

SALA CONCORDIA B

URGENZE CARDIOVASCOLARI

Moderatori: Francesco Rocco Pugliese, Furio Colivicchi (ANMCO)

Carlo Lavalle

Esistono le aritmie minacciose?



URGENZE CARDIOVASCOLARI

Esistono le aritmie minacciose?

Dott. Carlo Lavallo – Roma-



XII congresso nazionale

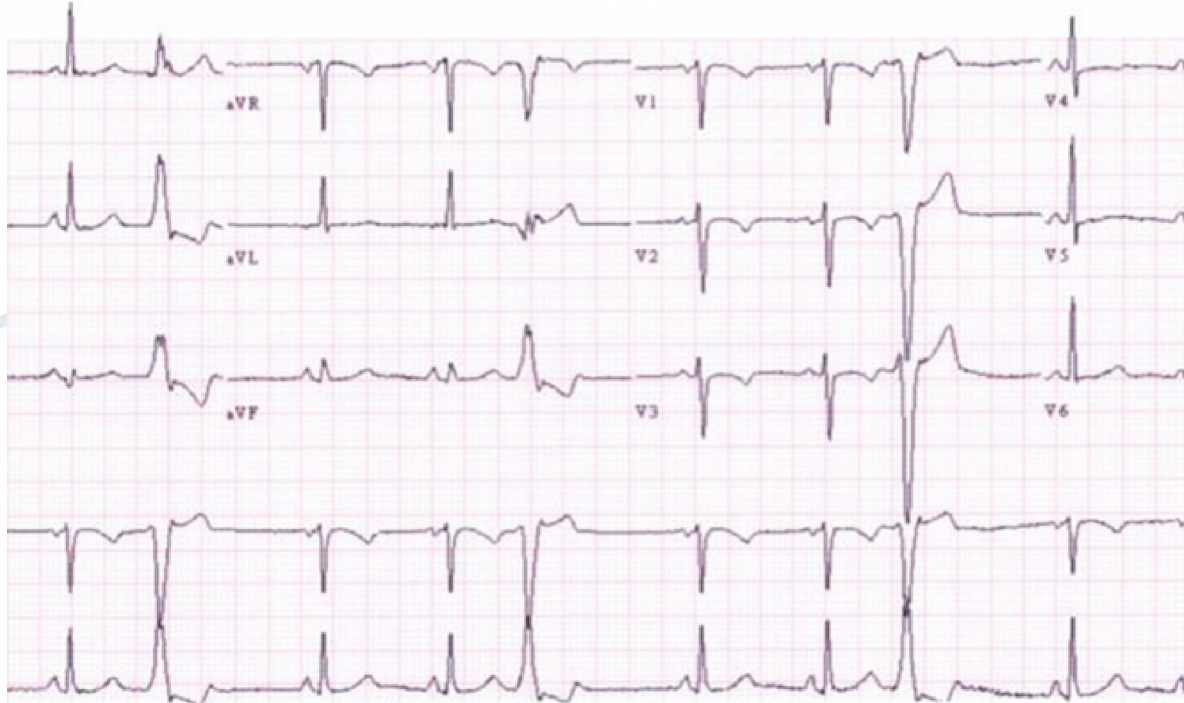
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RICCIONE 13-15 MAGGIO 2022



CASO CLINICO

Maschio 29 aa . Top Player. ECG per idoneità agonistica

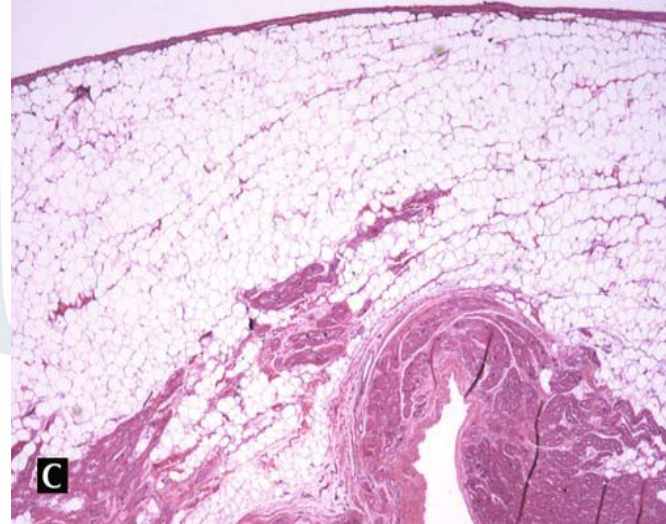


CASO CLINICO

- **Ecocardiogramma:** nei limiti
- **I° Test ergometrico:** Documentazione di 4 battiti extrasistolici ventricolari nel II, IV, V, e VI stadio della prova da sforzo. Le extrasistoli si sono manifestate durante sforzo.
- **II° Test ergometrico** a distanza di un anno: Documentata una singola extrasistole al tracciato pre-test (quindi a riposo) e “sporadica extrasistolia ventricolare a due morfologie per tutta la durata della prova”. Quindi nella suddetta prova da sforzo sono state registrate extrasistoli durante lo sforzo e con differenti morfologie (polimorfe).



MORTE IMPROVVISA NEL SONNO



DISPLASIA ARITMOGENA DEL VENTRICOLO DESTRO



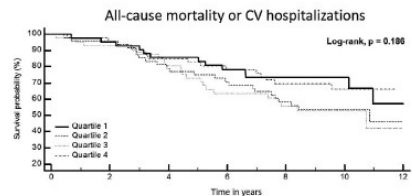
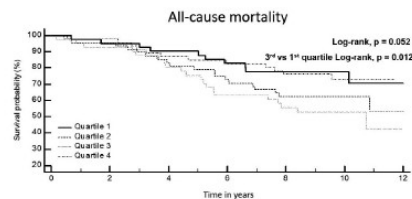
COSA RENDE UN'ARITMIA MINACCIOSA?

- Presenza di instabilità emodinamica
 - Cardiopatia strutturale
 - Frequenza elevata
- Instabilità elettrica
 - Propensione alla degenerazione in TF/Tdp (Canalopatie)

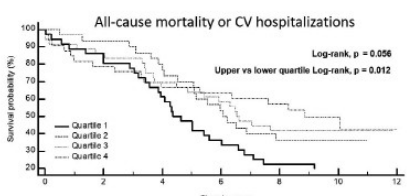
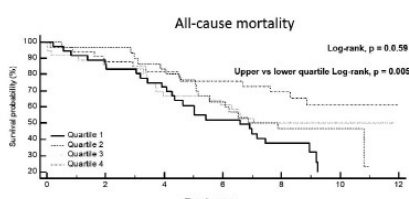
Prognostic significance of frequent premature ventricular contractions originating from the ventricular outflow tract in patients with normal left ventricular function

PVC Burden

Idiopathic



Structural heart Disease



Abstract

Introduction: Premature ventricular contractions (PVC) have been associated with mortality and heart failure (HF) regardless the presence of structural heart disease (SHD). The aim of this study was assessing the impact of burden and complexity of PVCs on prognosis, according to presence of SHD.

Methods: 312 patients were retrospectively evaluated out of 1967 consecutive patients referred for 24-hr Holter at a single hospital, with a PVC count >1% of total beats. Two groups with and without SHD. PVC burden (PVC%), presence of complex forms, incidence of all-cause death, combined outcomes of all-cause death and cardiovascular hospitalizations, HF death and HF hospitalizations and, sudden death (SD) or hospitalizations due to ventricular arrhythmias (VA) were assessed.

Results: Premature ventricular contraction burden was 2.7 (IQR: 1.6–6.7). SHD patients had more polymorphic PVCs, 77% versus 65%, $p = .022$, triplets and episodes of non-sustained ventricular tachycardia (NSVT): 44% versus 27%, $p = .002$; 30% versus 12%, $p < .0001$. In idiopathic patients, a PVC% in the third quartile was independently associated with all-cause mortality hazard ratio (HR) 2.288 (1.042–5.026) $p = .039$, but not in SHD. The complexity of the PVCs was not independently associated with outcomes in both groups. In SHD group, NSVT was associated with lower survival free from SD and VA hospitalizations, $p = .028$; after multivariable, there was a trend for a higher arrhythmic outcome with NSVT, HR 3.896 (1.093–16.81) $p = .068$.

Conclusion: Premature ventricular contractions in SHD showed more complex patterns. In idiopathic patients, a higher PVC count was associated with higher mortality but not in SHD patients. Complexity was not independently associated with worse prognosis.

DIAGNOSI DIFFERENZIALI TRA BEV BENIGNI E BEV «MINACCIOSI»

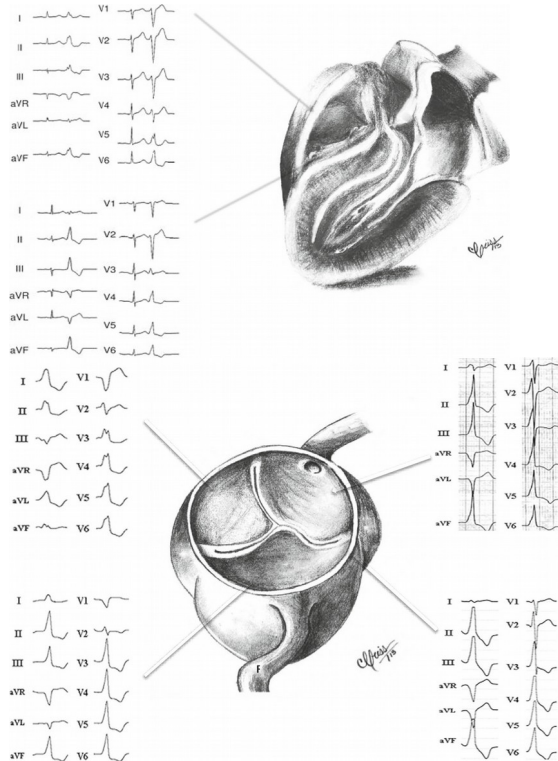
- Sene «non comune» cioè non tipica della extrasistolia idiopatica benigna
- Presenza di cardiopatia strutturale
- Risposta al test ergometrico
- Più di una morfologia
- PVC complesse: coppie, triplette e VT non sostenute.
- ECG basale (presenza di segni epsilon, o frammentazioni del QRS o onda J)
- PVC con QRS molto largo (frequentemente correlate a cardiomiopatia)

Questi fattori suggeriscono una prognosi peggiore nei pazienti con PVC.

È necessario effettuare ulteriori esami diagnostici per escludere patologie strutturali, ischemiche o elettriche.

Electrocardiographic features, mapping and ablation of idiopathic outflow tract ventricular arrhythmias

Carlo Lavalle¹  • Marco V. Mariani² • Agostino Piro² • Martina Straito² • Paolo Severino² • Domenico G. Della Rocca³ • Giovanni B. Forleo⁴ • Jorge Romero⁵ • Luigi Di Biase⁵ • Francesco Fedele²



- ✓ Circa l'80% di tutte le TV idiopatiche
- ✓ Morfologia definita
- ✓ In genere in numero elevato (> 10.000/24h)
- ✓ Si manifestano in cuore strutturalmente sano
- ✓ Buona tolleranza emodinamica
- ✓ Soppressione durante test ergometrico
- ✓ Monomorfe
- ✓ Prognosi: eccellente
- ✓ Terapia: nei sintomatici VERAPAMIL o β BLOCCANTI
- ✓ ABLAZIONE (successo 90%)

Aritmie ventricolari idiopatiche (benigne)

TV del Tratto di Efflusso

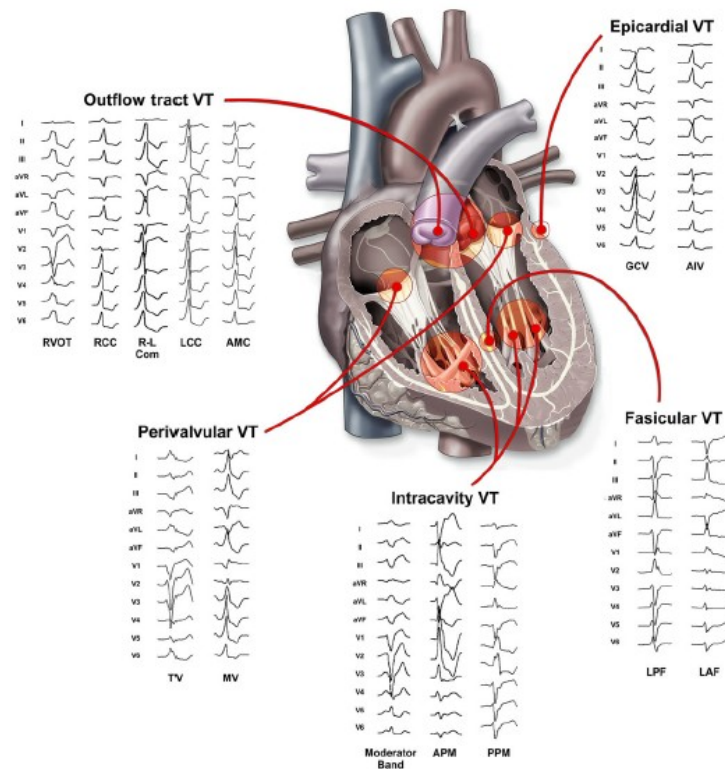
- Tratto di efflusso destro (RVOT)
- Tratto di efflusso sinistro (LVOT)
- Cuspidi aortiche Seno di Valsalva
- Continuità mitro-aortica
- Setto superiore basale (peri Hissiana)
- Arteria Polmonare
- Superficie Epicardica del tratto di Efflusso

Altre

- Anulus mitralico
- Anulus Tricuspidalico
- Muscoli papillari
- Epicardiche perivascolari

TV Fascicolare

- Fascicolo posteriore sinistro
- Fascicolo anteriore sinistro
- Bundle Settale alto



TRATTO DI EFFLUSSO DEL VENTRICOLO DESTRO



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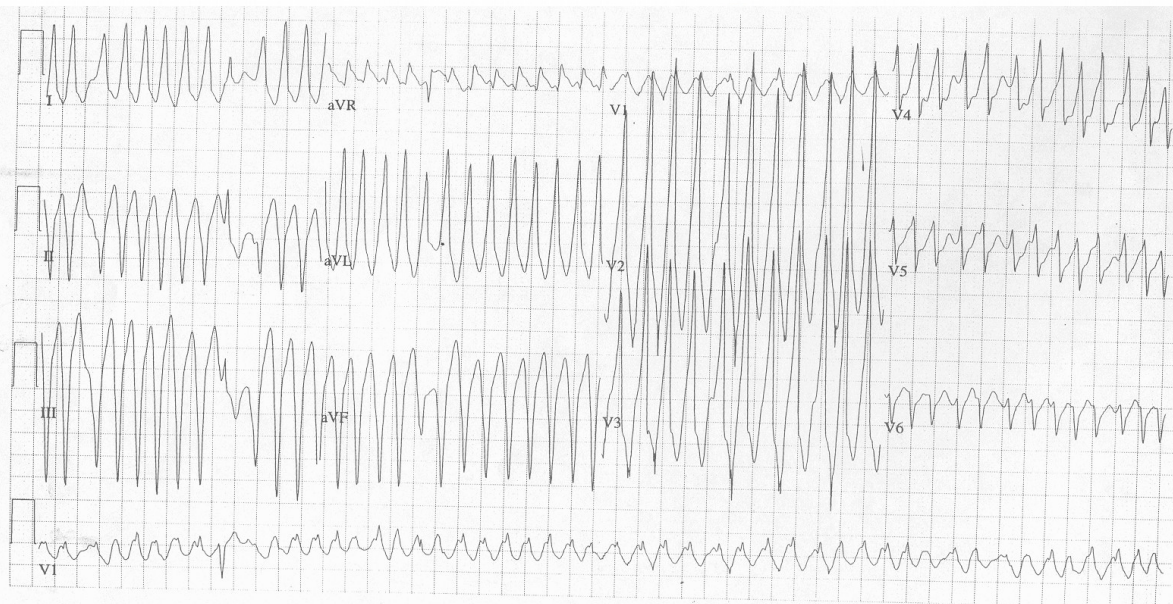
RICCIONE 13-15 MAGGIO 2022

Long-Term Follow-Up of Right Ventricular Monomorphic Extrasystoles

Fiorenzo Gaita, MD,* Carla Giustetto, MD,† Paolo Di Donna, MD,* Elena Richiardi, MD,* Luigi Libero, MD,† Maria C. Rosa Brusin, MD,† Giuseppe Molinari, MD,* Giampaolo Trevi, MD†
Asti and Torino, Italy

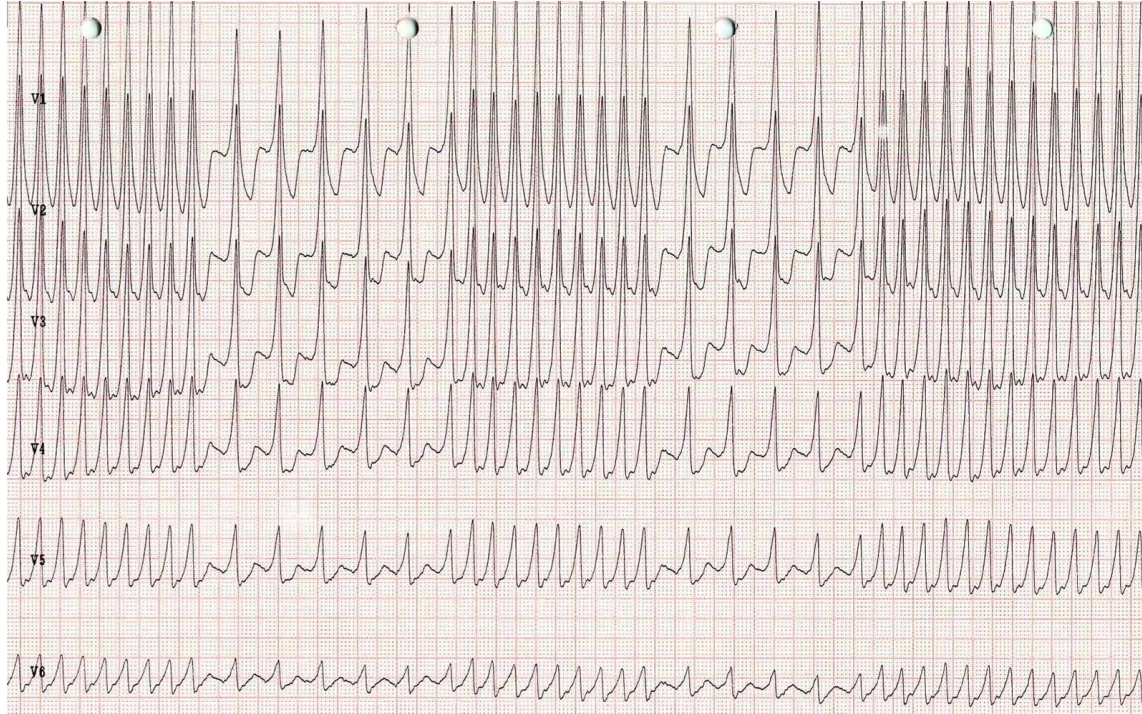
OBJECTIVES	The purpose of this study was to verify in a long-term follow-up whether frequent monomorphic right ventricle extrasystoles may progress to arrhythmogenic right ventricular dysplasia (ARVD).
BACKGROUND	Frequent monomorphic right ventricle extrasystoles are generally considered benign. However, in patients with this pattern, cardiac magnetic resonance (MR) has recently shown anatomical and functional abnormalities of the right ventricle.
METHODS	Sixty-one patients who had been classified by noninvasive examinations as having frequent idiopathic right ventricle ectopy were contacted after 15 ± 2 years (12 to 20) and submitted to clinical examination, electrocardiogram (ECG), Holter monitoring, stress test, signal averaged ECG, echocardiography and, in 11 patients, cardiac MR. The primary end point was to ascertain the presence of cases of sudden death or progression to ARVD.
RESULTS	At the end of the follow-up, 55 patients were alive; six died, none of sudden death; eight stated to be well but refused further examinations. The 47 patients examined had normal ECG; in 24 patients (51%), extrasystoles were no longer present at Holter monitoring; late potentials were present in up to 15% of the patients; the right ventricle was normal at echocardiography. In 8 of 11 patients (73%), cardiac MR showed focal fatty replacement and other abnormalities of the right ventricle.
CONCLUSIONS	In this long-term follow-up study, no patient died of sudden death nor developed ARVD; two-thirds of the patients were asymptomatic, and, in half of the patients, ectopy had disappeared. Focal fatty replacement in the right ventricle was present in most. (J Am Coll Cardiol 2001;38:364-70) © 2001 by the American College of Cardiology

INSTABILITA' ELETTRICA

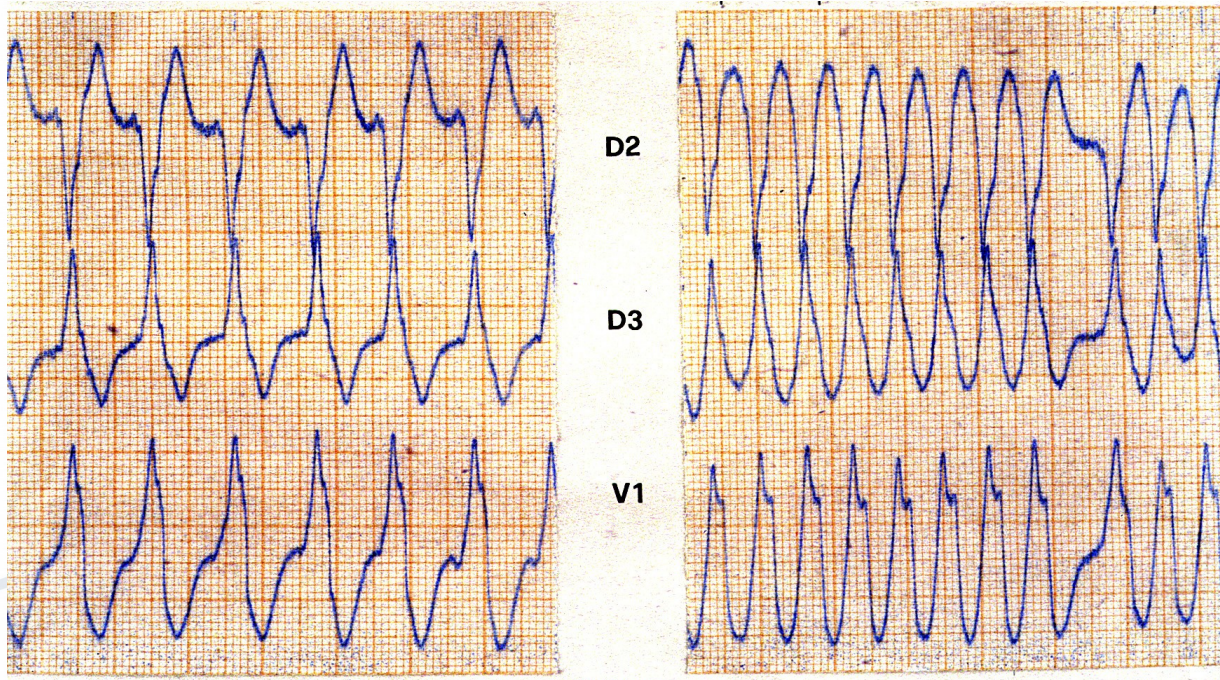


- Tachicardia a complessi larghi
- Intervalli RR grossolanamente irregolari non coerenti con VT
- Non presente un tipico aspetto a BBB coerente con FA con ritardo di conduzione i.v.
- Il grado di aberranza è inversamente correlato alla frequenza cardiaca: "effetto concertina" (non coerente con Afib con aberranza di conduzione)

Concertina effect: pathognomonic of pre-excited Afib



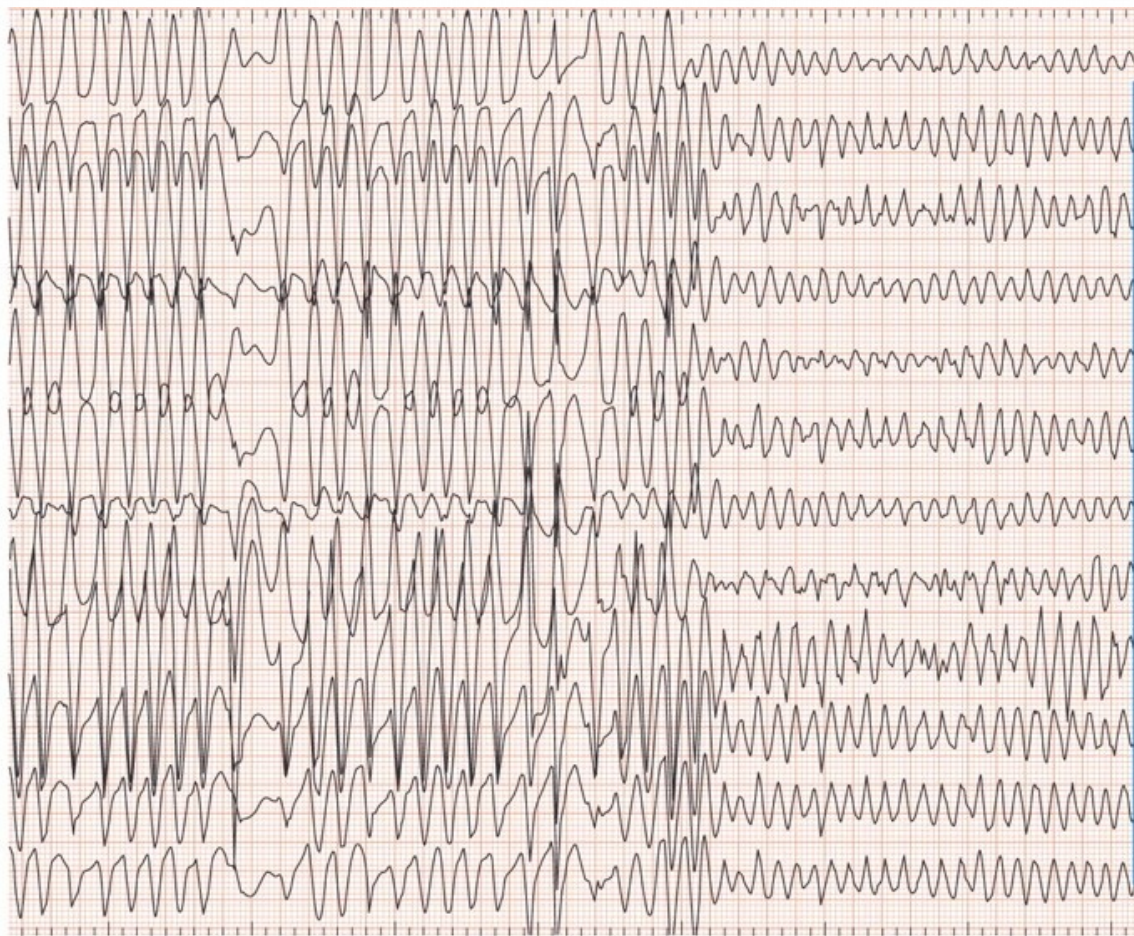
Più breve è l'intervallo R-R più stretto è il QRS



BASAL

AFTER I.V. VERAPAMIL

PRE-EXCITED AFIB MUST BE RECOGNIZED!!!



Immediate **DCC** is recommended
for patients with AF involving pre-
excitation when rapid tachycardia or
haemodynamic instability is present.

I

B

Cosa devi fare.....

When pre-excited AF is present,
 β -blockers, non-dihydropyridine
calcium channel
antagonists, digoxin, and adenosine
are contraindicated.

III

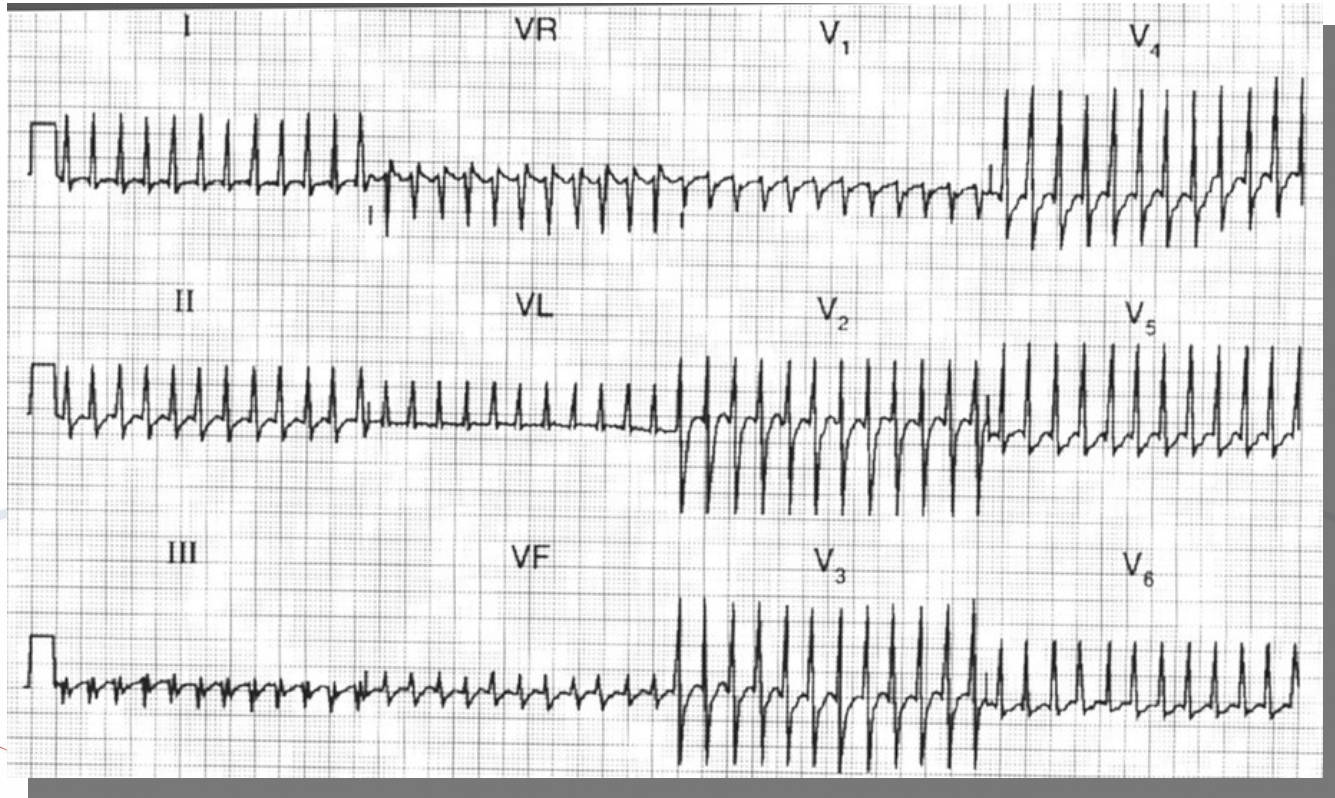
C

Cosa non devi fare !!!

PROPAFENONE

Cosa puoi fare

INSTABILITA' ELETTRICA

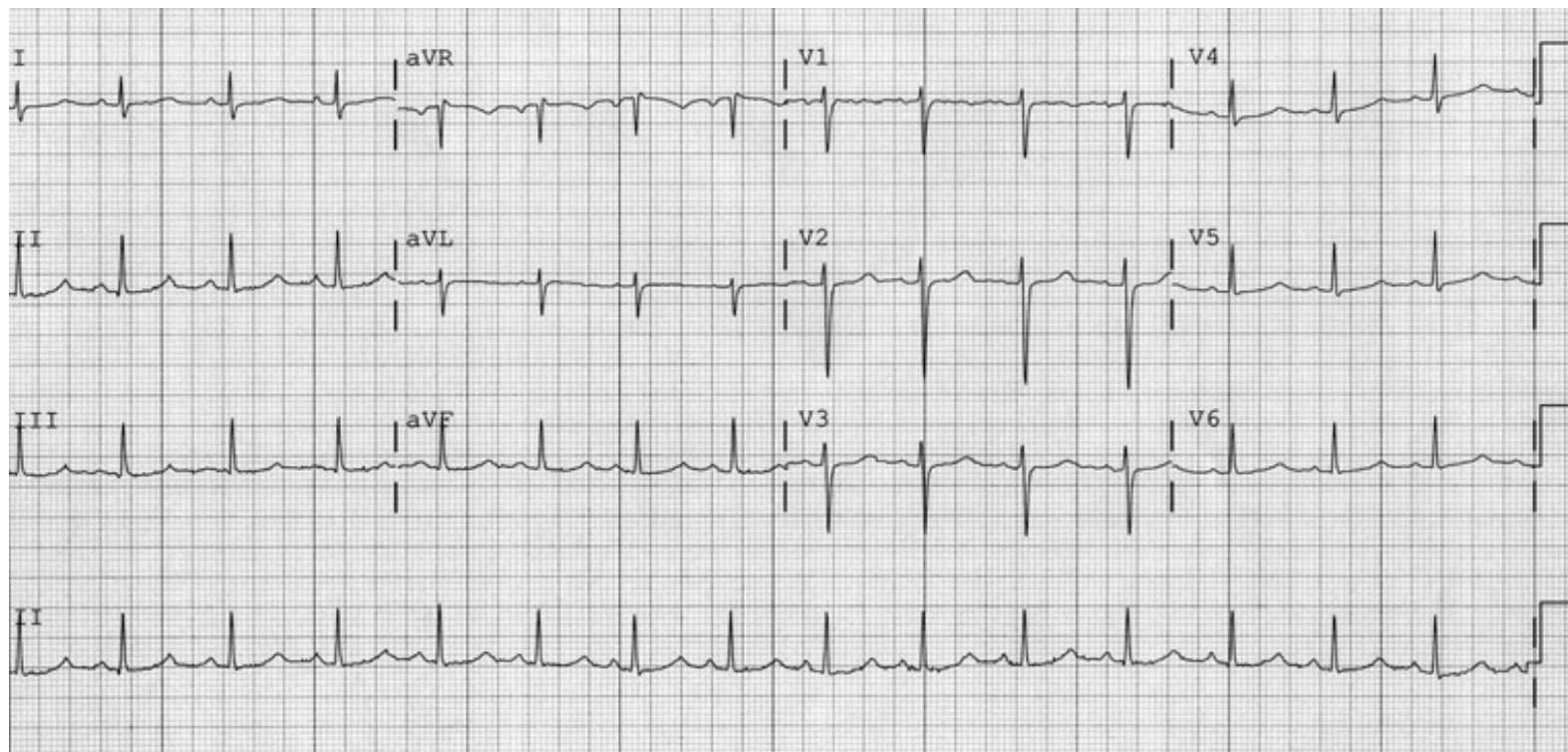


PZ DI 77 AA TRATTATO CON FLECAINIDE e.v.

CASO CLINICO SINCOPE

- Donna 39 aa anni giunge per rivalutazione di episodi sincopali
- Non fattori di rischio cardiovascolari
- Dall'età pediatria episodi di perdita di coscienza "etichettati" come attacchi epilettici
- In terapia stabile da circa 15 aa con: Tegredol e Keppra senza beneficio.
- Sincopi ricorrenti con una frequenza media di 1/mese, senza prodromi, alcune in relazione a stress emotivo, in assenza di contrazioni tonico-cloniche, traumatiche.
- Ripetuti interventi chirurgici per frattura della mandibola e della base del cranio

CASO CLINICO SINCOPE



CASO CLINICO SINCOPE

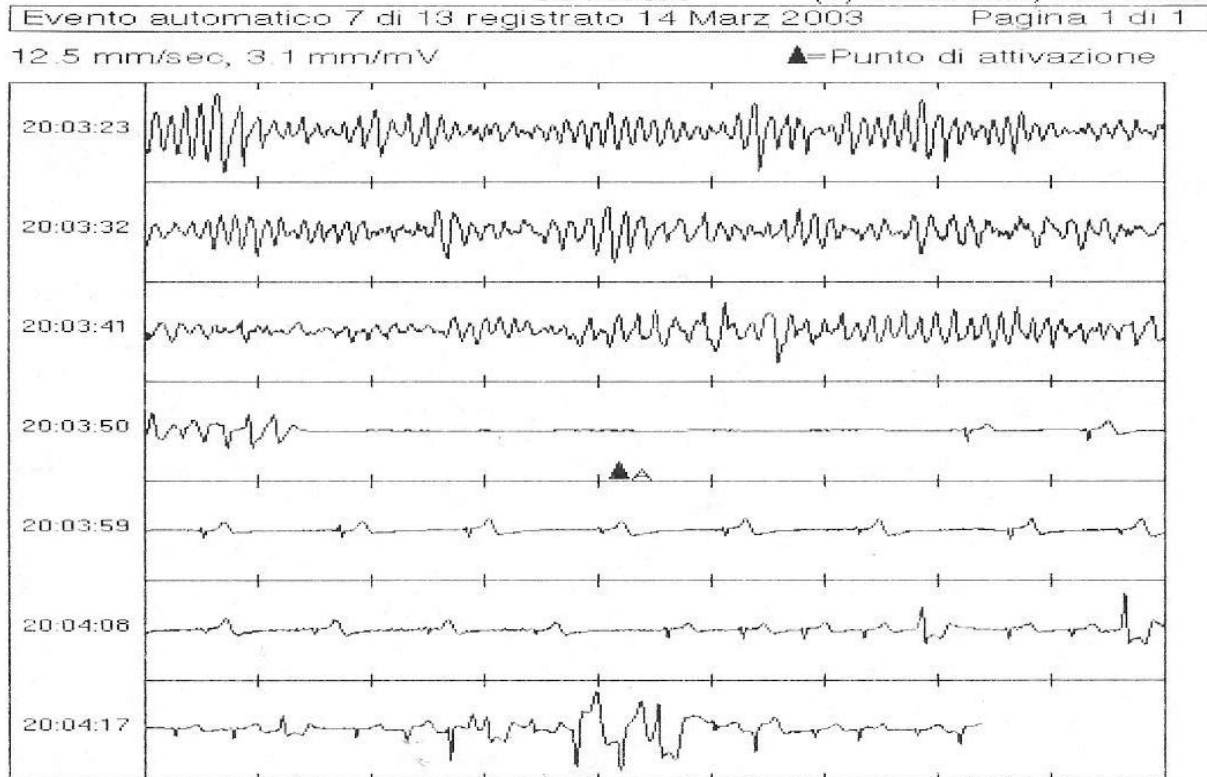
Ecocardiogramma: Nei limiti

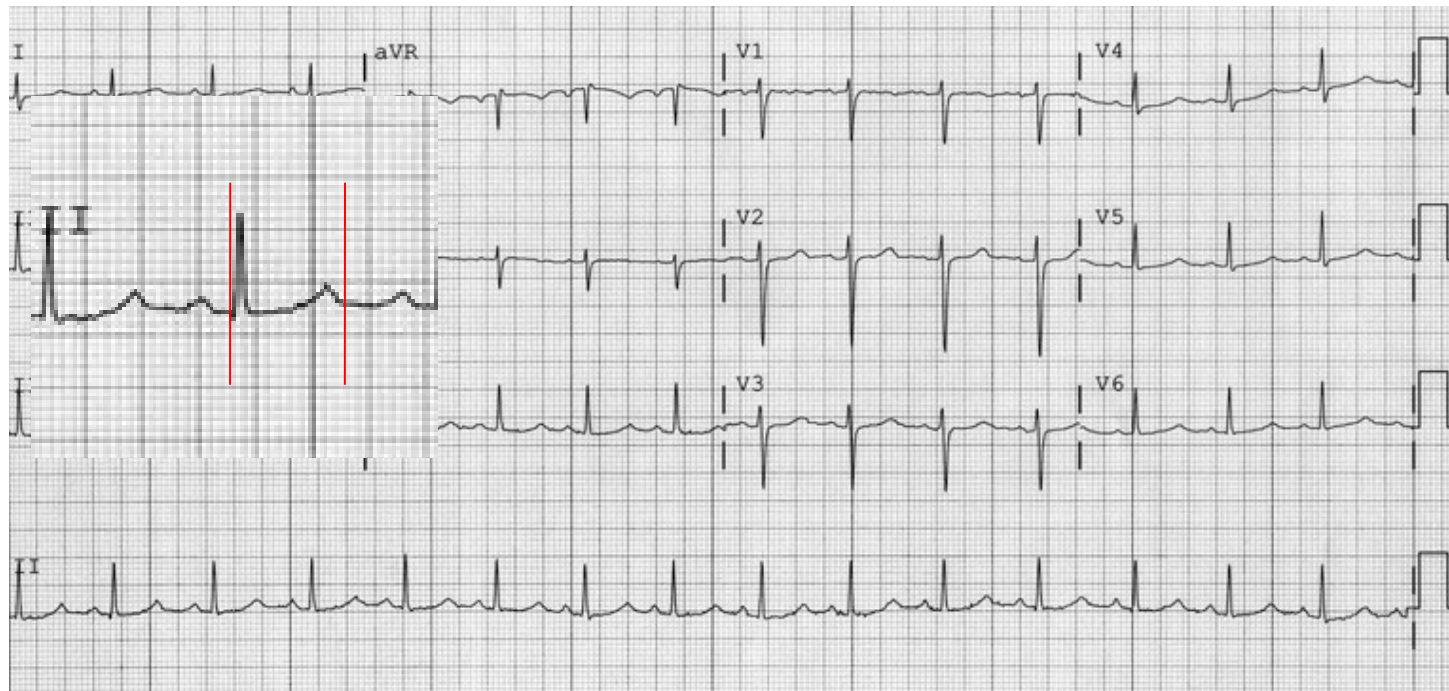
Test ergometrico: Negativo

Tilt Test: Positivo per sincope. Riflesso neuromediato di tipo misto dopo somministrazione di nitrato s.l. La paziente descrive il sintomo come differente dalla sincope clinica.

Impianto di Loop-recorder

INTERROGAZIONE DEL LOOP RECORDER





RR = 640

msec

Qt = 440

QTc = 550

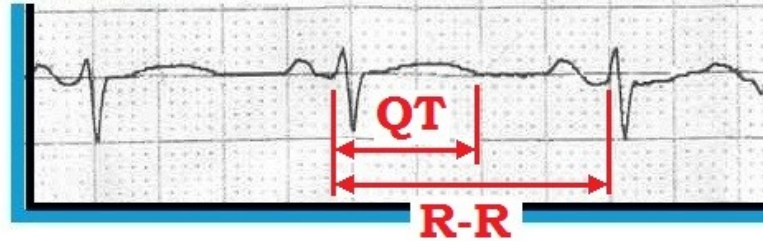
Capacità di riconoscere la LQTS

- Medici non cardiologi: 31%
- Cardiologi: 35%
- Elettrofisiologi: 74%
- Esperti della LQTS: 96%

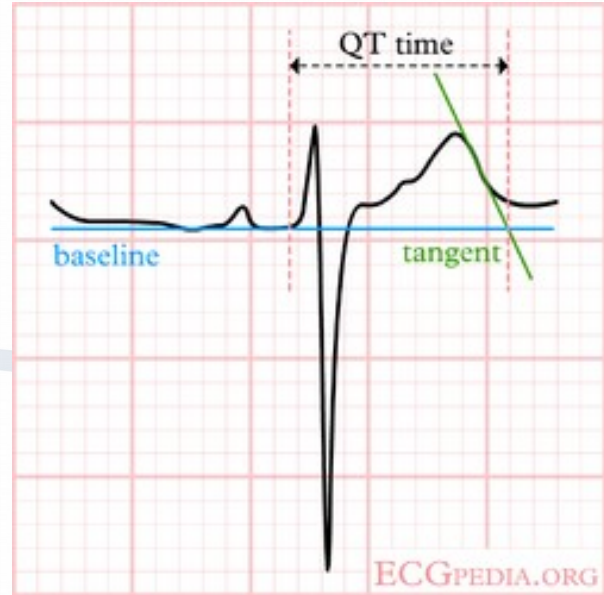
Criteri diagnostici

Recommendations	Class ^a	Level ^b	Ref. ^c
LQTS is diagnosed with either – QTc ≥ 480 ms in repeated 12-lead ECGs or – LQTS risk score >3 . ⁴³¹	I	C	This panel of experts
LQTS is diagnosed in the presence of a confirmed pathogenic LQTS mutation, irrespective of the QT duration.	I	C	This panel of experts
ECG diagnosis of LQTS should be considered in the presence of a QTc ≥ 460 ms in repeated 12-lead ECGs in patients with an unexplained syncopal episode in the absence of secondary causes for QT prolongation.	Ila	C	This panel of experts

Lead II



- The QT interval was found to be longest in lead II in most children with Long QT syndrome
- Sometimes, the T-wave will not be easily measured in lead II, and alternatively lead V5, V6 or I can be used



 *Current Cardiology Reviews*, 2014, 10, 287-294

CARATTERISTICHE CLINICHE

Rapporto genotipo-fenotipo

KCNQ1



LQTS 1

Onda T
bassa a
“larga base”

Iper tono
adrenergico
(emozione,
sforzo fisico es.
nuoto)



KCNH2



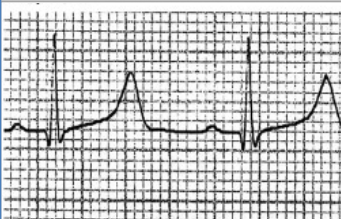
LQTS 2

Onda T
bifida con
notches o
negativa

Stress emotivi
Rumori
improvvisi



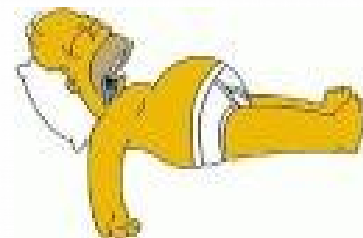
SCN5A



LQTS 3

Onda T
appuntita e
con inizio
tardivo

sonno o
riposo



TRATTAMENTO DELLA S. DEL QT LUNGO

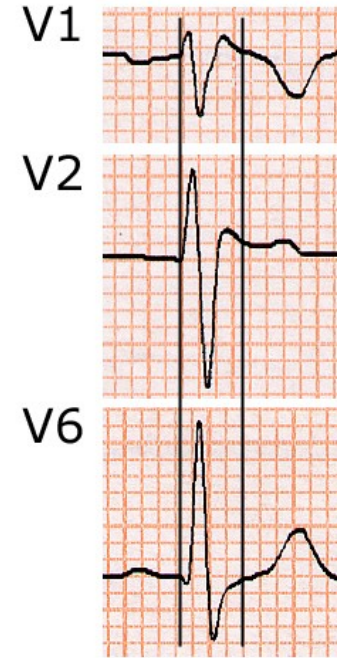
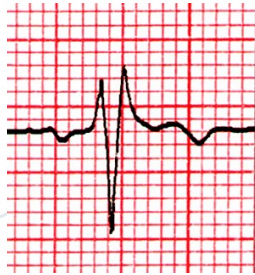
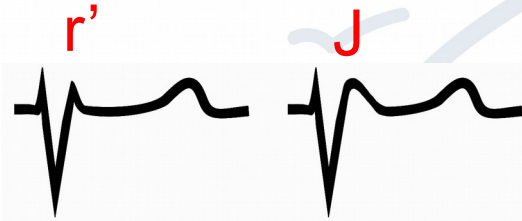
Recommendations	Class ^a	Level ^b	Ref. ^c
The following lifestyle changes are recommended in all patients with a diagnosis of LQTS: (a) Avoidance of QT-prolonging drugs (http://www.crediblemeds.org). (b) Correction of electrolyte abnormalities (hypokalaemia, hypomagnesaemia, hypocalcaemia) that may occur during diarrhoea, vomiting or metabolic conditions. (c) Avoidance of genotype-specific triggers for arrhythmias (strenuous swimming, especially in LQTS1, and exposure to loud noises in LQTS2 patients).	I	B	434
Beta-blockers are recommended in patients with a clinical diagnosis of LQTS.	I	B	435
ICD implantation with the use of beta-blockers is recommended in LQTS patients with previous cardiac arrest.	I	B	436–438

Beta-blockers should be considered in carriers of a causative LQTS mutation and normal QT interval.	IIa	B	67
ICD implantation in addition to beta-blockers should be considered in LQTS patients who experienced syncope and/or VT while receiving an adequate dose of beta-blockers.	IIa	B	439
Left cardiac sympathetic denervation should be considered in patients with symptomatic LQTS when (a) Beta-blockers are either not effective, not tolerated or contraindicated; (b) ICD therapy is contraindicated or refused; (c) Patients on beta-blockers with an ICD experience multiple shocks.	IIa	C	440
Sodium channel blockers (mexiletine, flecainide or ranolazine) may be considered as add-on therapy to shorten the QT interval in LQTS3 patients with a QTc >500 ms.	IIb	C	441–443
Implant of an ICD may be considered in addition to beta-blocker therapy in asymptomatic carriers of a pathogenic mutation in <i>KCNH2</i> or <i>SCN5A</i> when QTc is >500 ms.	IIb	C	67

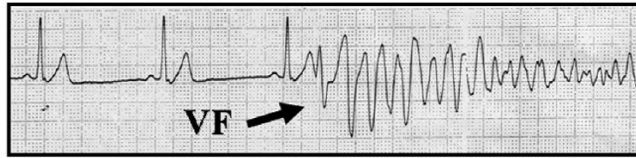
SINDROME DI BRUGADA



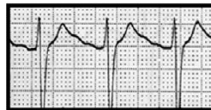
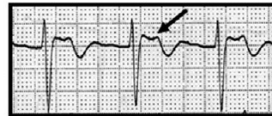
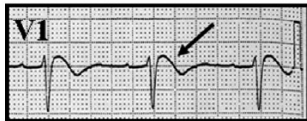
DIAGNOSI S. DI BRUGADA



Acute and chronic management in patients with Brugada syndrome associated with electrical storm of ventricular fibrillation



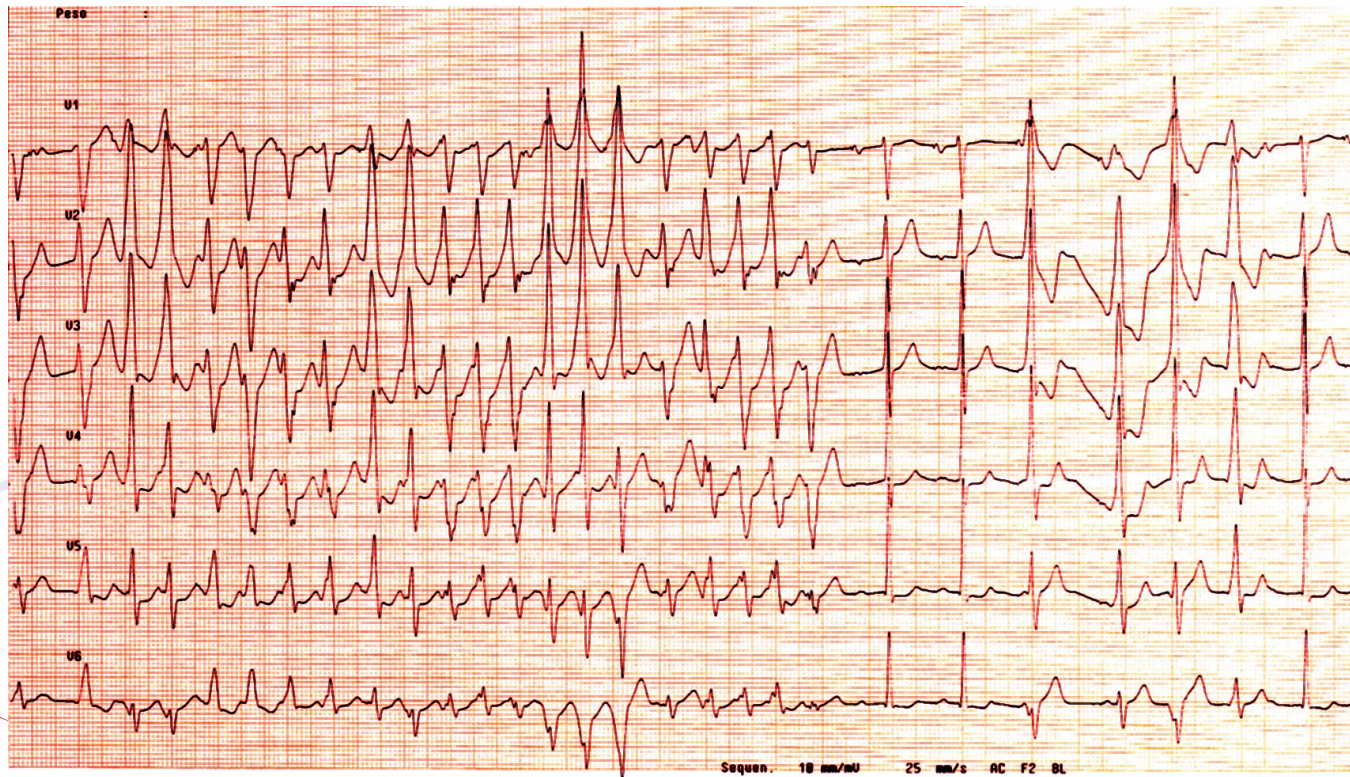
ST elevation $\Rightarrow$ ISP ($0.002 \mu\text{g/kg/min}$) $\Rightarrow$ ISP ($0.004 \mu\text{g/kg/min}$)



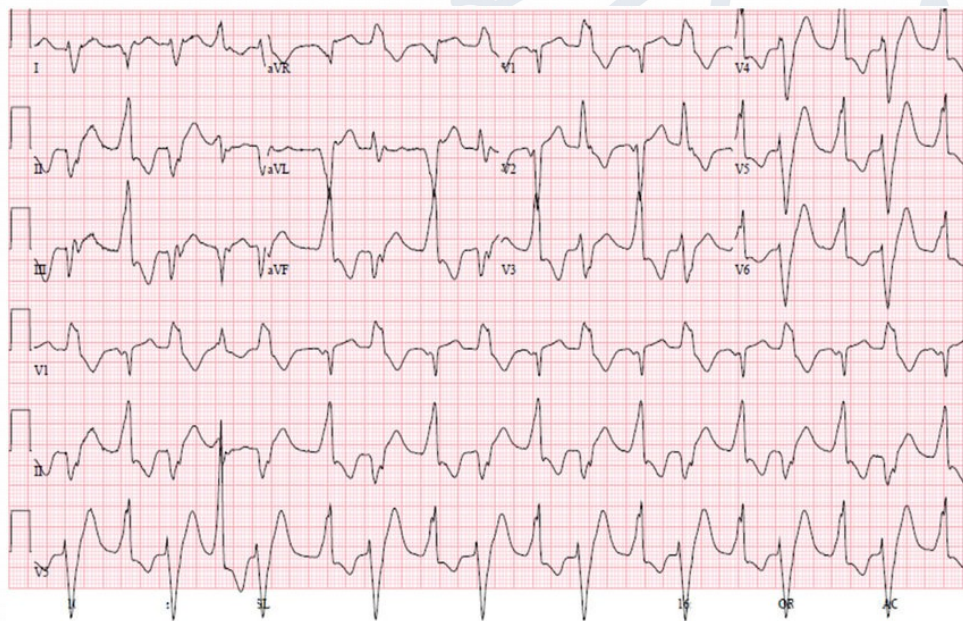
Risk stratification and management in Brugada Syndrome

Recommendations	Class ^a	Level ^b	Ref. ^c
The following lifestyle changes are recommended in all patients with a diagnosis of Brugada syndrome: (a) Avoidance of drugs that may induce ST-segment elevation in right precordial leads (http://www.brugadadrugs.org) (b) Avoidance of excessive alcohol intake and large meals (c) Prompt treatment of any fever with antipyretic drugs.	I	C	This panel of experts
ICD implantation is recommended in patients with a diagnosis of Brugada syndrome who (a) Are survivors of an aborted cardiac arrest and/or (b) Have documented spontaneous sustained VT.	I	C	451
ICD implantation should be considered in patients with a spontaneous diagnostic type I ECG pattern and history of syncope.	IIa	C	451
Quinidine or isoproterenol should be considered in patients with Brugada syndrome to treat electrical storms.	IIa	C	453
Quinidine should be considered in patients who qualify for an ICD but present a contraindication or refuse it and in patients who require treatment for supraventricular arrhythmias.	IIa	C	454
ICD implantation may be considered in patients with a diagnosis of Brugada syndrome who develop VF during PVS with two or three extrastimuli at two sites.	IIb	C	120
Catheter ablation may be considered in patients with a history of electrical storms or repeated appropriate ICD shocks.	IIb	C	201, 455

TV POLIMORFA ADRENERGICA



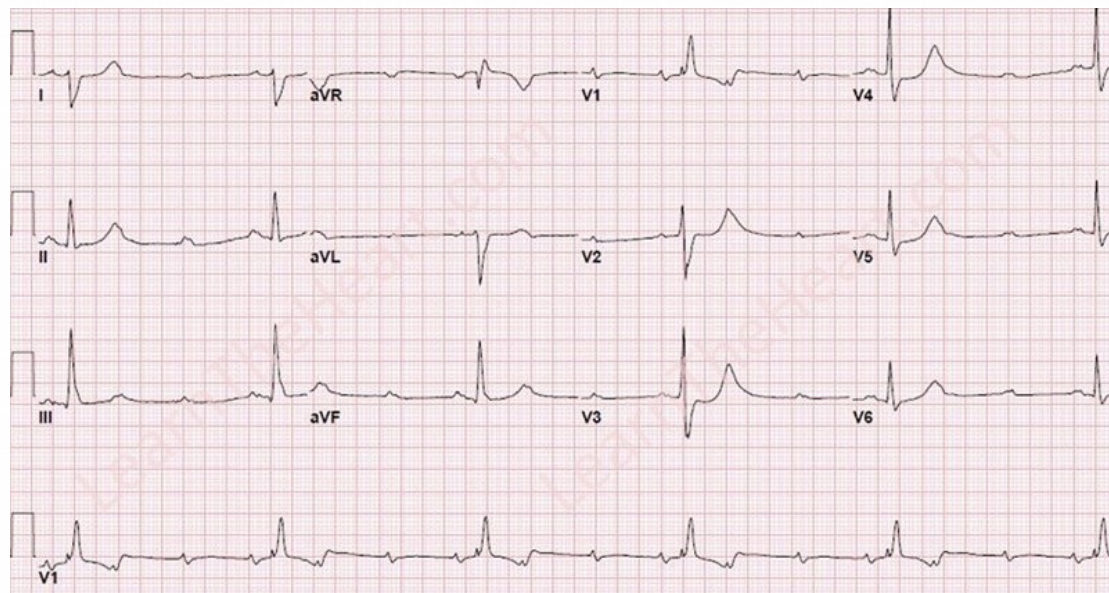
Tachicardia Ventricolare Polimorfa Catecolaminergica



Risk stratification and management in Catecholaminergic Polymorphic Ventricular Tachycardia

Recommendations	Class ^a	Level ^b	Ref. ^c
The following lifestyle changes are recommended in all patients with a diagnosis of CPVT: avoidance of competitive sports, strenuous exercise and stressful environments.	I	C	This panel of experts
Beta-blockers are recommended in all patients with a clinical diagnosis of CPVT, based on the presence of documented spontaneous or stress-induced VAs.	I	C	458, 460
ICD implantation in addition to beta-blockers with or without flecainide is recommended in patients with a diagnosis of CPVT who experience cardiac arrest, recurrent syncope or polymorphic/bidirectional VT despite optimal therapy.	I	C	458, 461
Therapy with beta-blockers should be considered for genetically positive family members, even after a negative exercise test	IIa	C	461, 462
Flecainide should be considered in addition to beta-blockers in patients with a diagnosis of CPVT who experience recurrent syncope or polymorphic/bidirectional VT while on beta-blockers, when there are risks/contraindications for an ICD or an ICD is not available or rejected by the patient.	IIa	C	463
Flecainide should be considered in addition to beta-blockers in patients with a diagnosis of CPVT and carriers of an ICD to reduce appropriate ICD shocks.	IIa	C	463
Left cardiac sympathetic denervation may be considered in patients with a diagnosis of CPVT who experience recurrent syncope or polymorphic/bidirectional VT/several appropriate ICD shocks while on beta-blockers or beta-blockers plus flecainide and in patients who are intolerant or have contraindication to beta-blockers.	IIb	C	464, 465
Invasive EPS with PVS is not recommended for stratification of SCD risk.	III	C	14

Bradiaritmie



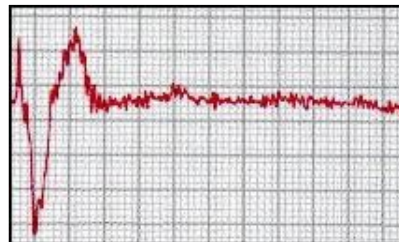
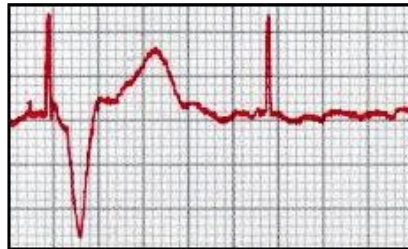
This Task Force concludes that temporary transvenous pacing should be avoided if possible; when it is required, the lead should remain *in situ* for as short a time as possible. The use of temporary

Recommendations regarding temporary cardiac pacing

Recommendations	Class ^a	Level ^b
Temporary transvenous pacing is recommended in cases of haemodynamic-compromising bradyarrhythmia refractory to intravenous chronotropic drugs. ^{764,765}	I	C
Transcutaneous pacing should be considered in cases of haemodynamic-compromising bradyarrhythmia when temporary transvenous pacing is not possible or available. ^{783–785}	IIa	C
Temporary transvenous pacing should be considered when immediate pacing is indicated and pacing indications are expected to be reversible, such as in the context of myocardial ischaemia, myocarditis, electrolyte disturbances, toxic exposure, or after cardiac surgery. ^{771–773}	IIa	C
Temporary transvenous pacing should be considered as a bridge to permanent pacemaker implantation when this procedure is not immediately available or possible due to concomitant infection. ^{771–773}	IIa	C
For long-term temporary transvenous pacing, an active fixation lead inserted through the skin and connected to an external pacemaker should be considered. ^{641,776,777,779}	IIa	C

MALFUNZIONAMENTO PMK

DIFETTO DI' PACING
Mancata cattura

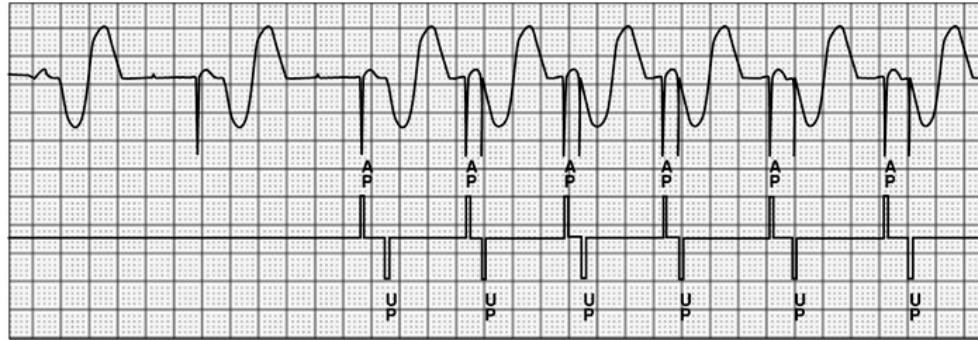


DIFETTO DI' SENSING o DIFETTO DI' PACING
Oversensing o Blocco in uscita

DIFETTO DI' SENSING
Undersensing



IL MAGNETE



- **Pace maker :**

- Monocamerale AOO, VOO
- Bicamerale DOO

- **Defibrillatori:**

- Inibizione delle terapie (shocks)



We see only what we know.

– Johann Wolfgang von Goethe

AZ QUOTES





Titolo del capitolo

CAPITOLO 1

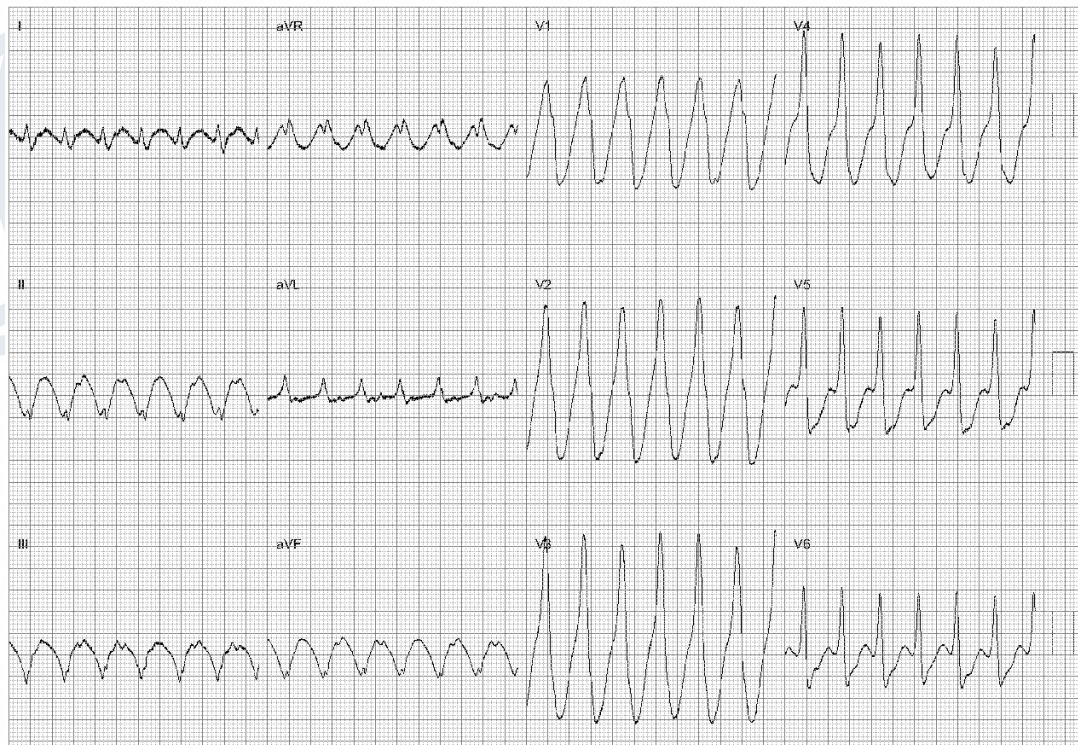
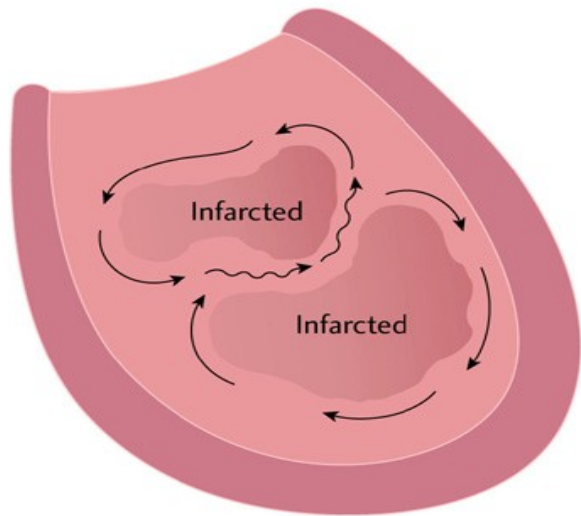


XII congresso nazionale

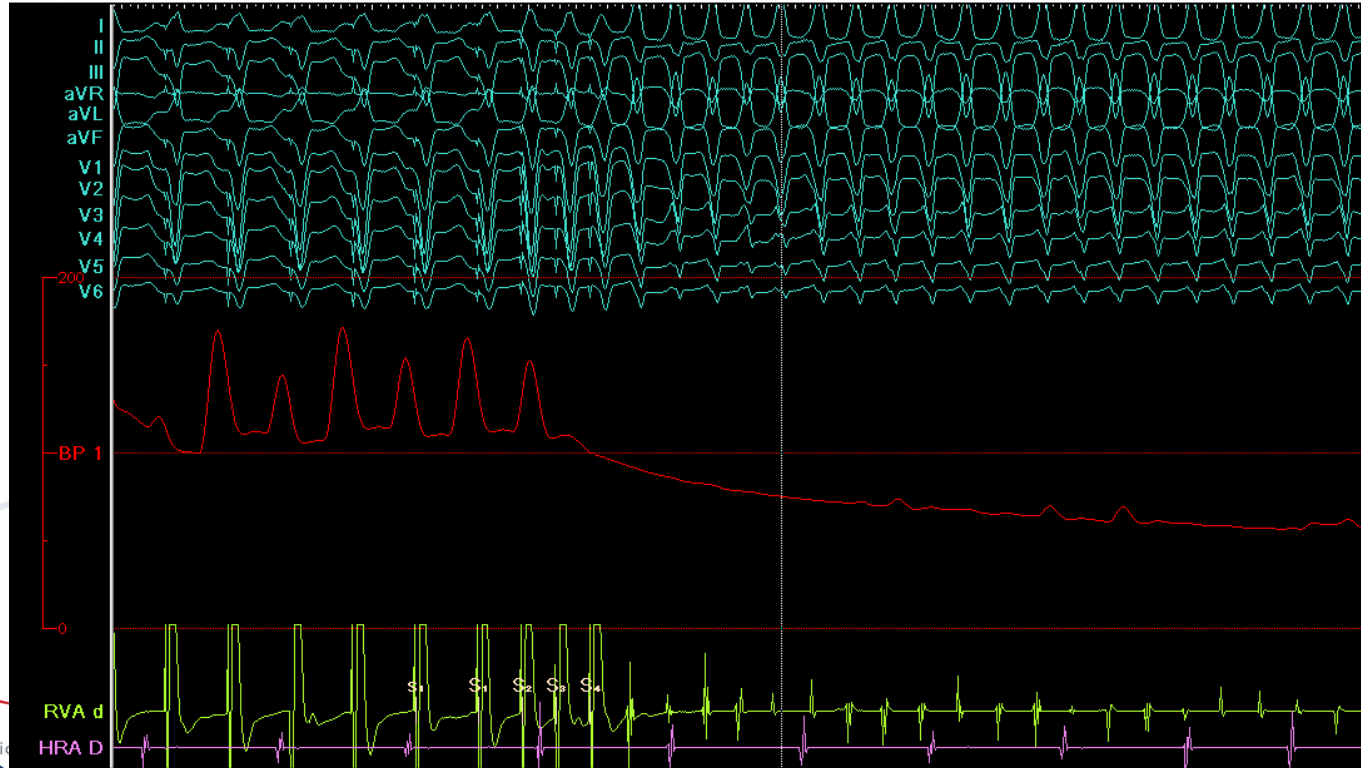
simeu

RICCIONE 13-15 MAGGIO 2022

TV in cardiopatia strutturale

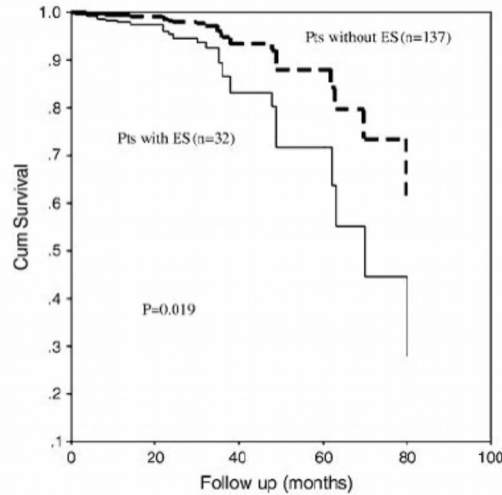


TV EMODINAMICAMENTE NON TOLLERATA



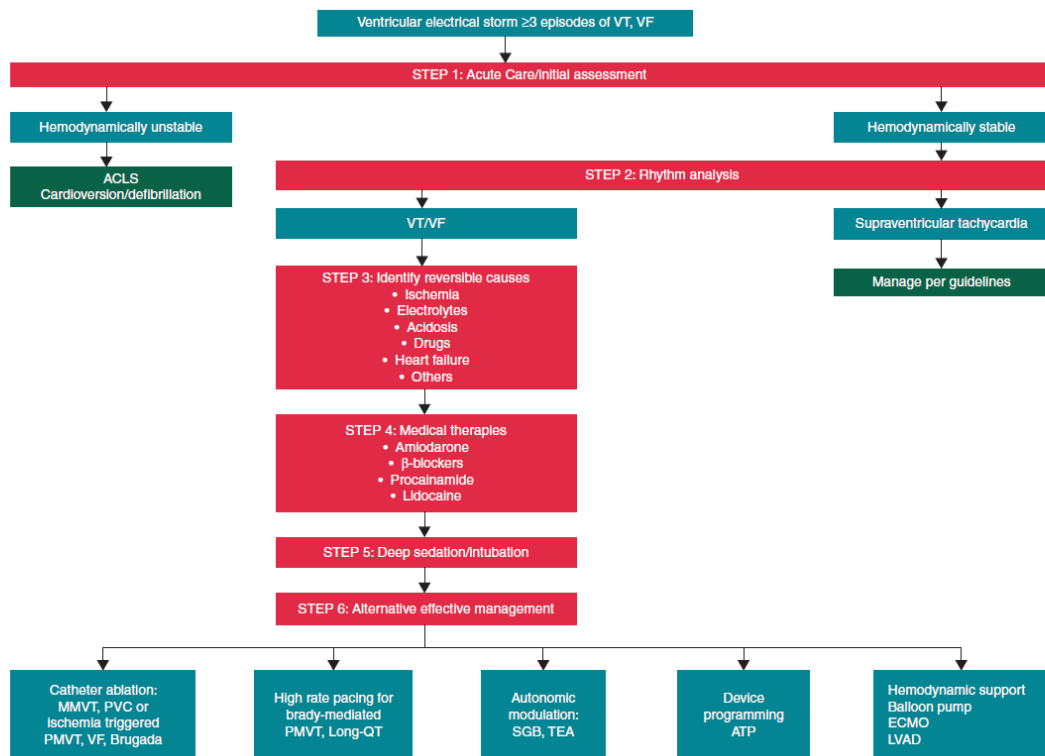
STORM ARITMICO

- Tre o più episodi distinti di tachicardia ventricolare o fibrillazione ventricolare nell'arco di 24h che hanno richiesto l'intervento del defibrillatore (Shock o ATP)
- Lo Storm Aritmico è un' emergenza clinica ed è un predittore indipendente di morte cardiaca a medio termine (mortalità 30-40% a due anni),
- Richiede l'ospedalizzazione nell'80-100% dei casi

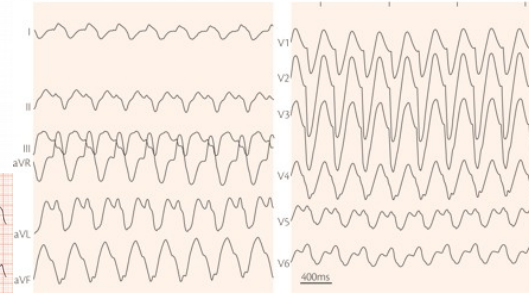
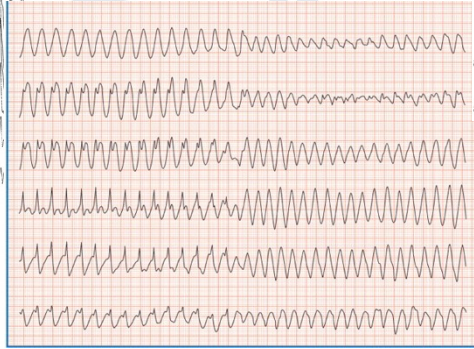
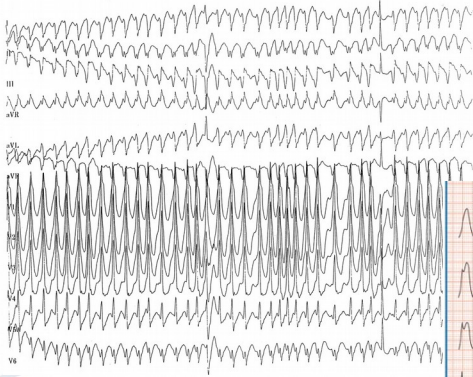


- Produce un vissuto drammatico nel paziente
- Richiede elevata specializzazione per il trattamento
- L'ablazione ha un ruolo centrale ma presenta delle difficoltà specifiche

Management of ventricular electrical storm: a contemporary appraisal



Check the patient not the monitor, right?



Kind of, but interpret ECG...