Translating Spanish Cardiology Reports: TEE or TTE? PET or SPECT?

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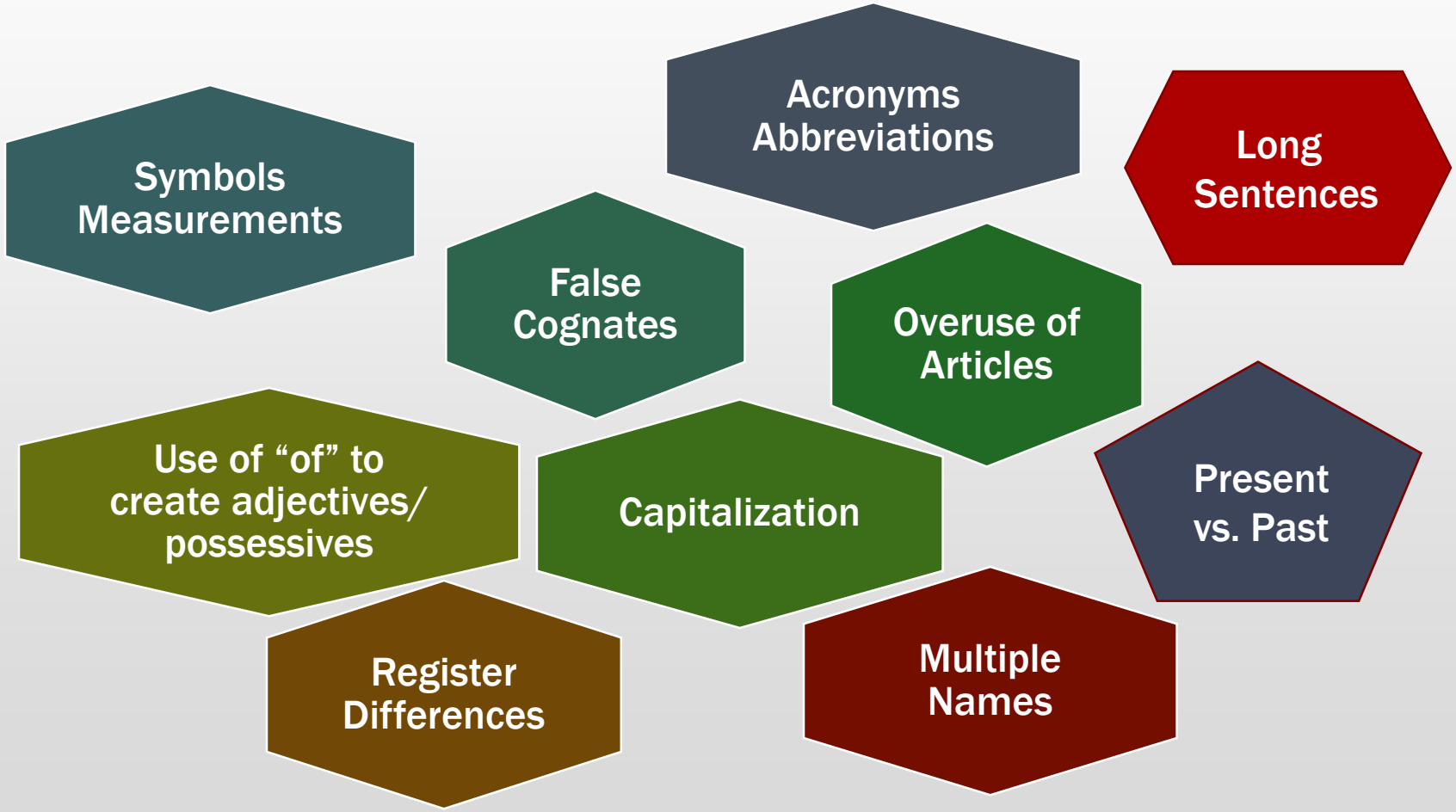
https://onlinelibrary.wiley.com/doi/abs/10.1111/anec.12321

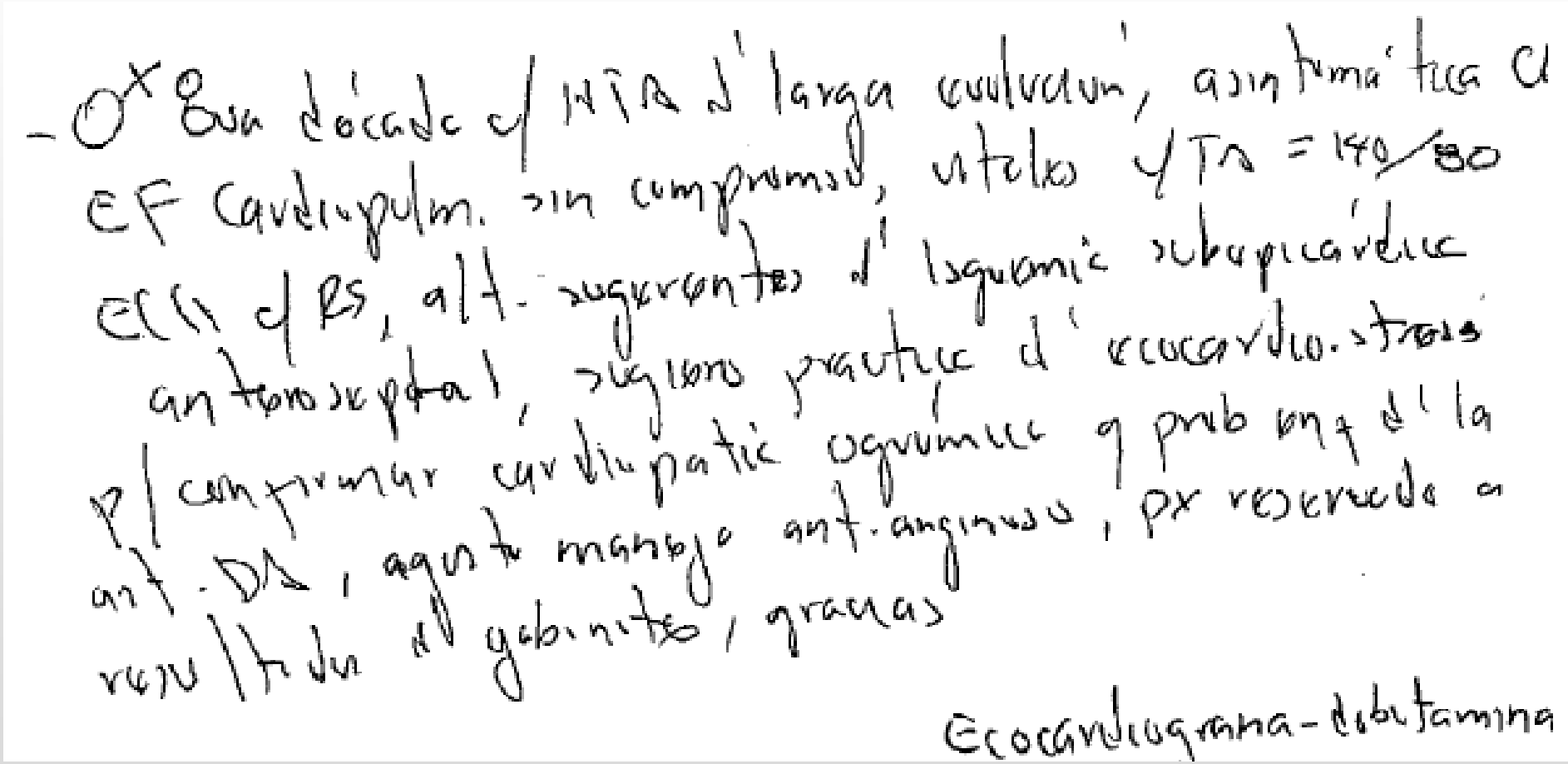
Where are they found?

- Patient Charts
- Discharge Summaries
- Progress Notes
- Specialist Reports
- Scans and Strips
- Professional

Difficulties



Translations - Patient Charts



Translations - Patient Charts

Female, in her 70s, with long-term HTN, asymptomatic. On physical examination, no cardiovascular system impairment, vital signs w/ BP = 140/80
ECG w/ sinus rhythm (SR) changes suggestive of anteroseptal subepicardial ischemia. I suggested performing a stress echocardiogram in order to confirm ischemic heart disease that likely [illegible] in the [anterior descending artery]. I am adjusting her anti-angina treatment; prescription is subject to all laboratory results. Thank you.

Dobutamine stress echocardiogram

Translation - Discharge Notes/Case Summaries (Epicrisis)

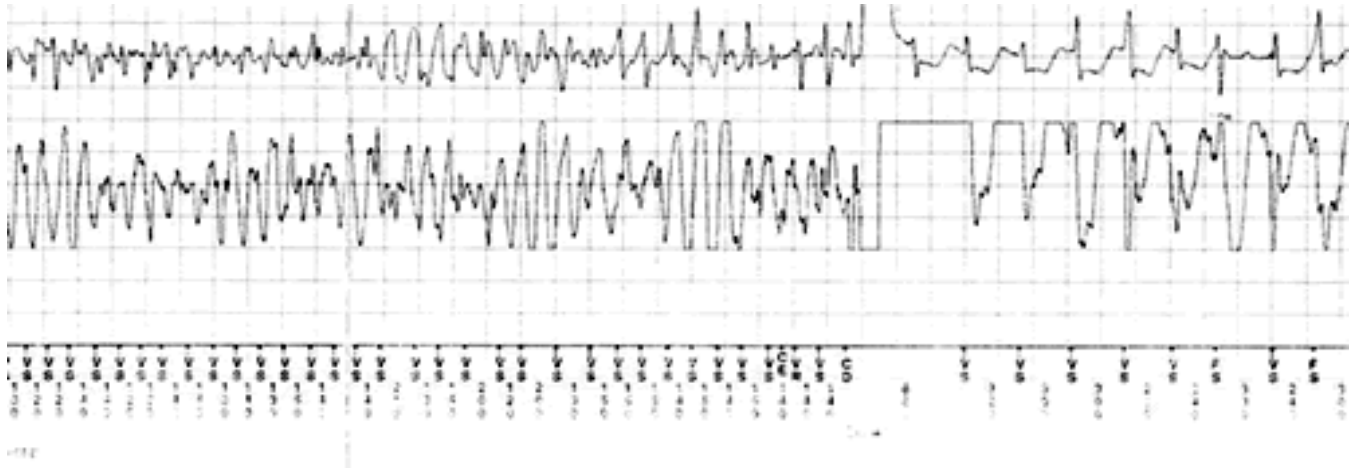
- Hernia dE hiatus.
- Visitada en CCEE de cardiologia el 03.03.2018: por cuadro de dolor tipo anginoso. ECG: RS a 75 lpm QRS estrecho. Ecoscopia: FEVI nomal no segmentarismos. IM ligera. Resto de valvulas Ok. VD no dilatado. No derrame pericardico. Se descarta ergometria convencional porque refiere que no puede hacerla por dolores lumbares. Se solicita SPECT. Desde esta visita toma Coronur.
- SCASEST 03/2018 (ECG aprecia Descenso del ST en I,II y aVL,V4-V6. No cambios a la administracion de NTG. Se deriva a Hospital Clinic donde le realizan triple Bypass el pasado 16.03.2018.

Translation -Discharge Notes/Case Summaries

- Hiatal hernia.
- Seen at cardiology outpatient services on 03/03/2018 for symptoms of angina. ECG: Sinus rhythm (SR) at 75 bpm, narrow QRS. Echocardiography: normal left ventricular ejection function (LVEF) with no segmental changes. Mild mitral valve insufficiency (MI). Other valves OK. Non-dilated right ventricle (RV). No pericardial effusion. Ruled out conventional stress test because patient reported that she was unable to do it due to low back pain. Ordered a SPECT. She has been taking Coronur since this visit.
- Non ST-elevation acute coronary syndrome (NSTE-ACS) 03/2018. ECG found ST segment depression in I, II and aVL, V4-V6. No changes with administration of nitroglycerin (NTG). Referred to Hospital Clinic where she underwent triple bypass on 03/16/2018.

Translation -Progress Notes

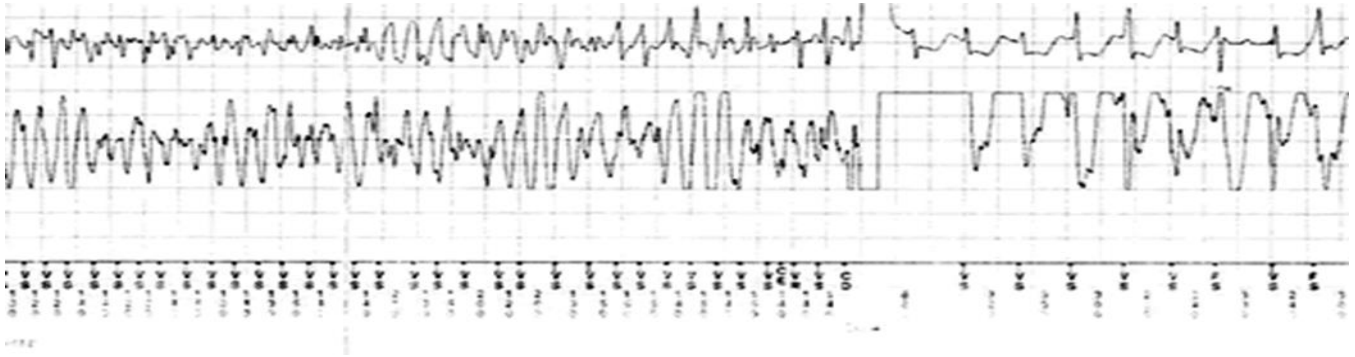
- Luego de su admisión, presentó episodios de arritmia ventricular en tres oportunidades, con registro del CDI de taquicardia helicoidal con posterior cardioversión por descarga del CDI, cuadro que cedió con el aporte de magnesio. (Figura 2).



- Durante su internación, presentó reiterados episodios de taquicardia ventricular polimorfa no sostenida, tipo torsade de pointes, con nuevas descargas del CDI. Se decidió entonces rotar el atenolol 100 mg/día por propanolol 120 mg/día.

Translation - Progress Notes

- Following admission, patient presented with episodes of ventricular arrhythmia on three occasions with a implantable cardioverter-defibrillator (ICD) helical recording of tachycardia followed by cardioversion by shock though the ICD, and symptoms eased with the administration of magnesium. (Figure 2)



- While hospitalized, patient had repeated episodes of nonsustained polymorphic ventricular tachycardia of the Torsades de pointes type with new shocks from the ICD. It was decided to switch atenolol 100 mg/day to propanolol 120 mg/day.

Style Guides - Medications

- AMA Manual of Style
  - Purchase
  - Use online for a fee
- Vancouver Style Guide
- Standard Guides (Chicago, APA)

Drugs.com/International
https://www.drugs.com/international/

International Nonproprietary Names
MedNet https://mednet-communities.net/inn/

Glossaries - Glosarios

Abbreviations – English

Pediatric Cardiology

http://savinglittlehearts.com/chd-heart-abbreviations/

Vascular Surgery

https://vascular.org/sites/default/files/vascular-surgery-abbreviations.pdf

General Glossary – Spanish version and English Version

Texas Heart Institute
https://www.texasheart.org/heart-health/heart-information-center/topics/glosario-de-terminologia-cardiovascular/

Abreviaturas – Español

Revisita española de cardiología

Vol 7

http://www.revespcardiol.org/es/abreviaturas/articulo/13108401/

Vol 8

http://www.revespcardiol.org/es/abreviaturas/articulo/13127252/

Books

Mosby

Stedman

Glossaries - Glosarios

Abreviaturas – español

Enfermedad coronaria en la mujer

http://www.fac.org.ar/1/publicaciones/libros/mujer/abreviaturas.php

Sociedad uruguaya de cardiología

http://cardiopunta2017.uy/trabajoslibres/abreviaturas

General – inglés>español

Gabriela Durazo

https://docplayer.es/49287937-Glosario-de-cardiologia-general-de-gabriela-durazo-ingles-espanol-espanol-ingles.html

Glosario inglés-español imágenes de resonancia magnética

http://www.medtrad.org/panacea/IndiceGeneral/n26_tradyterm-MendezCendon.pdf

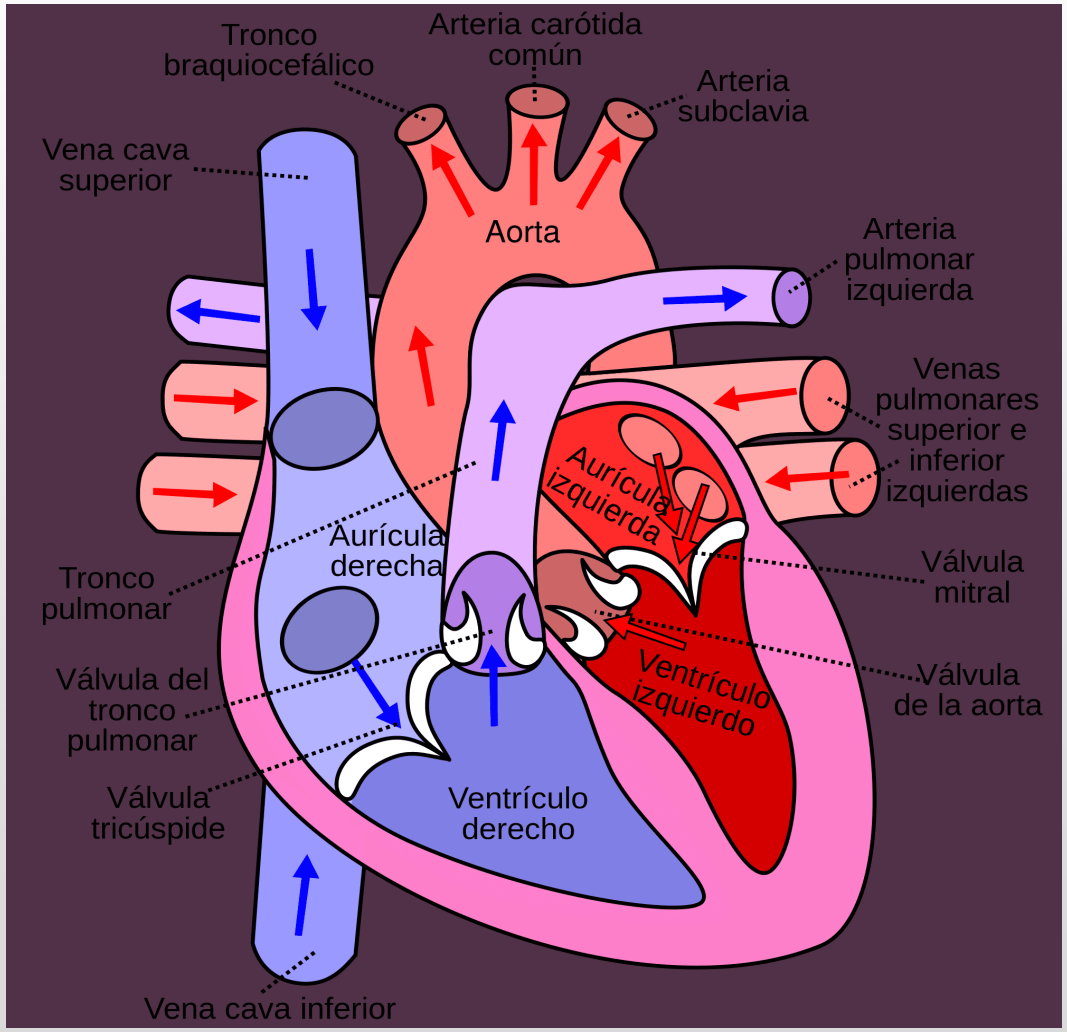
The Heart

EL CORAZÓN

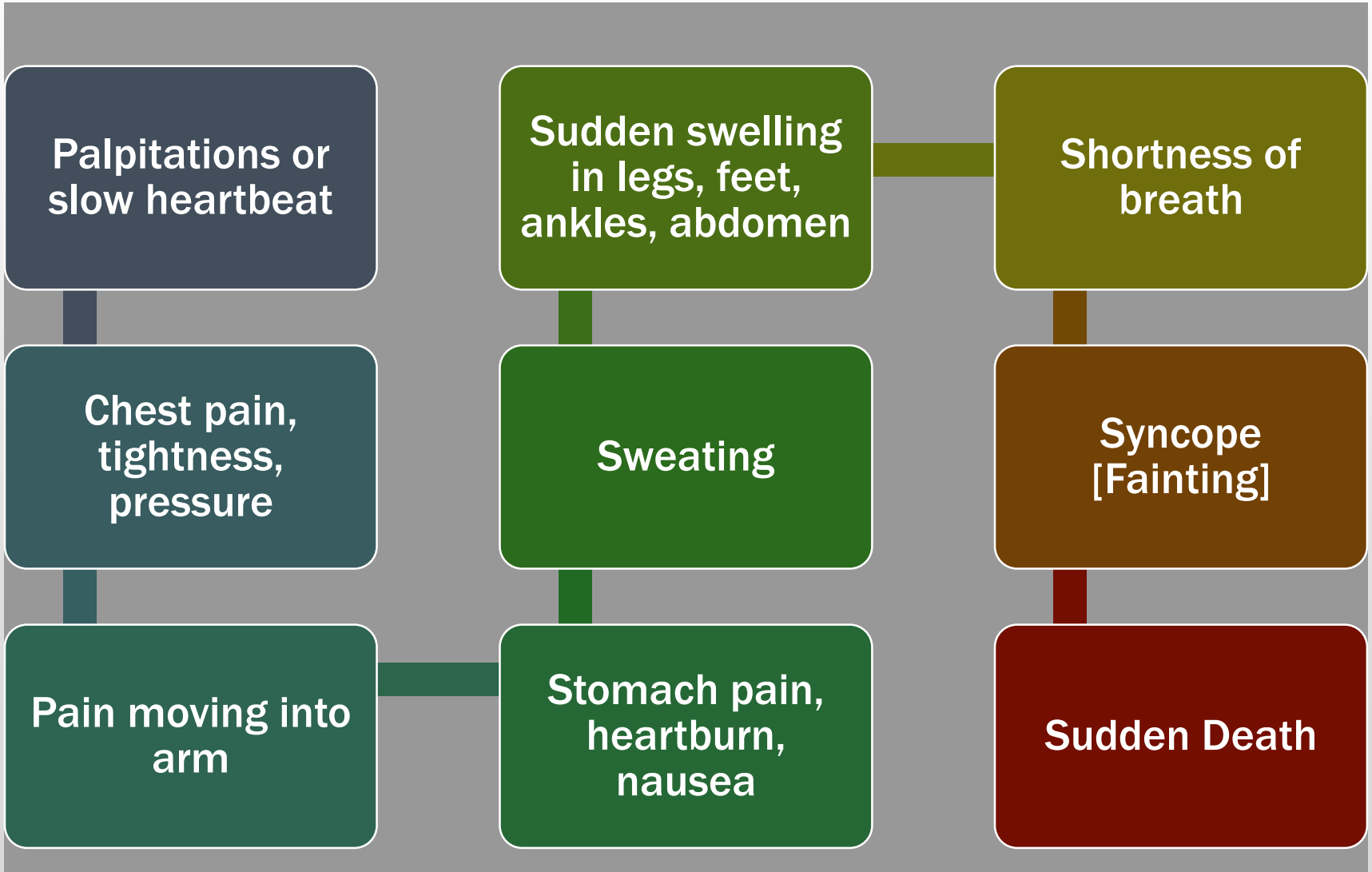
Diagram

Blood flows through the heart in four steps:

1. Right atrium receives oxygen-poor blood from the body and pumps it to the right ventricle through the tricuspid valve.
2. Right ventricle pumps the oxygen-poor blood to the lungs through the pulmonary valve.
3. Left atrium receives oxygen-rich blood from the lungs and pumps it to the left ventricle through the mitral valve.
4. Left ventricle pumps the oxygen-rich blood through aortic valve out to rest of body



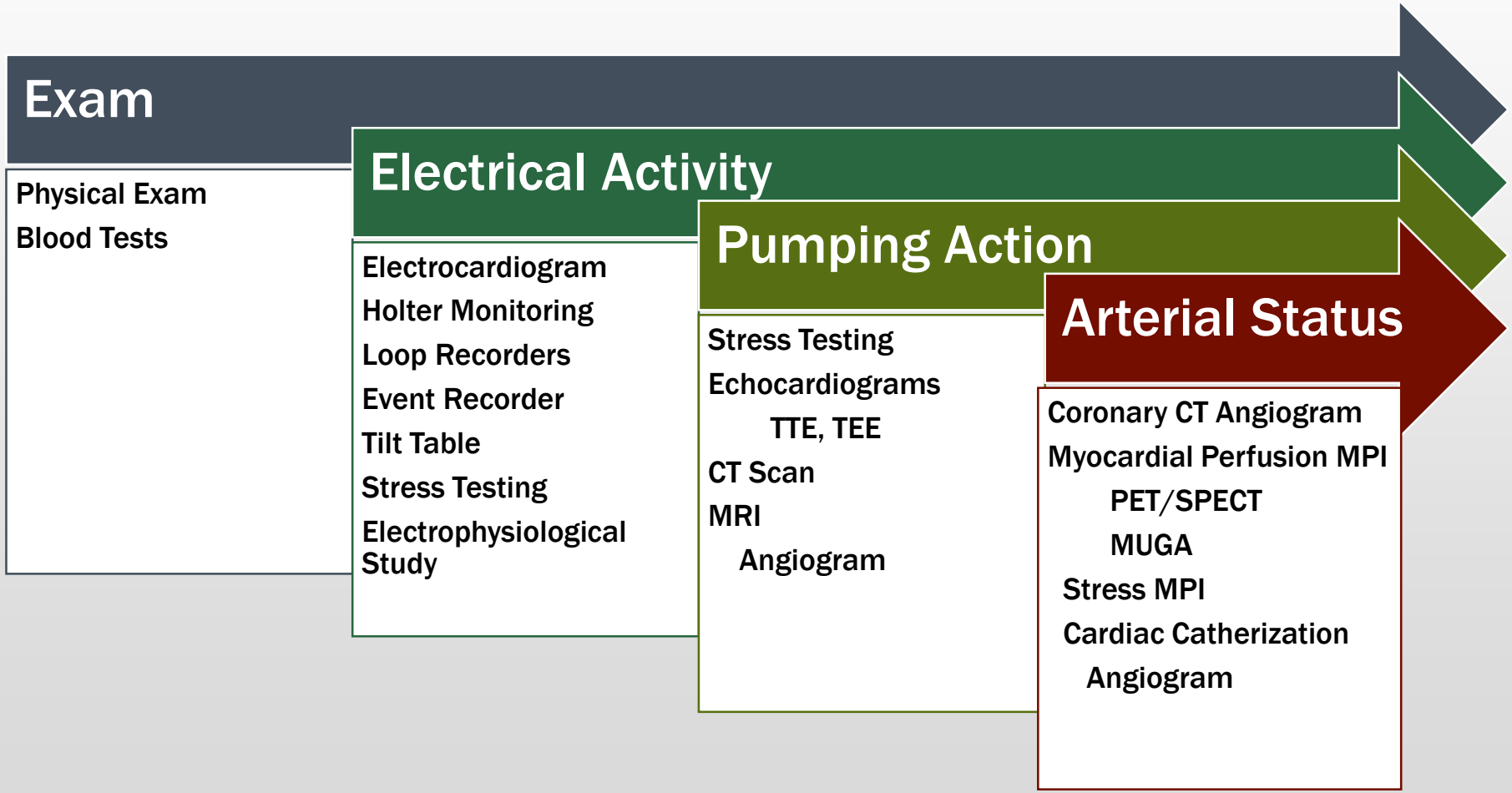
Symptoms of a heart problem



Tests carried out to observe...

- Undiagnosed chest pain, angina
- Electrical activity of heart – rhythm, rate
- Muscle status of heart – pumping action
- Arterial supply to heart muscle
- Vasculature status
- Functioning of heart valves
- Pericardium status – disease, failure
- Diagnose fainting spells

Possible Test Progression



How are tests chosen?

Electrocardiogram (ECG) (EKG)

ELECTROCARDIOGRAMA (ECG)

Electrocardiography - Electrocardiografía

What is it?

A recording heart's electrical activity to show anomalies (arrythmias).

Electrodes (usu. 12) attached to chest and other parts of body. These are connected to wires that feed results into machine that prints them out in form of waves. Not translated: I, II, III on limbs, additional limb: aVR, aVL and aVF Chest: V1 to V6

Why is it used?

Not invasive, easily available, few risks, not as expensive as other testing.

Establishes baseline information about structure of heart and its electrical conduction patterns.

Shows basic problems with heart tissues, chemical imbalances, enlarged or thickened muscles in walls of heart's chambers.

Electrocardiogram Measurements

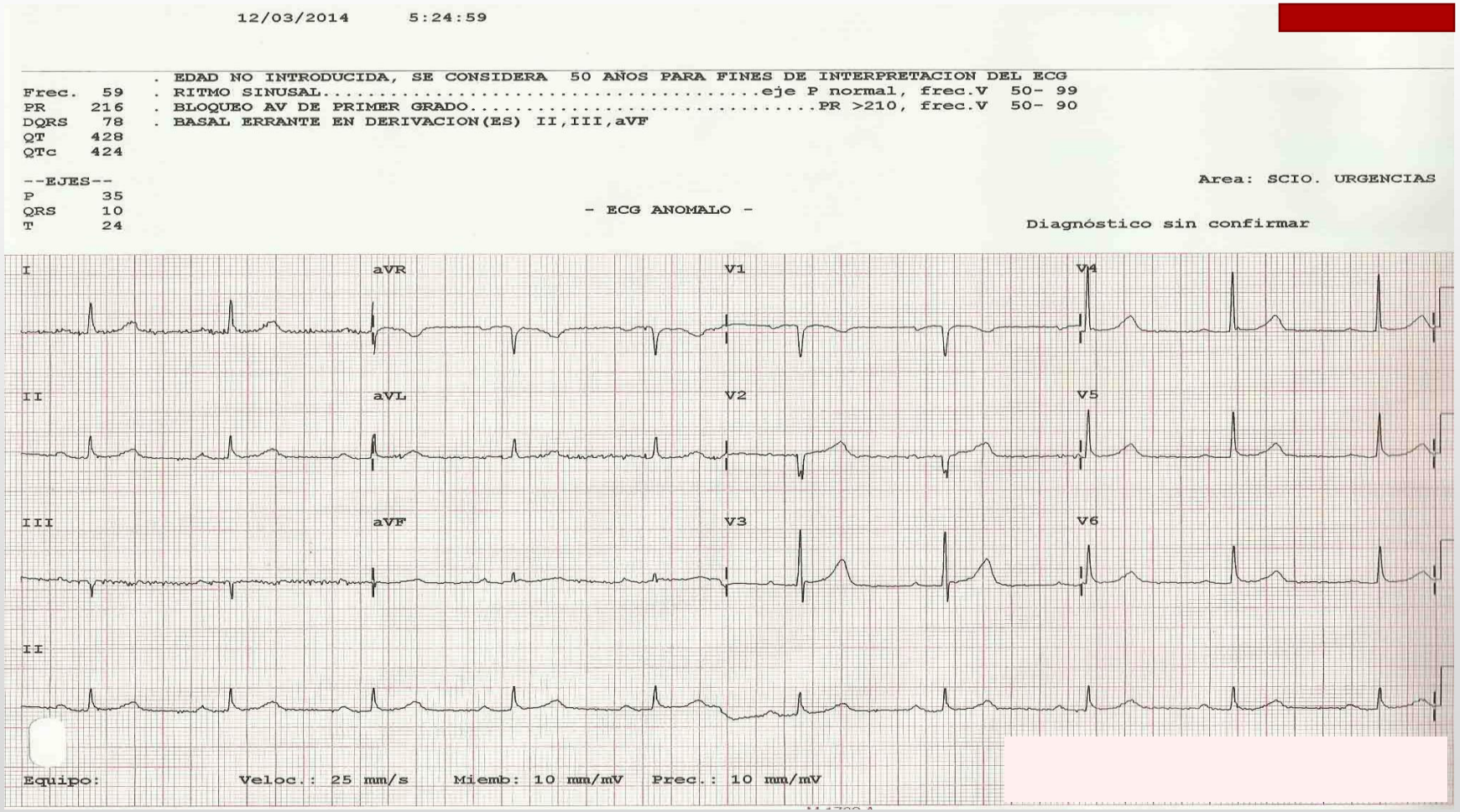
Heart Rate & Rhythm	• Rate = How fast (bpm) • Rhythm = Regular, Irregular, Regularly irregular
PR interval	• Start of P wave (the onset of atrial depolarization) until start of the QRS complex (the onset of ventricular depolarization);
QT interval	• From start of the Q wave to end of the T wave in the heart's electrical cycle. • Depolarization and repolarization of the ventricles.
Cardiac axis	• The vector sum, or average direction of the depolarization as it spreads through the ventricles.
ST segment	• The flat, isoelectric section of the ECG between the end of S wave (the J point) and start of the T wave. Represents the interval between ventricular depolarization and repolarization.

Key ECG Terms

(Lead labels don't change I, II, II, aVR, aVL, aVF, VI- V6)

- derivación – lead
- RS – SR (sinus rhythm) (normal)
- infra ST, infradesnivel del segmento ST –ST segment depression
- intervalo QT, intervalo PR – QT interval, PR interval
- línea basal errante – baseline drift, baseline wander
- onda aplanada – flattened wave
- onda de rampa suave – sloped wave
- onda invertida – inverted wave
- onda de rebote – reflection wave
- onda con muesca, onda dentada – notched wave
- onda picuda – peaked wave

Translation – ECG Scans and Strips



Translation – ECG Scans and Strips

03/12/2014 05:24: 59 AM

AGE NOT INPUT, WILL BE CONSIDERED TO BE 50 YEARS OLD FOR ECG INTERPRETATION PURPOSES.

HR 59 SINUS RHYTHM . . . . . .normal P axis, V-rate 50-99

PR 216 FIRST DEGREE AV BLOCK . . . . . PR>210, V-rate 50-90

QRSd 78 BASELINE WANDER ON LEAD(S) II, III, aVF

QTc 424

AREA: EMERGENCY DEPARTMENT

- - AXES - -

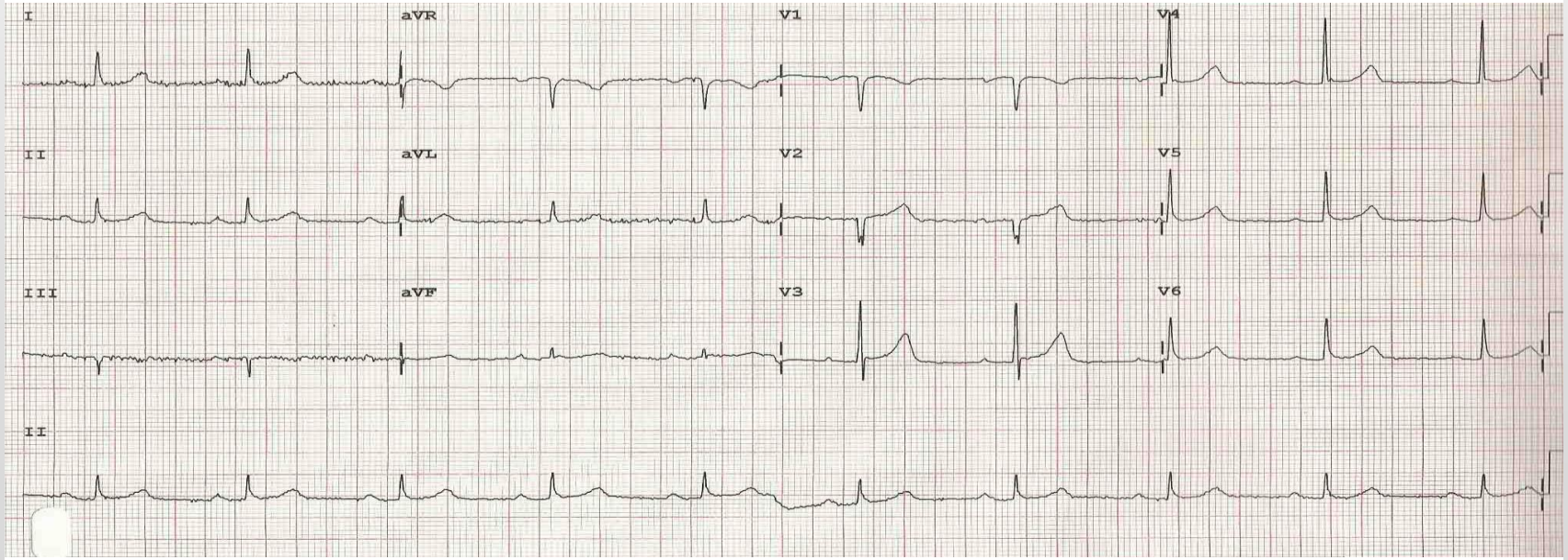
P 35

QRS 10

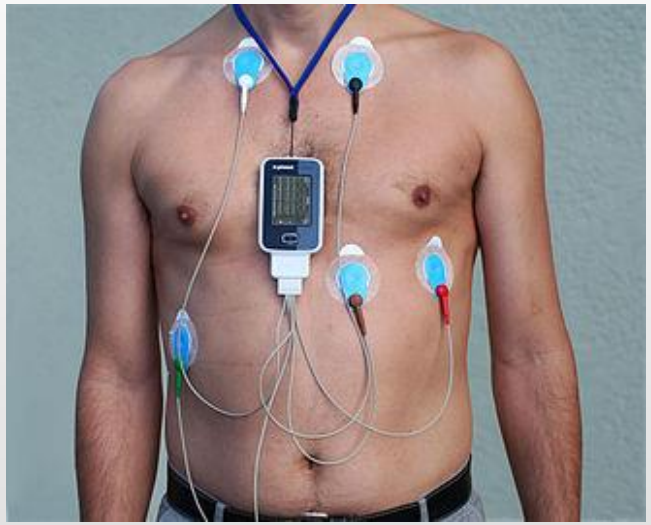
T 25

- ABNORMAL ECG –

Unconfirmed diagnosis



Team: Speed: 25 mm/s Limbs: 10 mm/mV Rate: 10 mm/mV :



Holter Monitoring

Monitorización Holter

Monitoreo Holter

Monitorización cardíaca en el hogar

Electrocardiografía ambulatoria

Holter Monitor – Monitorización Holter, Electrocardiografía ambulatoria

What is it?

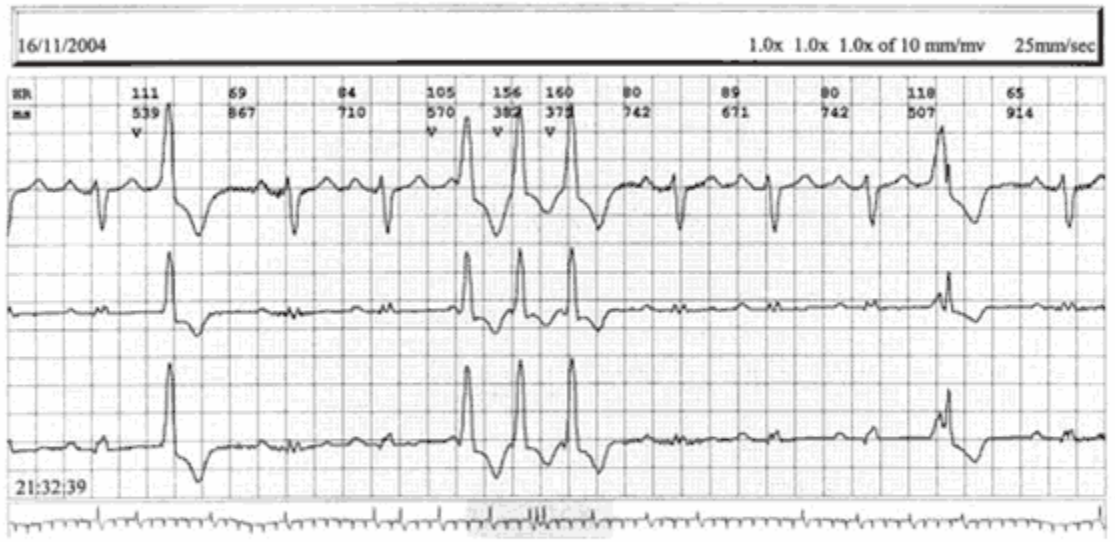
- Outpatient electrocardiography
- Small, battery-powered ECG
- Placed on chest with leads that record continuously for 24-48 hours
- Accompanied by activity diary
- Recording analyzed by health professional

Why is it used?

- Non-invasive, few risks, less expensive
- Used if electrocardiogram results inconclusive due to brief testing period or to diagnose fainting
- May show "silent" problems
- Arrythmias: palpitations, slow heart rate, skipped beats

Translation - Holter

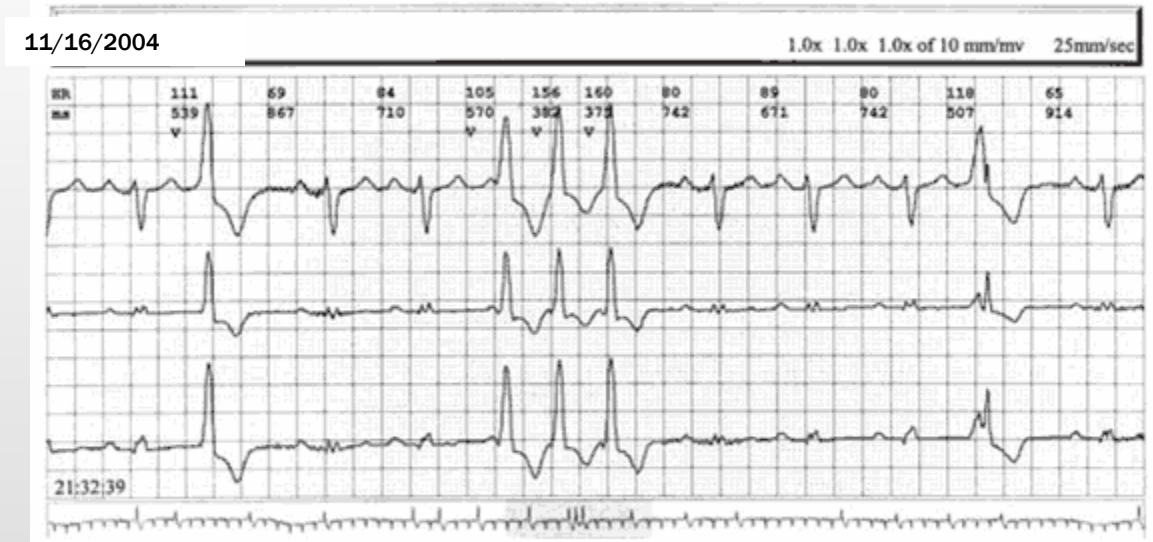
Ejemplos de trazados de Holter



Ritmo sinusal que alterna con extra-sístoles ventriculares (EV) frecuentes y un episodio de taquicardia ventricular no sostenida (3 complejos ventriculares con la misma morfología de los EV).

Translation - Holter

Examples of Holter Tracings



Sinus rhythm alternating with frequent ventricular extrasystoles (VES) and an episode of nonsustained ventricular tachycardia (3 ventricular complexes with the same morphology as the VESs.

Translation - Holter

Holter (13/02/2014): aleteo con pasaje AV variable predominio 4:1 diurno, pausas 1976 mseg con QRS angosto pudiendo corresponder a BAV alto grado transitorio durante el sueño.
ETE (29/10/2014): AI dilat leve. Sin masas ni trombos endocavitarios, septum indemne sin flujo transeptal

Holter (02/13/2014): Flutter with variable atrioventricular (AV) node conduction of predominantly 4:1 daily, 1976 ms pauses with narrow QRS, which may correspond to a high grade temporary atrioventricular block (AVB) while sleeping. Transesophageal echocardiogram (TEE) (10/29/2014): Mild enlargement of left atrium (LA). No masses or intracavitary thrombi, undamaged septum without transseptal flow.

Event Recorders

Registrador de evento

Monitor de eventos cardíacos

Grabador de eventos cardíacos

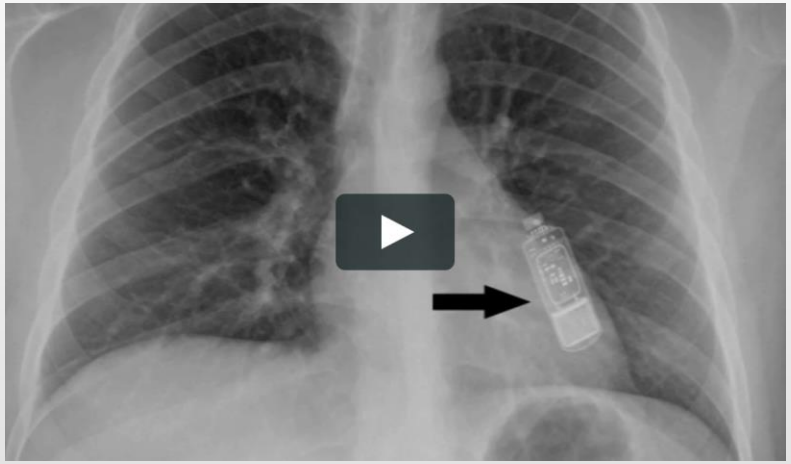
Event Recorder – Registrador de evento

What is it?

- Small, battery-powered ECG machine can carry in your pocket or wear on your wrist or belt.
- Does not record continuously. Individual turns on when feel symptoms (dizzy, irregular heartbeat) and places electrodes on chest.
- Samples transmitted for evaluation by healthcare professional

Why is it used?

- Non-invasive, few risks, less expensive
- To detect problems that don't show up on standard ECG
- Same reasons as for Holter but can be used for longer time (month or more) in order to analyze sporadic events.



Loop Recorder Implantable/ Insertable Heart Monitoring

Registrador subcutáneo implantable

Registrador de bucle implantable

Holter implantable subcutáneo

Loop Recorder – Implantable/insertable cardiac monitoring – Registrador subcutáneo implantable

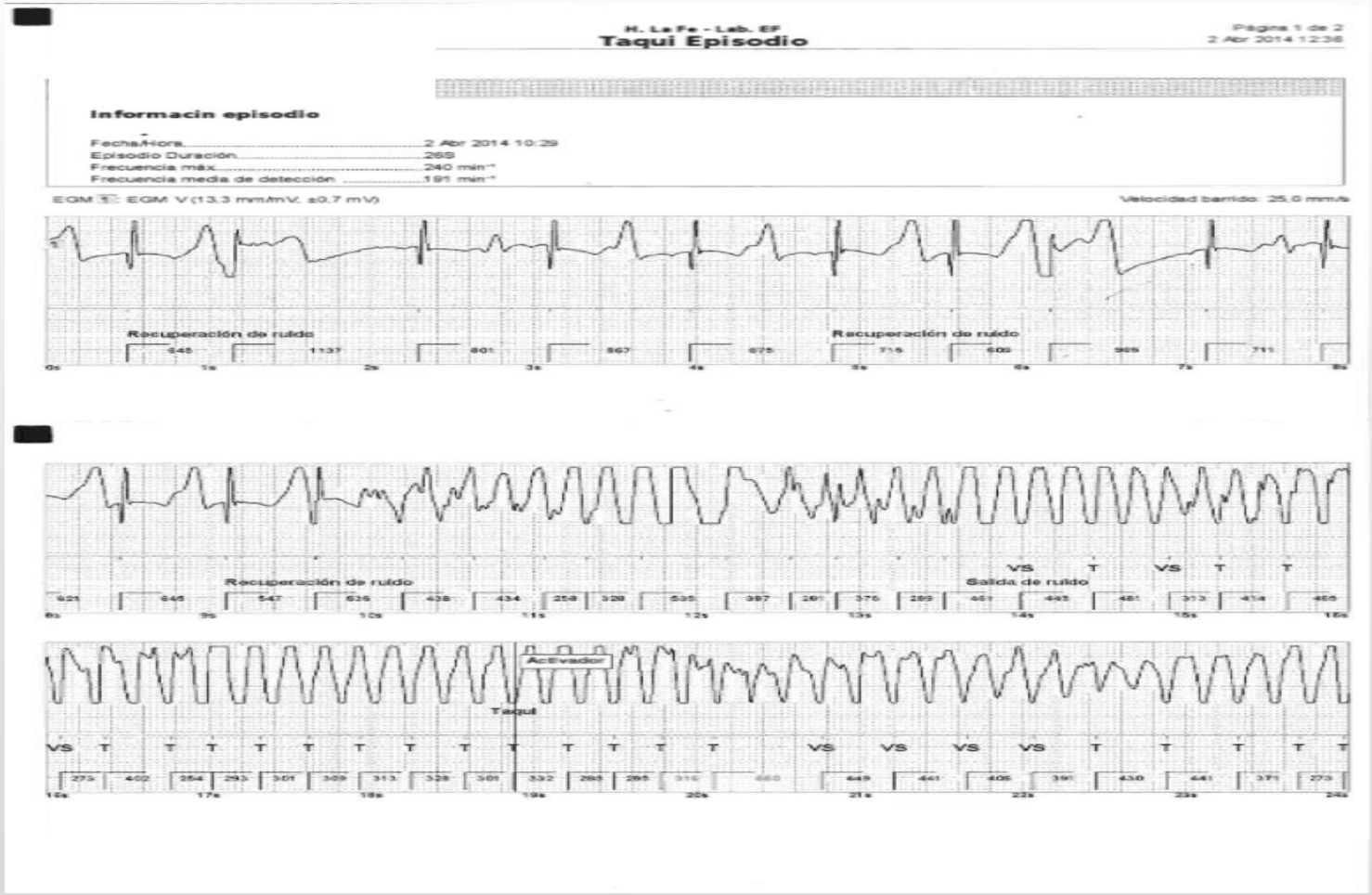
What is it?

- Device the size of a zip drive is implanted surgically under the skin (subcutaneously)
- When event occurs, individual presses button to send signal through activator (some are automatically triggered by heart rate changes)
- Events stored in memory with electrical activity before, during, and after for later evaluation by healthcare professional

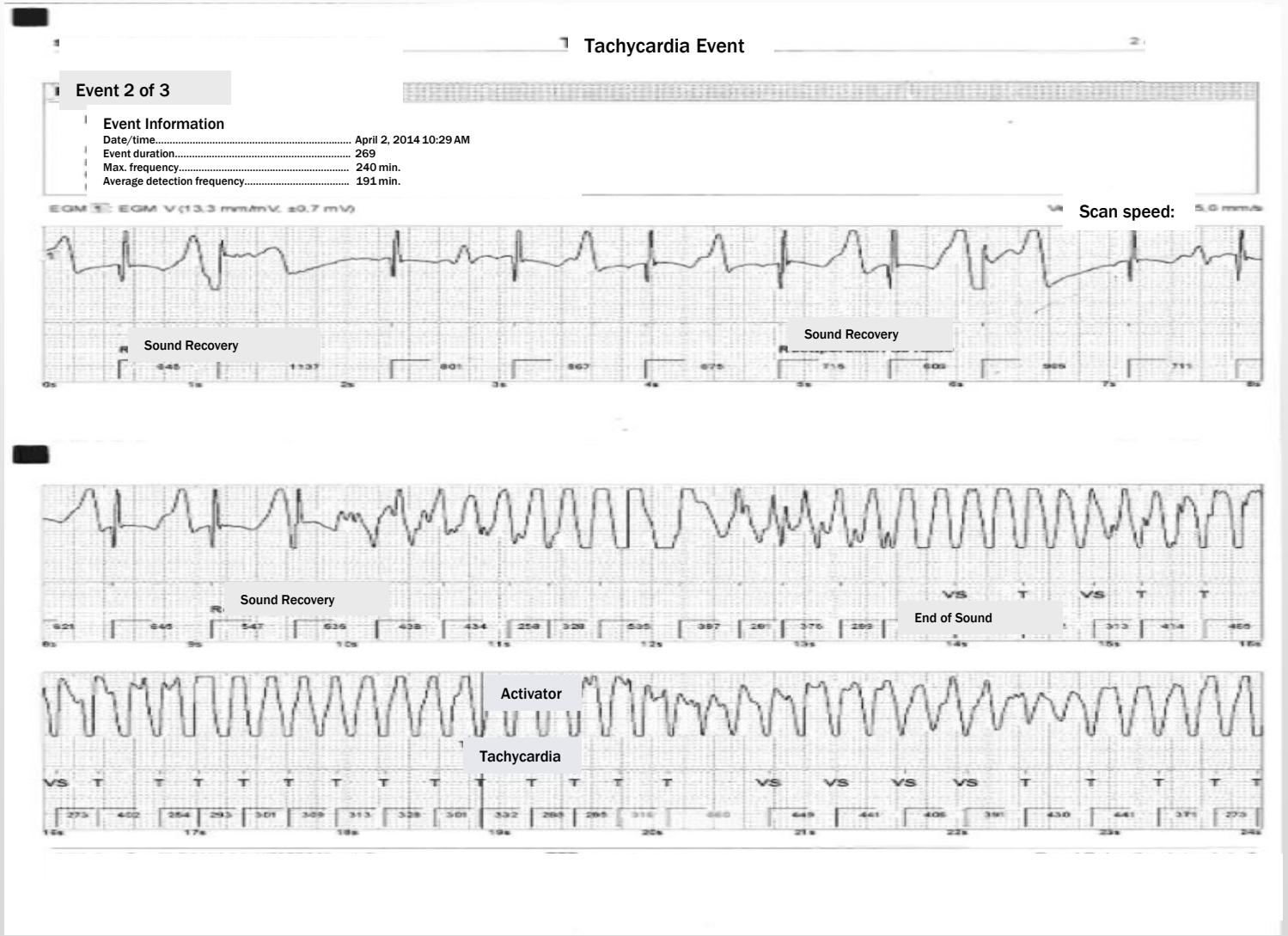
Why is it used?

- Non-invasive, few risks, less expensive
- Higher rate of diagnosis than with event recorder
- Can be continuous heart monitoring instead of event recording
- Can be left in place up to 2 years
- Most common is Reveal LINQ (Medtronic) – now 3 years.

Translation - Loop Recorder Strip



Translation - Loop Recorder Strip



Tilt Table Test

Prueba de la mesa inclinada

Prueba de inclinación

Prueba de la mesa basculante

Tilt-test

Tilt Table Test– Head-Up Tilt Table
Prueba/Test de la mesa inclinada/basculante

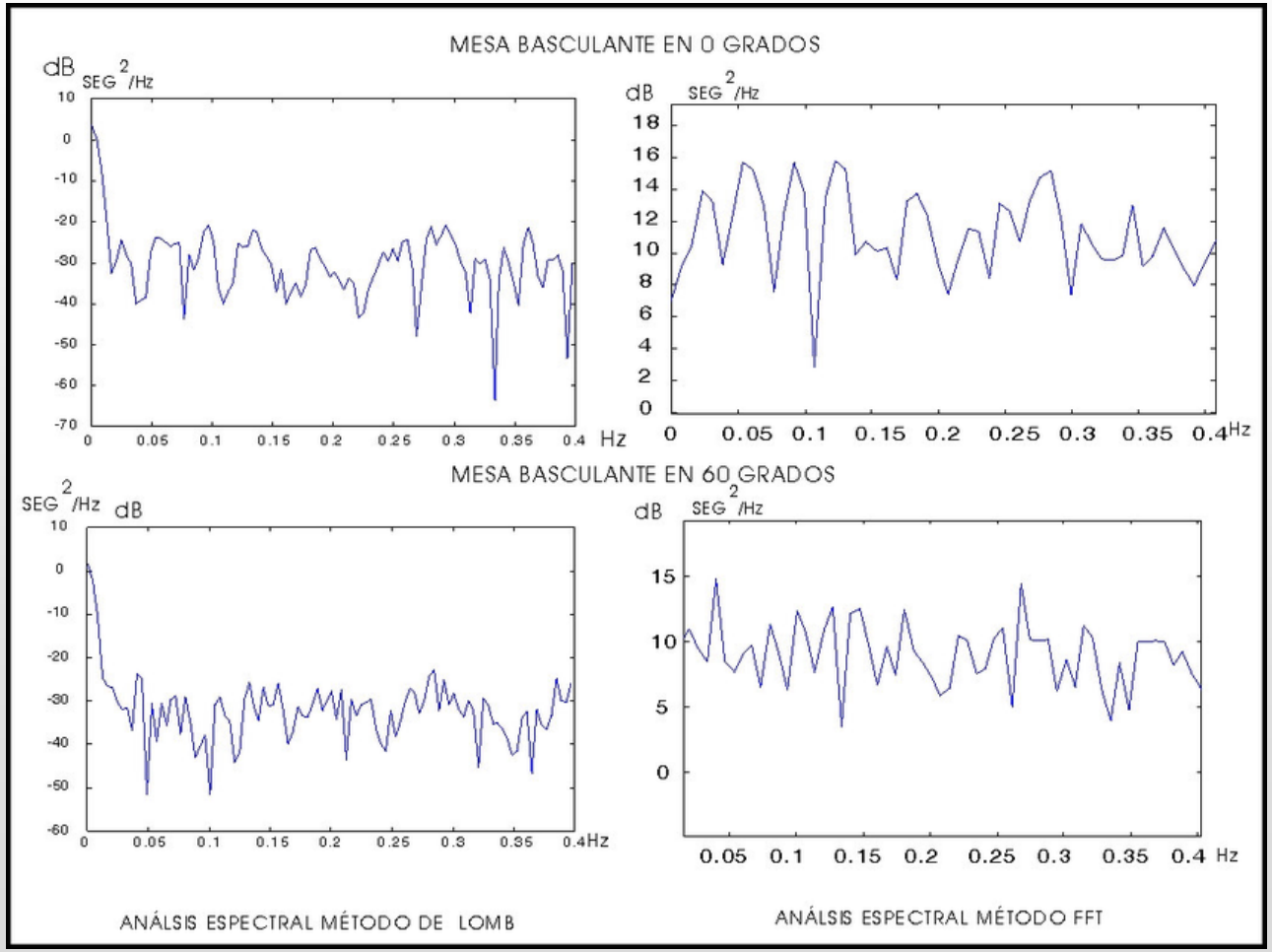
What is it?

- Patient strapped to table lying flat and then tilted almost completely upright, then at different angles
- Sometimes with IV administered drug, glyceryl trinitrate (nitroglycerin) or isoprenaline (medications to make heart beat faster)
- Blood pressure, pulse, electrocardiogram, and sometime blood oxygen saturation recorded and analyzed

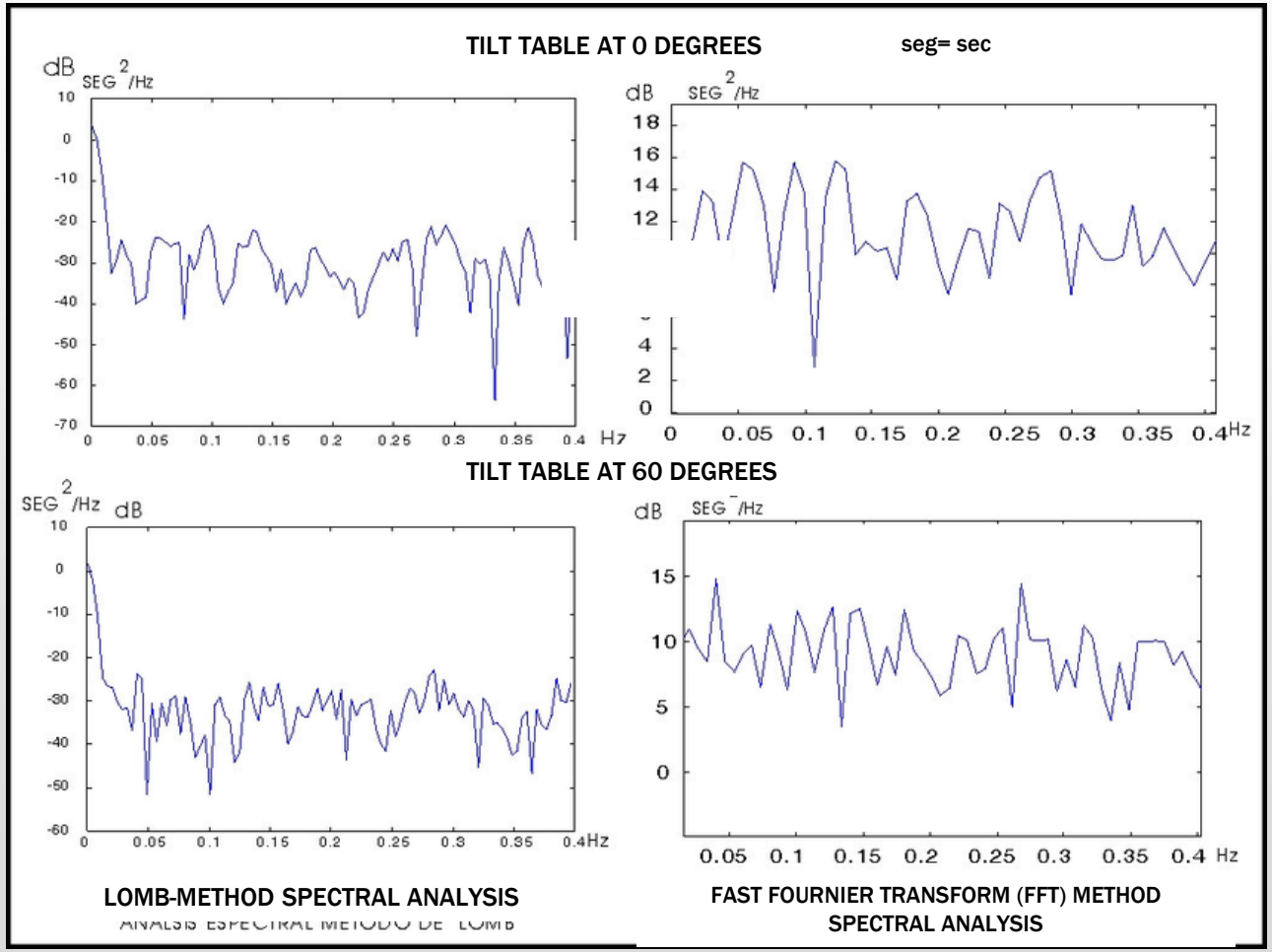
Why is it done?

- Non-invasive, few risks, less expensive
- Used to diagnose syncope (fainting, dizziness) suspected to be associated with drop in blood pressure or positional tachycardia

Translation - Tilt Table –
Prueba/Test de la mesa inclinada/basculante



Translation - Tilt Table –
Prueba/Test de la mesa inclinada/basculante



Stress Testing

Prueba de esfuerzo

Ergometría

Prueba ergométrica graduada

Prueba de esfuerzo con ejercicio

Stress Testing - Prueba de esfuerzo

What is it?

- Electrodes on chest for ECG, blood pressure cuff, and gamma camera may be used during regular exercise (treadmill or bike) or instead with medication-induced stress to see reactions.
- Non-exercise option with drugs (Dobutamine)

Why is it used?

- Non-nuclear stress testing: non-invasive, few risks, less expensive
- To show blood flow issues, mitral stenosis, mitral or aortic failure
- To demonstrate if there is reactive hypertension
- Can add Nuclear stress testing if regular stress test did not pinpoint cause of symptoms

Translation - Stress ECHO with dobutamine

ECOCARDIOGRAMA DE ESTRESS DOBUTAMINA
Protocolo: Dosis de 10 a 50 mcg/kg/min, alcanza 124 lpm (85% de la FCM). Se administraron 3 mgs de esmolol IV * Estudio Basal:
- Ventriculo izquierdo de tamaño normal, con hipertrofia parietal leve concentrica, funcion sistolica globa conservada en reposo, FEVI 60% sin alteraciones de la contractilidad segmentaria. Disfuncion diastolica grado I, con relacion E/E´de 8.4.
- Dilatacion moderada de la auricula izquierda (35 ml/m2 SC). Auricula derecha de tamaño normal
- Ventriculo derecho de tamaño y contractilidad normales
- Valvula aortica de aspecto degenerativo, engrosada, con leve calcificacion, sin lesion significativa.
- Raiz aortica y aorta ascendente proximal de tamaño normal, con esclerosis leve.
- Tronco de la arteria pulmonar de tamaño normal
- Valvula mitral con esclerosis leve, insuficiencia leve. AVM normal por THP - valvula tricuspide con insuficiencia leve, no se registra gradiente reverso significativo - No hay datos indirectos de hipertension arterial pulmonar
* Durante el estress inicial presenta un aumento de la contractilidad global, grosor parietal y la FEVI, en l dosis maxima se observa hipocinesia del septo anterior apical y septo medial, asociado a disnea. TA en e estress: 84/45. TA inicial 106/53, TYA final 100/54.
* Electricamente: Ritmo sinusal, PR normal, no necrosis, lesion o isquemia, durante el estress se observ repolarizacion precoz con elevacion del punto J en V3-V4, no arritmiaS
CONCLUSIONES: Eco Estress al 85% de la FCM de ALTA PROBABILIDAD para Isquemia Miocardica en dos segmentos del territorio de la coronaria descendente anterior

Translation - Stress with dobutamine

DOBUTAMINE STRESS ECHOCARDIOGRAM
Protocol: Dose of 10 to 50 mcg/kg/min, reaching 124 bpm (85% of maximum heart rate [MHR]). Administered 3 mg of esmolol IV* Baseline Test:
– Left ventricle of normal size, with mild concentric parietal hypertrophy, normal global systolic function at rest, left ventricular ejection fraction (LVEF) 60% with no changes in segmental contractility. Grade I diastolic dysfunction, with E/E' ratio of 8.4.
– Moderate enlargement of the left atrium (35 mL/m^2 BSA). Right atrium of normal size
– Right ventricle of normal size and contractility
– Aortic valve of degenerative appearance, thickened, with mild calcification, with no significant lesions.
– Aortic root and proximal ascending aorta of normal size, with mild sclerosis.
– Trunk of the pulmonary artery of normal size
– Mitral valve with mild sclerosis, mild insufficiency. Normal mitral valve area (MVA) by pressure half-time (PHT) – tricuspid valve with mild insufficiency, no significant reverse gradient recorded– there are no indirect data of pulmonary arterial hypertension
*During the initial stress, there was an increase in global contractility, parietal thickness and LVEF; at the maximum dose, hypokinesia of the apical anterior septum and middle septum were observed, associated with dyspnea. BP during stress: 84/45. Initial BP 106/53. Final [BP] 100/54.
*Electrically: Sinus rhythm, normal PR, no necrosis, lesion or ischemia; during the stress early repolarization was noted with J point elevation in V3-V4, no arrhythmias.
CONCLUSIONS: Stress echocardiography at 85% of MHR with HIGH LIKELIHOOD of Myocardial Ischemia in two segments of the territory of the left anterior descending coronary artery.

Nuclear Stress Testing - Pruebas de esfuerzo nuclear

What is it?

- Electrocardiogram, blood pressure cuff, and gamma camera (PET or SPECT) used during exercise on bicycle or treadmill
- Alternate rest with activity
- Radioactive tracer is introduced by IV (technetium, thallium, etc.) at peak of exercise in nuclear stress testing to better show problems

Why are they used?

- More invasive, IV, radioactive substances.
- To show blood flow issues, mitral stenosis, mitral or aortic failure
- To assess damage after heart attack
- To diagnose coronary artery disease
- Used when regular stress testing does not produce results.

Translation – Nuclear Stress Testing

Se efectuó una P.E.G. en bicicloergómetro con una carga ininical de 150 Kgm, e incrementos de 150 Kgm cada 3 minutos. En el pico del máximo esfuerzo se inyectaron 25 mCi de Tc99m MIBI en una vena periférica, continuando con el pedaleo por 1 minuto más. Una hora después se adquirieron las imágnes con una cámara Siemens modelo Signature de doble cabezal, con una rotación de 180°, con órbita no circular y detectores a 90°. La adquisición del estudio gatillado se realizó postesfuerzo. Con protocolo de dos días e igual técnica se adquirieron las imágenes de reposo.

A graded exercise test (GXT) was performed on an ergometric bicycle with an initial load of 150 kgm, with increases of 150 kgm every 3 minutes. At peak exertion, 25 mCi of Tc99m MIBI were injected in a peripheral vein, with pedaling continuing for 1 more minute. One hour afterward, images were taken with a dual head Siemens Signature model camera, with 180° rotation, non-circular orbit, and 90° detectors. A gated study was done post-exertion. Images at rest were taken with a two-day protocol and the same technique.

Electrophysio-logical Study

Estudio electrofisiológico

Estudio electrofisiológico intracardíaco (EEFIC)

Electrophysiological study – estudio electrofisiológico

What is it?

- Used to diagnose patients who may have cardiac rhythm issues (arrythmias)
- Local anesthesia, introduction of catheters directed to heart by X-ray or other localization systems that don't require radiation (Navex, Carto, Rhythmia)
- Records electrical activity, defines arrythmia and locates it
- Electrical pulses can be sent to make heart beat at different speeds.

Why is it used?

- More invasive, surgery, more risk and expense. Fairly dangerous if clots present
- Can provide cardiac mapping (cartografía electroanatómica, cartografía cardíaca, mapeo cardíaco) to locate arrythmias
- Determine the types of medicine or procedure that will control abnormal rhythm. (Pacemaker, Implantable defibrillator, cardiac ablation)

Echocardiogram (Echo)

Ecocardiograma (ECO)

Ultrasonido cardíaco

Ecoscopia

Echo: Type 1 - Transthoracic echocardiogram (TTE)

Ecocardiografía transtorácica (ETT)

Transthoracic echocardiogram – Ecocardiografía transtorácica

What is it?

- Most common form of echocardiogram.
- Transducer is placed on the chest or abdomen to obtain still or moving picture of the internal parts of the heart.
- Uses high frequency sound waves (ultrasound)
- Can be contrast-enhanced with micro-bubbles (microburbujas) (gas filled microbubbles administered by IV) High ability to reflect ultrasound waves.

Why is it used?

- Non-invasive testing, few risks, no radiation exposure.
  - The heart can be seen beating and pumping blood in order to:
    - To detect disease in heart muscle, valves, pericardium.
    - To detect heart tumors, birth defects, aneurysms
    - To evaluate murmurs, valve problems, fluid around the heart (leakage)
    - Possible obstructions in arteries

Echocardiogram Types and Techniques

- M-Mode (MME) - modo M, modo unidimensional, modo movimiento – not used much now. One-dimensional analysis of heart in motion. Provides spatial and temporal information. Ultrasound beam passes through single plane of heart
- 2-D and 3-D –Ecocardiografía 2D y 3D - A 2-D echo view appears cone-shaped on the monitor, and the real-time motion of the heart's structures can be observed. A 3D captures three-dimensional views of the heart structures with greater depth than 2-D echo.
- Doppler – Ecocardiografía Doppler [Dópler]. Ecodóppler, Ecodópler - used to measure and assess the flow of blood through the heart's chambers and valves. Frequency of the pitch is higher than in 2D. Used in 3 ways:

Echocardiogram Types and Techniques

- Continuous Doppler – Dópler continuo - uses continuous transmission and reception of ultrasound and measures along entire length of ultrasound beam. It does not measure at a specific depth and does not localize velocity measurements. Can show severity of valve stenosis or regurgitation by assessing shape and density of output.
- Pulsed wave Doppler - Dópler pulsado -measures the blood-flow velocity within a small area at a specified tissue depth by sending quick, short pulses of sound. It is used to assess ventricular in-flow patterns, intracardiac shunts, and to make precise measurements of blood flow at valve orifices.
- Color Doppler –Dópler color - uses measurements of the velocity and direction of blood flow to superimpose a color pattern onto a section of an image. Different colors are used to designate the direction of blood flow. This simplifies the interpretation. Color Flow Mapping – Mapeo Dópler

Translation – TTE - ETT

ECOCARDIOGRAMA 21/01/2015 AI Dilatacion leve
VI fey 55%
deprimida TAPSE 12.5mm
Pericardio: Derrame anteroposterior
(moderado). 5mm posteriro y 4 mm anteriro. Sin
compromiso de cavidades.
ECG: Ritmo irregular, PR 160 QRS 80 mseg, FC
80 eje -30 ST-T nivelado, conclusión: sinusal
con EV aisladas

Translation –TTE - ETT

ECHOCARDIOGRAM 01/21/2015 Slight enlargement of left atrium (LI), left ventricle (LV) ejection fraction (EjF) 55%, depressed tricuspid annular plane systolic excursion (TAPSE) 12.5 mm
Pericardium: Anteroposterior effusion (moderate) 5 mm posterior and 4 mm anterior. Cavities unaffected.
ECG: Irregular rhythm, PR interval 160, QRS 80 msec, HR 80, axis -30, straight ST-T segments, conclusion: sinus rhythm with isolated ventricular extrasystoles (VES).

Translation – TTE - ETT

Se realizó ecocardiograma transtorácico en modo M, bidimensional, Doppler color, pulsado y continuo. Hallazgos: Dilatacion de cavidades derechas . Diametro normal del ventriculo Izquierdo. AI: 65X49MM, AD: 53x62 Sin alteraciones en la movilidad del ventriculo izquierdo. Función sistólica del ventriculo Izquierdo conservada con FE de 64%, TAPSE 20 mm. Relacion E/a: normal . Válvula aórtica sin alteraciones de sus valvas, con una velocidad de 1.4 mseg. Valvula pulmonar sin alteraciones con una velocidad de 1.2mseg. Válvula mitral con insuficiencia severa Válvula tricúspides moderada, gradiente IT de 35 y PSAP; 46mmhg. Presencia de comunicacion interauricular del tipo ostium primum de 8mm con cortocircuito de Izquierda a derecha. Sin evidencia de cortocircuitos ni trombos intracavitarios por este método de estudio. Pericardio normal

Translation –TTE - ETT

A transthoracic echocardiogram in m-Mode, bidimensional, Doppler color, pulsed, and continuous. Findings: Enlargement of right cavities. Left ventricle (LV) is of normal diameter. Left Atrium (LA): 65 X 49 mm. Right Atrium (RA): 53 X 53 mm. No changes in the motility of the left ventricle. Systolic function of the left ventricle intact with an ejection fraction (EF) of 64%. tricuspid annular plane systolic excursion (TAPSE) 20 mm. Normal E/A ratio. Aortic valve without changes in its valves, with a speed of 1.4 ms. Pulmonary valve without changes with a speed of 1.2 msec. Severe insufficiency in mitral valve. Moderate tricuspid valve, tricuspid insufficiency (TI) gradient of 35 and pulmonary artery systolic pressure (PASP) of 46 mmHg. Presence of interatrial communication of the ostium primum type of 9 mm with a short-circuit from the left to the right. No evidence of short-circuits or intracavitary thrombi with this study method. Normal pericardium.

Echo: Type 2 Transesophageal Echocardiogram (TEE)

Ecocardiografía transesofágica (ETE)

Exploración cardíaca con endoscopia

Transesophageal echocardiogram – Ecocardiografía transesofágica

What is it?

- A transducer that produces the sound waves is attached to a thin tube that passes through mouth, down throat, and into esophagus.
- Sounds waves create images for interpretation. More detailed than TTE. Used when patient is obese or has scarring.

Why is it used?

- More invasive (tube into body) but no radiation
- Used when more detail needed, if chest wall is thick, patient obese, patient using ventilator. Better visualization of prosthetic heart valves and clots.
- Shows regurgitation (leaking backward), narrowing (stenosis)
- Sometimes used during surgery to repair valves, aorta tears, or congenital heart lesions.
- Sometimes used with cardiac catheterization.

Translation – Multiple ECHO

INDICACIONES: ECV - FA

EQUIPO:

MODO-M.

		NORMAL			NORMAL
VD (D)	37 mm	(< 30 mm)	Raiz Aortica.	36 mm	(< 35 mm)
SEPTUM (D)	12 mm	(6 – 11 mm)	Aurícula Izq.	26 mm	(< 40 mm)
VI (D)	42 mm	(< 55 mm)	Aorta Asc.	42 mm	(35 mm)
VI (S)	mm	(< 40 mm)	Anillo Ao.	18 mm	(23 – 26 mm)
Pared Post. (D)	11 mm	(6 – 11 mm)	MASA VI		H. (88- 224 g)
Fracción Expulsión.	55%	(> 50 %)			M. (67 – 162 g)

MEDICIONES DOPPLER.

AORTA			
Doppler Pulsado.	69 cm/seg.	ITV (TSVI)	cm.
Doppler Continuo.	133 cm/seg.	T. Eyección.	290 mseg.
MITRAL			
Onda E.	- cm/seg.	T. Desaceleración.	- mseg.
Onda A.	- cm/seg.	Indice Tei. Izq.	
PULMONAR			
Vel. Máxima.	- cm/seg.	T. Eyección.	- mseg.
T. Aceleración.	- mseg.	Continuo	71 cm/seg.
TRICUSPIDE.			
Onda E.	- cm/seg.	Presión Pulmonar.	40 mmhg.
Onda A.	- cm/seg.		

OTRAS MEDIDAS.

Area AI.	26 cm 2	Retardo PP-Septum	mseg.
Area AD.	27 cm 2	Q- Pw Pulmonar.	mseg.
Indice Motilidad VI.		Q- Pw Aortico.	mseg.
Grosor Relativo (VI)	(< 0.42)	DP / DT. VI.	mmHg / seg.
		Qp / Q s	

Translation – Multiple ECHO

Indications: Cardiovascular Disease (CVD) - Atrial Fibrillation (FA)

M-MODE

		NORMAL				NORMAL
Right ventricle (RV) Diastole (D)	37 mm	(<30 mm)		Aortic root	36 mm	(<35 mm)
SEPTUM Diastole (D)	12 mm	(6-11 mm)		Left atrium	26 mm	(<40 mm)
Left ventricle (LV) Diastole (D)	42 mm	(<55 mm)		Asc. aorta	42 mm	(35 mm)
Left ventricle (LV) Systole (S)	mm	(<40 mm)		Aortic ring	18 mm	(23-26 mm)
Posterior Wall Diastole (D)	11 mm	(6-11 mm)		Left ventricular (LV) mass		[H.] (88 – 224 g)
Expulsion Fraction	55%	(>50%)				[M.] (67-162 g)

DOPPLER MEASUREMENTS

AORTA			
Pulsed Doppler	69 cm/sec.	Velocity-Time Integral (VTI) Left Ventricle Outflow Tract (LVOT)	cm
Continuous Doppler	133 cm/sec.	Ejection Time	290 msec.
MITRAL			
E wave	- cm/sec.	Deceleration Time	- msec.
A wave	- cm/sec.	Index	
PULMONARY			
Maximum Velocity	- cm/sec.	Ejection Time	- msec.
Acceleration Time	- msec.	Continuous	71 cm/sec.
TRICUSPID			
E wave	- cm/sec.	Pulmonary Pressure	40 mmHg
A wave	- cm/sec.		

OTHER MEASUREMENTS

Left Atrium (LA) area	26 cm 2	Posterior Wall (PW) - Septum Delay	msec.

Cardiac Computed Tomography (CT)

Tomografía computarizada cardíaca (TCC)

Tomografía computada cardíaca (TCC)

Multi-Slice Computed Tomography (MSCT)
Tomografía computarizada multidetector o multicorte

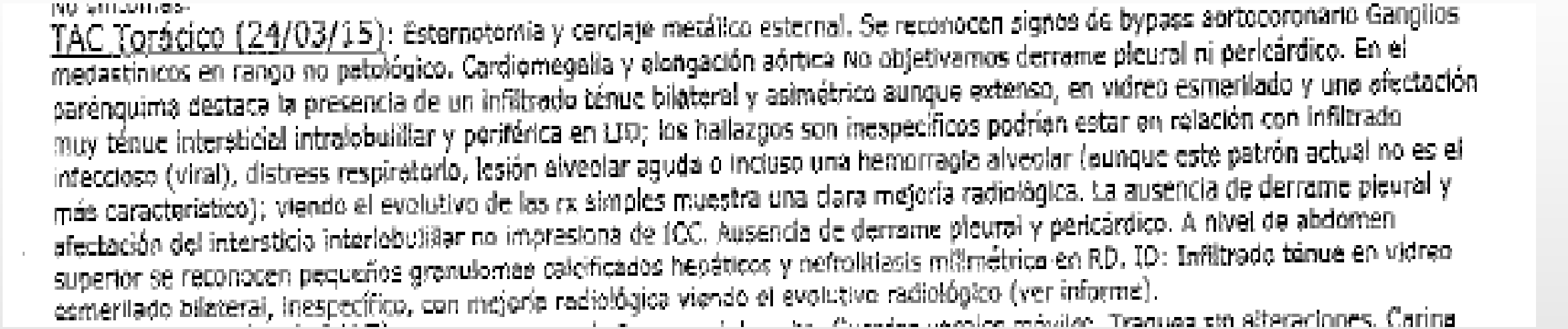
What is it?

- Uses X-rays and computer to create 3-D images.
- Now usually Multislice Computed Tomography (MSCT) – Tomografía computarizada multidetector o multicorte. - Multiple detectors are placed next to each other so the CT can detect multiple slice data at the same time (in a single scan).
- Structures may be seen in movement. Very high spatial and temporal resolution

Why is it used?

- Non-invasive testing, few risks, no radiation exposure.
- To detect lesions or calcium deposits (early calcification) in coronary arteries
- To observe very small structures in movement.
- To make early diagnosis of atherosclerosis

Translation – Thoracic CT



TAC Torácico (24/03/15): Esternotomía y cerclaje metálico esternal. Se reconocen signos de bypass aortocoronario. Ganglios mediastínicos en rango no patológico. Cardiomegalia y elongación aórtica. No objetivamos derrame pleural ni pericárdico. En el parénquima destaca la presencia de un infiltrado tenue bilateral y asimétrico aunque extenso, en vidrio esmerilado y una afectación muy tenue intersticial intralobulillar y periférica en LID; los hallazgos son inespecíficos podrían estar en relación con infiltrado infeccioso (viral), distress respiratorio, lesión alveolar aguda o incluso una hemorragia alveolar (aunque este patrón actual no es el más característico); viendo el evolutivo de las rx simples muestra una clara mejoría radiológica. La ausencia de derrame pleural y afectación del intersticio interlobulillar no impresiona de ICC. Ausencia de derrame pleural y pericárdico. A nivel de abdomen superior se reconocen pequeños granulomas calcificados hepáticos y nefrolitiasis milimétrica en RD. ID: Infiltrado tenue en vidrio esmerilado bilateral, inespecífico, con mejoría radiológica viendo el evolutivo radiológico (ver informe).

Thoracic CT (03/24/15): Sternotomy and sternal metallic cerclage. Signs of aortocoronary bypass are recognized. Mediastinal ganglia in non-pathological range. Cardiomegaly and aortic elongation. We did not see evidence of pleural or pericardial effusion. In the parenchyma the presence of a slight bilateral and asymmetrical infiltrate, although extensive, is noted as ground-glass opacity, and very slight interstitial intralobular, peripheral involvement; the findings are non-specific and could be related to an infectious (viral) infiltrate, respiratory distress, acute alveolar lesion, or even an alveolar hemorrhage (even though this current pattern is not the most characteristic); seeing the progress of simple prescriptions (RX), it shows clear radiological improvement. The absence of pleural effusion and interlobular interstitial involvement does not give the impression of congestive heart failure (CHF). Absence of pleural and pericardial effusion. At the level of the upper abdomen, small calcified granulomas and kidney stones are recognized in the right kidney (RK). Diagnostic Impression: Slight non-specific bilateral ground-glass infiltrate, with radiological improvement when viewing radiological progress (see report).

Coronary Computed Tomography Angiography (CCTA) (CTA)

Angiografía coronaria por tomografía computarizada (ACTC)

Coronariografía por [con] tomografía computarizada

Coronary Computed Tomography Angiography (CCTA) (CTA) – Angiografía coronaria por tomografía computarizada (ACTC)

What is it?

- CT Scan using a powerful X-ray machine and contrast material containing iodine to examine arteries supplying blood to the heart in order to find plaque build-up leading to stenosis
- Cross-sectional images can be reformatted to create 3D images

Why is it used?

- Noninvasive. No radioactive substances. No catheters through groin or arm.
- Low or intermediate risk
- To diagnose and locate arterial stenosis or blockages

Cardiac Magnetic Resonance Imaging

Resonancia magnética cardíaca (RMC)

Resonancia magnética del corazón

Cardiac MRI – Resonancia magnética cardíaca

What is it?

- Uses combination of large magnets, radiofrequencies, and a computer to make detailed images of organs and structures.
- (Possibly can't be used with a pacemaker or with metal inside body)
- Can be used with paramagnetic contrast solution (gadolinium) for a sequential MRI that produces better resolution of myocardial perfusion patterns. This might be used when someone has allergy to iodine used in CT scans

Why is it used?

- Noninvasive, painless, no radiation.
- More detail than other scans: shows functioning and structure
- To evaluate state of heart valves and major vessels
- To detect coronary artery disease and extent of damage, inflammation around heart, congenital defects, tumors, other abnormalities

Translation - MRI

- Se cuantificó el área de miocardio en riesgo en las imágenes T2-STIR como aquella con una intensidad de la señal ≥ 2 desviaciones estándar por encima de la señal del miocardio remoto no infartado (% masa del VI). Se consideró que había hemorragia intramiocárdica ante el hallazgo de un área de baja intensidad de señal rodeada por un área hiperintensa.
- Se cuantificó el área de la necrosis en las secuencias de realce tardío como aquella cuya intensidad de la señal es ≥ 2 desviaciones estándar por encima de la señal del miocardio remoto no infartado (% masa del VI). Asimismo se cuantificó en número de segmentos con un porcentaje de transmuralidad > 50%.

- Quantification of the myocardial area at risk in the T2-STIR images as having a signal intensity of ≥ 2 standard deviations above the remote non-infarcted myocardial signal (% of LV mass). It was believed that there was intramyocardial hemorrhage due to the finding of a low signal intensity area surrounded by an area of hyperintensity.
- The necrotic area was quantified in the delayed enhancement sequences as that with a signal intensity of ≥ 2 standard deviations above the remote non-infarcted myocardial signal (% of LV mass). It was also quantified as the number of segments with a transmurality percentage > 50%.

Myocardial Perfusion Tests – Nuclear Imaging

Pruebas de perfusión miocardíaca

Pruebas Nucleares

Myocardial Perfusion – Perfusión miocárdica- Pruebas nucleares

What is it?

- Combined with CT scan, stress testing, MRI
- Uses radioactive substance, called tracer administered in IV. SPECT or PET camera technology) Type of substance is determined by the camera
- Tunnel-shaped scanner and signals from tracer that computer converts to 3D images

Why is it used?

- More invasive, can involve use of radioactive substances
- Helpful when need to see if discomfort comes from lack of blood flow to heart muscle from blocked arteries.
- Changes in regional blood flow visualized and quantified
- Very useful in combination with anatomical imaging
- Note high cost to producing radionuclides

Single Photon Emission Computed Tomography (SPECT)

Tomografía computarizada por emisión de fotón único (TCEFU)
Tomografía computarizada de emisión monofotónica

SPECT Testing – Tomografía por emission de fotón único

What is it?

- MP Test using large circular device with a rotating gamma camera to acquire multiple images from multiple angles.
- A gamma-emitting radioisotope (radionuclide) such as thallium) injected into bloodstream. Images where cells absorbed radioactive substance.
- A computer applies a tomographic reconstruction to multiple projections yielding a 3D data set.

Why is it used?

- Semi-invasive, IV use, radioactive substance, more expensive
- Provides 3D information and about level of biological activity
- Emissions from radionuclide indicate amounts of blood flow
- SPECT Similar to PET because use of radionuclide and gamma camera but PET tracers emit positrons so more localization information and higher spatial resolution
- SPECT is cheaper – more easily obtained radioisotopes

Translation – SPECT - Stress

DESCRIPCION

Antecedentes:

Cintigrama de Perfusión Miocárdica SPECT MIBI reposo/Dipiridamol.
Se inyectan 8mCi de Tc99m-MIBI, obteniéndose a los 30 minutos imágenes de reposo con adquisición tomográfica del área cardíaca con ángulo de 180º.
Aproximadamente 4 horas después se inyectan 0.568 mg/kg de Dipiridamol e.v. en 4 minutos con control de presión arterial, monitorización cardíaca, handgrip de 4 minutos y se inyectan 22 mCi de Tc99m-MIBI, obteniéndose a los 30 minutos imágenes de estrés con adquisición tomográfica del área cardíaca con ángulo de 180º. Adquisición gatillada (8 Frames/Ciclo). Software de proceso Emory Cardiac Toolbox.

Solo se obtuvieron imágenes de reposo ya que el paciente habia sido revascularizado.
En las imágenes de reposo se aprecia una hipocaptación marcada a nivel apical e inferior y en menor cuantia a nivel septal.

Translation – SPECT Stress

DESCRIPTION
History:

MIBI Myocardial Perfusion Imaging SPECT at rest/dipyridamole.
8 mCi of Tc99m-MIBI was injected and after 30 minutes rest images were obtained with tomographic acquisition of the cardiac area at a 180° angle.
Approximately 4 hours later, 0.568 mg/kg of dipyridamole IV was injected over 4 minutes with monitoring of blood pressure and heart. A 4-minute handgrip strength test was done and 22 mCi of Tc99m-MIBI was injected; after 30 minutes, stress images were obtained with tomographic acquisition of the cardiac area at a 180° angle. Gated acquisition (8 Frames/Cycle). Processing software: Emory Cardiac Toolbox.

Only rest images were obtained since the patient has already been revascularized. The rest images show an marked decrease in uptake in the apical and inferior areas and to a lesser degree in the septal area.

Positron Emission Tomography (PET)

Tomografía por emisión de positrones (TEP)

Positron Emission Tomography (PET)
Tomografía por emisión de positrones (TEP)

What is it?

- Myocardial Perfusion Test using another type of gamma camera to provide information about blood flow through coronary arteries to heart muscle.
- Uses radioactive drug, a tracer, (often 18-fluorodeoxyglucose [FDG]) to show blood flow, metabolism, neurotransmitters
- Gamma camera picks up signals from tracers

Why is it used?

- Semi-invasive, IV use, radioactive substance, more expensive
- To diagnose coronary artery disease and heart attack damage.
- To provide information on type of procedure needed (stent, bypass, angioplasty, etc.)

MUGA – Multigated Acquisition Scan

Ventriculografía con radionúclidos
Ventriculografía nuclear
Gammagrafía MUGA
Gammagrafía cardíaca nuclear

MUGA - Multigated Acqusition Scan – Blood Pool Scan, Radionuclide angiography (RNA), Radionuclide ventriculography

ventriculografía nuclear, gammagrafía MUGA, ventriculografía con radionúclidos, gammagrafía cardíaca nuclear

What is it?

- Used to evaluate pumping action of left ventricle
- Red blood cells labeled with low-dose radioactive tracer (Technetium 99) Injected into IV.
- Gamma camera detects radiation given off by cells in order to produce video images of beating heart
- ECG leads on chest
- Multigated means timing camera to take pictures in relation to the ECG. Also called triggered.

Why is it used?

- Semi-invasive, IV use, radioactive substance, more expensive
- Highly accurate in determining pumping action of heart – left ventricular ejection fraction (LVEF good measure of overall heart function) More accurate LVEF than with ECO
- See what portion heart muscle working abnormally

MUGA scan – Gammagrafía MUGA

- **Resting gated blood pool scan (RGBPS), resting MUGA scans, resting radionuclide angiography** (ventriculografía de equilibrio, ventriculografía en reposo) - A nuclear scan to evaluate how well the heart wall moves and how much blood is pumped with each heartbeat, while you rest. Used to obtain images of both ventricles.

- **Exercise gated blood pool scans, exercise MUGA, exercise radionuclide angiography** (ventriculografía de esfuerzo, ventriculografía en esfuerzo) A nuclear scan to evaluate how well the heart wall moves and how much blood is pumped with each heartbeat, just after you have walked on a treadmill or ridden on a stationary bike.

Cardiac catheterization

Cateterismo cardíaco

Cardiac catheterization – cateterismo cardíaco

What is it?

- Procedure can diagnose and treat.
- Invasive- catheter (a small, flexible, hollow plastic tube) is inserted into an artery or vein in the neck, arm, or groin/upper thigh. A local anesthetic is given.
- The catheter is then threaded through the major blood vessels and into the chambers of the heart
- Small instruments can be advanced through the tube to the tip of the catheter. They include instruments to measure the pressure of blood to take ultrasound images of the interior of blood vessels, to take blood samples from different parts of the heart, or to remove a tissue sample (biopsy).

Why is it used?

- Invasive, surgery, more risk and expense
- Find out if there is disease of heart muscle, valves, or coronary arteries. Gold standard for diagnosing coronary artery disease. Dye may be used.
- Can evaluate structure, function, pressures, oxygen concentrations, biopsies.
- Can be used for diagnosis and for procedures (placement of stents, prostheses) Called interventional or therapeutic catheterization.
- Used for angiography or ventriculography

Coronary angiogram – Angiografía coronaria - Coronariografía

What is it?

- One type of cardiac catheterization.
- This is an X-ray movie taken when radiopaque dye (contrast) visible on X-ray is injected into a cardiac chamber or major blood vessel.
- Small tube (catheter) inserted into artery and threaded through to coronary arteries near heart (leg, arm, neck) (Cardiac catheterization)
- Measures pressures in cavities

Why is it used?

- Invasive, surgery, more risk (stroke) and expense. Uses cardiac catheterization
- To study narrow, blocked, enlarged, malformed arteries
- To help decide appropriate treatment: angioplasty, stent, bypass surgery, medication
- Used in surgery primarily with ablation

Translation – Coronary Angiogram

Coronariografía: Acceso arterial radial derecho
Se realiza angiografía coronaria con técnica habitual
HALLAZGOS CORONARIOGRAFIA
Coronaria izquierda:
-Tronco Común Izquierdo: normal.
- Descendente anterior sin lesiones significativas.
- Circunfleja: estenosis moderadas no significativas en segmento proximal y en porción proximal de bisectriz de calibre intermedio.
Coronaria derecha:
- CD con estenosis 90% en segmento proximal. Los stents implnatados en segmento distal no muestran reestenosis.
JUICIO DIAGNOSTICO
Estenosis severa en segmento proximal de CD. Resto de árbolc roonario sin cambios respecto a procedimiento previo con stnts en CD que mantienen un buen resultado tardió.
Con estos hallazgos se procede a realizaa ICP sobre lesión de CD proximal.
Angioplastia: ANGIOPLASTIA SOBRE ESTENOSIS CORONARIA DERECHA PROXIMAL
Cateter guía JR4/5F. Guia BMW. Tras prediltar la estenosis se implanta stent farmacoactivo Aima 3,0x24. Finalmente se postdilata porción proximal de stent con balón Simpass NC 3,5x15. Buen resultado aangiográfico.

Translation – Coronary Angiogram

Coronary angiogram. Access through right radial artery.
A coronary angiogram is performed with the usual technique.
CORONARY ANGIOGRAM FINDINGS
Left coronary artery:
- Left main coronary artery: normal.
- Anterior descending artery: no significant lesions.
- Circumflex: insignificant moderate intermediate stenosis in the proximal segment and in the proximal portion of the intermediate artery

Right coronary artery:
- Right coronary artery has 90% stenosis in the proximal segment. The stents implanted in the distal segment do not show restenosis

DIAGNOSTIC OPINION
Severe stenosis in proximal segment of right coronary artery. The rest of the coronary artery tree shows no changes with regard to previous stent procedure in the coronary artery which has provided a good long-term effect..
With these findings, a percutaneous coronary intervention (PCI) was performed on the lesion in the proximal coronary artery.
Angioplasty: ANGIOPLASTY ON RIGHT PROXIMAL CORONARY ARTERY STENOSIS
JR4/5 F Guide Catheter. BMW Guide. After predilating the stenosis, a drug-eluting stent is implanted. Aima 3.0 x 24. Finally, the proximal portion of the stent is postdilated with a Simpass NC balloon 3.5 x 15. Good angiographical result.

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