

# TUNNELED HEMODIALYSIS CATHETERS – THE DEVIL IS NOT SO BLACK AS HE IS PAINTED

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**Background.** Vascular access is of prime importance for hemodialysis patients. The aim of this study is to show acute (AC) and chronic (CC) complications during the insertion and the usage of tunneled catheters (TC) in a single Bulgarian hemodialysis center.

**Material and Methods:** This study is retrospective for five years period, between 1-st January 2010 and 31-st December 2014. There are 501 TC inserted with different size and tip design in the right/left internal jugular vein (R/LIJV), the right/left supraclavicular vein by the supraclavicular approach (R/LSCVSC), the left subclavian vein by the infraclavicular approach (LSCVIC) and in the left femoral vein (LFV), respectively (figure 1).

The distribution by sex, age, reason for hemodialysis treatment, primary patency, number and kind of AC and CC as well as the relationship between the complications and the insertion place are calculated.

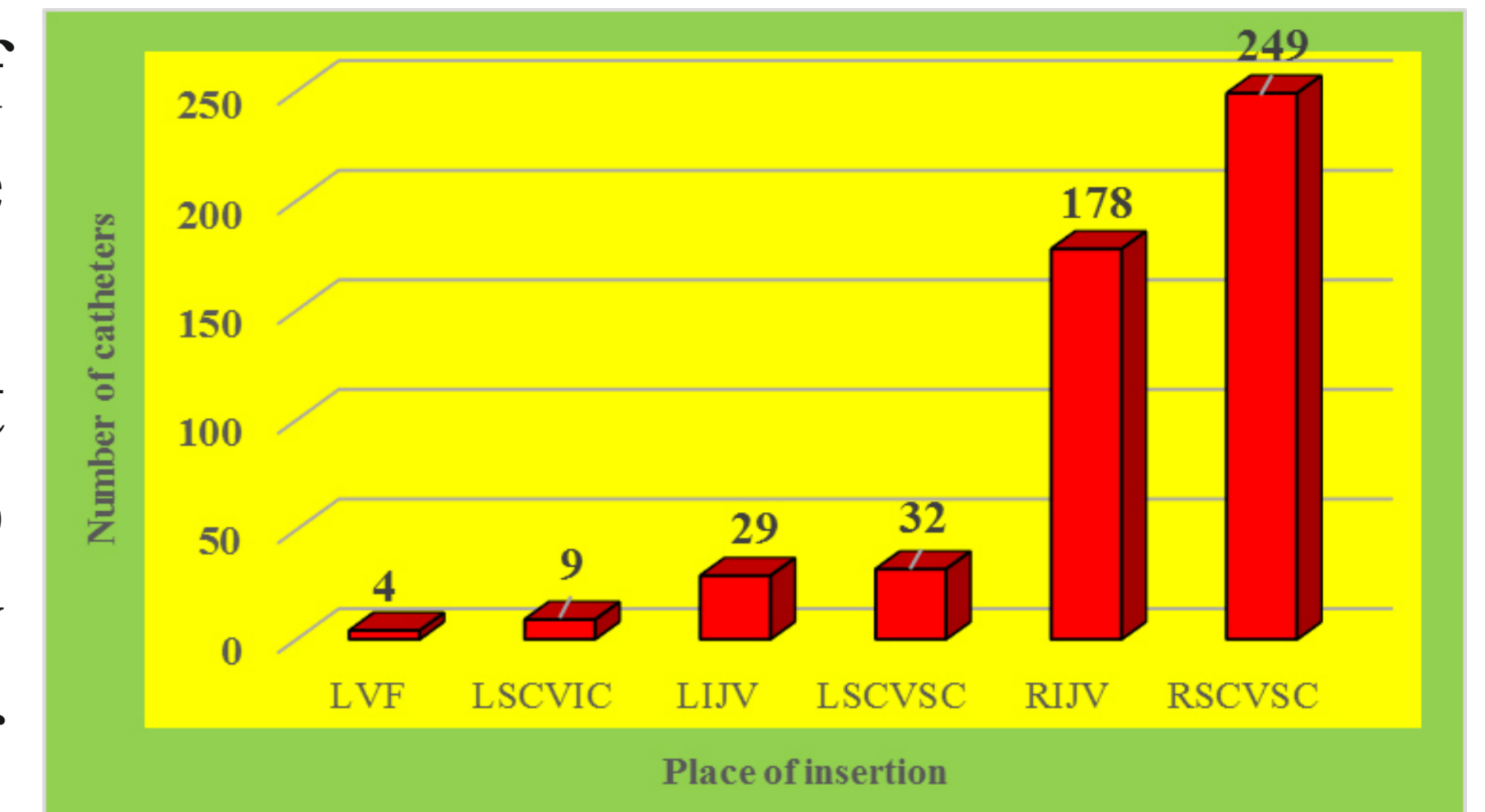


Figure 1 – Distribution of catheters by place of insertion. (LFV – left femoral vein; R/LIJV – right/left internal jugular vein; R/LSCVSC – right/left subclavian vein, supraclavicular approach; LSCVIC – left subclavian vein, infraclavicular approach.)

**Results:** There are 262 males with middle-age of 60.3 (+/- 12.8) years and 239 females with middle-age of 61.7 (+/- 11.5) years (figure 2).

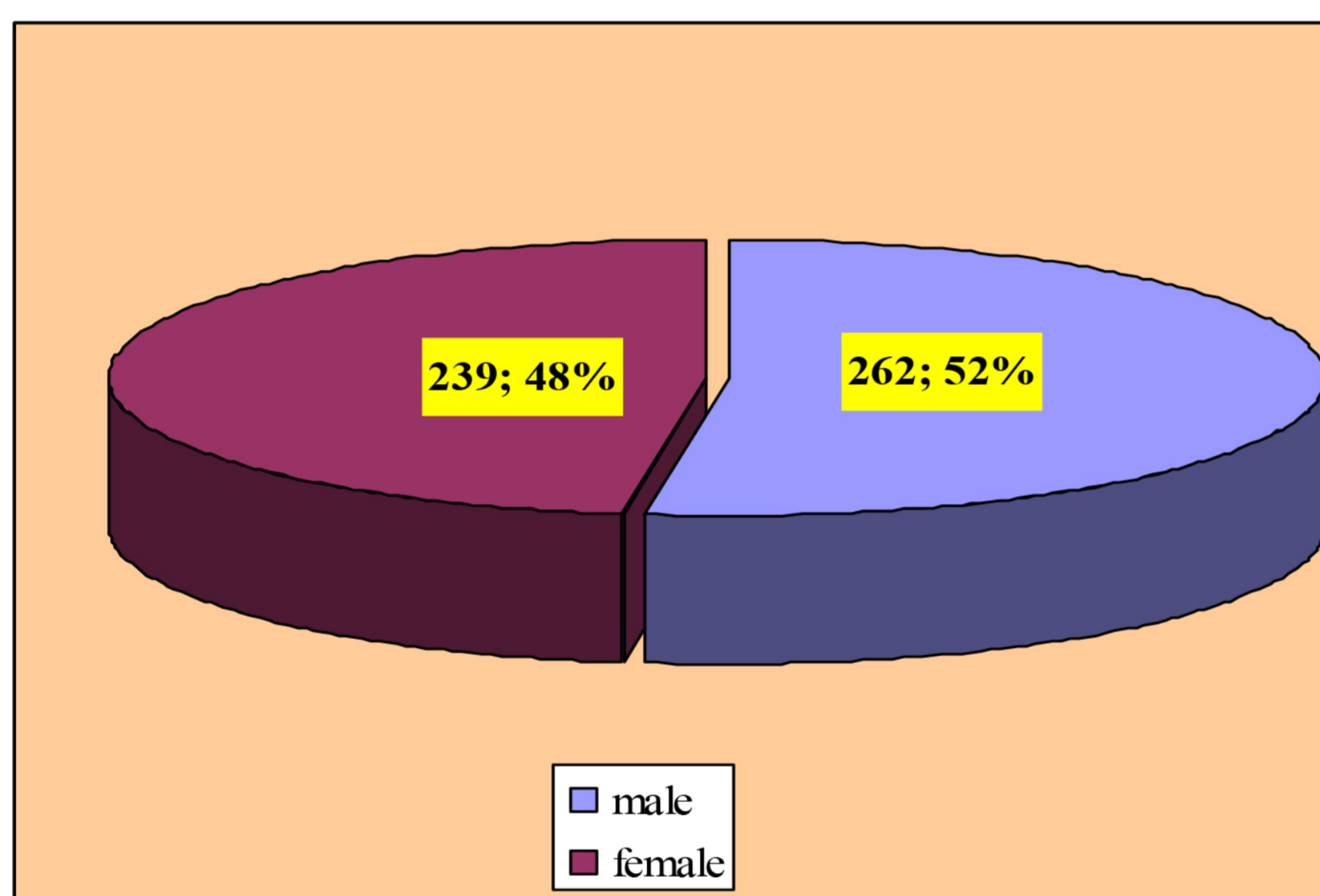


Figure 2 – Distribution of patients by sex (n = 501).

We find 6 cases (1.2 %) of AC – 4 of malposition and 2 of malignant arrhythmia, which are significantly correlated ( $p < 0.05$ ;  $r = 0.23$ ) to catheter insertion in RIJV (figure 3).

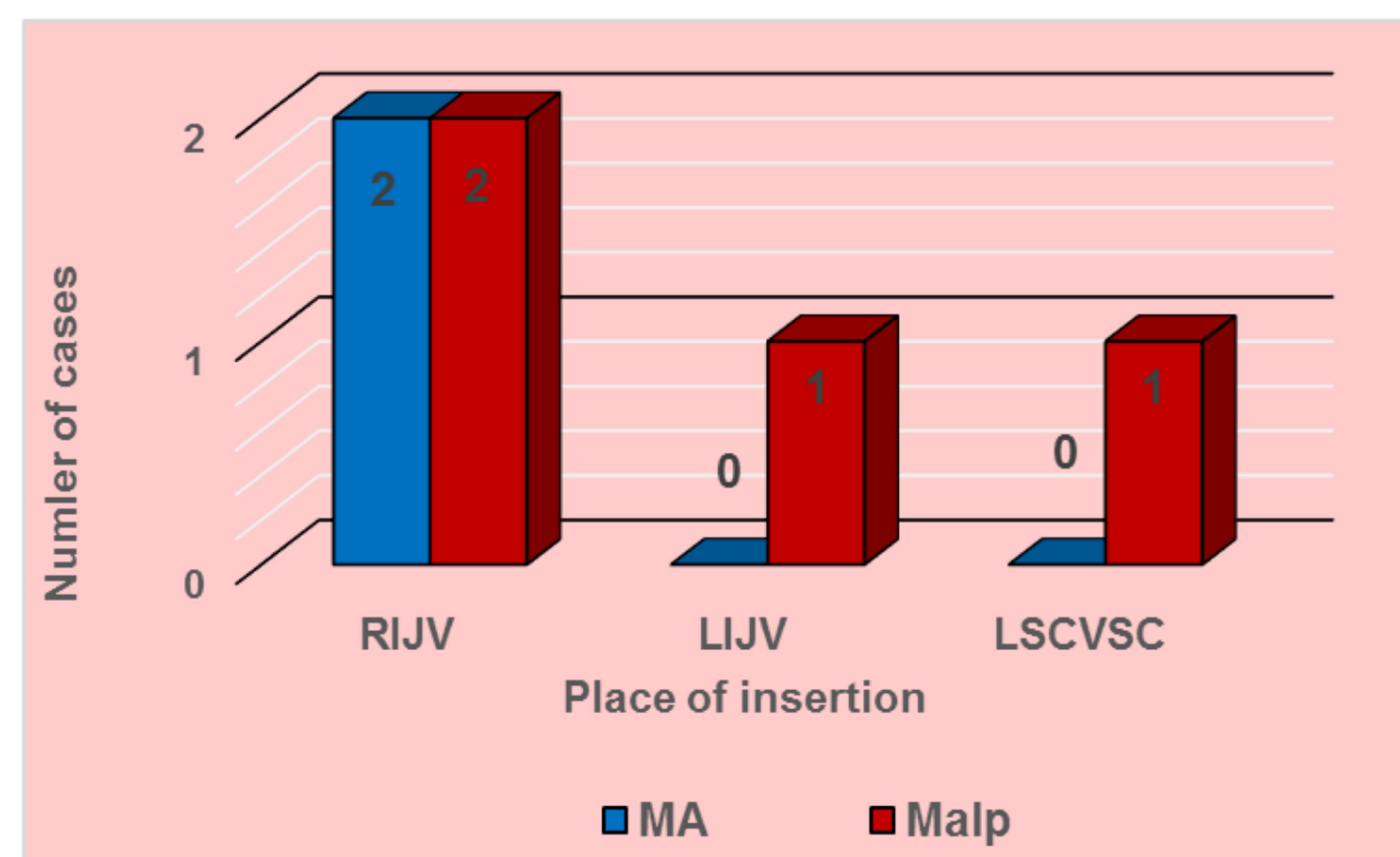


Figure 3 – Distribution of acute complications depending on the insertion place. (RIJV – right internal jugular vein, LIJV – left internal jugular vein, LSCVSC – left subclavian vein supra-clavicular approach.) (MA – malignant arrhythmia, Malp. – catheter malposition.)

There are 86 (17 %) cases of CC: 43 (8.5 %) – infectious complications, 22 (4.3 %) – thrombosis (intra- and extraluminal), 12 (2.4 %) – mechanical injury and 9 (1.8 %) of central vein stenosis (figure 4).

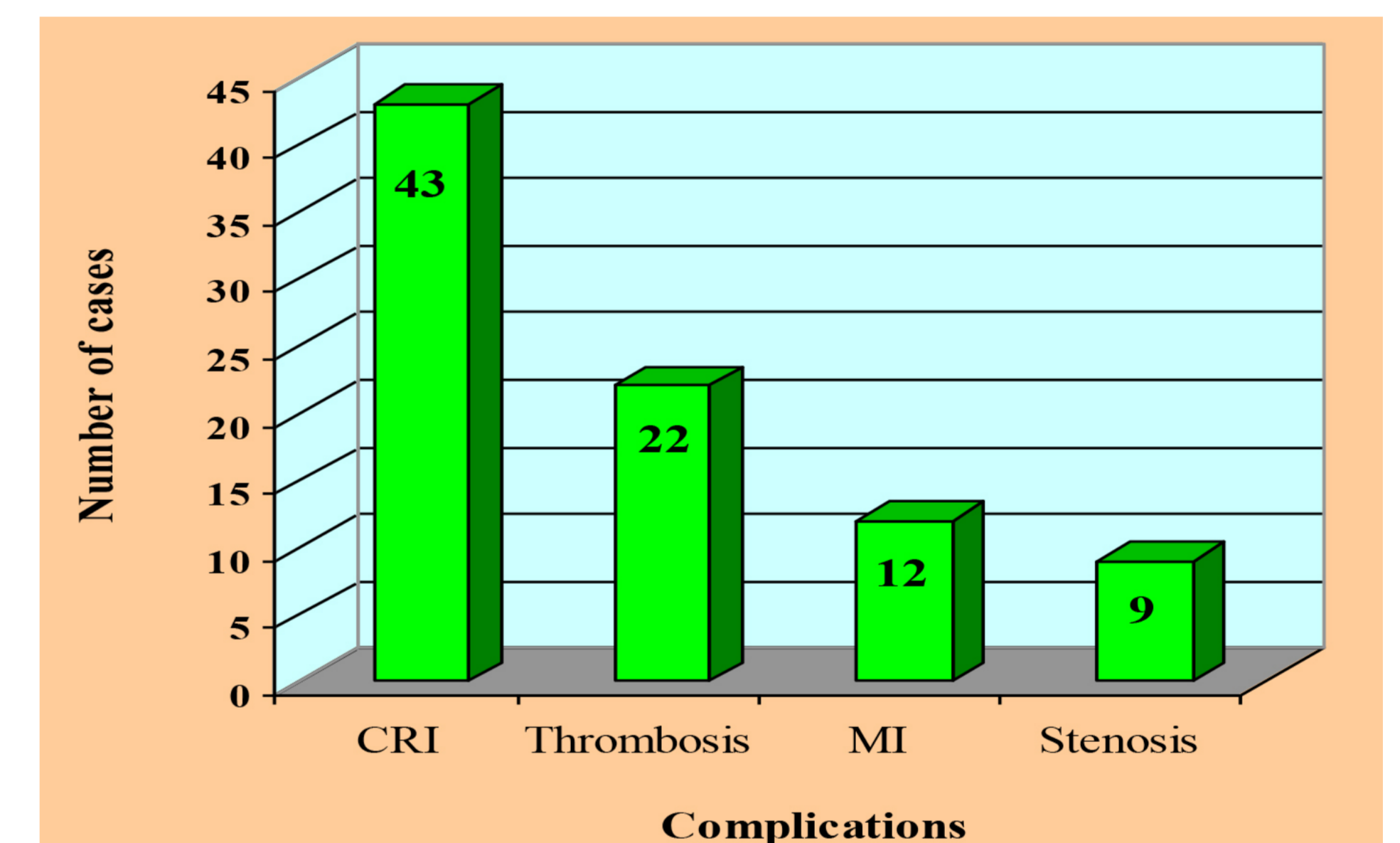


Figure 4 – Chronic complications distribution. (CRI – catheter related infection; MI – mechanical injury; Stenosis – catheter-related central vein stenosis; Thrombosis – catheter-related thrombosis.)

No significant correlation ( $p > 0.05$ ) is observed between the CC and the insertion place. We ascertain significant correlation ( $p = 0.0001$ ) between the diameter of the catheter and its patency (figure 5). The median primary patency is 388 days (figure 6).

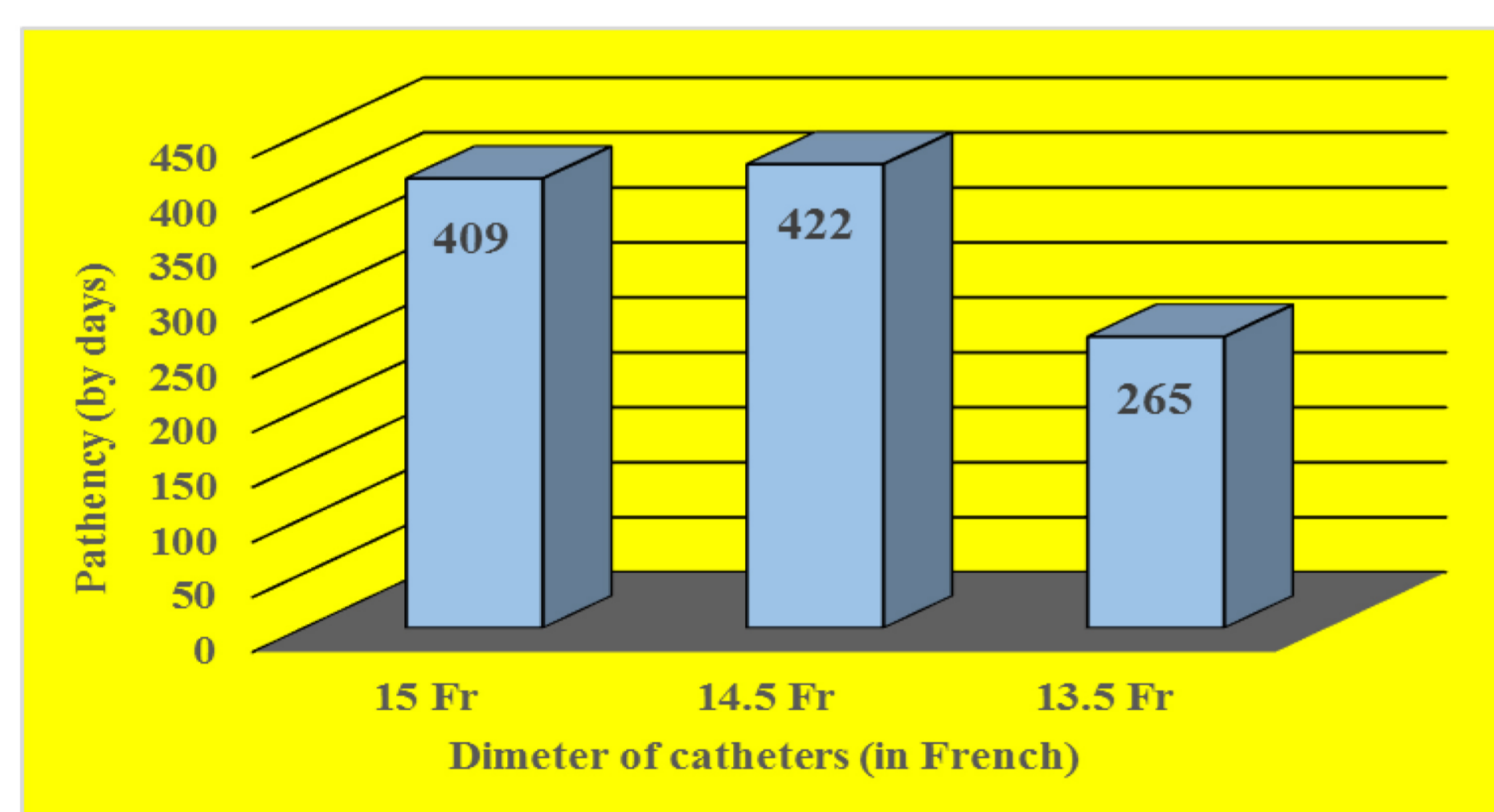


Figure 5 – Catheters patency depending on their diameter: the correlation is significant ( $p = 0.0001$ ) only between catheters with diameters 14.5/15 Fr and this with diameter 13.5 Fr.

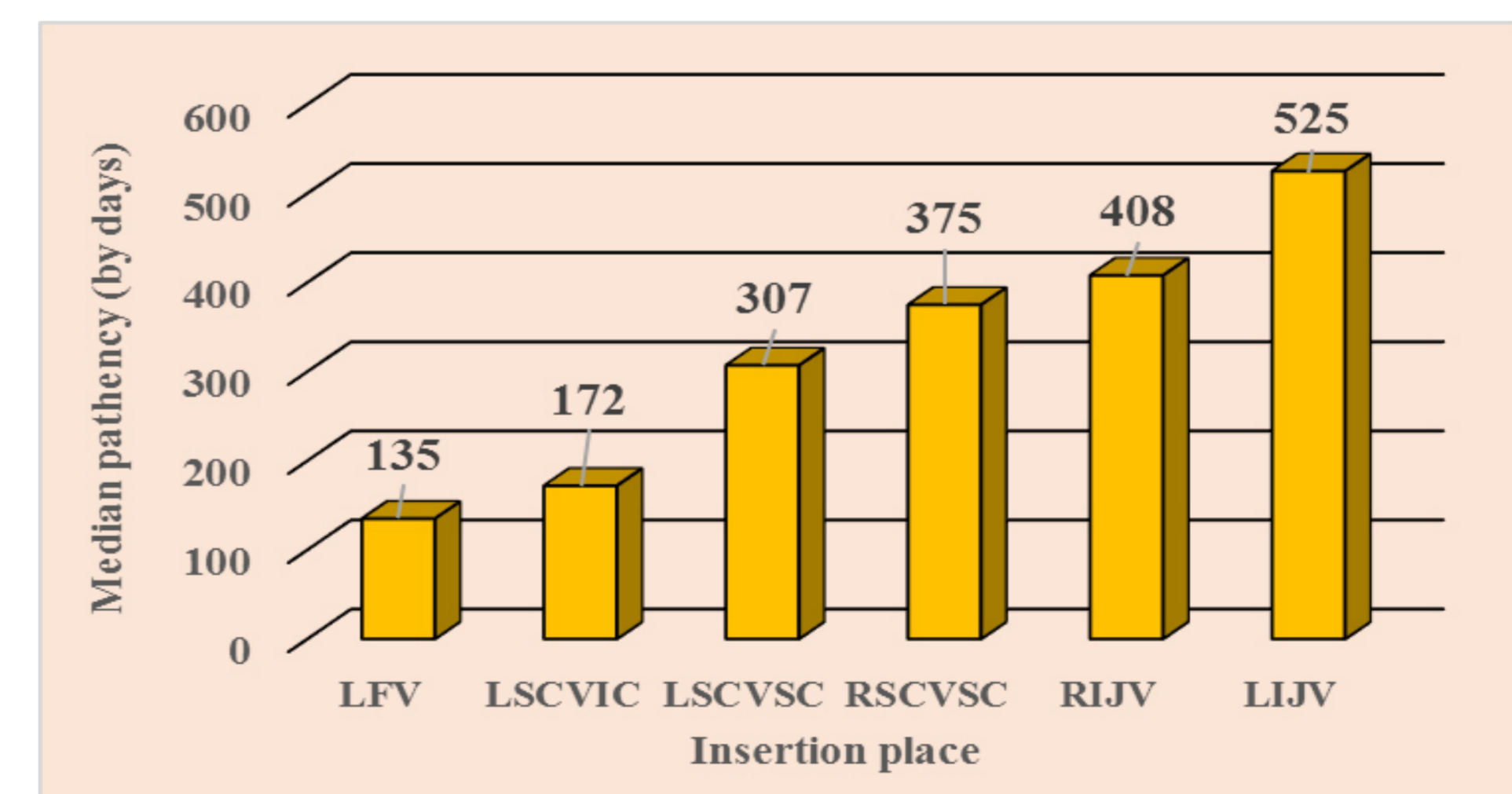


Figure 6 – Median patency of catheters depending on their insertion place. (LFV – left femoral vein; R/LIJV – right/left internal jugular vein; LSCVIC – left subclavian vein, infraclavicular approach; R/LSCVSC – right/left subclavian vein, supraclavicular approach.)

**Conclusion:** We conclude that the cannulation of the central vein for hemodialysis can be successfully executed by nephrologists. We have not found correlation between the chronic complications and the insertion place, but we ascertain statistical relationship between the diameter of the catheter, its left insertion place and the better primary patency.

**Key words:** hemodialysis vascular access, tunneled catheters, complications.