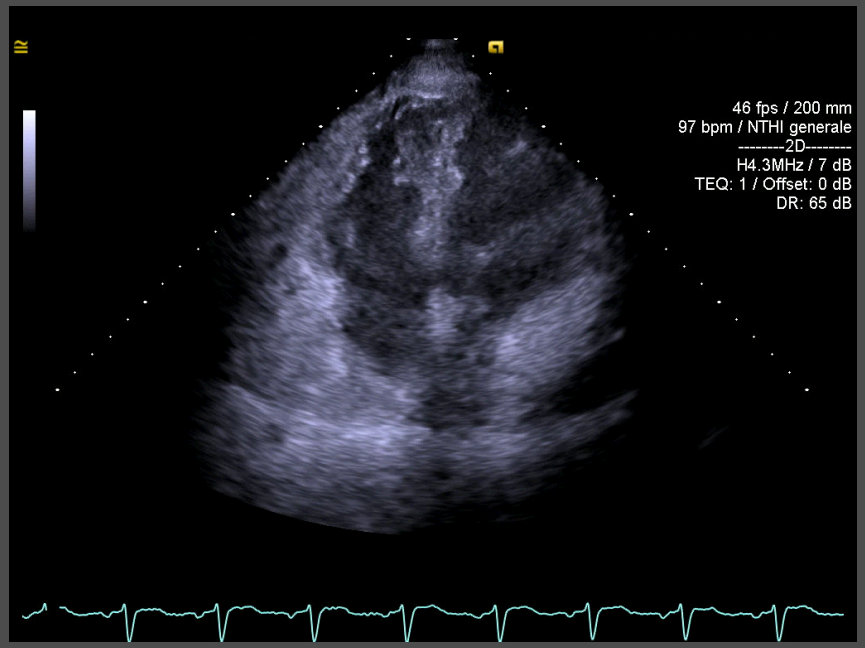
Caso clinico

- L.P. paziente di 79 anni.
- Ca epidermoide bronco principale sn.
- E/O: dispnea, giugulari turgide.

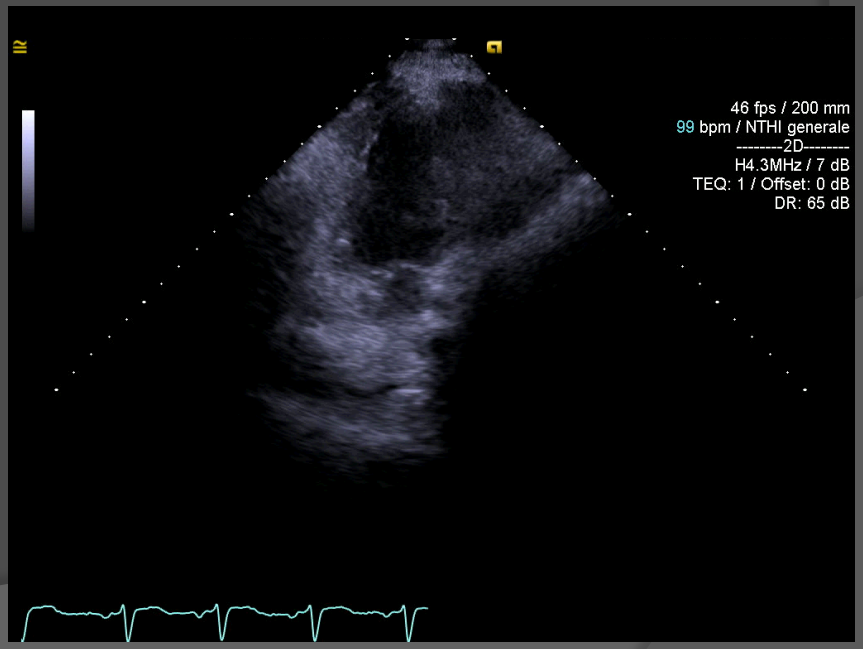




Caso clinico



Viene effettuata pericardiocentesi



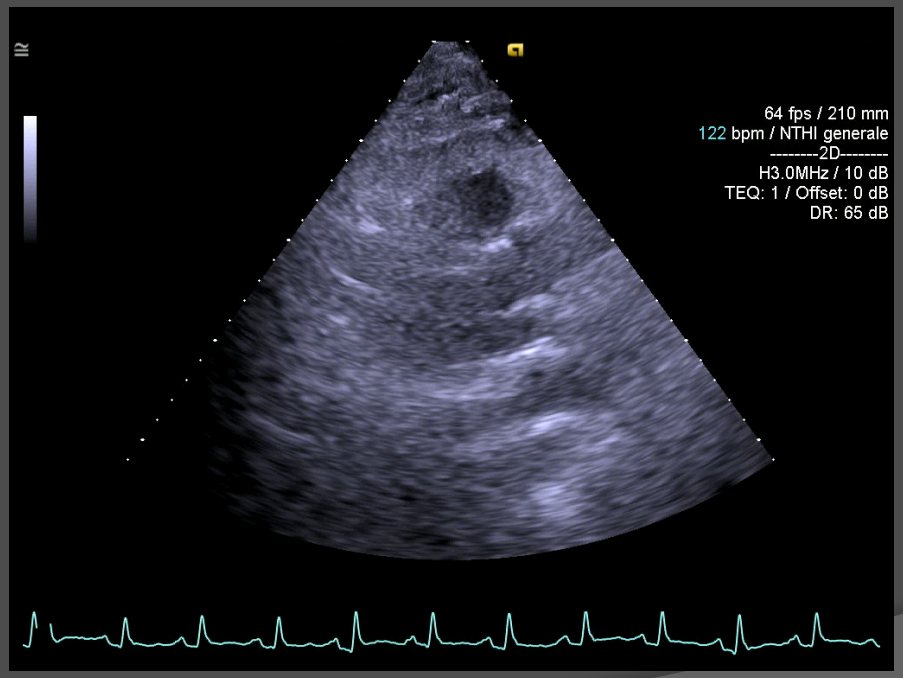
Estratti 1200 cc. di liquido sieroematico:
Miglioramento quadro clinico

Caso clinico -ca 1 mese dopo

- Dopo un periodo di discreto compenso emodinamico

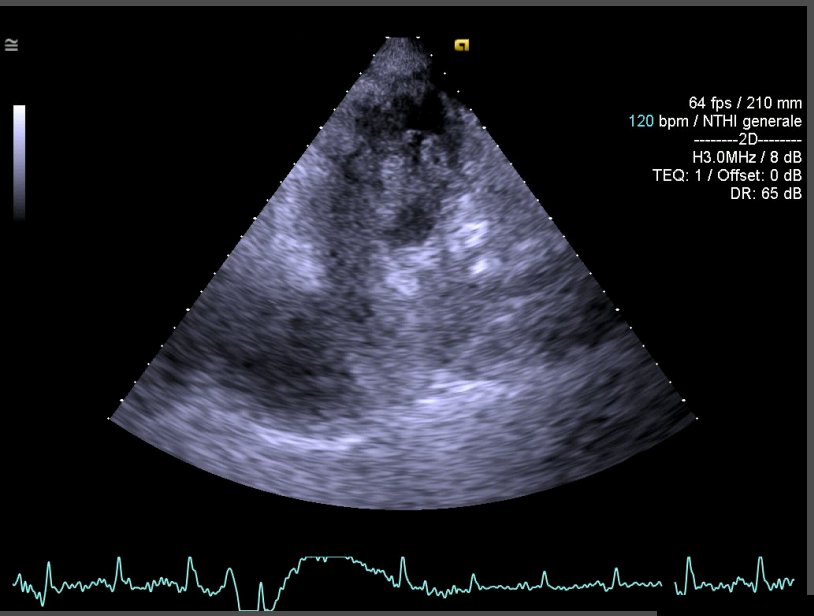
  Si ripresenta la situazione iniziale.

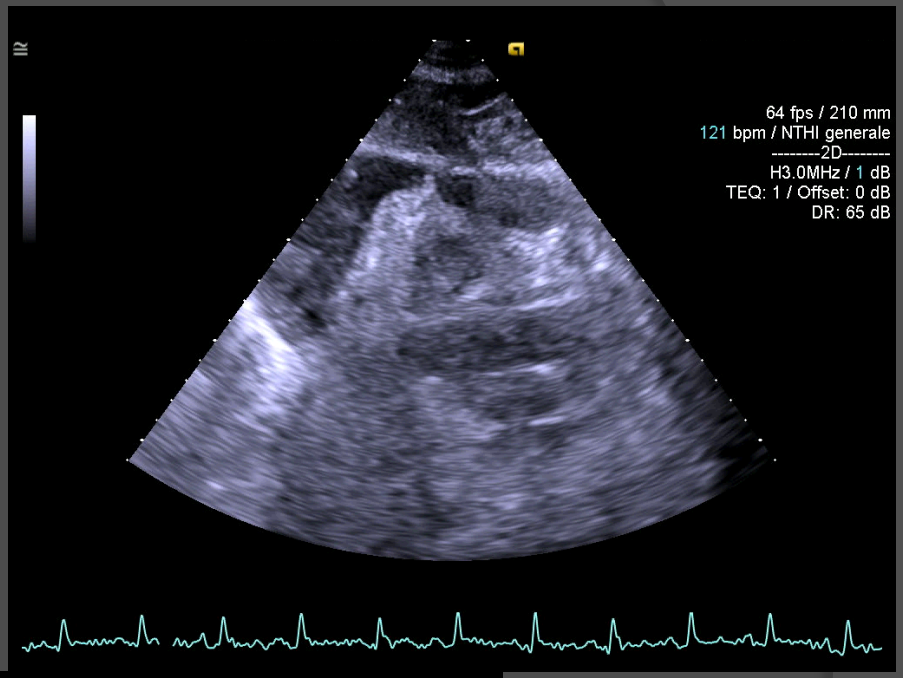
  E/O: dispnea, tachicardia e giugulari turgide.

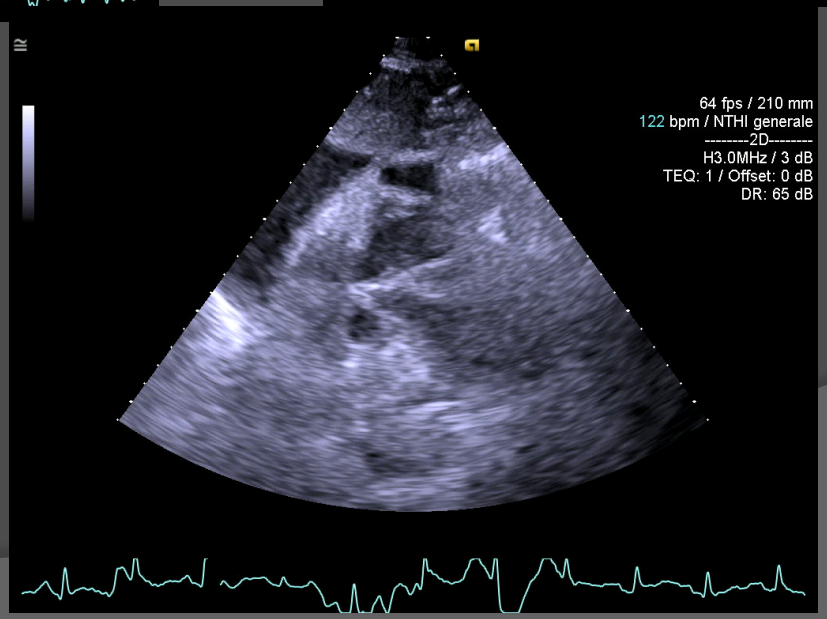


Recidiva di versamento pericardico

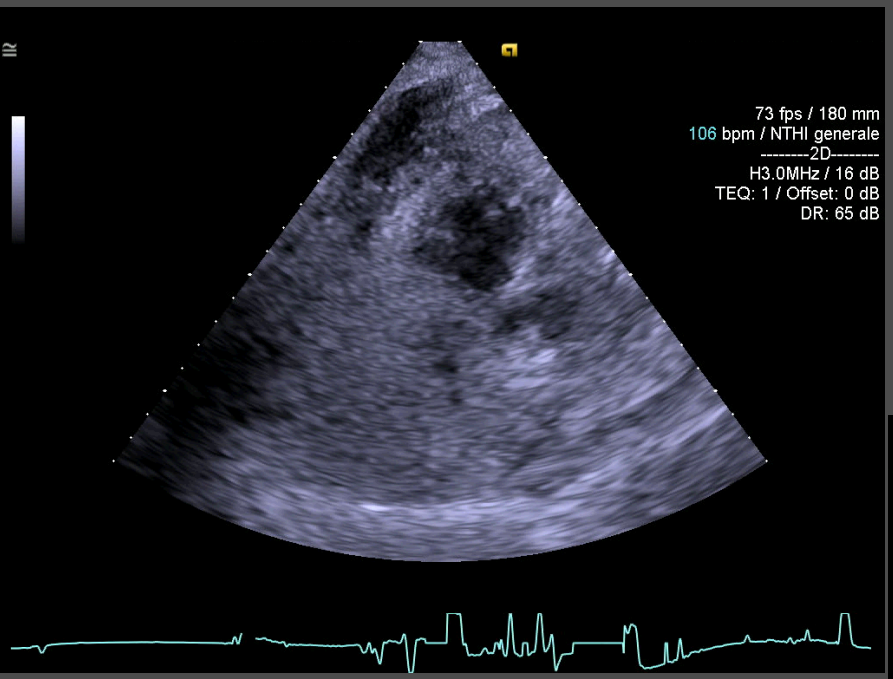
Caso clinico

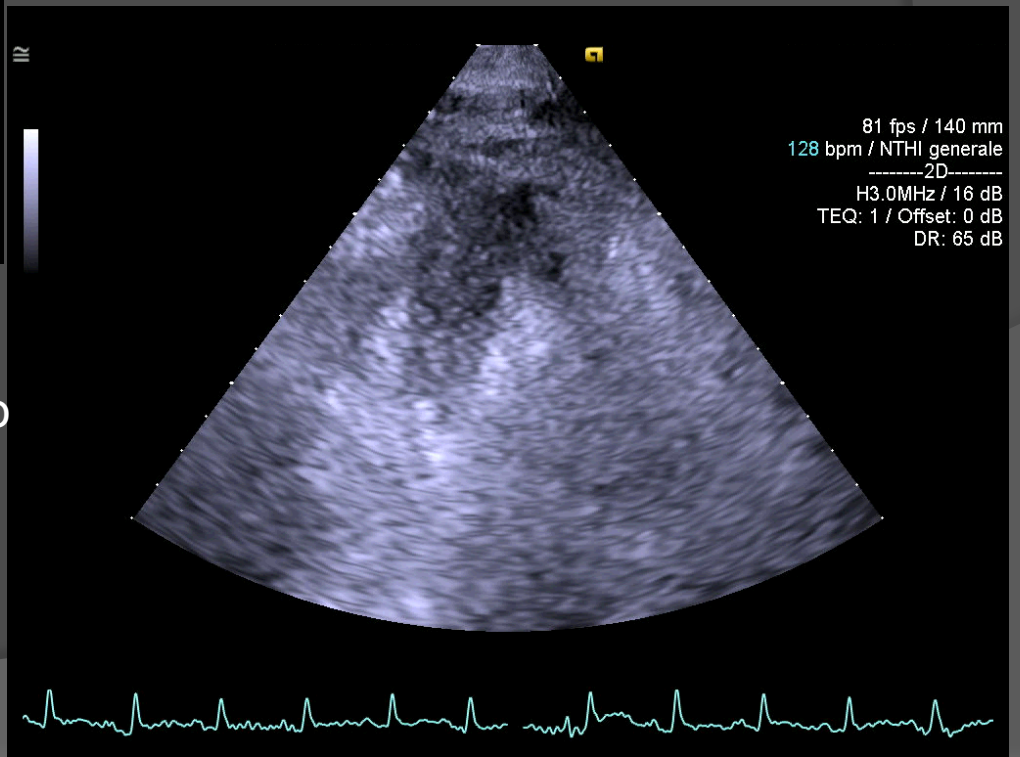






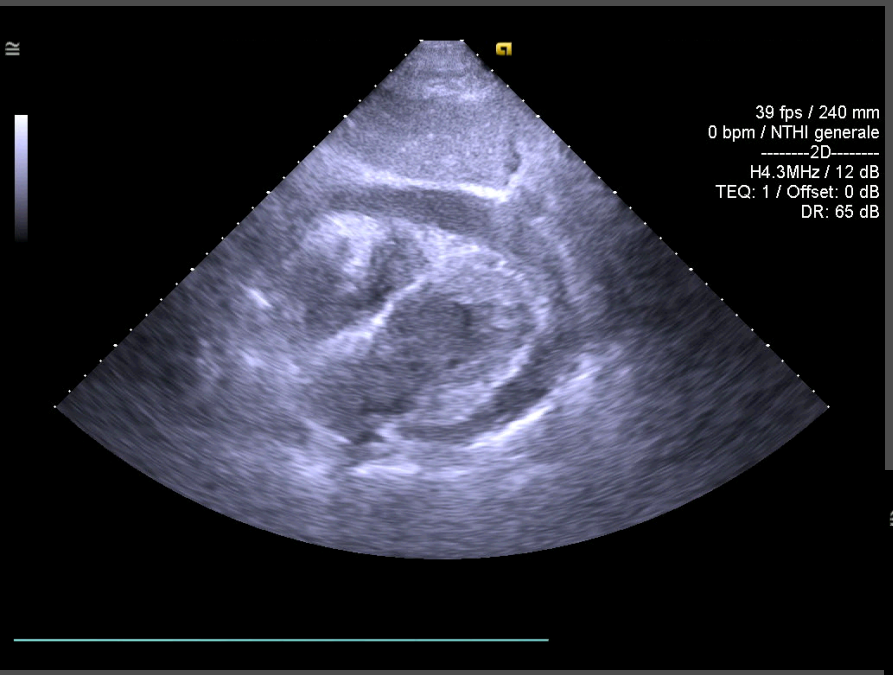
Versamento localizzato
A ridosso dell'Atrio dx

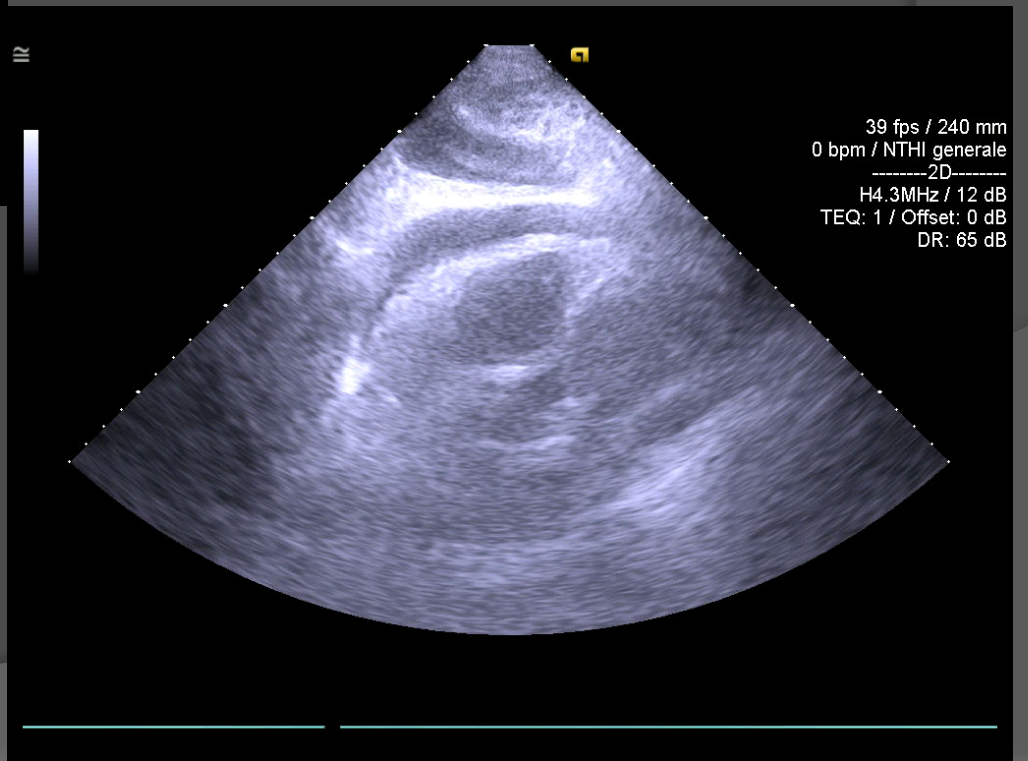




Recidiva di versamento con meccanismo di tamponamento localizzato

Caso clinico





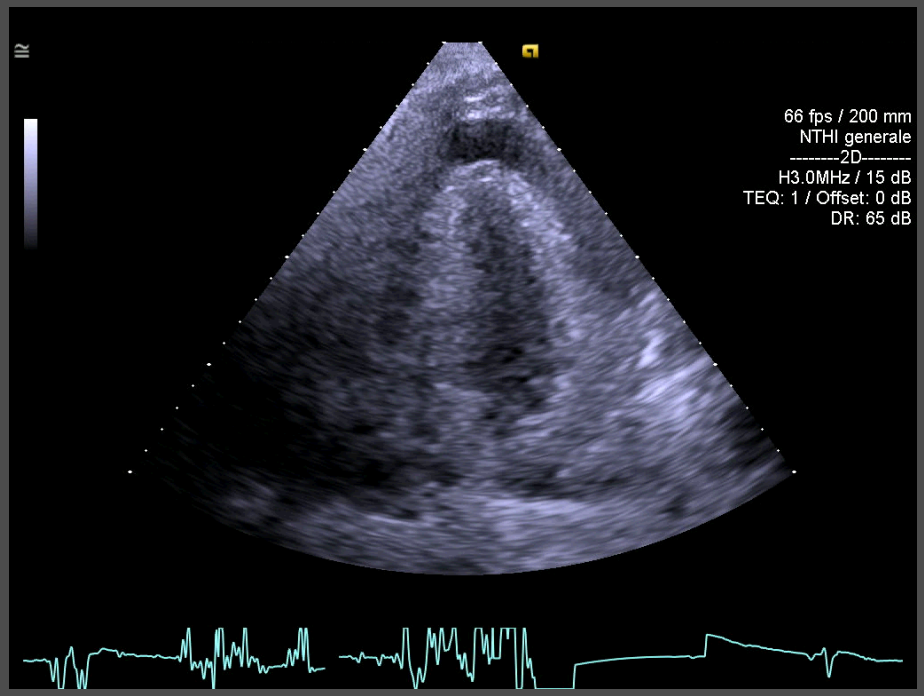
BPCO

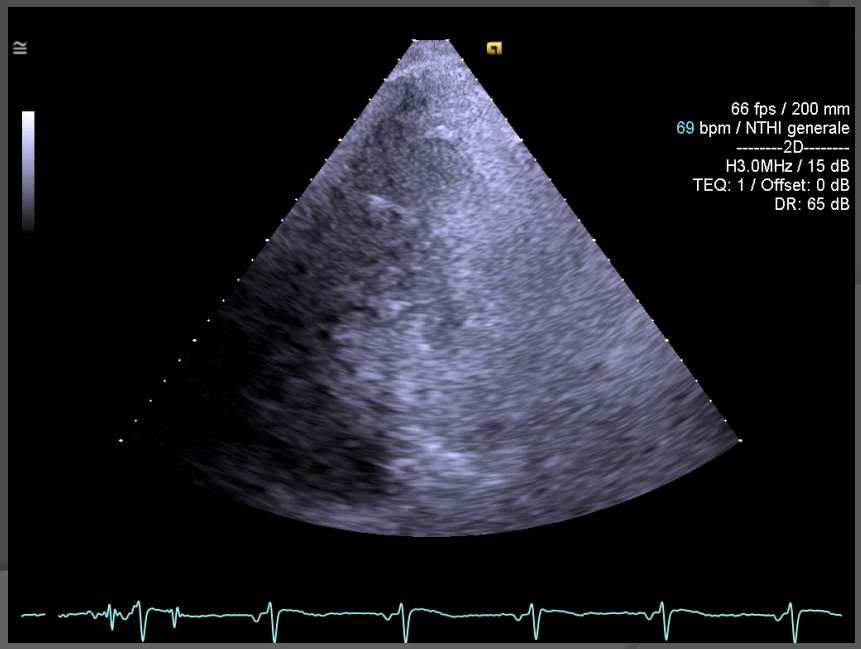
E/O dispnoico,

leggermente tachicardico

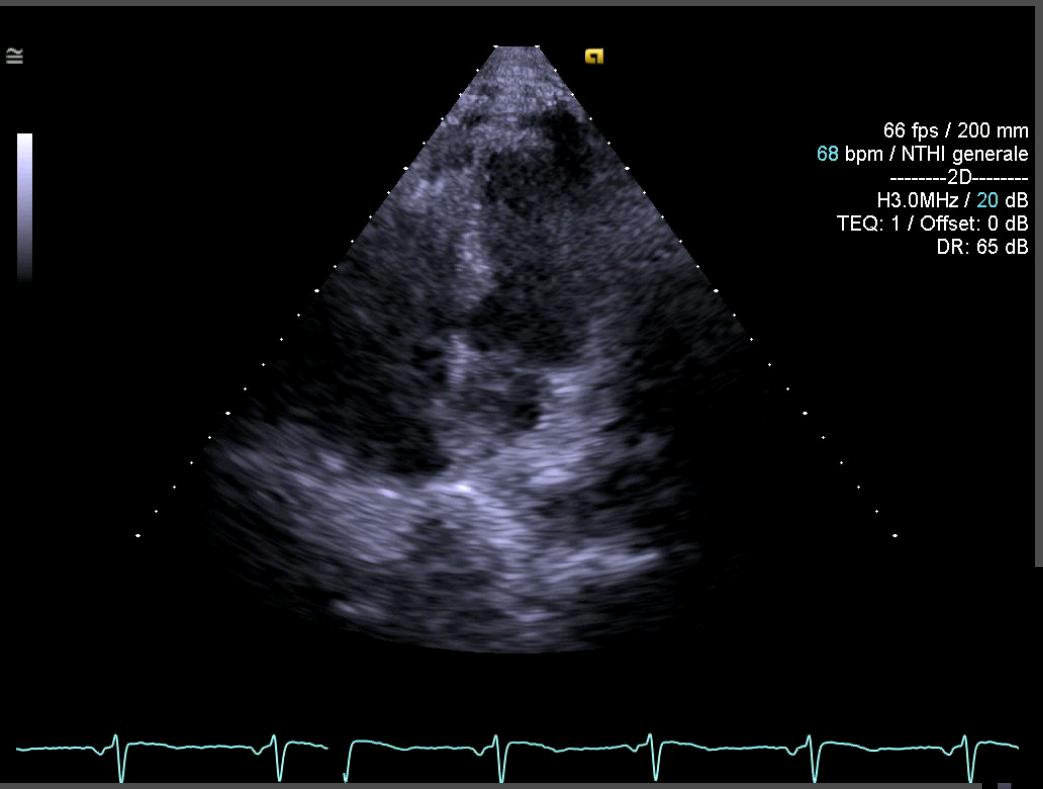
normale P.A.

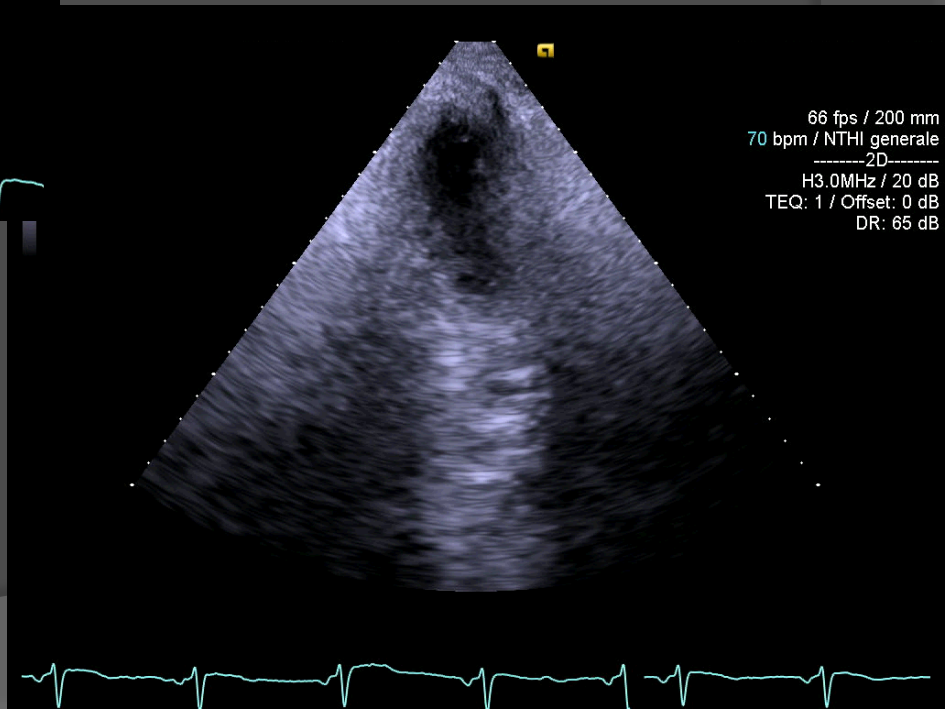
giugulari turgide



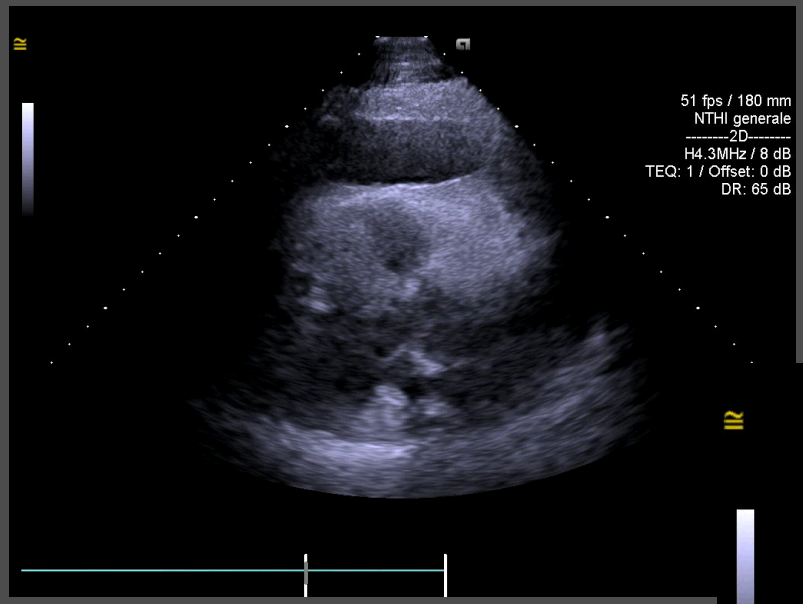


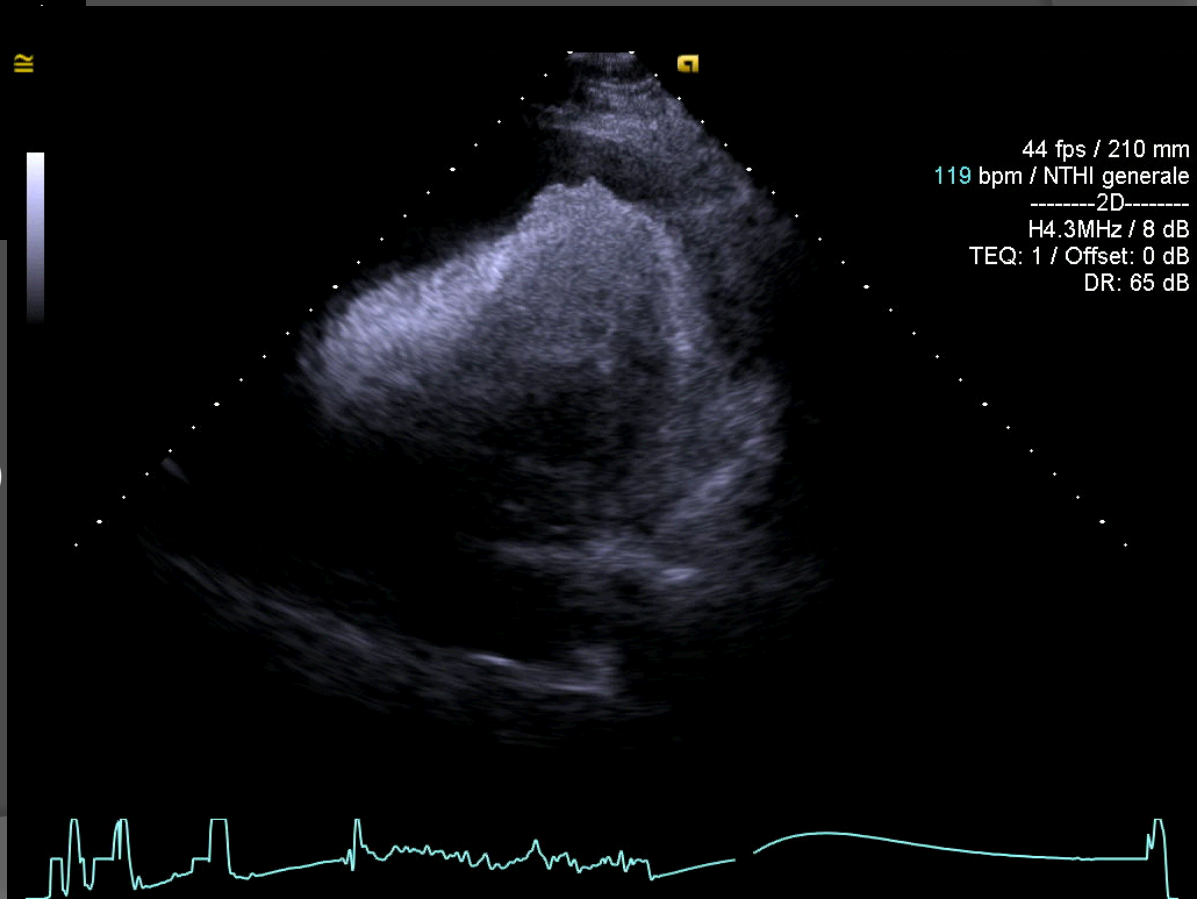
Versamento pericardico
Pericardiocentesi : evacuati ca 450 cc
CA 125


66 fps / 200 mm
68 bpm / NTHI generale
--------2D--------
H3.0MHz / 20 dB
TEQ: 1 / Offset: 0 dB
DR: 65 dB

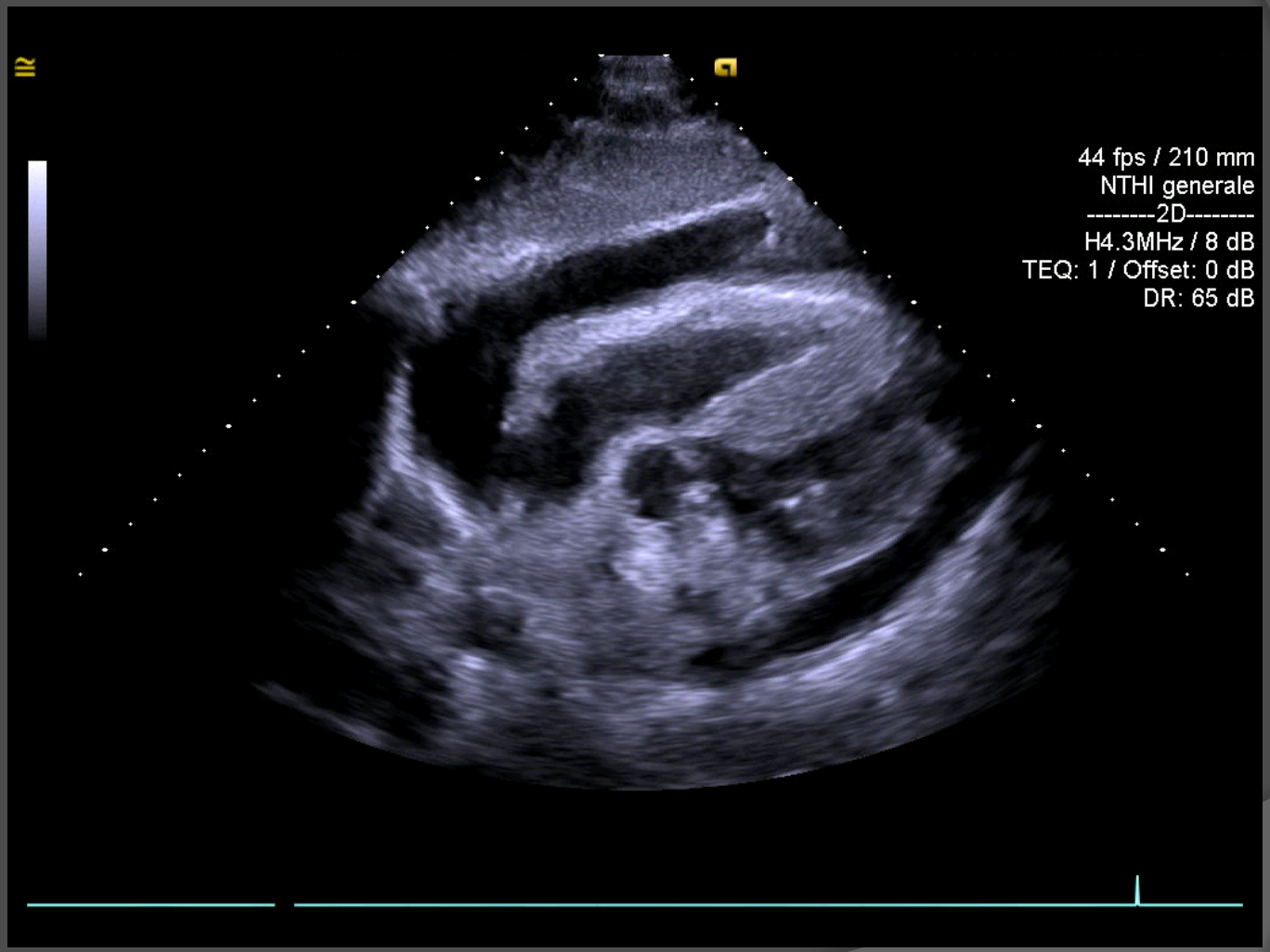

66 fps / 200 mm
70 bpm / NTHI generale
--------2D--------
H3.0MHz / 20 dB
TEQ: 1 / Offset: 0 dB
DR: 65 dB

Caso clinico

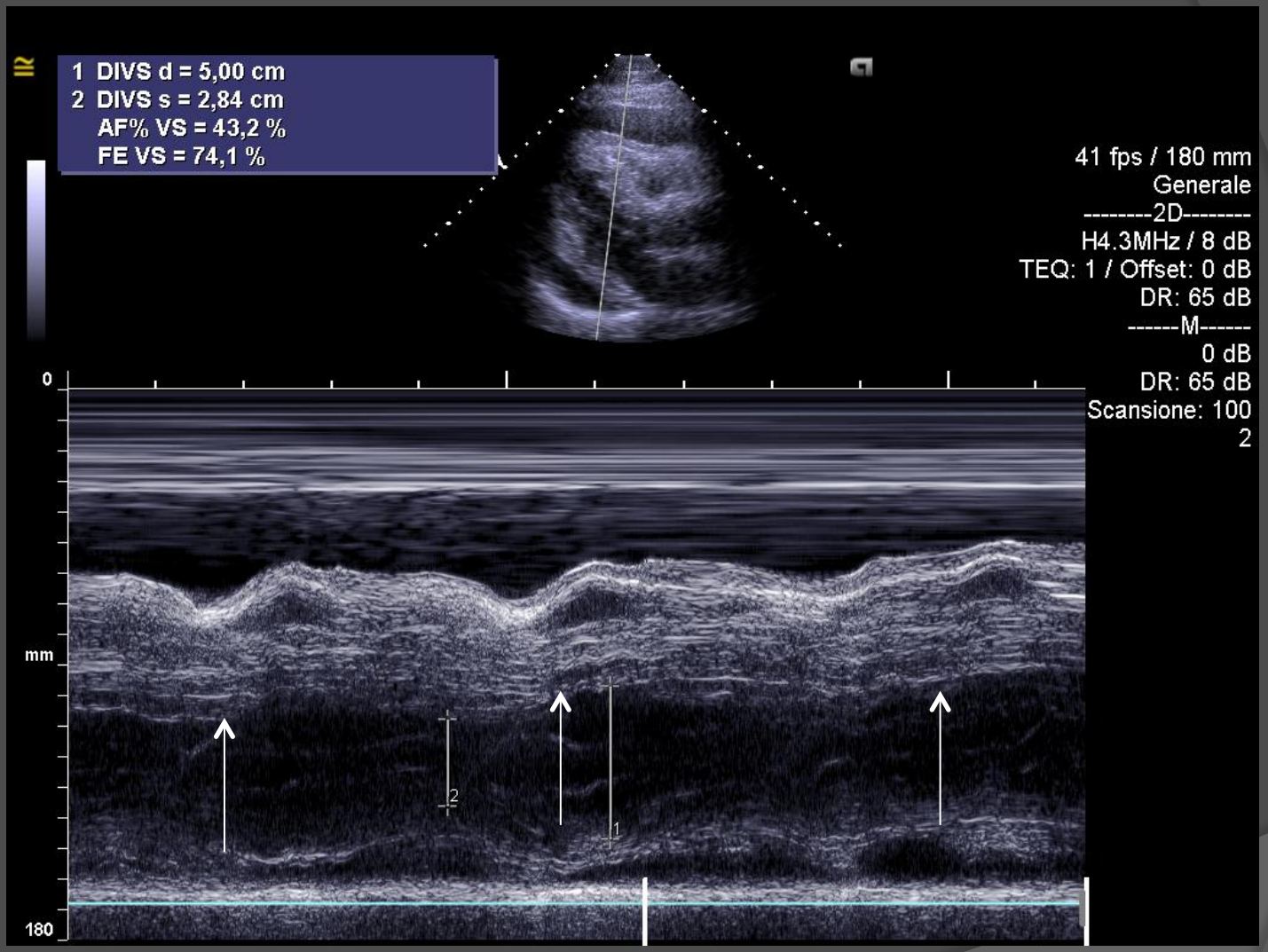




BPCO riacutizzata
Apnea ostruttiva notturna (casco)
Recente riscontro (15 gg) di versamento pericardico.
E/O assenza di polso paradosso
decubito indifferente

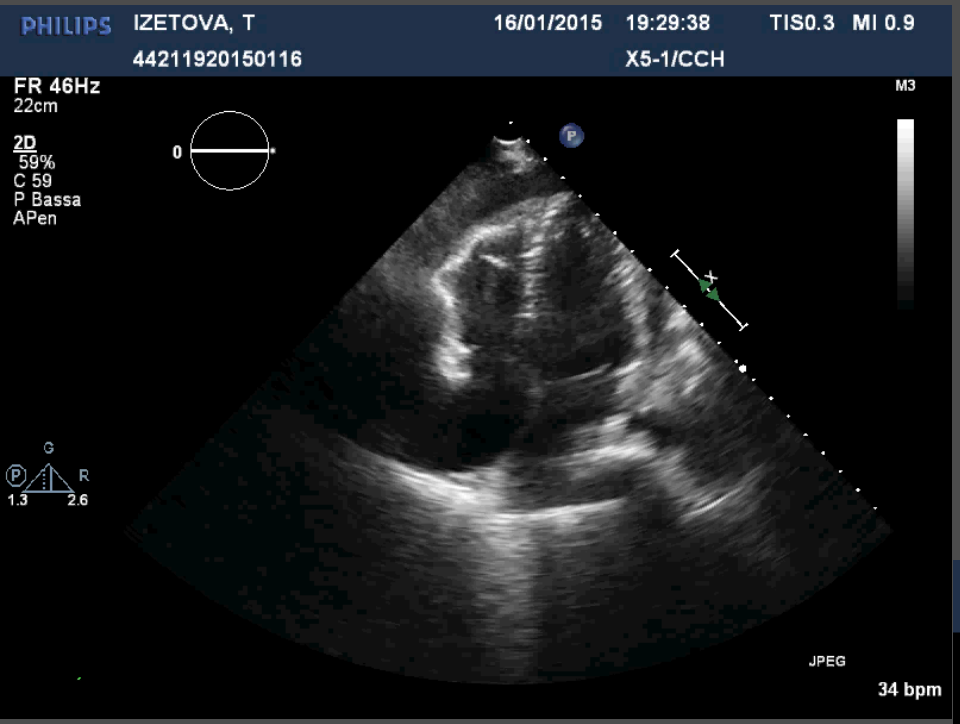

44 fps / 210 mm
NTHI generale
--------2D--------
H4.3MHz / 8 dB
TEQ: 1 / Offset: 0 dB
DR: 65 dB

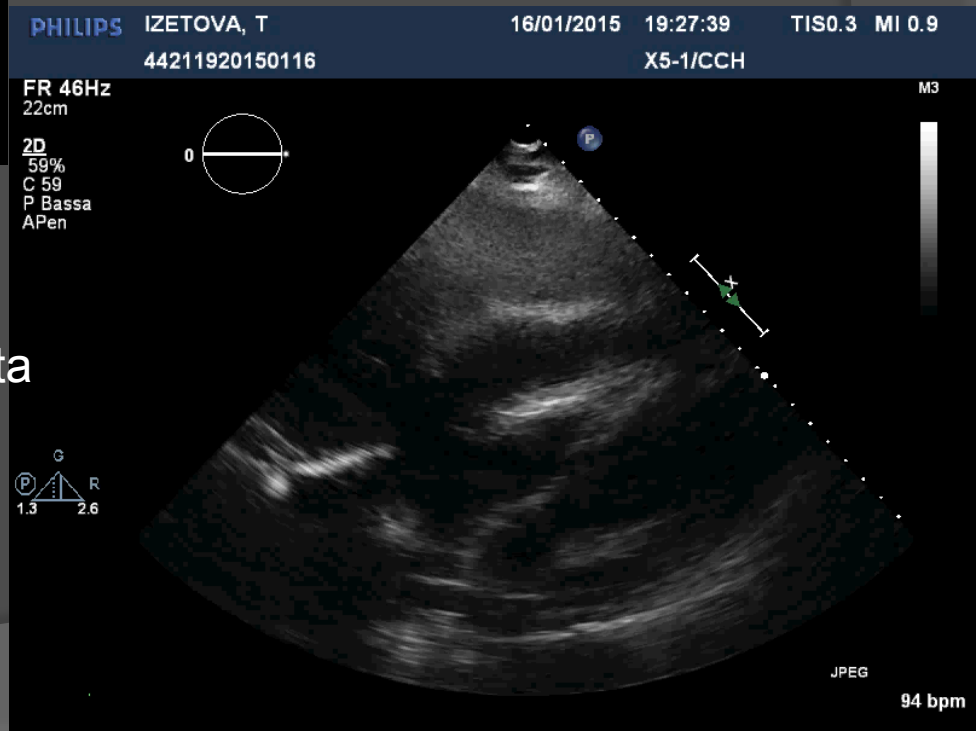
Caso clinico



Il paziente ricoverato in ospedale (UTSIR), il normale decubito, l'assenza di polso paradosso abbiamo optato per la terapia medica (08/04/2015).

Caso clinico

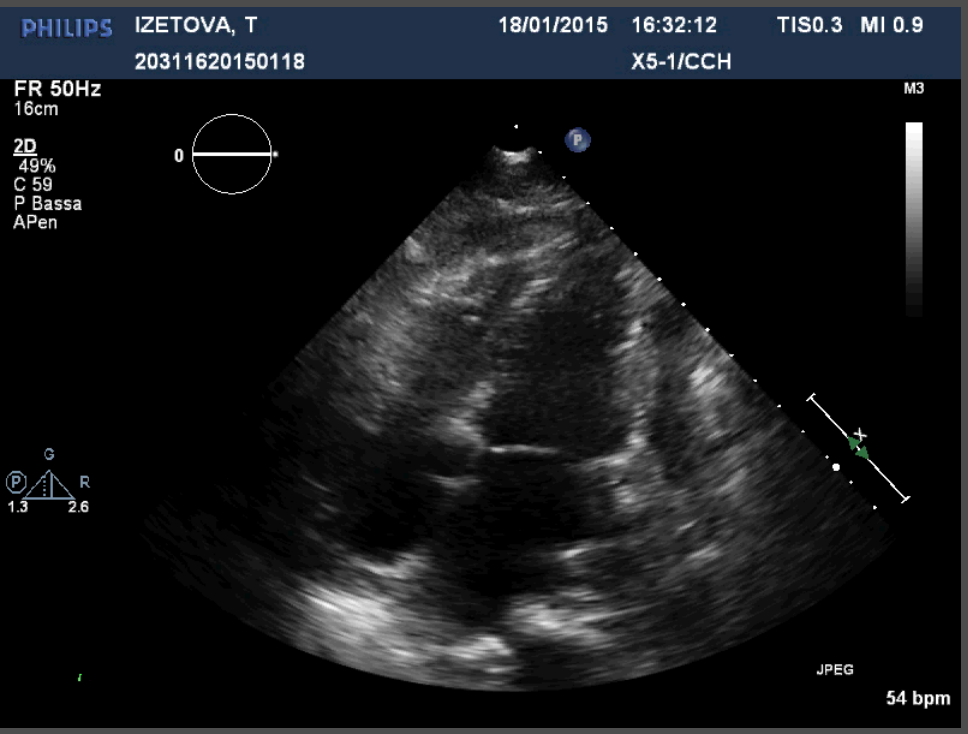


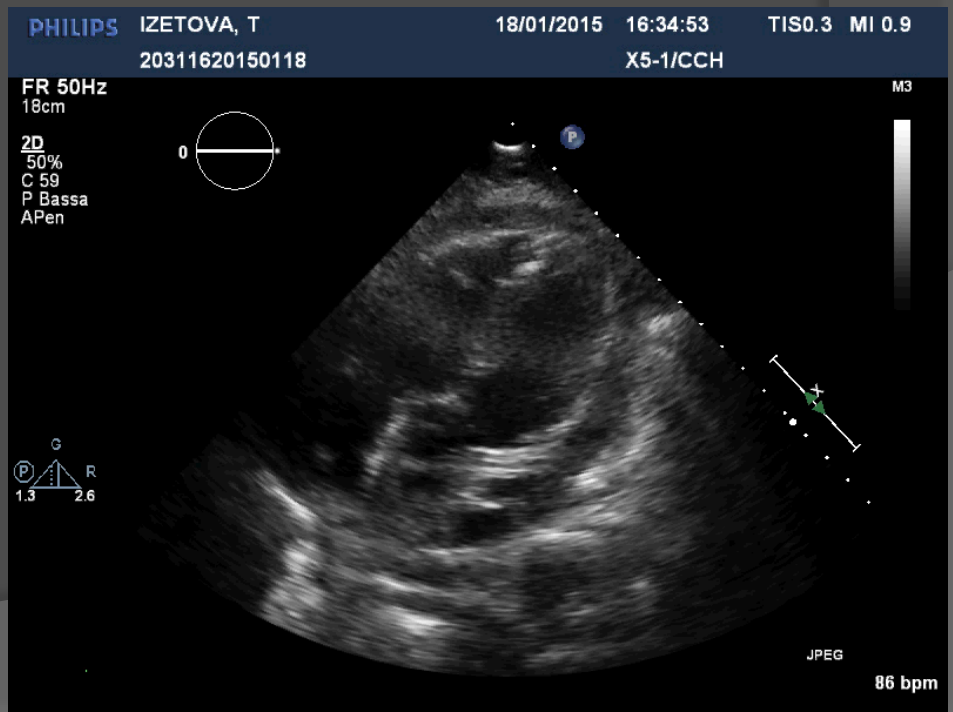


Paziente dispnoica con posizione obbligata seduta. Polso piccolo.
P.A. 90/60 mmHg

Estratti ca 180 cc liquido bianco lattiginoso maleodorante.

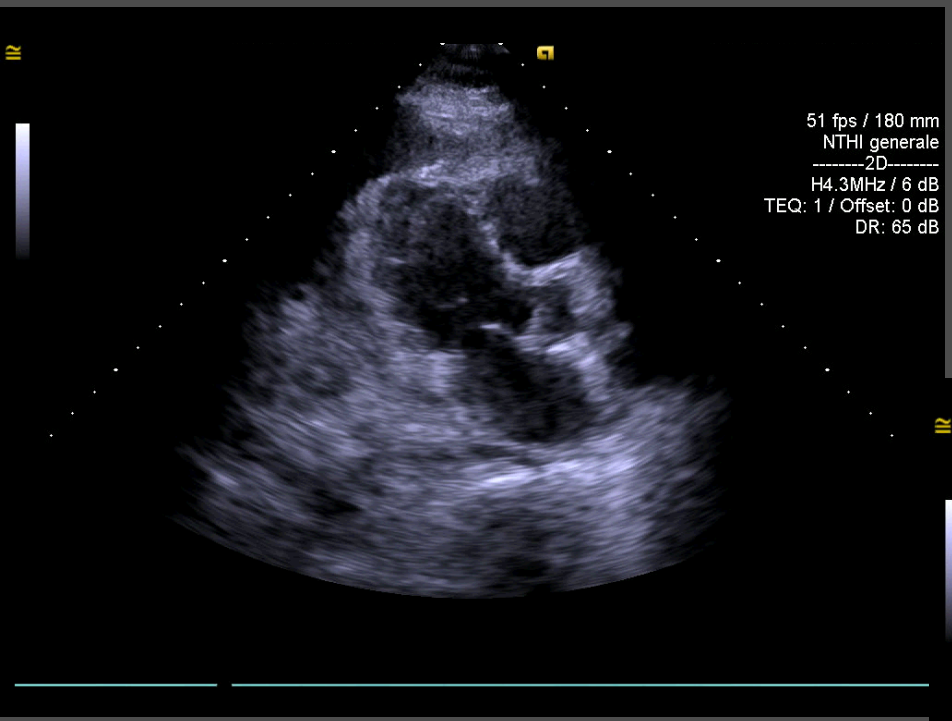
Caso clinico

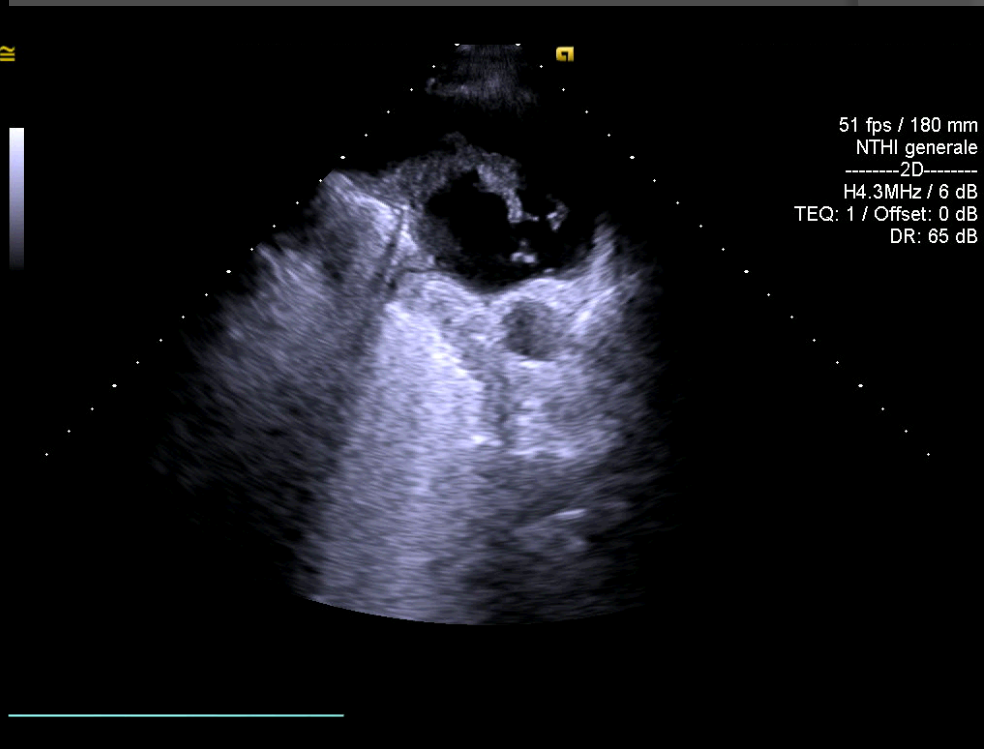




Dopo 3 gg paziente nuovamente sintomatica
Pericardiocentesi chirurgica:
Foglietto pericardico ispessito;
Versamento pericardico bianco-ocra
Eseguite inseminazioni su più terreni di coltura

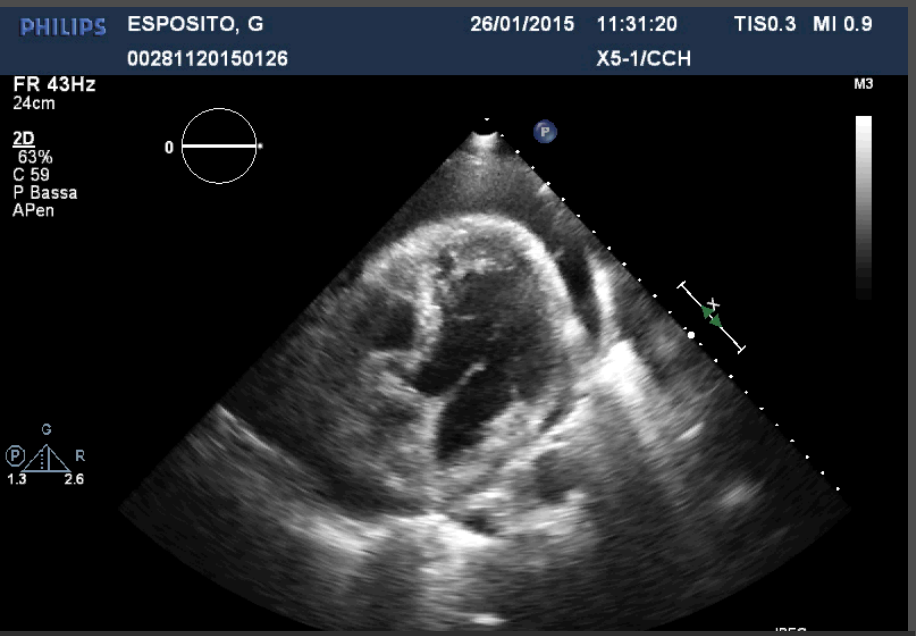
Caso clinico





Dispnea, ipotensione, nuova revisione Chirurgica.
Terreni di coltura positivo per lo sviluppo Dell Streptococco Gordonii normale della fauna batterica orale

Caso clinico



Violento dolore toracico ca 20 gg prima
Tardivo riscontro di aneurisma ao asc + vers pericardico

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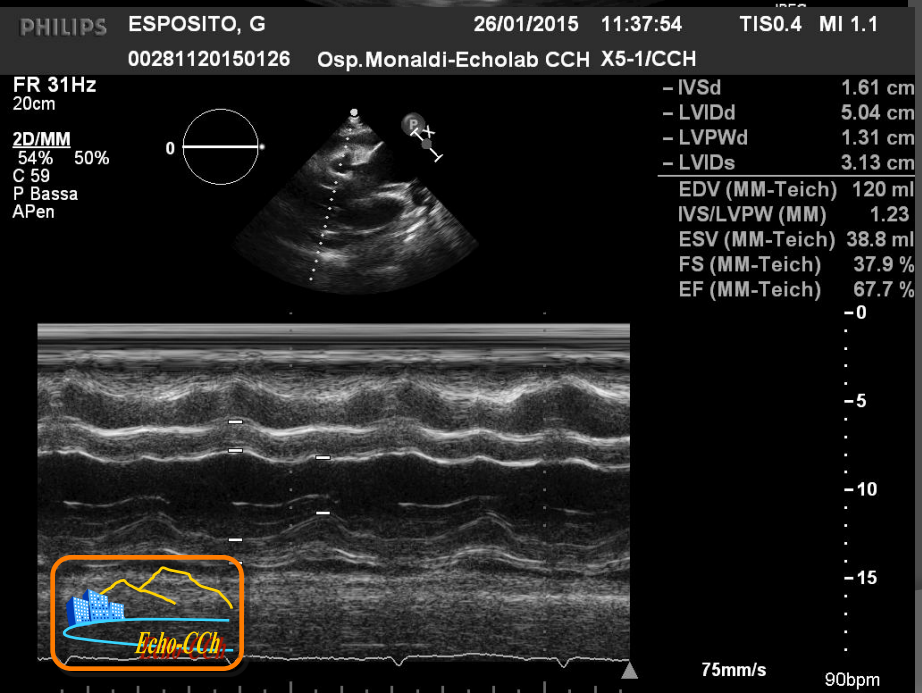
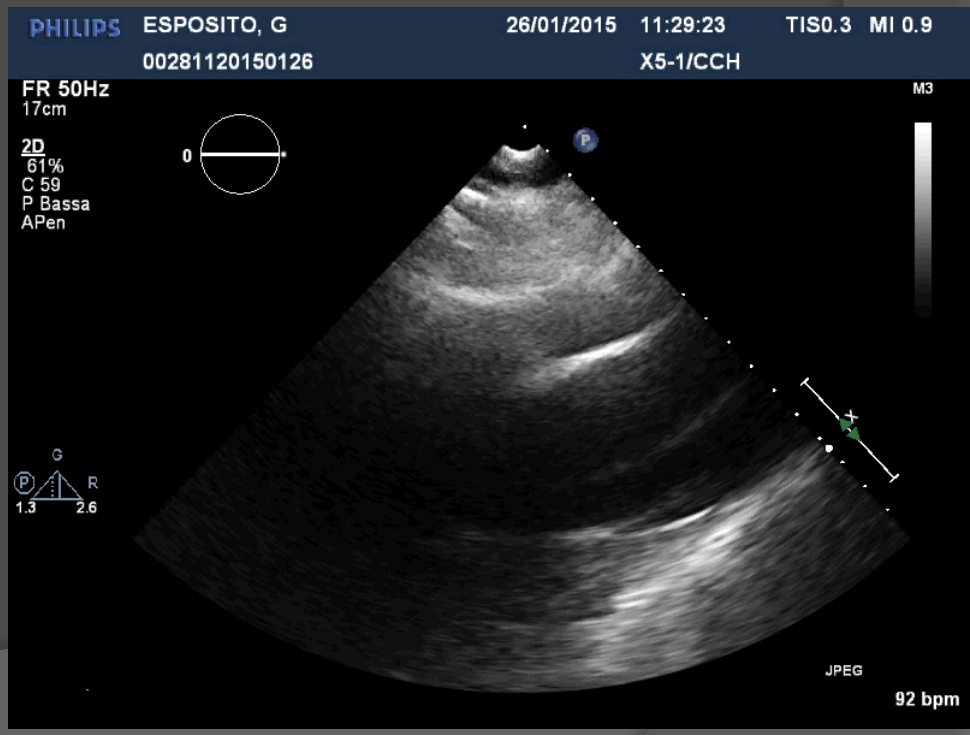
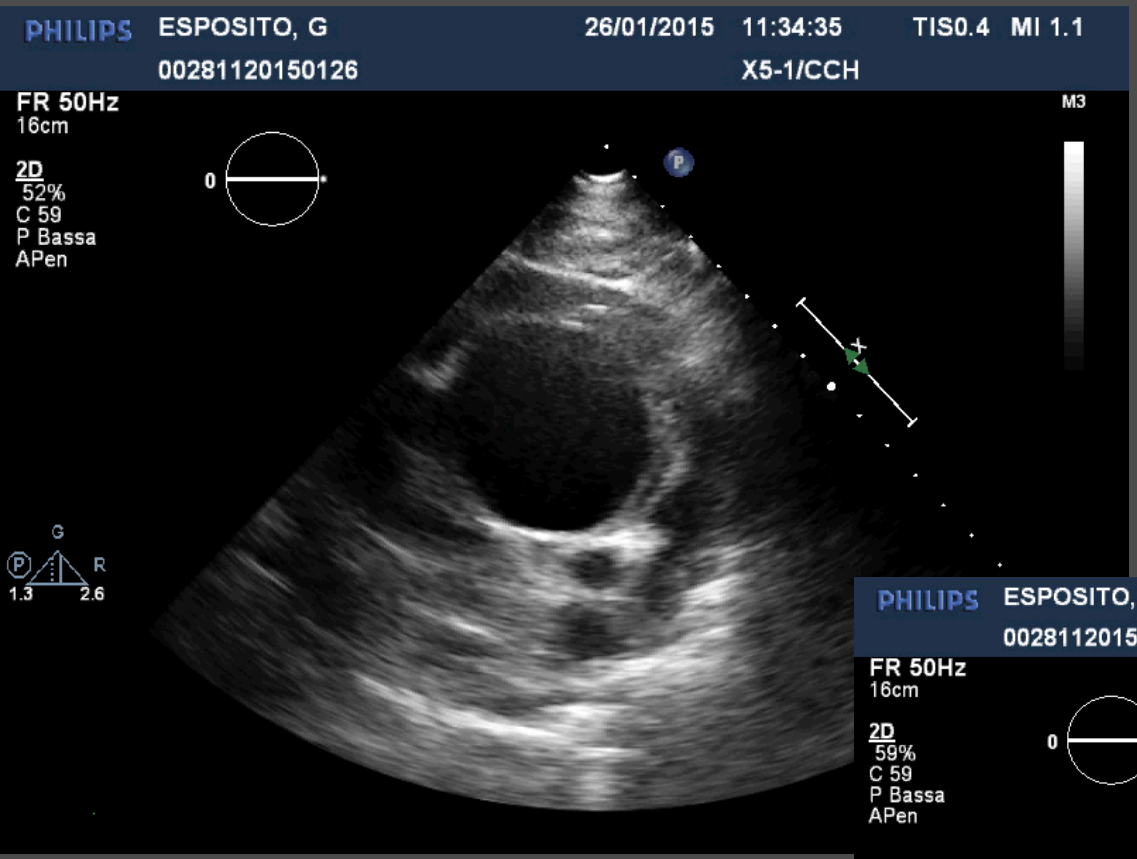
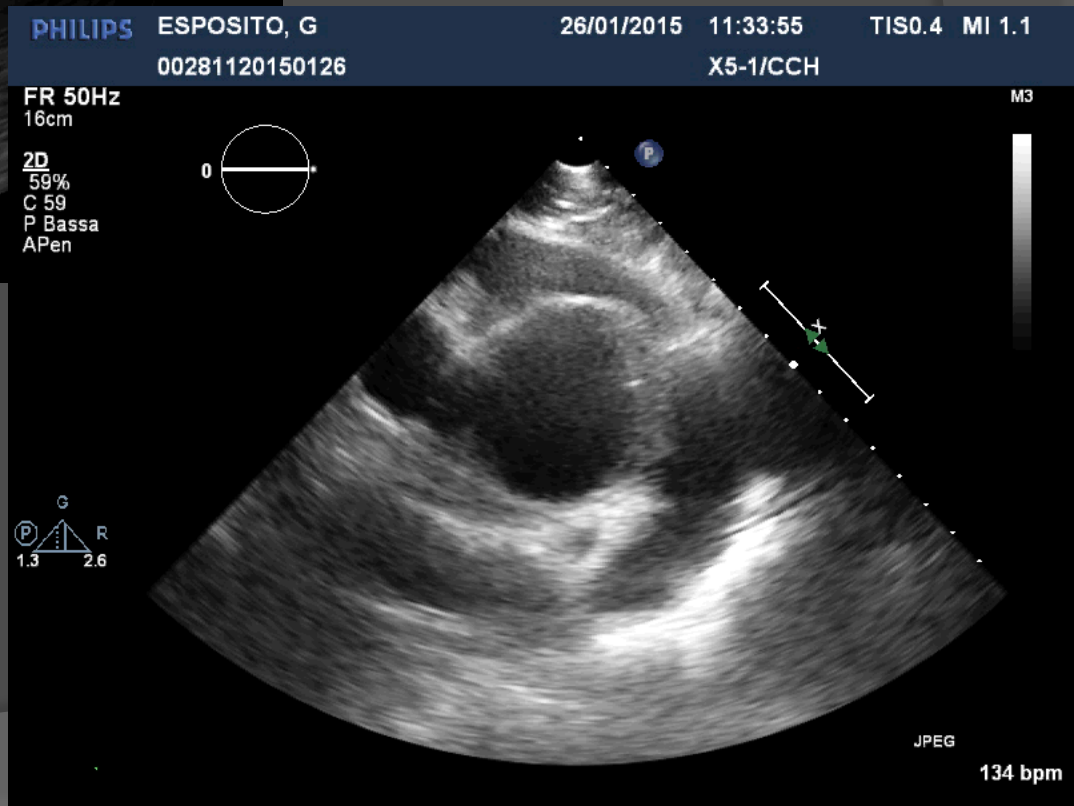
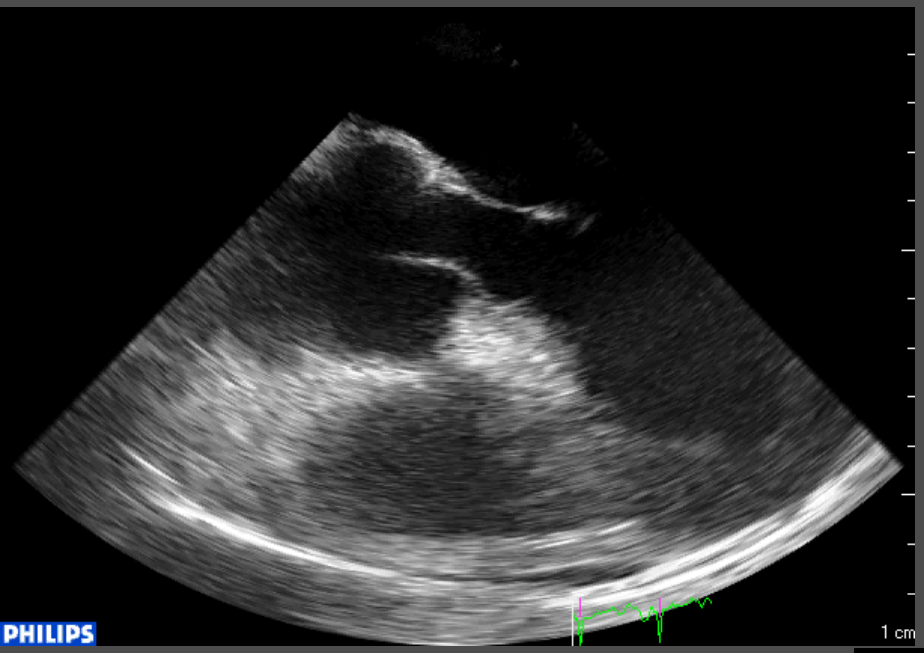


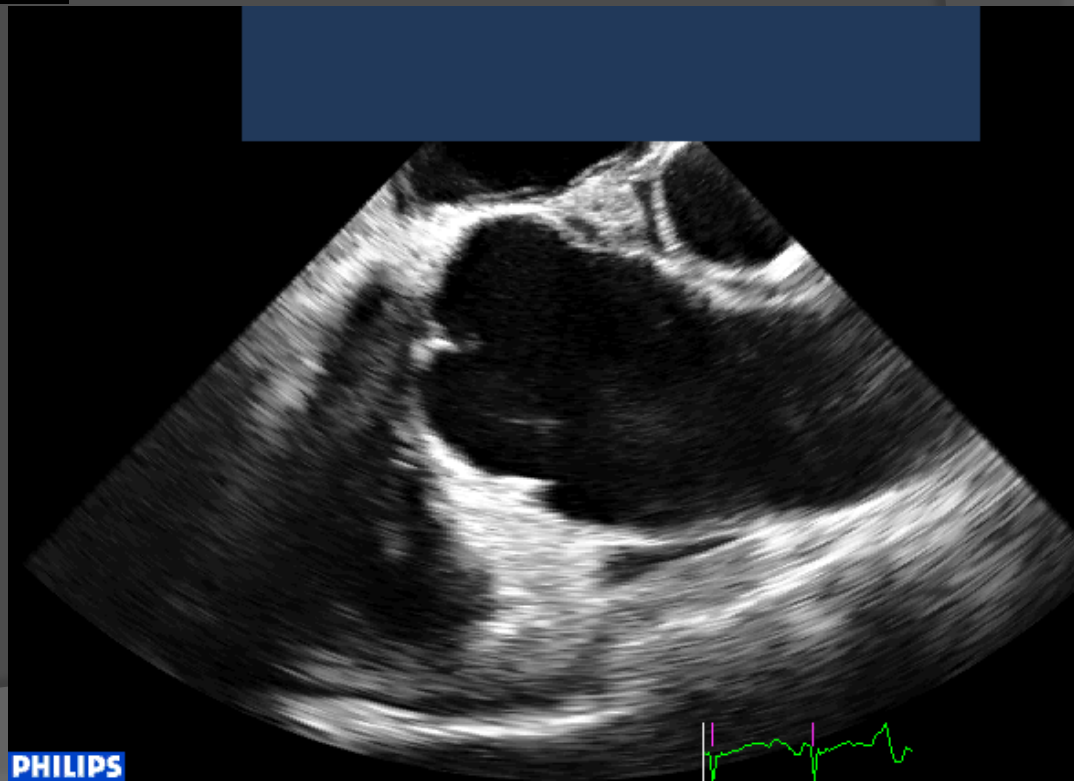






Versamento pericardico non tamponante
dissezione aortica


PHILIPS
1 cm


PHILIPS


52071120110803
CX7-2t/TEE
FR 50Hz
10cm
M4
2D
66%
C 50
P Off
Gen.
0 97 180
JPEG
123 bpm
Temp. PAZ.: 37.0C
Temp. TEE: 39.0C


52071120110803
CX7-2t/TEE
0Hz
M4
0 146 180
JPEG
124 bpm
Temp. PAZ.: 37.0C
Temp. TEE: 39.1C


1
2
3
4
5
6

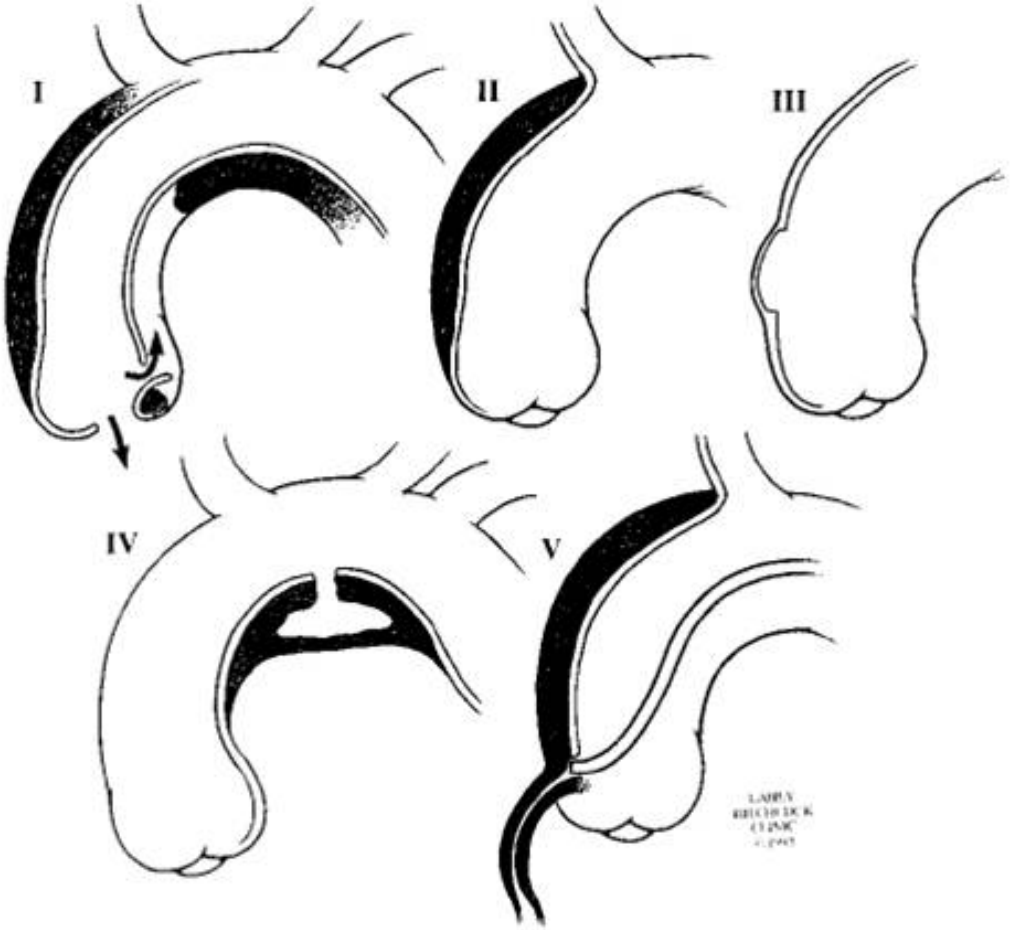


Figure 1. Classes of aortic dissection: class 1, classic dissection with flap between true and false aneurysm and clot in false lumen; 2, intramural hematoma; 3, limited intimal tear with eccentric bulge at tear site; 4, penetrating atherosclerotic ulcer with surrounding hematoma, usually subadventitial; 5, iatrogenic or traumatic dissection illustrated by coronary catheter causing dissection.

Lars G. Svensson, MD, PhD; Sherif B. Labib, MD; Andrew C. Eisenhauer, MD; John R. Butterly, MD

Circulation. 1999;99:1331-133

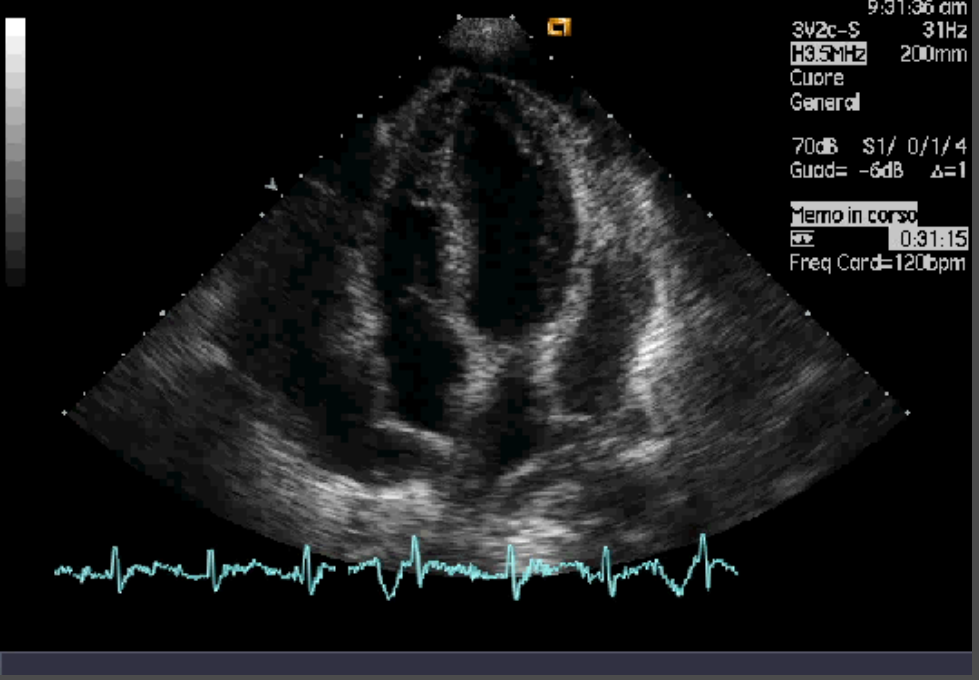
Terapia del tamponamento

- Pericardiocentesi ecoguidata
- Drenaggio chirurgico
- Pericardiectomia chirurgica parziale o completa

Terapia del tamponamento

Drenaggio chirurgico
Pericardiectomia chirurgica

- Necessario in caso di emopericardio, specie se post traumatico o iatrogeno
- Necessario quando non c'è possibilità di eseguire una pericardiocentesi (assenza di spazio di sicurezza, versamento saccato, etc.)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200mm
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General
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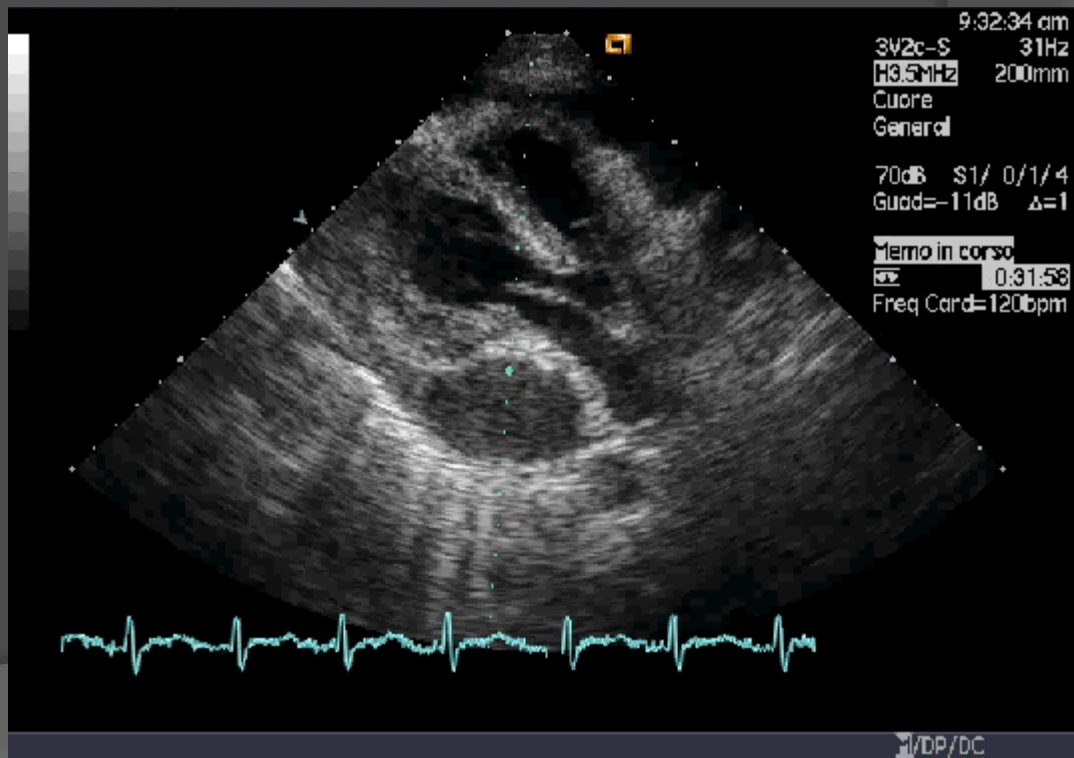
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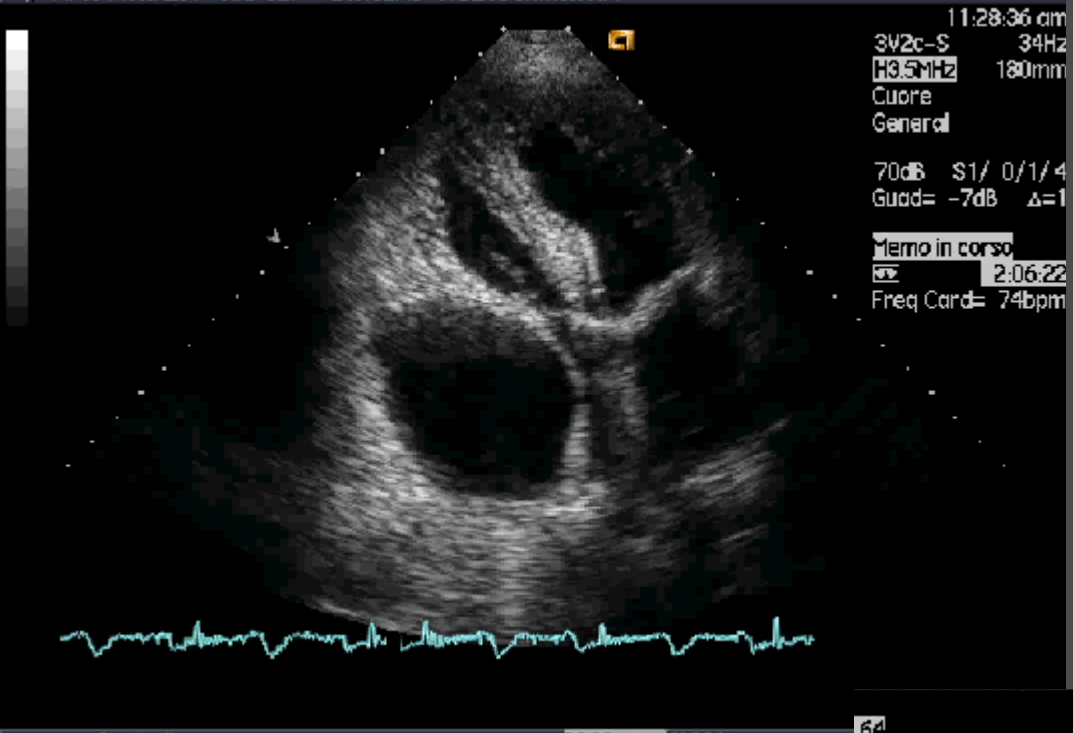
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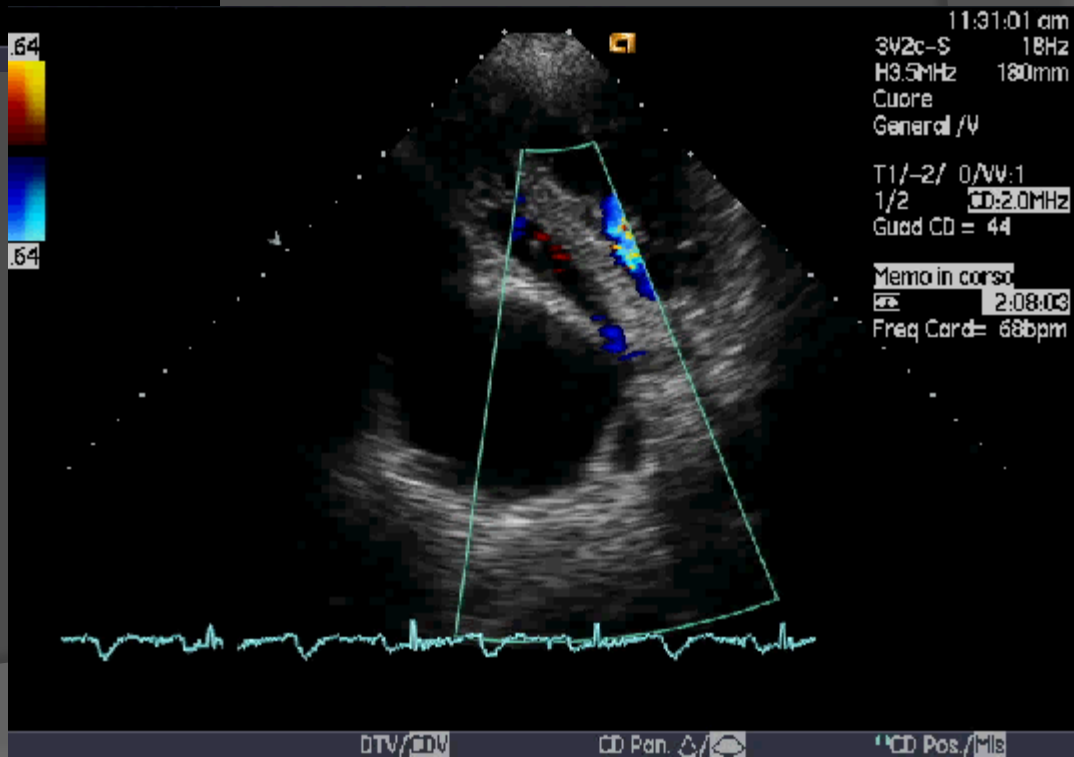
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Guad CD = 44
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2:08:03
Freq Card= 68bpm
DTV/CDV
CD Pan. Δ/
CD Pos./Mis

Pericardial Effusion After Cardiac Surgery: Risk Factors, Patient Profiles, and Contemporary Management

Elena A. Ashikhmina, MD, Hartzell V. Schaff, MD, Lawrence J. Sinak, MD, Zhuo Li, MS, Joseph A. Dearani, MD, Rakesh M. Suri, MD, DPhil, Soon J. Park, MD, Thomas A. Orszulak, MD, and Thoralf M. Sundt III, MD

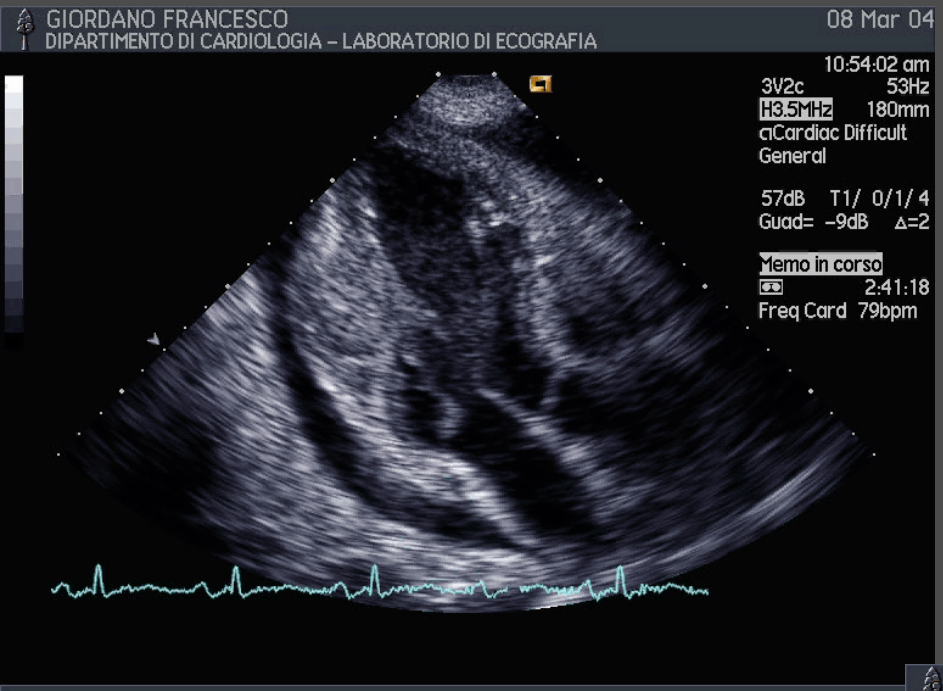
Divisions of Cardiovascular Surgery and Biomedical Statistics and Informatics, Mayo Clinic, Rochester, Minnesota

[redacted] To identify risk factors for effusion, study patients were compared with patients without effusions.

Results. Of 21,416 patients identified, 327 (1.5%) had pericardial effusion (study group), 280 (86%) of whom had nonspecific symptoms. Clinical features of tamponade were documented in 138 patients (42%). Effusions were evacuated by echocardiography-guided pericardiocentesis (n = 169, 52%) or surgical drainage (n = 75, 23%).

Conclusions. In our study, pericardial effusion occurred in 1.5% of patients, and symptoms were nonspecific. Several factors, mainly related to preoperative characteristics and type of operation, predispose patients to effusion. Echocardiography-guided pericardiocentesis is effective and safe in these patients.

(Ann Thorac Surg 2010;89:112–8)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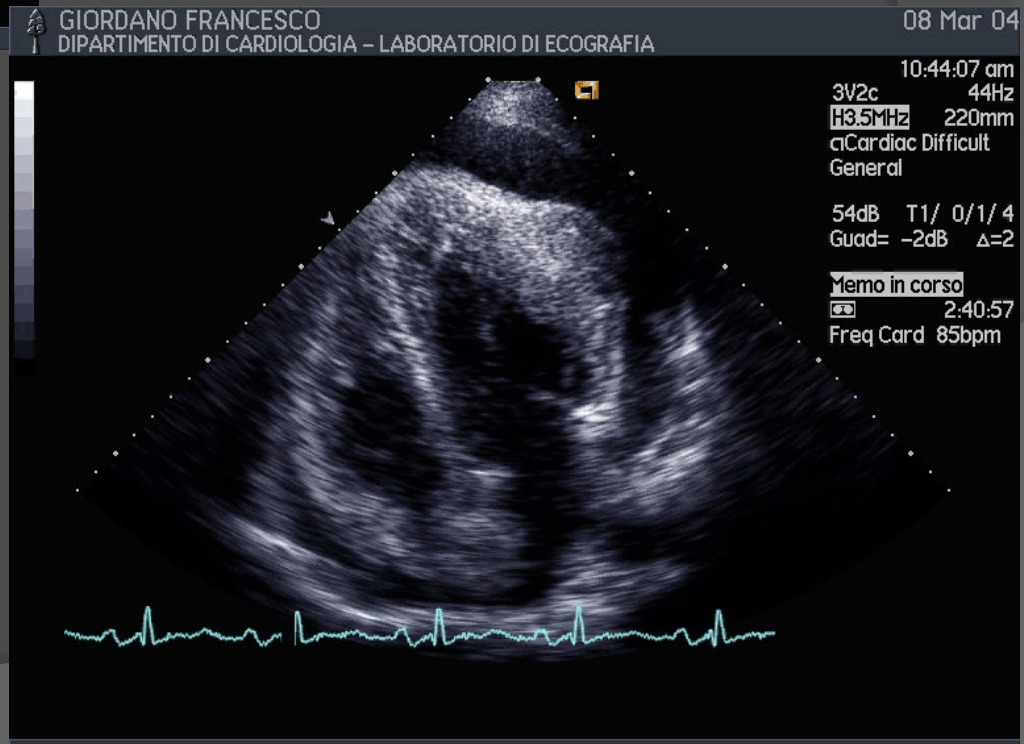
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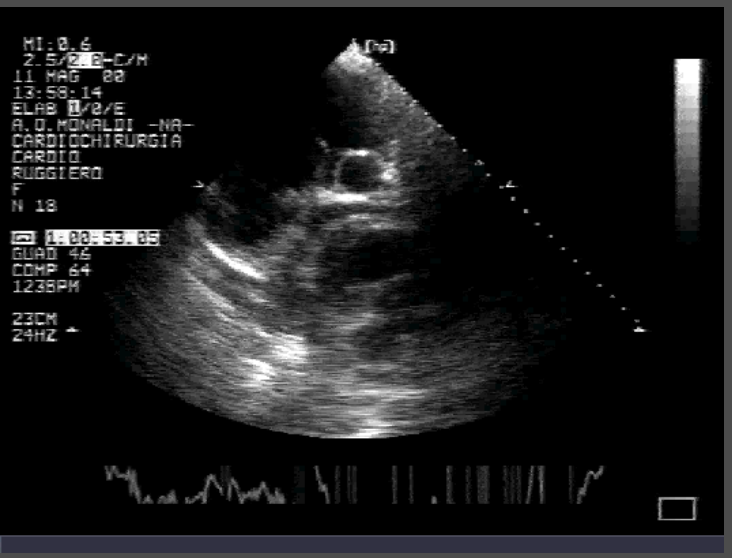
Anche l'eventuale presenza di liquido in cavità pleurica è "facilmente" evidenziabile dalla metodica ecocardiografica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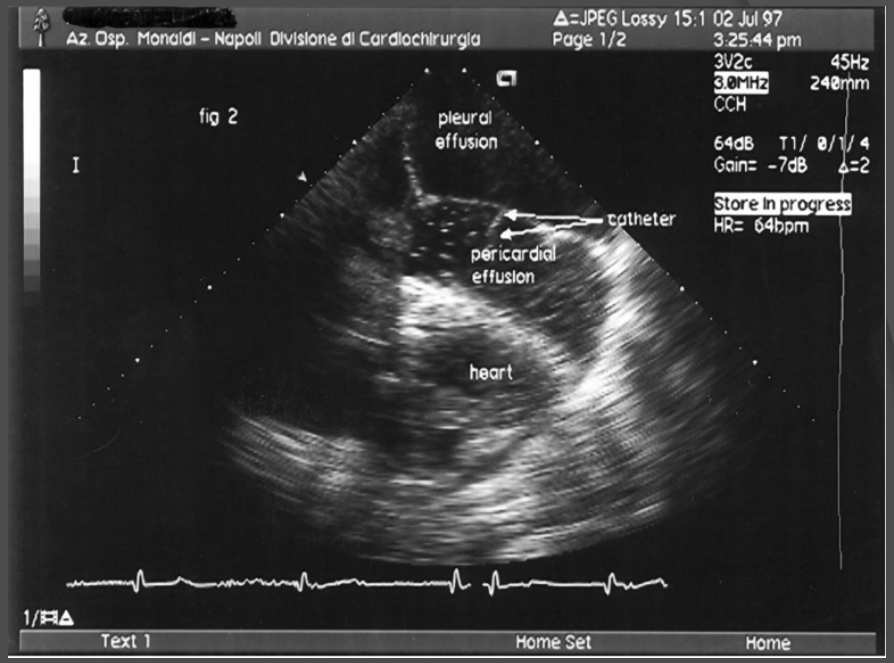
Az. Osp. Monaldi – Napoli Divisione di Cardiochirurgia
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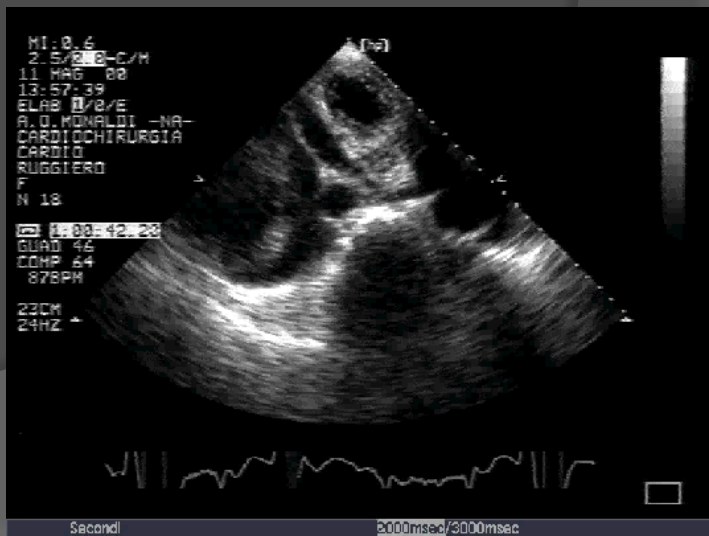
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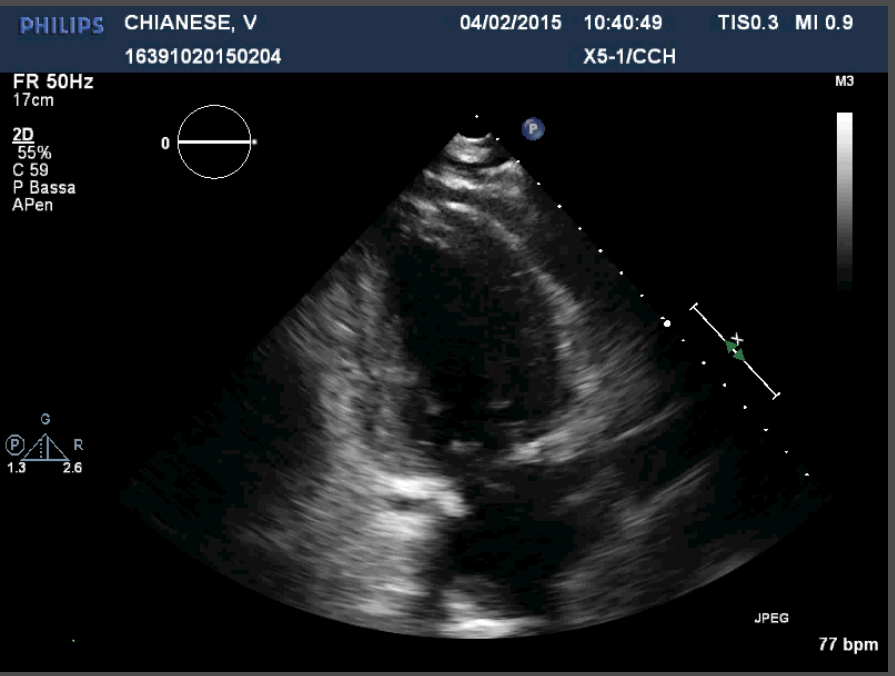
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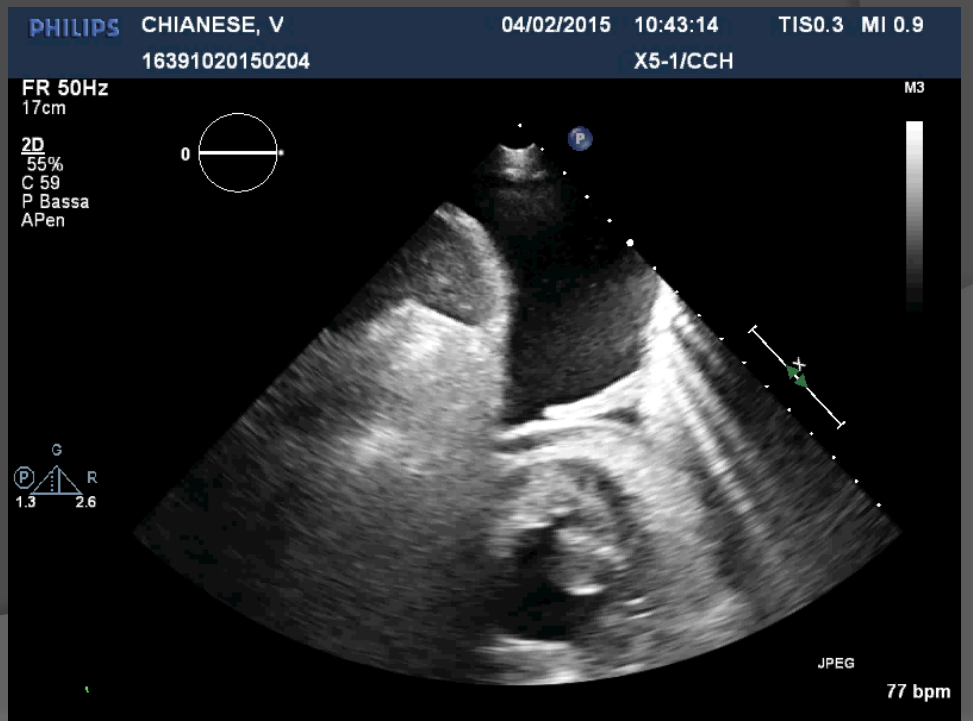
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Focus box 1 Pericardiocentesis

Pericardiocentesis is life saving in cardiac tamponade (level of evidence B, class I indication) and indicated in effusions >20 mm in echocardiography (diastole)[23] but also in smaller effusions for diagnostic purposes (pericardial fluid and tissue analyses, pericardioscopy, and epicardial/pericardial biopsy)(level of evidence B, class IIa indication).[2,8,15,16] Aortic dissection is a major contraindication.[22] Relative contraindications include uncorrected coagulopathy, anticoagulant therapy, thrombocytopenia <50000/mm^3, small, posterior, and loculated effusions. Surgical drainage is preferred in traumatic haemopericardium and purulent pericarditis.[7]

Pericardiocentesis guided by fluoroscopy is performed in the cardiac catheterisation laboratory with ECG monitoring. Direct ECG monitoring from the puncturing needle is not an adequate safeguard. Right-heart catheterisation can be performed simultaneously, allowing exclusion of constriction. It is prudent to drain the fluid in <1 l steps to avoid the acute right-ventricular dilatation.[24] The subxiphoid approach has been used most commonly, with a long needle with a mandrel (Tuohy or thin-walled 18-gauge) directed towards the left shoulder at a 30° angle to the skin. This route is extrapleural and avoids the coronary, pericardial, and internal mammary arteries. The operator intermittently attempts to aspirate fluid and injects small amounts of contrast. If haemorrhagic fluid is freely aspirated a few millilitres of contrast medium may be injected under fluoroscopic observation (sluggish layering inferiorly indicates that the needle is correctly positioned). A soft J-tip guidewire is introduced and after dilatation exchanged for a multi-holed pigtail catheter. It is essential to check the position of the guidewire in at least two angiographic projections before insertion of the dilator and drainage catheter.

Echocardiographic guidance of pericardiocentesis is technically less demanding and can be performed at the bedside.[13] Echocardiography should identify the shortest route where the pericardium can be entered intercostally (usually in the sixth or seventh rib space in the anterior axillary line). Prolonged pericardial drainage is performed until the volume of effusion obtained by intermittent pericardial aspiration (every 4–6 h) fall to <25 ml per day.[25] The feasibility is high (93%) in patients with anterior effusion ≥10 mm while the rate of success is only 58% with small, posteriorly located effusions. Fluoroscopic and haemodynamic monitoring improve feasibility (93.1% vs. 73.3%) in comparison to emergency pericardial puncture with no imaging control.[26] The tangential approach using the epicardial halo phenomenon in the lateral view[27] significantly increased the feasibility of fluoroscopically guided pericardiocentesis in patients with small effusions (200–300 ml)(92.6% vs. 84.9%) and very small effusions (<200 ml)(89.3% vs. 76.7%). Pericardiocentesis with echocardiography guidance was feasible in 96% of loculated pericardial effusions.[28] Rescue pericardiocentesis guided by echocardiography relieved tamponade after cardiac perforation in 99% of 88 patients, and was the definitive therapy in 82%.[29]

The most serious complications of pericardiocentesis are laceration and perforation of the myocardium and the coronary vessels. In addition, patients can experience air embolism, pneumothorax, arrhythmias (usually vasovagal bradycardia), and puncture of the peritoneal cavity or abdominal viscera.[26] Internal mammary artery fistulas, acute pulmonary oedema, and purulent pericarditis were rarely reported. The safety was improved with echocardiographic or fluoroscopic guidance. Recent large echocardiographic series reported an incidence of major complications of 1.3–1.6%.[13,25,28,29] In fluoroscopy-guided percutaneous pericardiocenteses[30] cardiac perforations occurred in 0.9%, serious arrhythmias in 0.6%, arterial bleeding in 1.1%, pneumothorax in 0.6%, infection in 0.3%, and a major vagal reaction in 0.3%. Incidence of major complications was further reduced by utilizing the epicardial halo phenomenon for fluoroscopic guidance.[27]

ESC Guidelines Eur Heart J. 2004 Apr;25(7):587-610

Consecutive 1127 Therapeutic Echocardiographically Guided Pericardiocenteses: Clinical Profile, Practice Patterns, and Outcomes Spanning 21 Years

TERESA S. M. TSANG, MD; MAURICE ENRIQUEZ-SARANO, MD; WILLIAM K. FREEMAN, MD; MARION E. BARNES, MS; LAWRENCE J. SINAK, MD; BERNARD J. GERSH, MB, ChB, DPHIL; KENT R. BAILEY, PhD; AND JAMES B. SEWARD, MD

Mayo Clin Proc. 2002;77:429-436

procedures develop effusions that can be rapidly, safely, and effectively managed with echo-guided pericardiocentesis. Extended drainage with use of a pericardial catheter has become standard practice, and concomitantly, recurrence rates and need for surgical management have decreased considerably.

Sito di puntura

- Chest wall 86%
- Subcostal 12%
- Not documented 2%

Chest wall sites:
- 71% apical
- 5% left parasternal
- 5% left axillary
- 4% righ parasternal
- 1% posterolateral

Nella nostra esperienza il rapporto si inverte

Tsang et al. Chest 1999;116:322-331

Mayo Clin Proc. 2002;77:429-436

L'ecocardiografia ha notevolmente migliorato le possibilità diagnostiche e terapeutiche del tamponamento cardiaco. E' comunque la valutazione clinica in associazione alla diagnostica a determinare la scelta terapeutica più appropriata

Conclusioni

- In presenza di un versamento pericardico valutiamo diversi fattori:
- Sintomatologia
- Quadro clinico- ecocardiografico
- Possibile eziologia
- Verosimile evoluzione
- Tipo di approccio terapeutico

Conclusioni

- La pericardiocentesi è in classe I solo in caso di tamponamento
- Per la pericardiocentesi è necessario lo spazio di sicurezza
- In caso di emopericardio iatrogeno; da dissezione aortica; rottura di cuore la pericardiocentesi è da eseguirsi solo nel tentativo di migliorare la sintomatologia in attesa di intervento.