

Original Report**Right Sided Precordial Leads Electrocardiographic Mapping in Normal Individuals and in Patient with Acute Myocardial Infarction and Various Intra Ventricular Conduction Defect**

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**ABSTRACT**

Early recognition of right ventricular infarction is essential as the time of onset of its hemodynamic consequences is unpredictable. Right precordial surface ECG is performed in this case as conventional lead is not useful. Based on clinical assessment total 100 subjects were divided into three groups: Group A: 25 normal subjects, Group B: 25 patients with intra ventricular conduction defects - LBBB or RBBB and Group C: 50 patients of acute MI. Inverted T waves was 68.16% in pts with RBBB (n=15, tab1); for LBBB (n=10, tab 2), 100% QS pattern and incidence of upright T wave was 90.4%. Increased incidence of QS pattern was seen in Isolated Inferior MI (n=16, tab 3) or with Posterior Wall Infarction. (n=9, tab 4) and T wave was upright in 51.25% & 64.2% respectively. QS Pattern approached 100% in V5R & V6R in pts of acute inferior and RVMI (n=3, tab 5). In Antero-Septal MI (n=12, tab 6), cutting of initial r wave in V1, V3R & V4R strongly suggests a septal MI. Acute Extensive Anterior MI (n=10, tab 7) showed QS pattern (84.4%). ST segment was found elevated in 42.8% leads V4R-V1 & upright T waves were 82%. In cases of acute MI QS pattern in right sided chest leads was seen in right ventricular infarction, antero-septal infarction and extensive anterior infarction. We conclude that for the diagnosis of right ventricular infarction ST elevation should occur in all right sided leads from V1 to V6R, and correct lead placement is essential so that right ventricular infarction may not be missed.

**Keywords:** RV infarction, Right precordial surface ecg, ivcd, acute extensive anterior MI**1. INTRODUCTION:**

Early recognition of right ventricular infarction is essential as the time of onset of its hemodynamic consequences is unpredictable. Right precordial surface ECG is performed in this case as conventional lead is not useful. No work done yet on the ECG pattern on different points on right side of chest in case with intra ventricular conduction defects and acute MI.

We aim to establish ECG pattern of right sided leads in case of normal, intra ventricular conduction defects (LBBB or RBBB) and to find out the effect of AMI on right sided leads by right precordial surface ECG mapping .

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Email: [golu.09@gmail.com](mailto:golu.09@gmail.com)DOI: [10.46978/sjc.20.1.4.18](https://doi.org/10.46978/sjc.20.1.4.18)**2. METHOD**

This study is conducted in the department of cardiology, Calcutta national medical college and associated hospitals in Kolkata and patients were taken from cardiology ICCU, wards and outdoors. Based on clinical assessment total 100 subjects were divided into three groups:

A. **Group A:** 25 normal subjectsB. **Group B:** 25 patients with intra ventricular conduction defects - LBBB or RBBB and C. **Group C:** 50 patients of acute MI.

Table 1	V6R	V5R	V4R	V3R	V1	AV.
<b>QRS morphology</b>						
rSR'	18.6	24.2	25.4	26.6	25.2	24
rR'/R/Rr'	10.6	15.8	13	10.4	7.8	11.52
QR/qR	64.2	60	59	57.8	59.2	60.04
Others(rs/QS)	6.6	0	2.6	5.2	7.8	4.44
<b>ST segment</b>						
T wave						
upright	14.4	26.6	26.6	29.4	32	25.8
inverted	68.2	65.8	70.8	68	68	68.16
flat	17.4	7.6	2.6	2.6	0	6.04

Table 2		V6R	V5R	V4R	V3R	V1	AV.
QRS morphology	RS	0	0	0	0	0	0
	QS	100	100	100	100	100	100
ST segment	Elevated*						
	Depressed	0	18	32	38	38	25.2
	Flat	0	0	0	0	0	0
		100	82	68	62	62	74.8
T wave	Upright	86	90	92	92	92	90.4
	Inverted	8	10	8	8	8	8.4
	Flat	6	0	0	0	0	1.2

Table 3		V6R	V5R	V4R	V3R	V1	AV.
QRS morphology	rS	25	36.25	71.25	76.25	88.75	59.5
	QS	42.5	35	16.25	11.25	2.5	21.5
	Qr/QR	20	17.5	5	0	1.25	8.75
	Others(qR/rSr)	12.5	11.25	7.5	12.5	7.5	10.25
ST segment	Elevation	0	0	1.25	0	0	0.25
	Flat	100	92.5	98.75	100	100	98.25
	Depressed	0	7.5	0	0	0	1.5
T wave	upright	46.25	48.75	51.25	43.75	51.25	48.25
	inverted	36.25	33.75	33.75	31.25	31.25	33.25
	Flat	17.5	17.5	15	25	17.5	18.5

Table 4		V6R	V5R	V4R	V3R	V1	AV.
QRS morphology	RS	91	87	78	74	22	70.4
	QS	4	13	22	26	78	28.6
	rSR'	5	0	0	0	0	1
ST segment	Flat	Flat	Flat	Flat	Flat	Flat	Flat
T wave	upright	5	47	78	91	100	64.2
	inverted	64	53	18	9	0	28.8
	flat	31	0	4	0	0	7

Table 5	V6R	V5R	V4R	V3R	V1	AV.
QRS morphology						
QS	93	67	47	7	0	42.8
rs/RS	7	33	53	93	100	57.2
ST segment						
Elevation	74	80	80	80	80	78.8
Flat	26	20	20	20	20	21.2
T wave						
upright	33	40	93	100	100	73.2
inverted	67	47	7	0	0	24.2
Flat	0	13	0	0	0	2.6

Table 6	V6R	V5R	V4R	V3R	V1	AV.
QRS morphology						
QS	100	100	100	100	100	100
rS	0	0	0	0	0	0
ST segment						
Elevated	0	0	14	20	77	22.2
Flat	100	100	86	80	23	77.8
T wave						
Upright	17	17	17	17	17	17
Inverted	7	33	83	83	83	57.8
Flat	76	50	0	0	0	25.2

Table 7	V6R	V5R	V4R	V3R	V1	AV.
QRS morphology						
QS	78	86	86	86	86	84.4
rS	16	8	8	8	8	9.6
Others(qR)	6	6	6	6	6	6
ST segment						
Elevated	0	6	28	88	92	42.8
Flat	100	94	72	12	8	57.2
T wave						
Upright	62	72	84	92	100	82
Inverted	32	16	0	0	0	9.6
Flat	6	12	16	8	0	8.4

### 3. RESULT

Inverted T waves was 68.16% in pts with RBBB (n=15, tab1); for LBBB (n=10, tab 2), 100% QS pattern and incidence of upright T wave was 90.4%.

Increased incidence of QS pattern was seen in Isolated Inferior MI (n=16, tab 3) or with Posterior Wall Infarction. (n=9, tab 4) and T wave was upright in 51.25% & 64.2% respectively. QS Pattern approached 100% in V5R & V6R in pts of acute inferior and RVMI (n=3, tab 5).

In Antero-Septal MI (n=12, tab 6), cutting of initial r wave in V1, V3R & V4R strongly suggests a septal MI. Acute Extensive Anterior MI (n=10, tab 7) showed QS pattern (84.4%). ST segment was found elevated in 42.8% leads V4R-V1 & upright T waves were 82%.

### 4. DISCUSSION

In this study we found that right sided chest leads in LBBB without infarction shows predominant QS pattern with frequently elevated ST segment and an upright T wave whereas in RBBB ST segment was found to be flat in all precordial leads and mostly inverted T wave.

In cases of acute MI QS pattern in right sided chest leads was seen in right ventricular infarction, antero-septal infarction and extensive anterior infarction. Thus a QS pattern in all right sided leads is suggestive but not diagnostic of right ventricular infarction.

We found an important differentiating point from RVMI which usually shows ST elevation up to V6R whereas septal MI can show ST elevation in V1 frequently and it may extend upto V3R-V4R but almost never in V5R-V6R. But ST elevation less than 1mm was not given any significance for diagnosis of right ventricular infarction.

### 5. CONCLUSION

We conclude that for the diagnosis of right ventricular infarction ST elevation should occur in all right sided leads from V1 to V6R, and correct lead placement is essential so that right ventricular infarction may not be missed.

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