



Research Brief

Rotablation in complex ACS versus Non-ACS patients: Prospective follow up study from tertiary care centre in North India

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ARTICLE INFO

Article history:

Received 18 July 2022

Accepted 21 November 2022

Available online 24 November 2022

Keywords:

RA

Rotational atherectomy

ACS

Acute coronary syndrome

IVUS

Intravascular ultrasound

ABSTRACT

The purpose of this study is to compare short term outcome of rotablation in ACS versus non-ACS patients. 60 Consecutive patients who underwent rotational atherectomy were followed prospectively. The mean duration of follow up was 13.05 ± 5.2 months. The mean ejection fraction was $52.41\% \pm 9.4\%$. 45% patients had diagnosis of CSA and 55% were ACS. The mean syntax score was 29.23 ± 7.99 . LAD was the most common vessel treated by RA in 76.6%. Rotablation of LM was done in 30%. IVUS guided procedure was done in 66.7%. RA can be done with comparable safety and success in both non-ACS and ACS patients.

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1. Introduction

RA is an indispensable device in treatment of calcified lesions.¹ However its use is sometimes debated in ACS patients including STEMI. ACS patients are in general more difficult to treat and calcified CAD in ACS is more challenging as there is always a concern of using RA in these patients as it may cause platelet activation and complications like slow flow/no flow. Aggressive dilatations and cutting balloons are commonly used in these patients but they may not be enough to prevent stent under expansion and mal apposition which may lead to adverse short and long term outcomes.² With advances in technique and more experience with imaging, use of this therapy is probably safer even in acute situations.^{3, 4, 5}

2. Materials and method

60 Consecutive patients who underwent rotational atherectomy from January 2020 to December 2021 were included in the study. This was a prospective observational follow up study. Patient's data were reviewed and severity of calcification⁶ was decided upon

angiography. Rotablation was done for severe or moderately calcified lesions. All the enrolled patients were followed up clinically through regular OPD visits and telephonic follow-up every 3 months. Routine angiographic follow was not done and repeat intervention was planned if there was significant angina or a positive stress test during follow up. Symptoms, Signs and other categorical data were presented as n (%); continuous data were summarized as mean \pm standard deviation & range or median as appropriate. Categorical variables were presented as percentage and continuous variables were presented as mean and median. SPSS was used for analysis.

3. Results

This study included 60 consecutive adult patients admitted in a tertiary care referral hospital in North India to study clinical and angiographic profile of patients undergoing rotablation and followed them clinically during the study period of 24 months. Among all patients 55% had diagnosis of ACS and 45% had CSA (A comparison table (table no 1) between ACS and CSA was provided in supplementary material) Among patients with ACS 26.6%, 21.66% and 6.66% had Unstable Angina, NSTEMI and STEMI respectively. 56.6% had triple vessel disease. 38.3% of patient had left main disease. The mean syntax score was 29.23 ± 7.99 . LAD (76.6%) was the most common vessel treated. Rotablation of LM was done in 30% of cases. RCA and LCX was treated by rotablation in 16.7% and 13.3% of cases. 6.6% patients underwent rotablation of two vessels in the

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same procedure. 1.5 mm rota burr (68.4%) was the most commonly used burr size followed by 1.25 mm burr (11.7%). 2 mm rota burr was used in one case. More than one burr was used in 11.7% with upgradation of burr size. IVUS was used in 66.7% cases. Cutting balloon was used in 18.3% of cases. Three patients had intravascular lithotripsy along with rota as additional plaque modification method.⁷ Two patients underwent supported PCI with intra-aortic balloon pump. Two patients had perforation which was managed successfully with prolonged balloon inflation.⁸ One had on table death due to acute vessel closure. During follow up one patient had NYHA Class 2 angina which was managed medically. 3 patients died on follow up, 1 patient had possible stent thrombosis at 3 months and the other 2 patients died of non-cardiac causes. One patient was lost follow up. . Four patients in our study had STEMI, all of them had presented out of window period. Rotablation was done earliest at 3 days after MI in 1 patient and none underwent Rotablation in primary PCI. No STEMI patient had complications during or after procedure and are doing well except one patient who died 3 weeks post procedure due to severe Covid 19 infection.

4. Discussion

Rotablation is used for heavily calcified lesions in patients who present with stable angina but it has also been used in ACS settings including STEMI. There are published studies and registries where rotablation has been used in ACS patients with comparable safety and outcomes,⁹ though most of them are retrospective studies with limited data from India except the study done by Baruah et al¹⁰ which is a prospective study. Our study is also a prospective follow up study where more than 50 percent of patients presented with ACS.

Multivessel disease was present in majority of the patients in most of the studies except the study done by Baruah et al, and also the mean burr size used by most of the studies was 1.5 mm. Most of the studies did not report the syntax score, however in our study the mean syntax score was 29.23 ± 7.99 whereas it was 24 ± 11.25 in Baruah et al study and 35.3 ± 14 in Chen Y–W et al study which shows increased complexity of lesions in Chen Y–W et al and our study. Severe calcification was present in more than 80% of patients which is significantly more than previous studies. Mean syntax score was not significantly different between Non-ACS and ACS patients. LM-PCI was done in 30% of patients. Imaging was done in 66.7% of the patients in our study whereas in most of other studies it was done in very few patients. Clinical characteristics were comparable in ACS and Non – ACS patients as given in Table 1 except the incidence of HTN which was more in ACS subset. The technique and procedural outcomes including burr size and number of RA runs were also similar in both subsets. Procedural success and complications were comparable to other studies and were similar between Non-ACS and ACS patients, and we did not find increased slow flow or no flow in ACS patients in contrast to previous study.⁹ In this study we had better short-term outcomes with MACE of 1.6% vs mean of 6.1% in other studies^{11, 12, 13, 9, 14, 10, 15} (see table 2 for comparisons). On median follow up of 13 months no TLR was observed and MACE events were much lower as compared to other studies. This could be due to lack of angiographic follow up, greater use of imaging which was before used in 2/3rd and newer antiplatelets used in 1/3rd of total patients.

It is accepted that IVUS guided PCI³ is more precise as we can select best tools for plaque preparation and deploy stents at appropriate landing zones. Also in this study in addition to RA, cutting balloon was used in almost 20% patients and IVL was used in 5% patients.⁷ Appropriate use of additional and complementary devices can reduce the risk of major complications like coronary perforation or burr entrapment.

5. Conclusion

Rotational atherectomy can be done with comparable safety and high procedural success in both non-ACS and ACS patients. Use of imaging considerably reduces complications and short-term MACE. Rotational atherectomy is an underused procedure despite of its multiple benefits in complex calcified lesions.

Note – see supplementary material for tables.

Declaration of competing interest

The author's relationships/activities/interests should be defined broadly. For example, if your manuscript pertains to the epidemiology of hypertension, you should declare all relationships with manufacturers of antihypertensive medication, even if that medication is not mentioned in the manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ihj.2022.11.008>.

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