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Research Article

**A RETROSPECTIVE ASSESSMENT OF PERCUTANEOUS  
ANGIOPLASTY'S OUTCOME IN PATIENTS WITH OSTEAL  
LESIONS IN CORONARY ARTERY DISEASE (CAD)****Dr. Hafiz Waqar Younis, Dr. Samrina Habib Ullah, Dr. Ahmed Tariq  
DHQ Hospital Kasur****Abstract:**

**Objective:** The aim of this research was the assessment of Percutaneous Angioplasty's outcome in patients with osteal lesions in coronary artery disease.

**Methodology:** Our research design was retrospective which included all coronary angiograms and we carried it out at the catheterization laboratory of Sir Ganga Ram Hospital, Lahore from September 2016 to November 2017.

**Results:** This research contained the specimen of 50 patients amongst which the numbers of male and female were 35 and 15 respectively having ages above forty years. Every patient was having single target osteal lesion; 06 patients (05 male and 01 female) had ostial LCX lesion, for ostial LAD Lesion 29 patients (20 male and 09 female) gone through PCI, and RCA stenosis was in 15 patients (five female and ten male). Residual stenosis reduced after balloon dilation at high pressure. We treated 38 patients with DES (Drug Eluting Stents) and 12 with BMS (Bare Metal Stents). The procedure was successful in all cases as none of the patients faced complication before or after the procedure.

**Conclusion:** The main point of concern while treating the osteal lesion is making sure that osteal junction covers completely with the stent insertion. Better procedural understanding, and improvement in adjunctive drug therapy, techniques and equipment have altered a great deal of the interventional cardiology practice.

**Keywords:** Osteal Stenosis, Cutting Balloon (CB), Percutaneous Transluminal Coronary Angioplasty (PTCA), Coronary Artery Disease (CAD).

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**INTRODUCTION:**

The derivation of the term “ostium” is from the Latin word for mouth “os”. An ostial lesion is a reference to the lesion located at the ostium of a vessel [1]. Some authors call the lesion as the osteal lesion if it is located within 05 millimetres from the origin of the vessel, we usually consider a lesion an “osteal” lesion when it is situated within 03 millimetres of the vessel’s origin. Some authors call the lesion as the “osteal” lesion if it is located within 05 millimetres of the vessel’s origin [2]. Coronary osteal lesions, besides atherosclerosis, may uncommonly occur in different other disease conditions like Takayasu’s arteritis, syphilis, postradiation fibrosis and fibromuscular dysplasia [3, 4]. The osteal right coronary artery lesion’s independent predictors are female sex and family background history of hypercholesterolemia and CAD [5]. A strong correlation is in between osteal right coronary artery and left main coronary artery [6, 7]. A potentially deadly condition is a bilateral tight coronary osteal lesion, which can produce myocardial infarction, sudden cardiac death, ischemic cardiomyopathy or angina. Infarction or global ischemia also poses a strong risk of sudden death [8]. A clinical and initial angiographic success rate is in osteal lesions’ coronary angioplasty but limitation remains in restenosis. Overcoming elastic recoil and the maximization of initial luminal gain and overcoming elastic recoil are the stents’ beneficial actions. It is technically feasible to use a CB for Percutaneous Transluminal Coronary Angioplasty (PTCA) and then stenting. Right coronary ostium’s stenosis poses a high risk for restenosis of the stent. As the hardware has improved and experience has increased, the management of isolated osteal disease of the LMCA greater than 3.5 millimetres can be done by stenting & debulking, or stenting alone [10, 11]. A technique used to position correctly the stent in osteal stenosis is passing another wire through the stent’s last cell. The technique of anchor wire, which Szabo described first, will help in accurate placement of an osteal stent as well as in elimination of errors in positioning outside or inside the ostial narrowing [12]. The implantation of Drug-eluting stent in de-novo osteal LAD lesions seems to be effective and safe and reduces significantly the rates of restenosis as compared to the experience history with the procedure of Bare Metal Stent [13]. The rate of success in the procedure is high by the insertion of the stent into saphenous vein graft ostial lesions but the high rate of restenosis is the limitation, which these lesions’ angiography faces. This limitation may be the result of the surrounding aortic wall’s calcification, fibrosis, atherosclerosis’ simultaneous presence, and a higher concentration of elastic and

muscle fibres around the ostium, which after balloon inflations causes recoil [15]. Most of the coronary artery stenosis is dilated successfully with the use of conventional balloon dilation. This research analyses the PCI data of ostial lesions.

**METHODOLOGY:**

Our research design was retrospective which included all coronary angiograms and we carried it out at the catheterization laboratory of Sir Ganga Ram Hospital, Lahore from September 2016 to November 2017. The criteria to include were osteal lesions and single de novo lesions. We excluded those patients from our research who had left main more than 50%, LVEF less than 30%, valvular heart disease, co-existing chronic heart failure, contra-indication to anticoagulation, chronic renal failure, poorly, visible lesions, difficult anatomy, one artery having multiple stenosis, overlap, diffuse disease, multi-vessel disease and left main disease. We crossed all the osteal lesions by guide wire through the respective guiding catheter. After that, we applied pressure around six to eight ATM to pre-dilate with a balloon of the appropriate type and then according to the size and length of the lesion, deployed the stent. We selected both the types of stents i.e. BMS and DES but most of them were Endeavour (DES). All the drug elusive stents were of sirolimus type as the rate of restenosis is less with them when compared with BMS. We also deployed BMS because of financial limitations. The use of DES was more because of the govt. provided us with the Endeavour stents. It is a Drug Elusive Stent of good quality. We evaluated the patients for the incidence of major adverse cardiac events comprising acute myocardial infarction, death and repeat revascularization’s need with either PCI or coronary artery bypass. After the procedure of forty-eight hours, the hospital discharged the patients.

**RESULTS:**

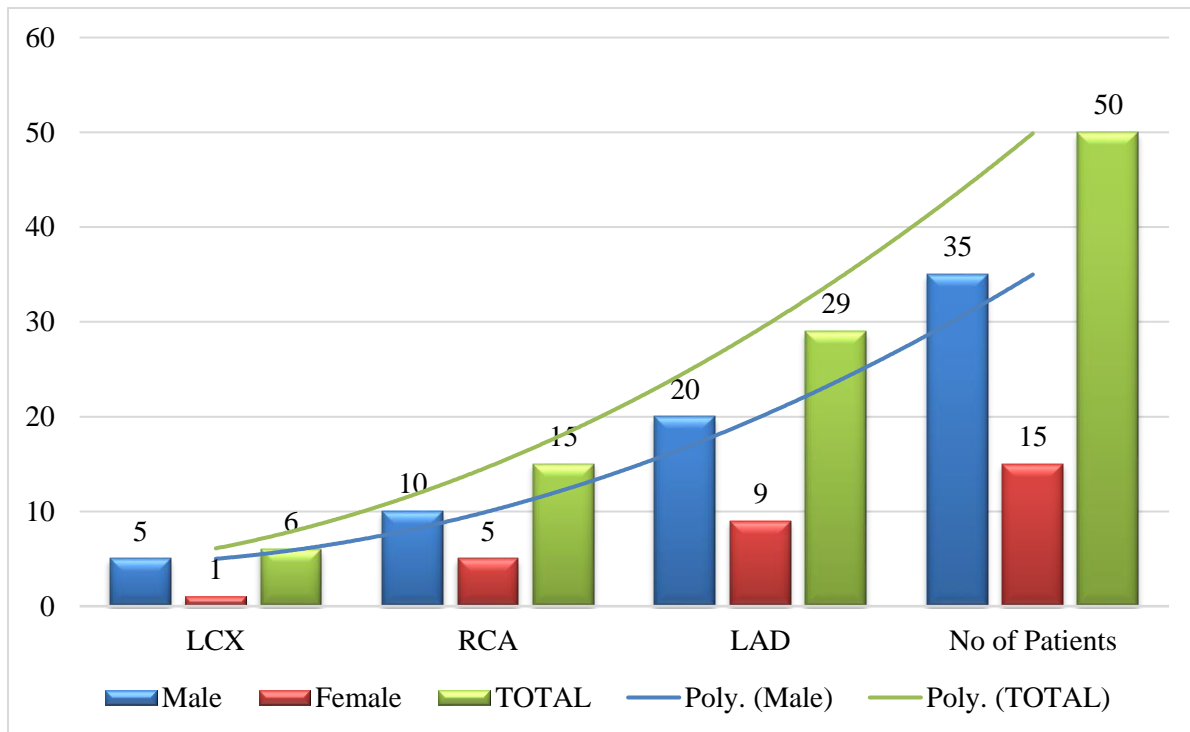
This research contained the specimen of 50 patients amongst which the numbers of male and female were 35 and 15 respectively having ages above forty years. Every patient was having single target osteal lesion; 06 patients (05 male and 01 female) had ostial LCX lesion, for ostial LAD Lesion 29 patients (20 male and 09 female) gone through PCI, and RCA stenosis was in 15 patients (five female and ten male). Residual stenosis decreased after balloon dilation at high pressure, which only a few patients needed. We treated 38 patients with DES (Drug Eluting Stents) and 12 with BMS (Bare Metal Stents). The procedure was successful in all cases as none of the patients faced complication before or after the procedure. The duration of the follow-up period was six to twelve months during which we recorded that most of the

patients improved significantly improved symptoms. Fourteen had arrhythmias, nine had a myocardial

infarction, eleven were with unstable angina, 06 gone through restenosis, while none of them died.

**Table – I: Patients' Demographics**

Gender	LCX	RCA	LAD	No of Patients
Male	5	10	20	35
Female	1	5	9	15
<b>TOTAL</b>	<b>6</b>	<b>15</b>	<b>29</b>	<b>50</b>



**Table – II: BMS Versus DES Stents**

Stent Type	LCX	RCA	LAD	No of Patients
Bare Metal	2	4	6	12
Drug Elusive	4	11	23	38
<b>TOTAL</b>	<b>6</b>	<b>15</b>	<b>29</b>	<b>50</b>

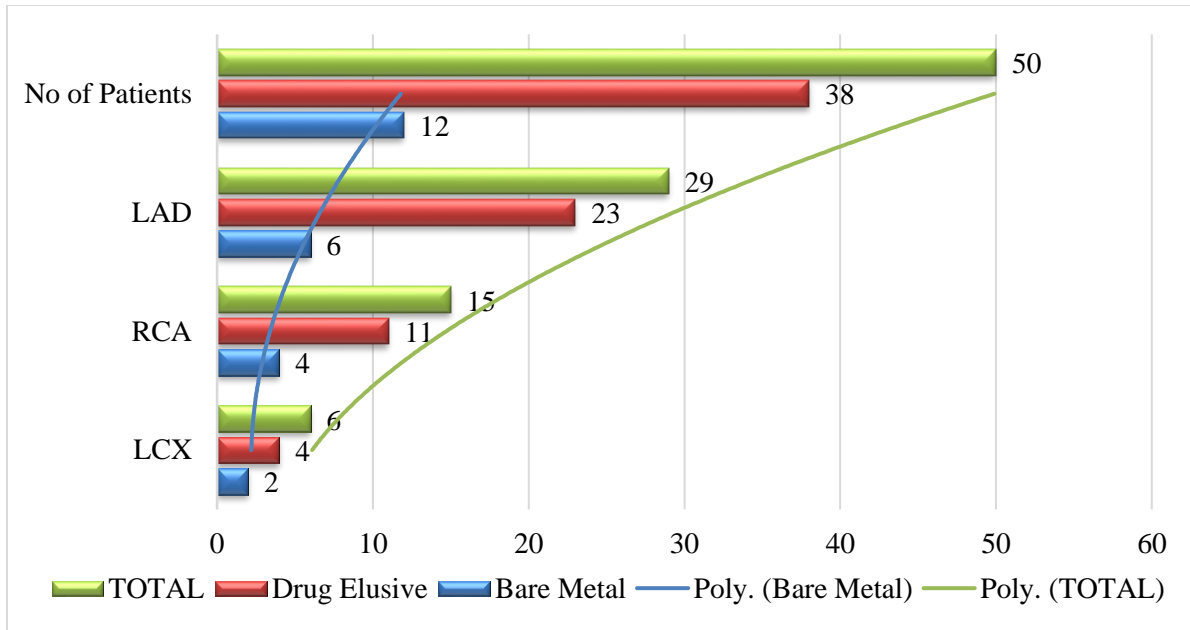
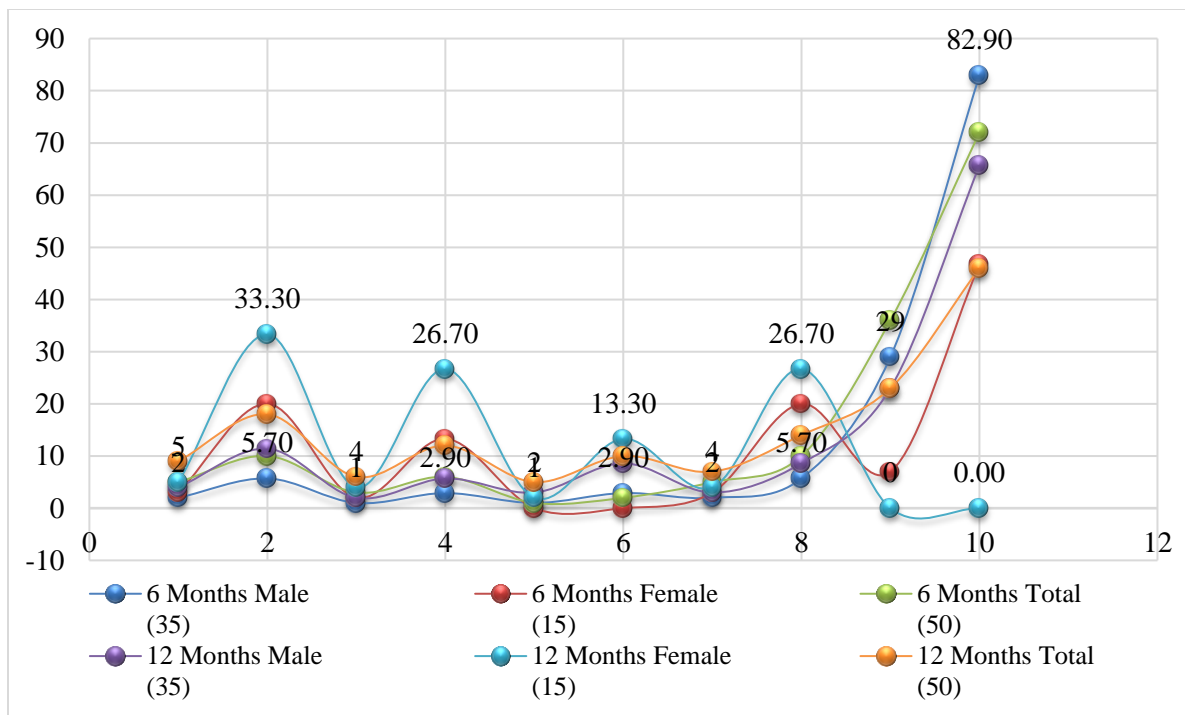


Table – III: Patient’s Follow-up (50)

Observations		6 Months			12 Months		
		Male (35)	Female (15)	Total (50)	Male (35)	Female (15)	Total (50)
Arrythmias	Number	2	3	5	4	5	9
	Percentage	5.70	20.00	10.00	11.40	33.30	18.00
Myocardial Infarction	Number	1	2	3	2	4	6
	Percentage	2.90	13.30	6.00	5.70	26.70	12.00
Re-stenosis	Number	1	0	1	3	2	5
	Percentage	2.90	0.00	2.00	8.60	13.30	10.00
Unstable angina	Number	2	3	5	3	4	7
	Percentage	5.70	20.00	10.00	8.60	26.70	14.00
No disease	Number	29	7	36	23	0	23
	Percentage	82.90	46.70	72.00	65.70	0.00	46.00



### DISCUSSION:

Coronary ostial stenosis, which involves both the coronary ostial, is a rare incidence. The plaque can form unusual places, such as it may surround the coronary ostial and at the ascending aorta. The interference with the function of the aortic valve can happen due to this atheroma [16]. Syphilitic aortitis, fibromuscular dysplasia, Takayasu's arteritis and post-radiation might be the cause of bilateral coronary ostial stenosis in the patients of young age who were not having known risk factors of conventional coronary disease or who weren't having any identifiable etiological background [17]. It is safe to do De-bulking before stenting at the LAD's ostium and rate of technical success is high with this procedure [18]. Plaque fracture, compression and stretching are the three steps of the mechanism in the procedure of balloon angioplasty [19]. The stenosis components face the application of force in a random way with the procedure of balloon dilation in a stenosis [20]. Although the technique of CB is useful in the cases having ostial lesions with or without stenting [21], we were unable to use it due to financial limitations. Conventional balloon enabled us in our cases to obtain sufficient luminal gain, which facilitated us in inserting a stent. The combined use of this procedure produced good post-procedural results, which caused neither immediate nor late complications. The best position of guiding catheter is outside the ostium within the proximity sufficient to make the adjacent aorta opaque and

hence localize the targeted ostium. However, in order to avoid damaging or dislodging the stent, we must maintain a sufficient distance of guiding catheter from the ostium. Conventionally, surgical patch aortocoronary osteoplasty or CABG was the therapy choice in ostial stenosis of the coronary artery. Since then the rate of success of PCI is more than ninety-five percent and the serious complications' risk has declined significantly due to the use of different stents, balloons and several other tools [22]. The cases of restenosis have decreased with the use of DES as compared to BMS implantation [23]. The dilation can specifically prove to be difficult with the use of conventional balloon angioplasty in ostial lesions (in grafts or in native vessels). The procedure involving insertion of stent into saphenous vein graft aorto-ostial lesions produces a high rate of success [24]; but, the restenosis is still not a preferred method of treatment for plaque excision because stenting and balloon angioplasty posed a significant risk of jeopardizing the ostium of the mid circumflex, left anterior descending artery, or both [25, 26]. Overcoming the elastic recoil and the maximization of initial luminal gain are the stents' beneficial actions. The aorto-ostial lesions may get suitable treatment due to these mechanical advantages [27].

### CONCLUSION:

The main point of concern while treating the ostial lesion is making sure that the stent, which is inserted covers ostial junction completely. The stent, when

inserted after the CB angioplasty, is a feasible procedure in order to treat osteal lesions. Although, it is useful in dilation of the stenosis, which is resistant to conventional dilation alone, thus facilitates stent insertion and perhaps improves long-term outcomes, we were still unable to use it due to financial limitations. Better procedural understanding and improvement in adjunctive drug therapy, techniques and equipment have altered a great deal of the interventional cardiology practice.

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