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Research Letter

Abnormal origin of right coronary artery and use of Tiger catheter through femoral route

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ABSTRACT

Background: Abnormal origin of right coronary artery (RCA) is not uncommon. The incidence is .25–.92%. Right Judkin catheter is used universally for engaging right coronary ostium from femoral route. We have tried Tiger catheter from femoral route in abnormal origin of RCA patients. We were successful in cannulating RCA ostium in most of the cases.

Materials and methods: We have studied about 5120 patients over 4 years. We have selected patients from November 2010 to November 2014. Our patients are from two institutions—I.P. G.M.E.R., Kolkata and Burdwan Medical College, West Bengal. Right Judkin 3.5 and 4 were used universally. We have used AL-1,2,3, AR1,2, multipurpose, different guide catheters for cannulating RCA ostium in those cases where we failed to engage by right Judkin catheter. We have used Tiger catheter as a last resort when all endeavor failed.

Results and analysis: Among 40 cases of left sinus origin Type A—9, Type B—14, Type C—6, Type D—3, and Type E—8 patients were observed. But 668 cases abnormal origin of RCA were from right coronary sinus only. High take-off origin were 422 cases (8%), low take-off were 132 cases (2.5%), and posterior origin were 114 cases (2%). We could engage right coronary ostium by Tiger catheter in 690 cases (97%). We failed in 23 cases (3%).

Conclusion: Tiger catheter can be used successfully in abnormal RCA origin cases. It is more effective but less risky in comparison to other catheters.

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1. Introduction

The incidence of anomalous origin of coronary arteries varies from .03% to 5.64%.¹ Separate origin of left anterior descending (LAD) and left circumflex artery (LCX) is the commonest. Abnormal origin of right coronary artery (RCA) is not uncommon. The incidence is .25–.92%. Anomalous origin of arteries can cause dyspnea, palpitation, angina, dizziness, and

syncope. It may even lead to sudden death during exertion.² Abnormal origin of RCA is usually from right coronary sinus. Sarkar et al.³ had experienced abnormal origin of RCA about 20% of their patients. Right Judkin catheter is used universally for engaging right coronary ostium from femoral route. Different catheters are used for cannulating RCA ostium in abnormal origin cases. These catheters could be Amplatz left (AL-1,2,3), Amplatz right (AR-1,2), Judkin left (JL), left and right extra backup guide catheter (left EBU and right EBU), Voda,

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Mach-1,11, and multipurpose catheter. There is no universal diagnostic or guide catheter for engagement of these difficult abnormal RCA origin cases. We have tried Tiger catheter from femoral route in abnormal origin of RCA patients. We were successful in cannulating RCA ostium in most of the cases.

2. Materials and methods

We have studied about 5120 patients over 4 years. We have selected patients from January 2011 to December 2014. Our patients are from two institutions—I.P.G.M.E.R., Kolkata and Burdwan Medical College, West Bengal. Both are tertiary medical centers and Govt. medical colleges. For coronary angiography, we have taken patients with ST segment elevation myocardial infarction with post-infarct angina, non-ST segment elevated myocardial infarction, and high-risk stable angina (Treadmill test positive at <5 METs). Few of them have undergone angioplasty and stenting in the same period and some at later date. Our objective was to study abnormal RCA origin cases. Right Judkin 3.5 and 4 were used universally. We have used AL-1,2,3, AR1,2, multipurpose, different guide catheters for cannulating RCA ostium in those cases where we failed to engage by right Judkin catheter. We have used Tiger catheter as a last resort when all endeavors failed.

2.1. Statistical analysis

We have analyzed categorical variables in percentage and used chi-square test to assess significance of our data.

3. Results and analysis

In the years 2011 and 2012, we have used Tiger catheter when all other catheters failed. But from 2013 to 2014, we have used Tiger catheter when right Judkin catheter failed. We have seen abnormal origin in 714 cases (14%). RCA origin from left coronary sinus was in 40 cases (.8%). In 6 patients (.1%), RCA origin was from non-coronary sinus. Among 40 cases of left sinus origin, Type A—9 patients, Type B—14 patients, Type C—6 patients, and Type D—3 patients were observed. We have seen RCA originating from opposite half of left sinus in 8 cases. We named it Type E. But 668 cases abnormal origin of RCA were from right coronary sinus only. High take-off origin was 422 cases (8%), low take-off was 132 cases (2.5%), and posterior origin was 114 cases (2%) (Fig. 1a). We could engage right coronary ostium by Tiger catheter in 690 cases (97%). We failed in 23 cases (3%). We have to use pigtail catheter in those failed cases. We have failed in 18 cases of posterior origin, 4 cases of RCA originating from opposite half of left sinus (Type E), and one case of Type D. We were successful in all cases of high take-off, low take-off, non-coronary sinus origin, and other cases of left sinus origin (Tables 1–4).

4. Discussion

Coronary catheters have five parts—hub, shaft, secondary curve, primary curve, and tip. Guide catheter in comparison to diagnostic catheter have three braided layers causing more stiffness, larger internal diameter, and short, more angulated

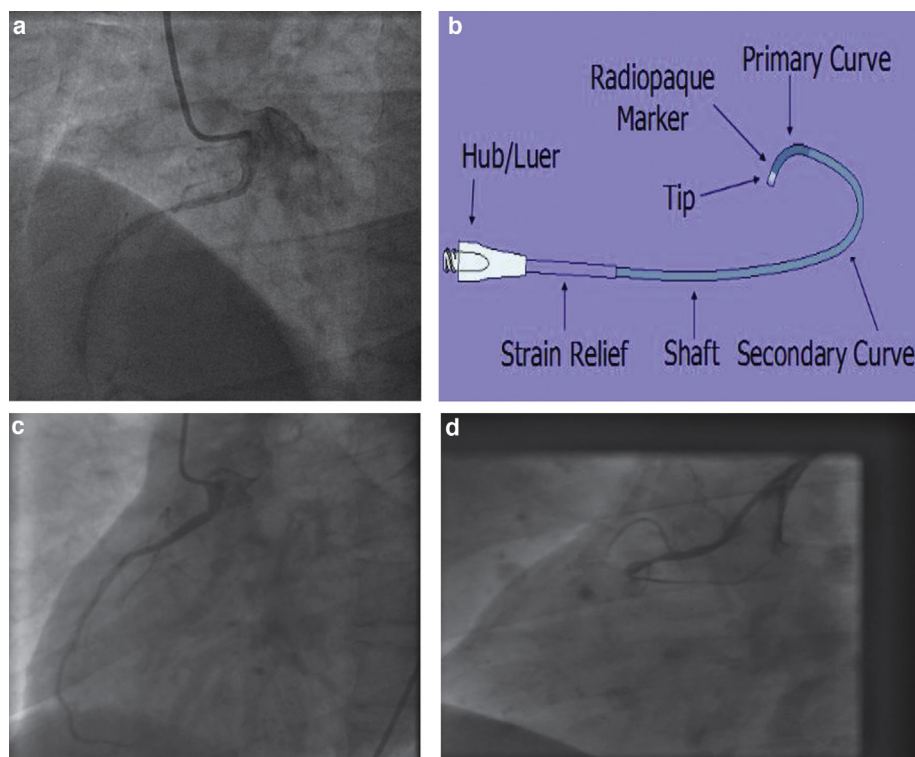


Fig. 1 – (a) RCA originating from posterior part of coronary sinus; (b) design of coronary diagnostic catheter; (c) RCA originating from non-coronary sinus; and (d) RCA originating from aorta (supravalvular level).

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