

ECG DIVINO

Asti



CASO N° 4

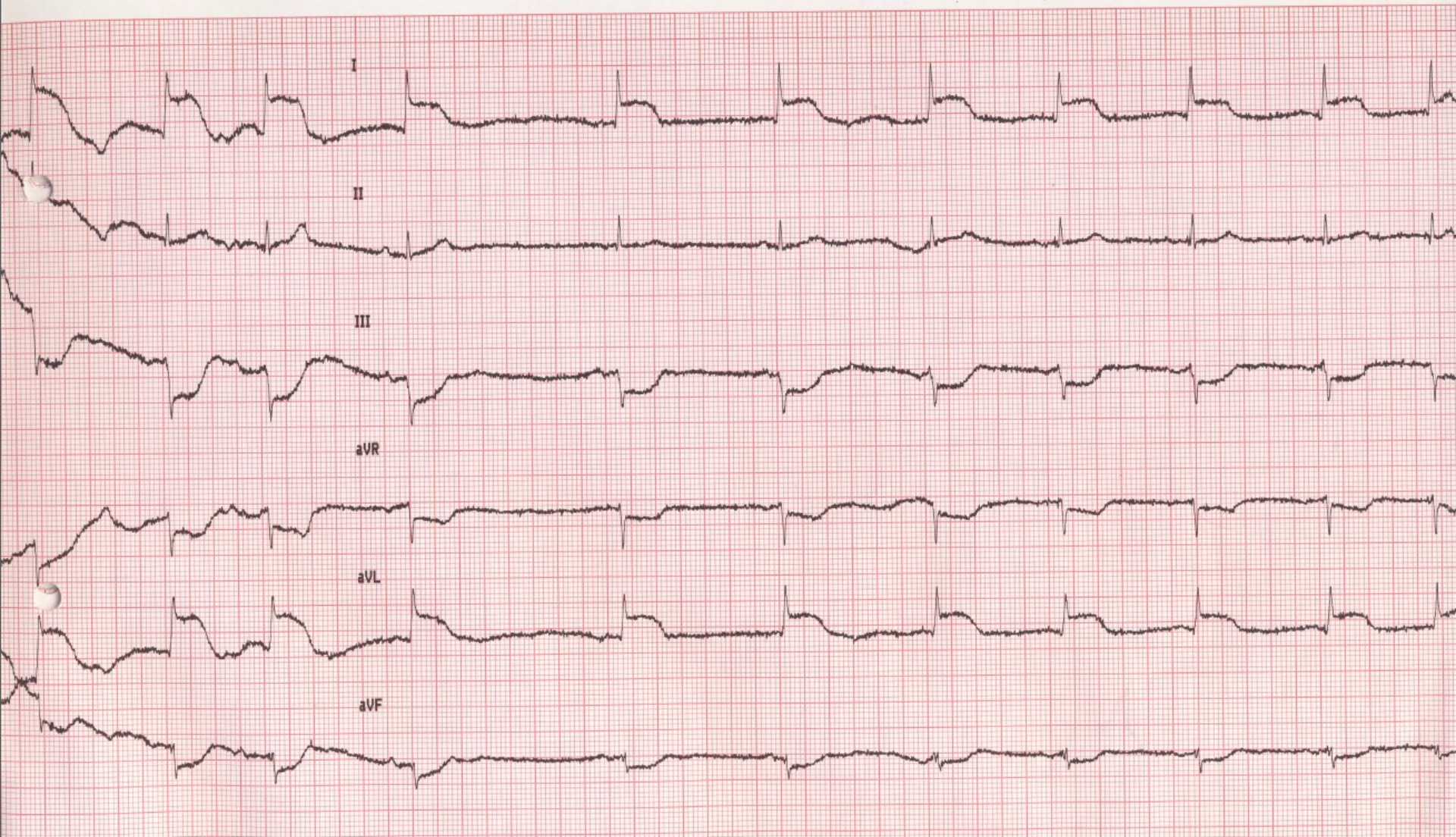
ECG DIVINO

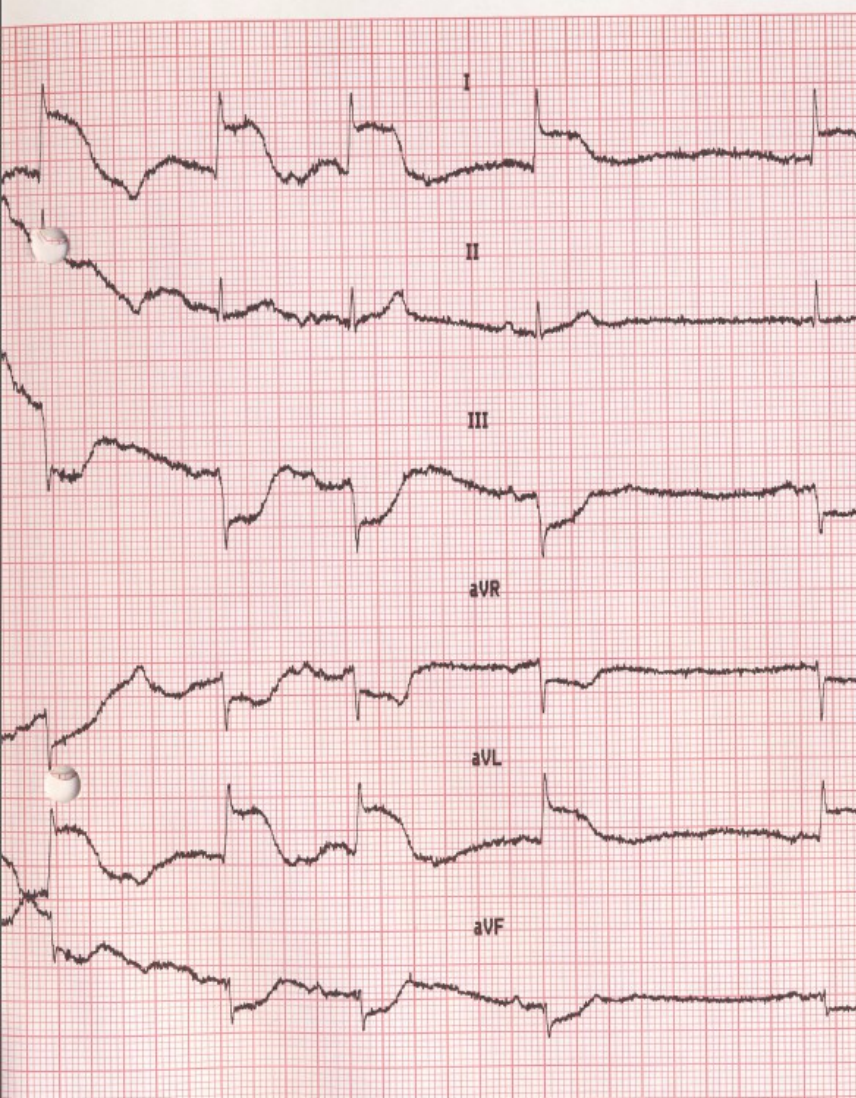
24 Settembre 2016 - Asti



Dr. D. Sillano – Dr.ssa F. Cocco
S.C. Cardiologia
Ospedale Cardinal Massaia, Asti





**DOMANDA 1****INTERPRETAZIONE?**

- 1) CORRENTE DI LESIONE
- 2) TRANSITORIA IPOPERFUSIONE CORONARICA
- 3) CARDIOPATIA DA STRESS (SD. DI TAKO-TSUBO)
- 4) PERICARDITE ACUTA
- 5) BRUGADA ATIPICO
- 6) ALTRO

DOMANDA 2

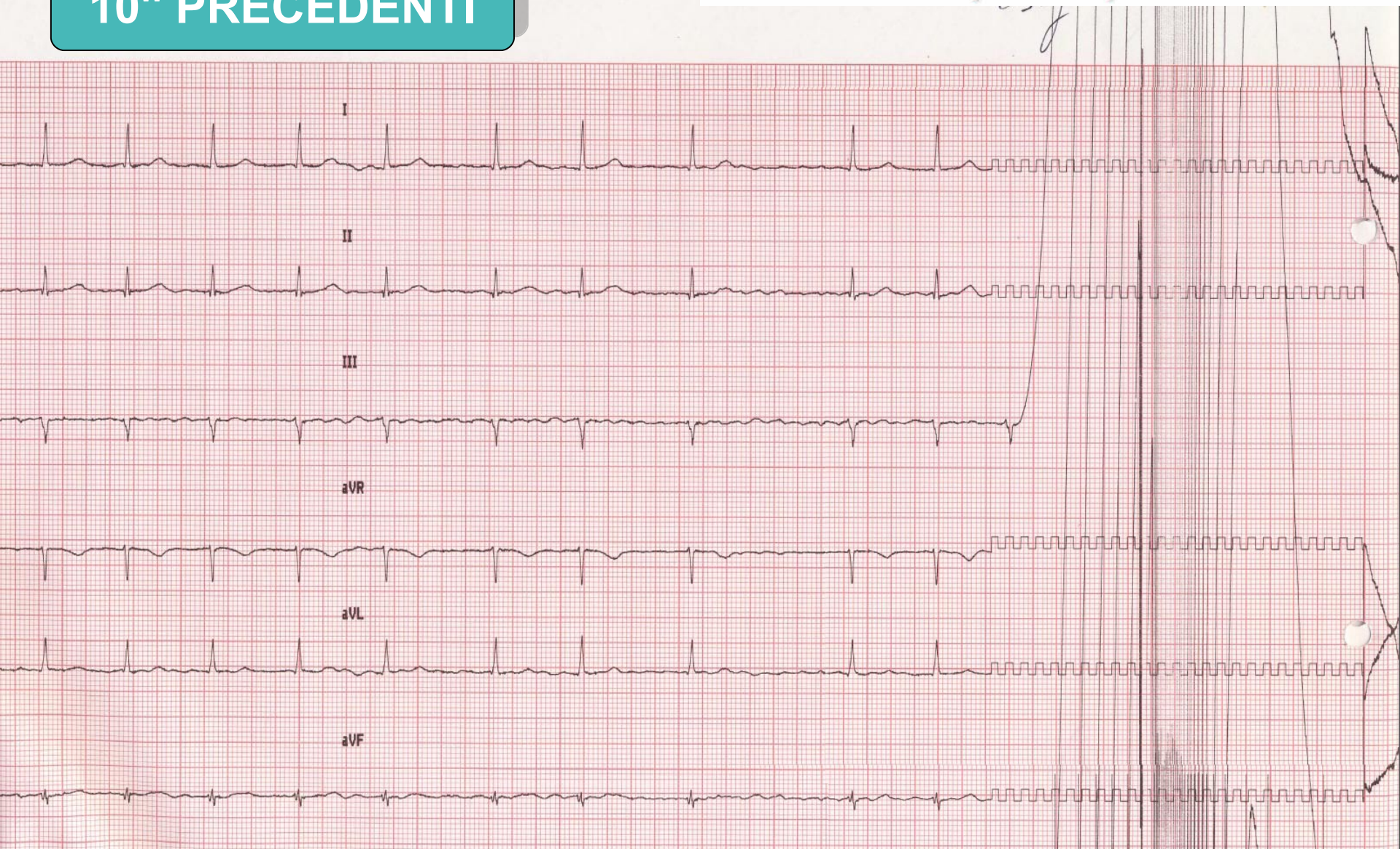
cosa vorreste vedere...

- 1) ECG NEI 10 SECONDI PRECEDENTI (solo periferiche)**
- 2) ECG NEI 10 SECONDI SUCCESSIVI (solo periferiche)**
- 3) ECG 5 MINUTI DOPO (12 derivazioni)**
- 4) DATI CLINICI PAZIENTE**

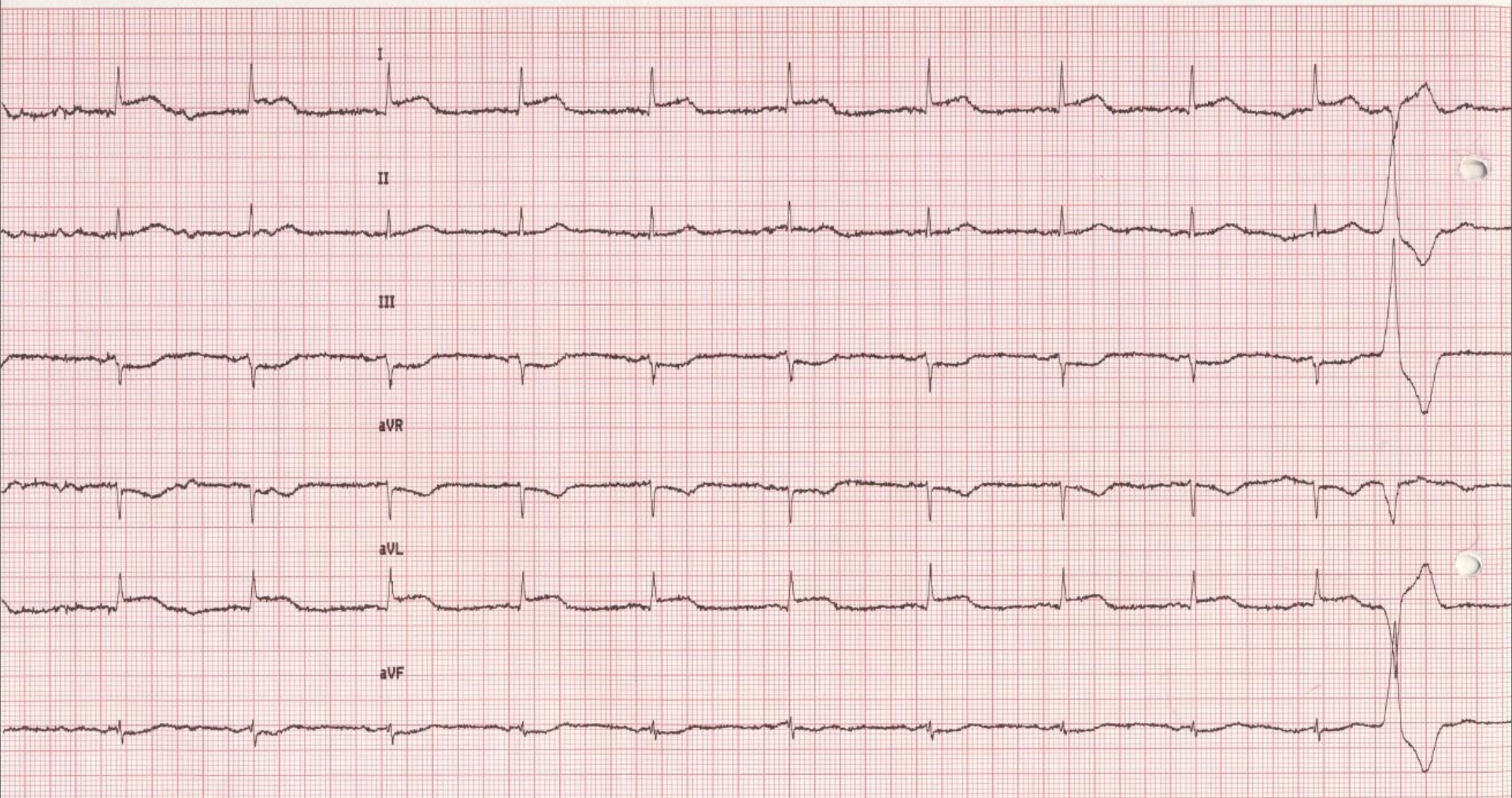




10" PRECEDENTI

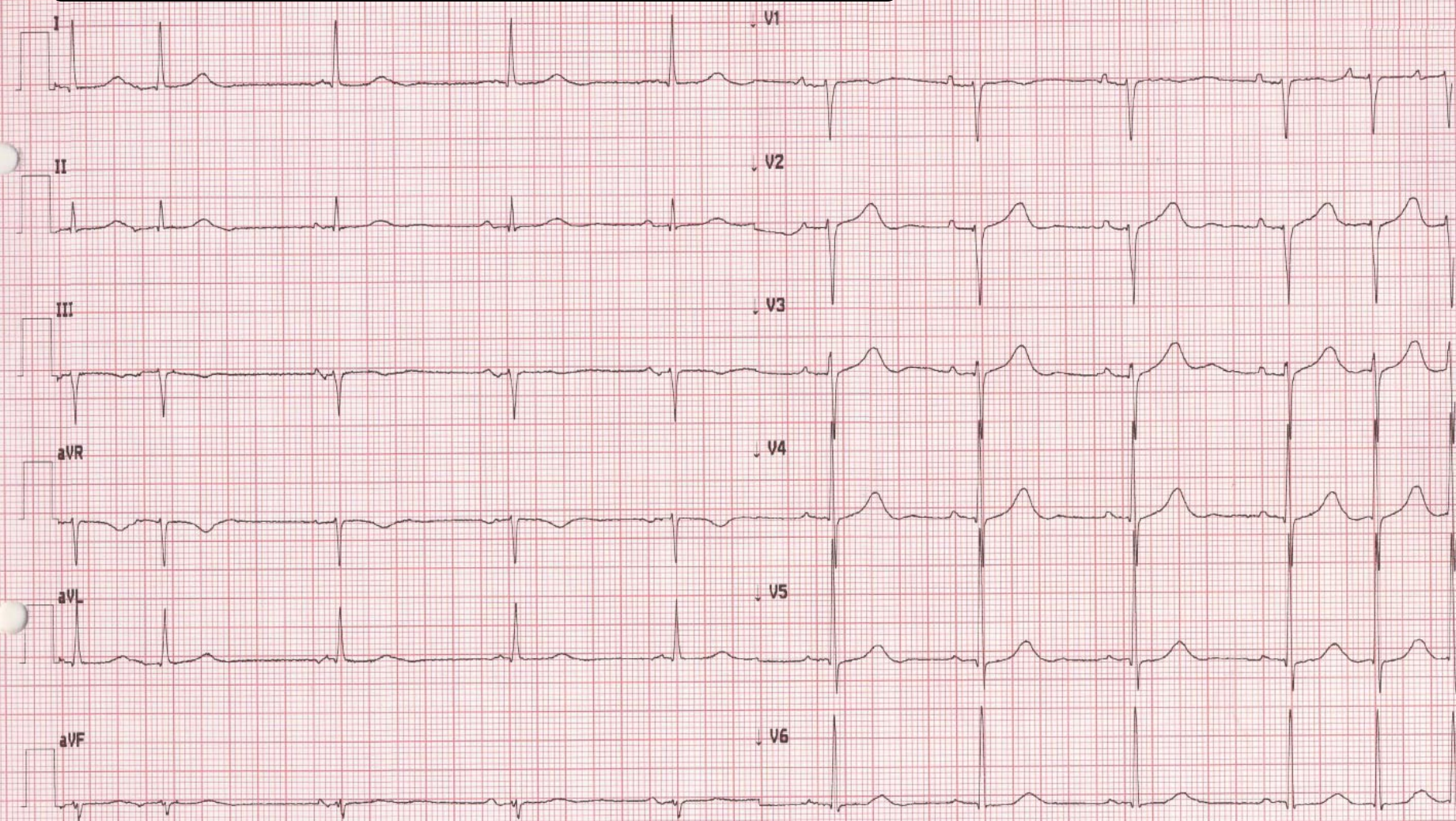


10" SUCCESSIVI





ECG CIRCA 5' DOPO



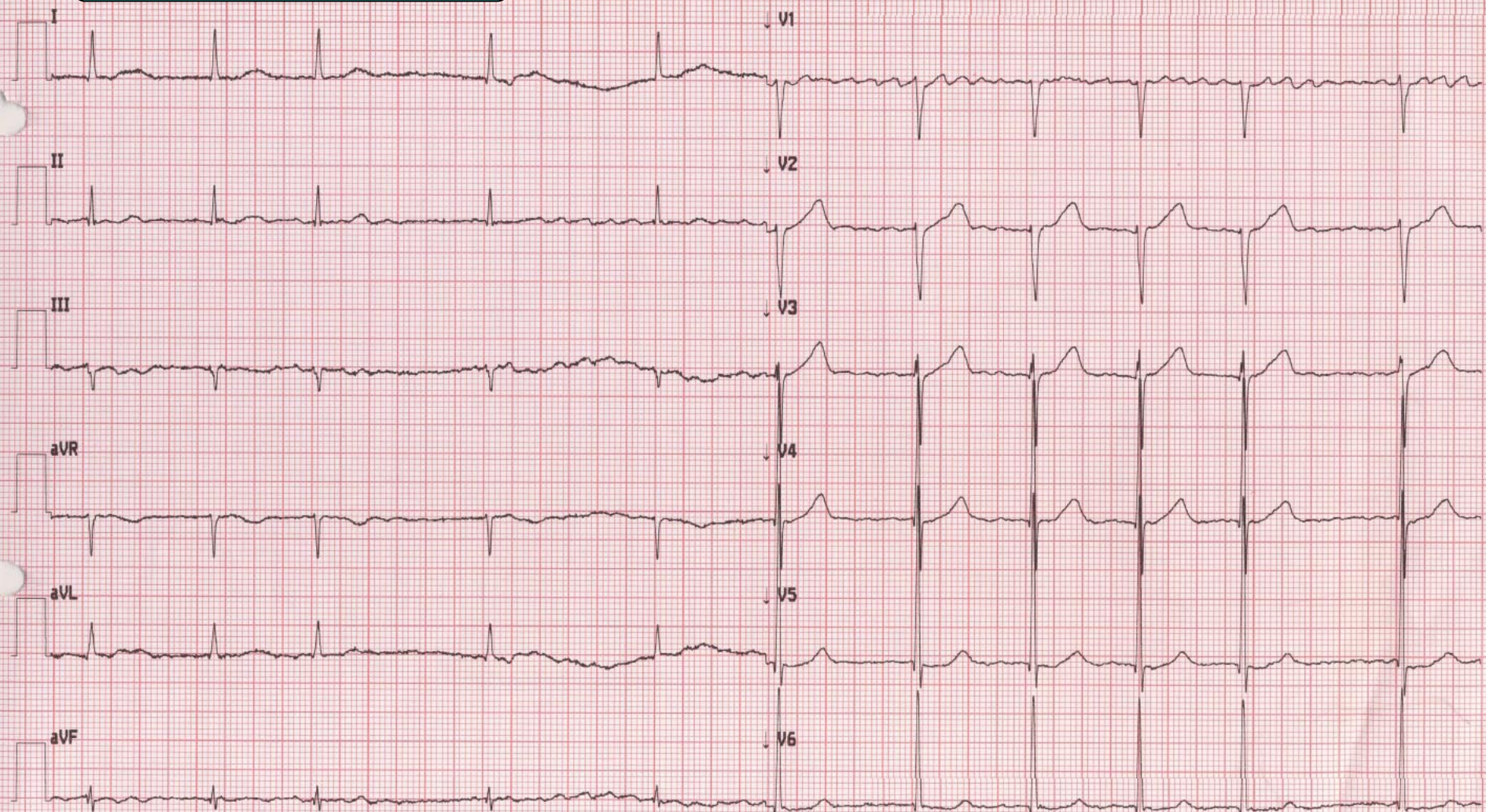
DATI CLINICI

- Sig. G.A. 78 anni. Ipertensione arteriosa, dislipidemia, ex fumatore.
- Fibrillazione atriale persistente nota da 2 mesi, in TAO con Warfarin. Assume Bisoprololo 2,5 mg, Digossina 0,125 mg (Ramipril 5 mg, Atorvastatina 20 mg).
- Sintomatico per astenia, nega angor e dispnea. TSH normale. Ecocardio: lieve IVS, FE 55%, lieve dilatazione atriale sn, IM 2+/4.
- Entra in DH per CVE. Ultimi 4 INR settimanali in range terapeutico.

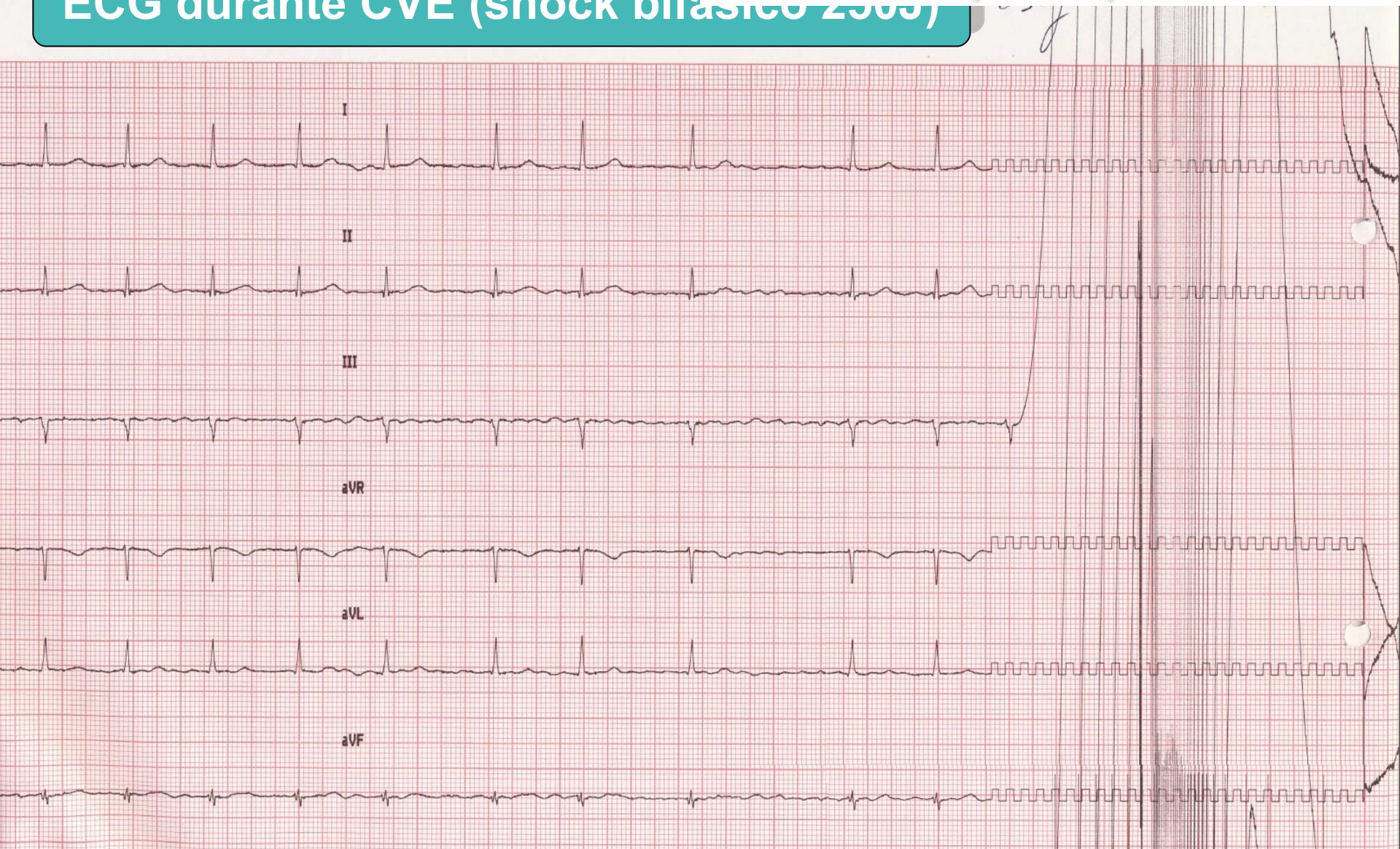




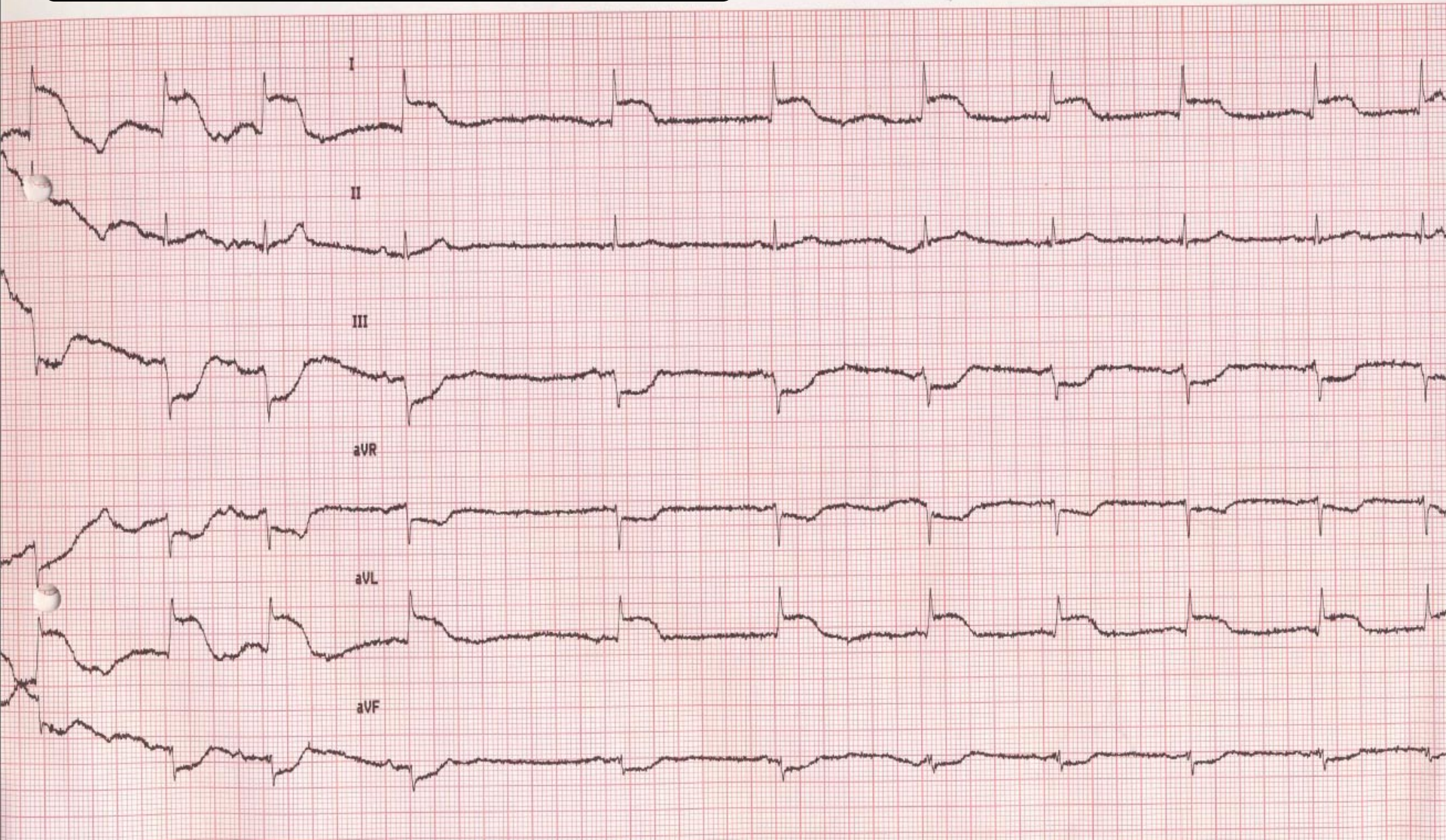
INGRESSO DH



ECG durante CVE (shock bifasico 200J)



IMMEDIATO POST-SHOCK



DOMANDA 2

IPOTESI DIAGNOSTICA?

- 1) EMBOLIZZAZIONE CORONARICA**
- 2) VASOSPASMO**
- 3) DISSEZIONE CORONARICA**
- 4) STUNNING VENTRICOLARE ED IPOPERFUSIONE**
- 5) VOGLIO UN CAFFE'**

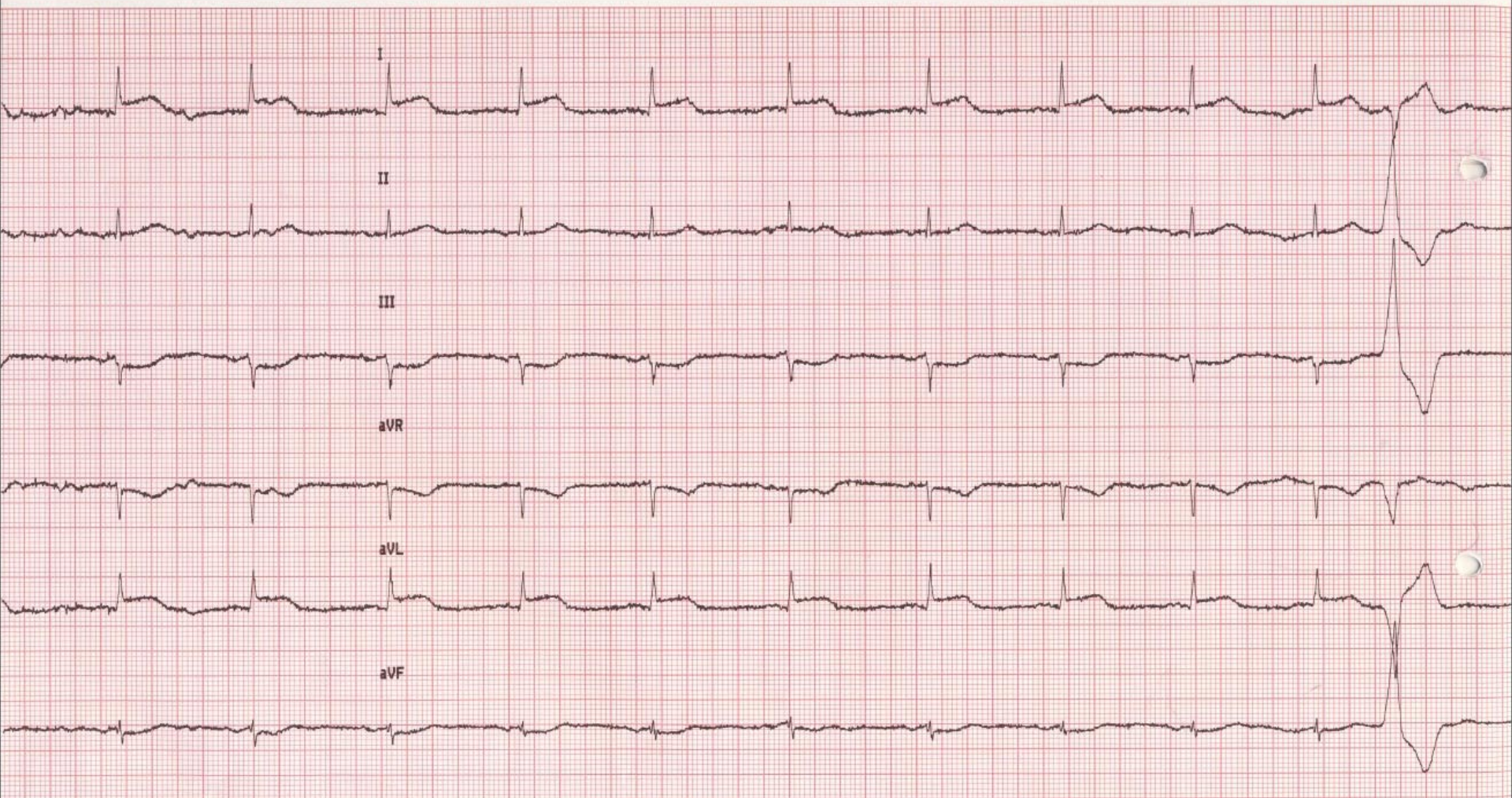


REGISTRAZIONE CONTINUA

ECG DIVINO



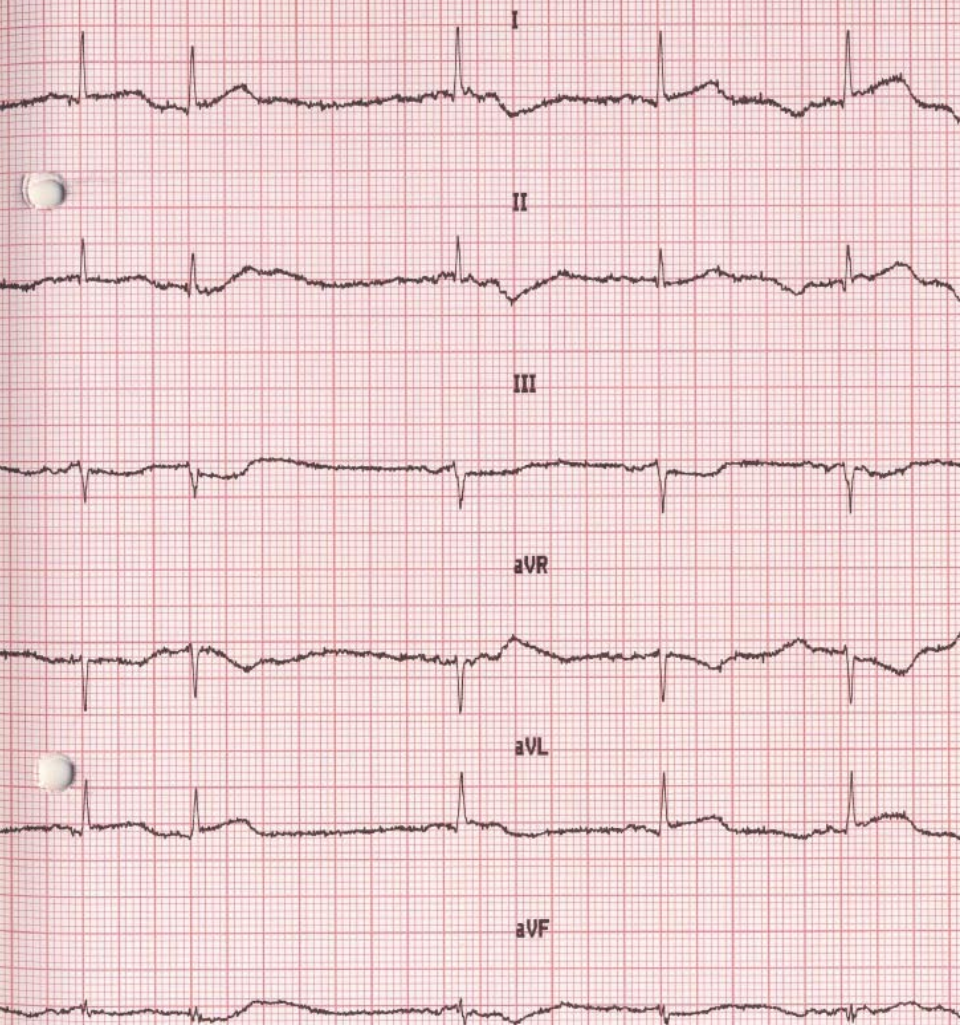
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REGISTRAZIONE CONTINUA

ECG DIVINO

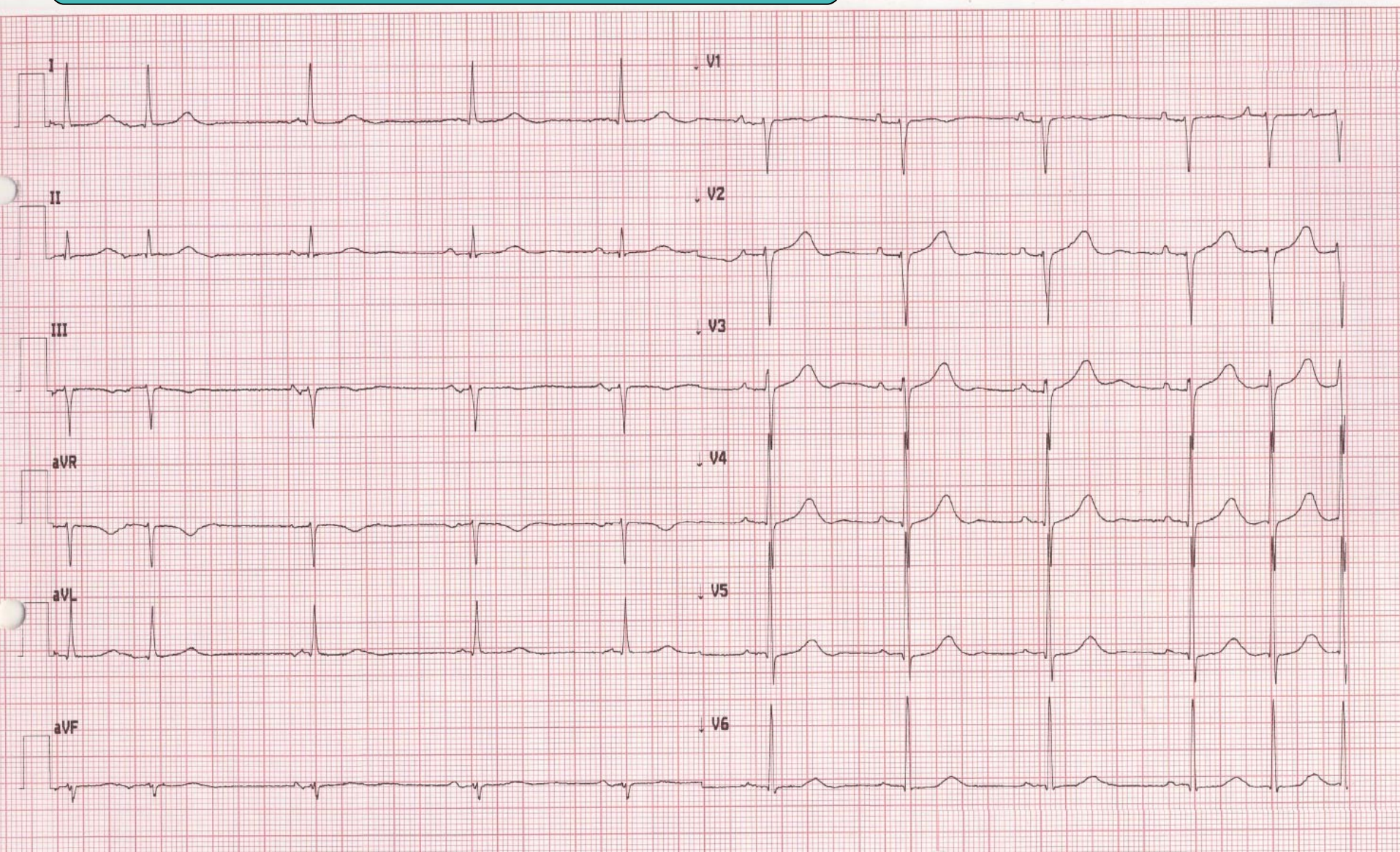
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ECG CIRCA 5' POST SHO

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ITER SUCCESSIVO?

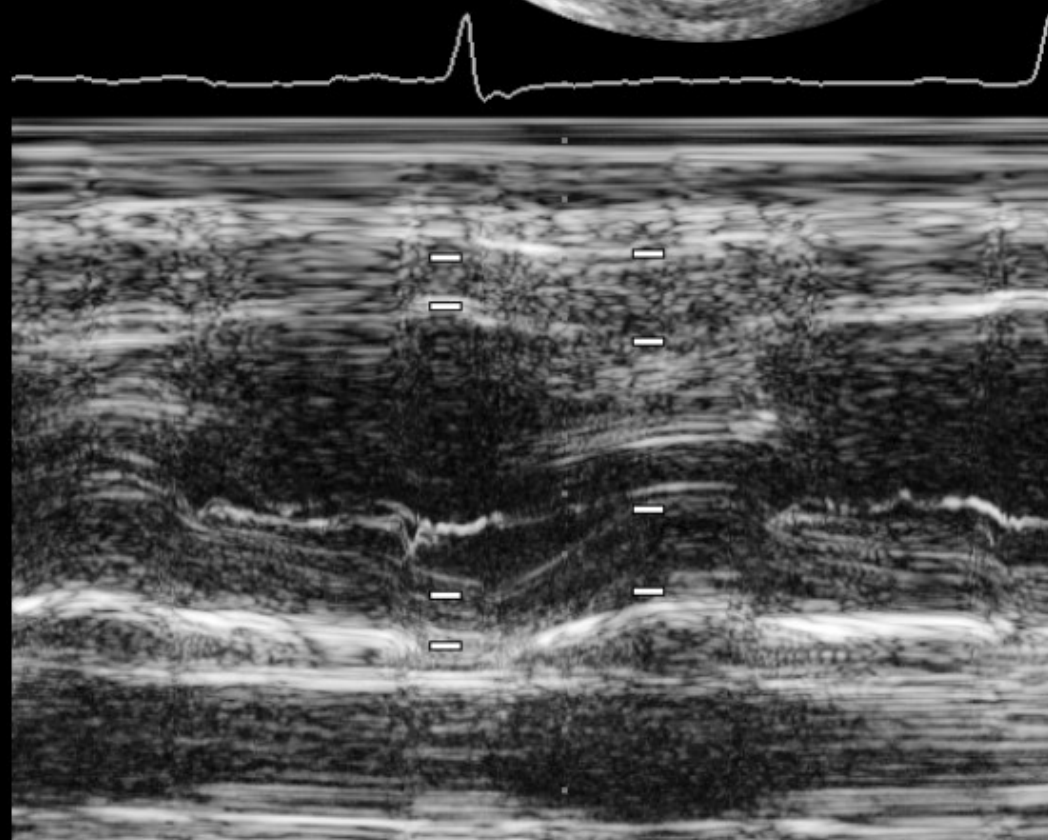
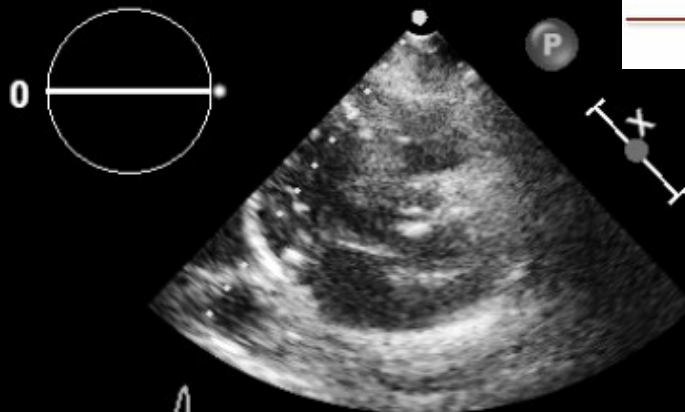
- 1) DIMISSIONE SENZA ALTRI ACCERTAMENTI**
- 2) MONITORAGGIO ECG E CURVA MARKERS**
- 3) ECOCARDIOGRAMMA TRANSTORACICO**
- 4) ECOCARDIOGRAMMA TRANSESOFAGEO**
- 5) TEST DI ISCHEMIA (ecostress/SPECT)**
- 6) CORONAROGRAFIA**



FR 31Hz
13cm

2D/MM

92% 88%
C 50
P Bassa
AGen



- LVPWs	1.39 cm	-0
- LVIDs	2.85 cm	.
- IVSs	1.49 cm	.
- LVPWd	0.860 cm	.
- LVIDd	4.90 cm	.
- IVSd	0.827 cm	-5
EDV (MM-Teich)	113 ml	.
Massa LV (Cubico)	141 g	.
IVS/LVPW (MM)	0.962	.
IVS % (MM)	80.2 %	.
FS (MM-Teich)	41.8 %	.
ESV (MM-Teich)	30.9 ml	-10
EF (MM-Teich)	72.7 %	.
LVPW % (MM)	61.6 %	.

75mm/s

57bpm





Lancet. 1965 Sep 25;2(7413):612-4.

Complications of cardioversion.

Turner JR, Towers JR.

PMID: 4157503

Minerva Cardioangiol. 1989 Oct;37(10):451-6.

[ST segment elevation after elective electric cardioversion].

[Article in Italian]

Cassin M, Charmet PA, Brieda M, Zanuttini D.

Abstract

From a group of 142 patient with atrial fibrillation or atrial flutter treated with DC shock, we selected 5 cases who showed a marked ST segment elevation immediately after electrical cardioversion. Only two patients, who received high voltage DC shock (950 and 1220 Joules) revealed prolonged and significant increase of CPK values. Our data suggest that ST segment transitory elevation after DC shock should probably not be considered a sign of myocardial injury even though this could be the case when high voltage DC shocks are used.





Am Heart J. 1991 Jan;121(1 Pt 1):51-6.

Incidence and clinical significance of ST segment elevation and atrial flutter.

Van Gelder IC¹, Crijns HJ, Van der Laarse A, Van Gilst WH, Lie KI.

⊕ Author information

Abstract

To study the incidence and clinical significance of postshock ST segment elevations, we recorded 12-lead ECGs immediately after transthoracic direct-current electrical cardioversion in 146 patients with atrial fibrillation or flutter. Among 23 patients (19%), acute ST segment elevations amounted to 1.4 ± 0.8 mV (mean $\pm$ SD) and occurred after 243 ± 114 joules (cumulative dose) in the precordial leads only in 14, concomitantly in precordial and inferior leads in two, and in the precordial and anterolateral leads in seven. They normalized within 1.5 ± 0.8 minutes. Occurrence of ST segment elevation was related to previous pericardiotomy (p less than 0.00001) and age (p = 0.01). Estimation of myocardial enzyme release did not show evidence of myocardial damage. Patients with ST segment elevations had a lower conversion rate (48% versus 76%, p = 0.005). Long-term maintenance of sinus rhythm was also diminished (35% versus 59%, p = 0.03). Results of this study show that postcardioversion ST segment elevation occurs predominantly in postpericardiotomy patients and may be associated with an unfavorable arrhythmia prognosis.

INCIDENZA SOPRA-ST POST CVE 19%:

- solo precordiali 61%
- precordiali + laterali 30%
- precordiali + inferiori 9%



ST-segment changes after direct current external cardio Incidence, characteristics and predictive factors

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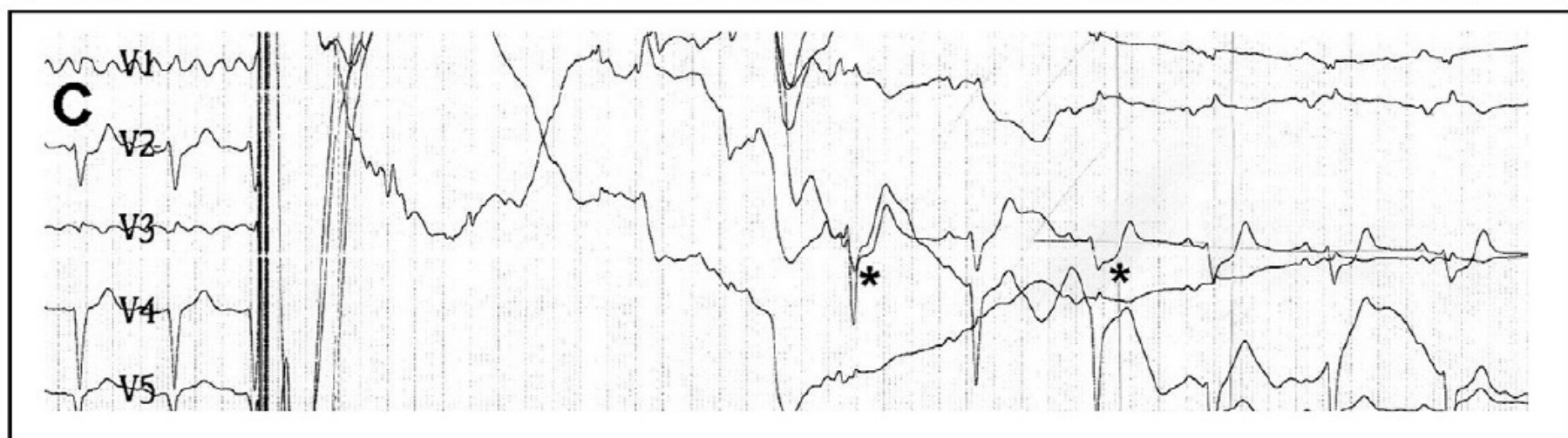
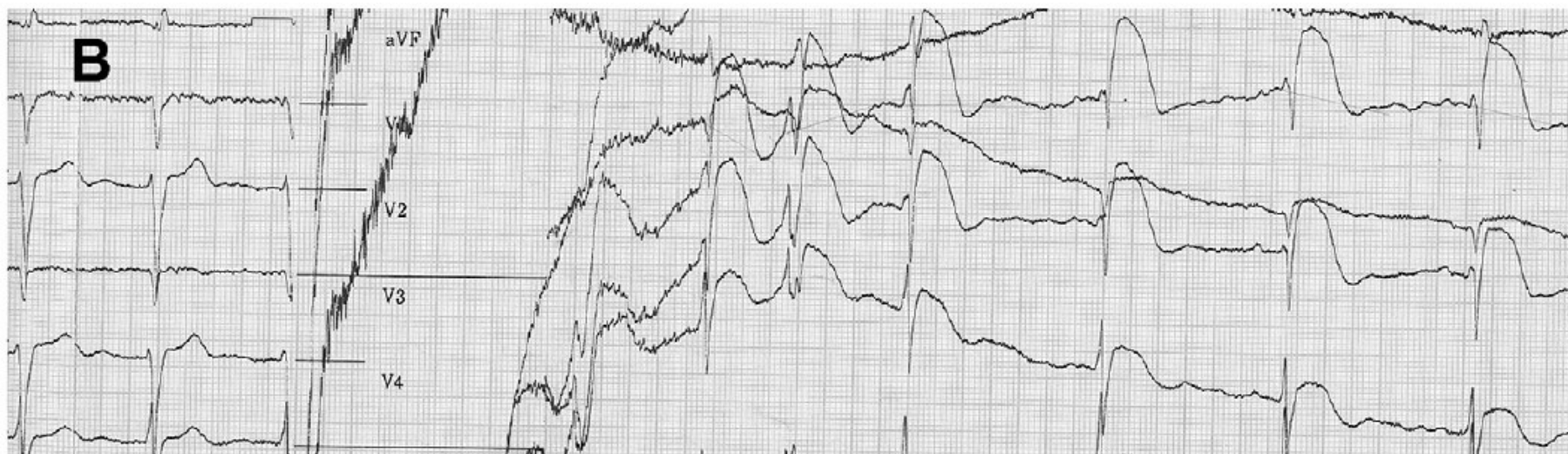


Philippe Rumeau, Joelle Fourcade, Alexandre Duparc, Aurélien Hébrard

Pierre Massabuau, Nicolas Detis, Meyer Elbaz, Didier Carrié, Michel Galinier, Marc Delay, Philippe Maury*

- SOTTO-ST 13%

International Journal of Cardiology 148 (2011) 341–346





REVISIONE LETTERATURA

ST-segment changes after direct current external cardioversion for atrial fibrillation. Incidence, characteristics and predictive factors

Philippe Rumeau, Joelle Fourcade, Alexandre Duparc, Aurélien Hébrard, Pierre Mondoly, Anne Rollin, Pierre Massabuau, Nicolas Detis, Meyer Elbaz, Didier Carrié, Michel Galinier, Marc Delay, Philippe Maury*

International Journal of Cardiology 148 (2011) 341–346

Results of multivariate analysis using regression logistic model incorporating the strongest related parameters after univariate analysis.

	p =	OR	Lower 95% CI	Upper 95% CI
<i>ST changes</i>				
Short AF history duration	0.044	1.012	1.003	1.021
Low systolic blood pressure	0.021	1.037	1.011	1.063
Increased CRP	0.0028	1.149	1.055	1.252
Monophasic DC shocks	0.00007	38.27	6.519	224.72
Hypocalcemia	0.0035	5.473	1.932	15.504
Low BMI	0.028	1.211	1	
<i>ST elevation</i>				
Use of propofol	0.038	9.759	1	
Monophasic DC shock	<0.0001	83.822	12	
Increased CRP	0.123	1.057	0	
<i>ST depression</i>				
Low LVEF	0.014	123	3	
Biphasic DC shock	0.01	11.43	1	

It appears that ST changes can be currently best explained by a persisting non transmural depolarisation of some myocardial cell layers induced by the DC shock, leading to a persistent voltage gradient along the ventricular wall [14,28]. This sustained depolarisation was suspected by Jones et al. to be caused by alterations in the electrical properties of the cellular membrane secondary to micro-breaks, a phenomenon called "electroporation" [29,30] which can last from a few seconds [30] to minutes [31] according to the model studied.





REVISIONE LETTERATURA

Kok LC, Mitchell MA, Haines DE, Mounsey JP, DiMarco JP. Transient ST elevation after transthoracic cardioversion in patients with hemodynamically unstable ventricular tachyarrhythmia. Am J Cardiol 2000;85(878-881):A9.

**- 15% DI SOPRA ST TRANSITORI IN PAZIENTI SOTTOPOSTI
A CVE DI TACHICARDIE VENTRICOLARI SOSTENUTE
(INDOTTE AL SEF).**





TAKE HOME MESSAGES

- **FENOMENO COMUNE** (INCIDENZA SOPRA-ST FINO AL 27%)
- **RAPIDA E SPONTANEA REGRESSIONE**
- SI ASSOCIA CON **ETA' AVANZATA, PREGRESSA PERICARDIOTOMIA, USO DI PROPOFOL E SHOCK MONOFASICO**
- **ASSENZA DI DANNO CARDIACO IN FASE ACUTA** (NON INCREMENTO SIGNIFICATIVO DEI MARKERS CARDIACI)
- VASOSPASMO POCO PROBABILE
- IPOTESI:
DC SHOCK PROVOCA **GRADIENTE ELETTRICO TRA STRATO SUB-EPICARDICO ED ENDOCARDICO** (DANNO TRANSITORIO DELLA MEMBRANA CELLULARE: "ELECTROPORATION")



