

# Transient Myocardial Infarction Pattern Following D. C. Cardioversion

By

R.C. Hansoti, M.D., FCCP; FACC\*, A.G. Desai, M.D., D.M.\*\*  
S. Sharma, M.D., D.M., MNAMS\*\*\*, Anil Kumar, D.M.\*\*  
and M.D. Shah\*\*\*\*

## A CASE REPORT

### Introduction:

Cardioversion has come to be accepted as one of the most effective measures for terminating tachyarrhythmias. Its after effects on the myocardium have also been documented. Here we present yet another unusual feature following cardioversion and i.e. the transient appearance of infarction pattern on the surface E.C.G.

### Case Report:

A 65 years old male patient C.D. was admitted to our hospital in a state of altered consciousness. He had been admitted to a private nursing home for the same and a routine E.C.G. taken there revealed supraventricular tachycardia (SVT) without aberrancy for which he was transferred to our hospital.

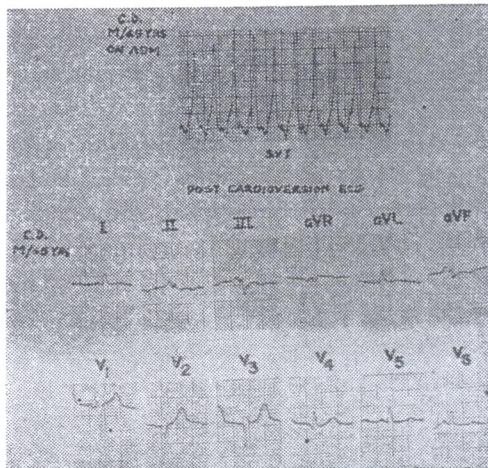


Fig. 1. Shows supraventricular tachycardia (SVT). The lower Panel shows post cardioversion 12 lead ECG with significant "Q" waves in V2 V3 and V4 leads (ONADM—on admission).

- 
- \* Professor and Head of Department of Cardiology,
  - \*\* Tutor in Cardiology,
  - \*\*\* Reader in Cardiology,
  - \*\*\*\* Registrar in ICCU

From: Department of Cardiology, B.Y.L. Nair Ch. Hospital, Dr. A.L. Nair Road, Bombay-400 008 (INDIA)

Correspondence to: Dr. A.G. Desai, M.D., D.M.,

The patient was responding to painful stimuli and neurological examination elicited evidence of previous left sided hemiparesis with no fresh changes. His blood pressure was 80/50 mm Hg and had a pulse rate of about 180/min. A synchronous DC shock of 10 Joules was administered to the patient following which he went into asystole and for which only external cardiac massage was instituted. The patient immediately regained his rhythm but again went into SVT. A DC shock of 150 Joules was then given following which he reverted to sinus rhythm. The postcardioversion 12 lead ECG showed an anteroseptal infarction pattern with significant 'Q' waves in leads V2, V3. The serum enzyme reports following cardioversion showed serum glutamic oxalacetic transaminase: 43 k.u., serum glutamic pyruvic transaminase: 36 k.m. and serum lactose dehydrogenase: 165 I.U. (Normal SGOT: 8-40 k.u.; SGPT: 8-35 k.m.; SLDH: 70-240 I.U.). The patient was monitored in the Intensive Cardiac Care Unit. However, the 12 lead ECG taken on the next day and that

taken after 7 days failed to show any of those significant 'Q' waves in the chest leads. The serum enzymes on both these occasions were within normal limits.

### Discussion:

Although earlier reports of cardioversion suggested a benign nature,(1) complications, occasionally dangerous ones, are known to occur. Complications are reported in about 14.5% of cases.(2) Amongst them, increase in serum levels of SGOT and SLDH is the most frequent and occurs in about 9% of the cases. It is thought to be due to myocardial damage or skeletal muscle damage and is seen particularly with high energy level settings of 300 Joules or more. Pulmonary and systemic arterial embolisation are also known to occur following cardioversion.(3) Hypotension, cardiac enlargement with pulmonary venous congestion and pulmonary edema have also been reported.(4) Increase in ventricular ectopic activity is known and ECG changes like T wave inversion and multifocal VPC's are common and may persist for several days, sometimes upto 6 months. Complications are frequent in patients with chronic atrial fibrillation, cardiomyopathy, coronary artery disease or in those who are fully digitalised.

A previously noted but not readily accepted and appreciated artifact termed as the ECG "Smudge" pattern is known to occur. This abnormality occurs when the electrode paste is hastily applied forming a thin film across the precordium and thereby producing a confluence of electrical potential that may artifactually resemble acute ischemia.(5) However in our case after cardioversion the jelly was totally rubbed off and then a fresh ECG was taken.

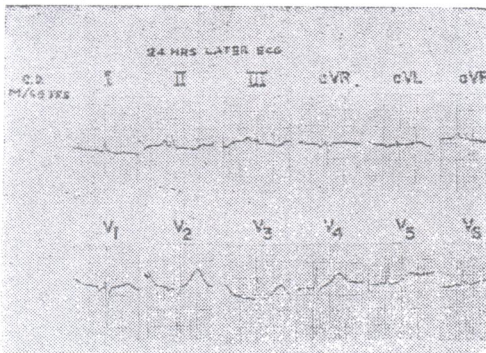


Fig. 2. 12 lead ECG taken 24 hours following cardioversion showing disappearance of "Q" waves from anterior chest leads.

Transient ST-elevation is reported infrequently to accompany DC cardioversion. The similarity of transient ST-elevation post-cardioversion to that of variant angina has been indicated. Electrical current is capable of inducing vasospasm; hence a transient ST rise following cardioversion deserves consideration. ST-elevation following DC-cardioversion lasting 20 seconds to 2 minutes is an infrequent but well documented occurrence, reported in 3% of 2341 cardioversions. DC shock has also revealed histologic damage to myocardium in animals.(6)

Here in this case, we are documenting yet another unusual feature i.e. transient but significant 'Q' waves in the surface ECG following DC cardioversion.

#### References:

1. Lown B.: Cardioversion of arrhythmias II. *Mod. Conc. Cardiovasc. Disc.* 1964: 33,869.
2. Resnekow L., McDonald, Lawson: Complications in 220 patients with cardiac dysrhythmias treated by phased direct current shock and indications for electro-conversion. *Br. H.J.* 1967: 29, 926.
3. Nawab A., La Due J.S.: Post-conversion system arterial embolisation. *Am. J. Card.* 1965: 16, 452.
4. Resnekow L., McDonald L.: Pulmonary edema following treatment of arrhythmia by direct current shock. *Lancet* 1965: 1, 506.
5. Grayboys T. Band Majzoub J.A.; "Smudge" ECG: *New England Journal of Medicine.* 1975:292, 50.
6. Zelinger A.B., Falk R.H., Hood W.B.: Electrical-induced sustained myocardial depolarization as a possible cause for transient ST elevation post-DC elective cardioversion. *Am. Heart J.* 1982:103, 1073.