

Description and analysis of the intracavitary electrocardiogram at the insertion of the peripheral central insertion catheter (PICC) in the adult patient.

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INTRODUCTION

The functioning of the PICC depends on the tip position.
The intracavitary electrocardiogram (EKG-IC) locates the tip of the catheter by observing cardiac electrical activity from an intracavitary electrode.

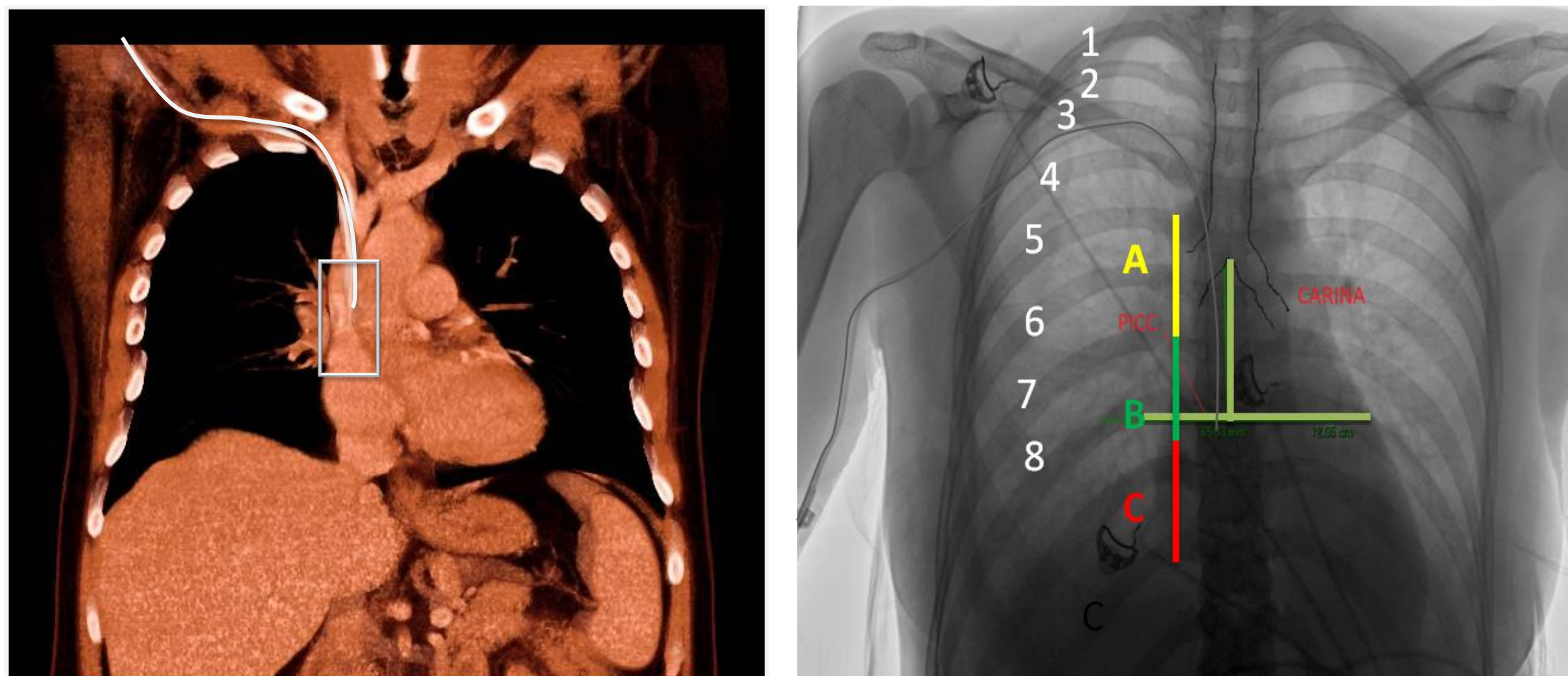


Figure 1 y 2 : TIP LOCATION X-ray examination. Source: own elaboration



EKG EKG-IC

Figure 3: Tip location EKG-IC

OBJECTIVE

Evaluate the tip position of the PICC by observing morphological variations of the p wave, QRS complex, and T wave of the intracavitary electrocardiogram.

METHOD

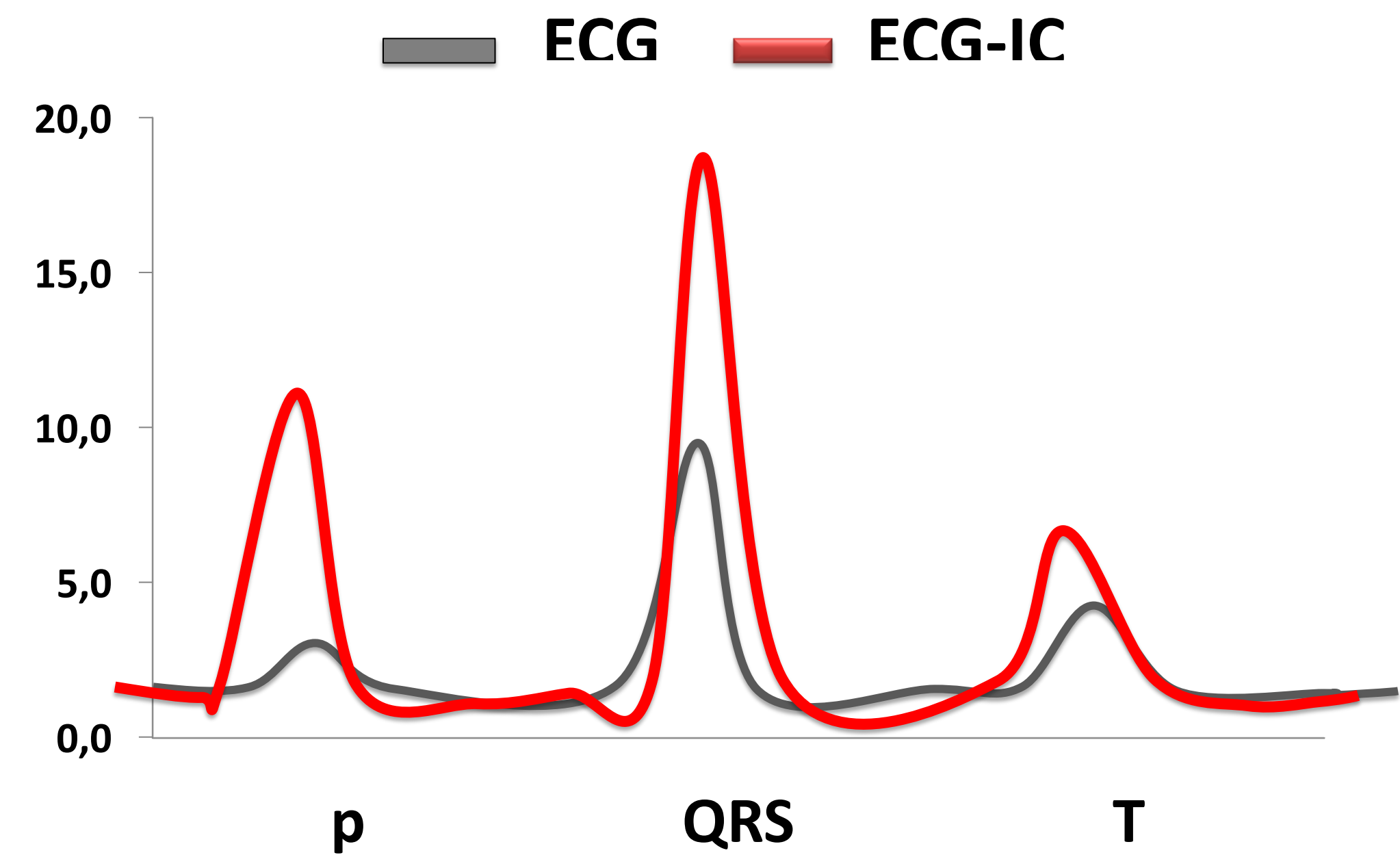
Descriptive, clinical series study.
Sampling: convenience –selected patients requiring PICC and chest X-ray at Fundación Jimenez Díaz.



PRELEMINARY RESULTS

Variable	N (%)
Carina (mm)*	40,1 (24)
Location in relation with the carina:	
- Zone A: hasta 20mm	4(16,7)
- Zone B : (>20mm-54mm)	11(45,8)
- Zone C: ≥55mm	9(37,5)

Table 1: PICC location on the chest radiograph



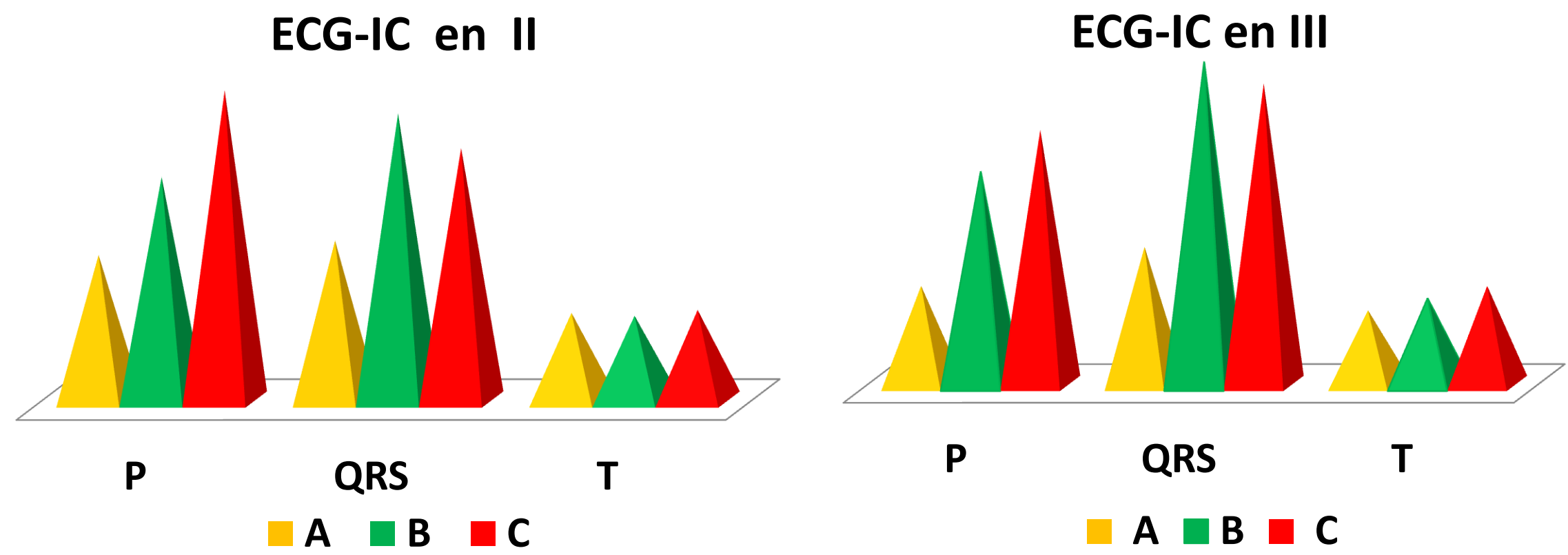
Graphic 1 :Growth of the EKG-IC waves in relation to the baseline EKG

P Wave and QRS	IIP	IIQRS	IIT	IIIP	IIQRS	IIIT
EKG	0,9	4,9	1,9	0,9	4,0	2,0
EKG-IC	6,8	9,4	2,4	7,2	10,4	3,4

Table 2 :Growth of the EKG-IC waves in relation to the baseline EKG, in millimeters

	P Media (DE)	QRS Media (DE)	T Media (DE)
II			
- Zone A	5 (3)	5,5 (2,6)	3 (2,1)
- Zone B	7,7 (3,2)	9,9 (4,3)	2,9 (2,1)
- Zone C	10,7 (6,7)	8,7 (5,8)	3,1 (1,3)
III			
- Zone A	4 (4,5)	5,6 (5,6)	3 (1,7)
- Zone B	8,7 (4,1)	13,2 (8,4)	3,5 (4,1)
- Zone C	10,4 (6)	12,3 (10)	4 (1,6)

Table 3. Relationship of ECG-IC with chest radiography , in mm



Graphic 2 . Relationship of ECG-IC with chest radiography .

Correlations	Correlation coefficient	p
II		
- P	0,490	0,015
- QRS	0,383	0,065
- T	0,213	0,317
III		
- P	0,425	0,038
- QRS	0,413	0,045
- T	0,212	0,319

Table 4. ECG-IC correlations with chest radiography

DISCUSSION

Tip location is an indicator of quality and safety in the insertion of PICC. The ECG-IC is a safe and accuracy technique.

CONCLUSIONS

- The p wave and QRS complex have a clear increase in amplitude or height in the EKG-IC, while the T wave has hardly any modifications.
- The p and QRS waves grow according to the catheter approaches the right atrium in the ECG-IC, that is, the catheters located in Zone B and C have p and QRS waves higher height than the catheters in Zone A
- EKG-IC changes that happen in the p wave and the QRS complex provide information about the catheter's path and position, while the T wave does not provide any information.

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