

## Pattern of left main stenosis at a tertiary cardiac center of Nepal.

Binay Kumar Rauniyar, Milan Gautam, Ranjit Sharma, Subodh Bir Singh Kansakar, Rajib Rajbhandari, Arun Maskey, Rabi Malla

Department of Cardiology, Shahid Gangalal National Heart Center, Bansbari, Kathmandu, Nepal

**Corresponding author:** Binay Kumar Rauniyar  
Department of Cardiology,  
Shahid Gangalal National Heart Center, Bansbari, Kathmandu, Nepal,  
**Email Address:** brauniyar@hotmail.com

### Abstract

**Background and Aims:** Left main stem stenosis is defined as a lesion occupying more than 50% of the lumen diameter. Various studies have shown that left main stem stenosis occurs in 4%-6% of all the patients undergoing coronary angiography. We aim to find out the pattern of Left main stem disease in cardiology department of a tertiary cardiac center of Nepal.

**Methods:** This was a retrospective study and was conducted from the properly maintained record of 2 years (August 2011 to July 2013) from cardiocatheterization labs of Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal.

**Results:** During the study period 3290 coronary angiogram were done. Among them 102 (3.1%) patients had left main stem stenosis of more than 50%. Mean age of the patients with left main stem stenosis was  $60.6 \pm 10.1$  yrs. Most of (73.5%) of patients with left main stem stenosis were of age more than 55 years. Most (80.3%) of them were male. Ostial left main stem stenosis was present in 32 (31.3%) patients whereas distal left main stem stenosis was present in 70 (68.6%) patients. In patients with Left main stem stenosis, single vessel disease was present in 12 (11.7%), double vessel disease in 33 (32.3%) and triple vessel disease in 49 (48.0%) patients, whereas 8 (7.8%) patients with non-critical coronary artery disease.

**Conclusion:** Left main stem disease is not an uncommon angiographic finding and is often associated with multivessel coronary artery disease. It commonly occurs in distal part of vessel and the patients were older males.

**Keywords:** Coronary artery disease; Distal left main; Left main stem stenosis.

### INTRODUCTION

Left main coronary artery is the most important coronary artery since it is responsible for blood supply to more than two thirds of the heart muscle. A significant left main stem (LMS) stenosis is considered to be a lesion occupying over 50% of the vessel diameter. LMS stenosis currently occurs in 4% to 6% of all patients undergoing coronary angiography (CAG)<sup>1</sup> and in 30% of coronary artery bypass grafting (CABG)<sup>2</sup> patients.

LMS stenosis occurs as an isolated lesion in 6% to 9% of patients, whereas over 70% to 80% of patients also have multi vessel coronary artery disease (CAD)<sup>3-10</sup>. As, LMS stenosis has high risk of restenosis.<sup>11</sup> So, traditionally, CABG is the treatment of LMS coronary artery stenosis. However, drawbacks include multiple vascular anastomoses (which consume bypass conduits and can lead to complications), permanent occlusion of the LMS coronary artery,<sup>1</sup> and less physiologic retrograde myocardial perfusion.<sup>12</sup>

Looking at the severity of the disease and difficulties in treatment, in this study, we aim to study pattern of LMS stenosis in cardiology department of a tertiary cardiac center in Nepal.

### METHOD

This was a retro prospective study single center. This study was conducted from the properly maintained record of 2 years (August 2011 to July 2013) of cardiac catheterization labs of

tertiary cardiac center, Shahid Gangalal National Heart Center. Records from all the patients undergoing CAGs were collected. Most trials of treatment and treatment guidelines define significant LMS stenosis as a greater than 50% diameter stenosis as judged by contrast angiography.<sup>13</sup> Same diagnostic criteria were used in our study. Study was approved by the institution review committee of the national heart centre. All data was analyzed using SPSS 16.0.

### RESULTS

During the study period 3290 coronary angiogram were done. Among them, 952 (28.9%) had normal coronary artery, 401 (12.1%) had non-critical CAD, 842 (25.5%) had single vessel disease (SVD), 557 (16.9%) had double vessel disease (DVD), 436 (13.2%) had triple vessel disease (TVD) and 102 (3.1%) patients had LMS stenosis.

Among the 102 patients with LMS stenosis mean age of patients was  $60.6 \pm 10.1$  years. Seventy Five (73.5%) patients were of age more than 55 years. Most 82 (80.3%) of them were male. Fifty three (51.9%) were hypertensive, 47 (46.0%) were diabetic. Chronic stable angina was the main reason for coronary angiogram in LMS stenosis patients as shown in table 1.

**Table 1.** Baseline characteristics of LMS stenosis patients

Age	60.6+/-10.1 years
Male	82 (80.3%)
Hypertension	53 (51.9%)
Diabetes Mellitus	47 (46.0%)
Acute Coronary Syndrome	33 (32.3%)
Chronic Stable Angina	69 (67.6%)

As shown in table two LMS stenosis patients were more in >55years age group and in male. Ostial LMS stenosis was present in 32 (31.3%) patients whereas distal LMS stenosis was present in 70 (68.6%) patients

**Table 2.** Statistical analysis was done in various subgroups:

Age	>55years	<55years	P value
	75	27	<0.001
Sex	Male	Female	
	82	20	<0.001
Location of the lesion	Ostial	Distal	
	32	70	<0.001

\*P value was calculated using Fischer's exact test (F test)

## DISCUSSION

Many studies have shown that LMS stenosis (40% to 94%) occur in the distal segment of the artery and extend into the proximal coronary arteries.<sup>3-10</sup> In our study location of the lesion was distal in 70 (68.6%) patients. In a study by Saeed Sadeghian et al showed that the proportion of the male sex in those with LMS was higher than that of the ones without LMS stenosis (87.8% vs. 71.4%,  $P=0.020$ ) and that patients with LMS stenosis were older (mean age of  $58.8\pm 10.5$  years in those with LMS stenosis vs.  $55.6\pm 9.2$  in the ones without LMS,  $P=0.03$ ).<sup>14</sup> In our study the mean age of presentation was  $60.6\pm 10.1$  yrs and the proportion of male sex was 80.3%.

In most studies LMS stenosis occurs as an isolated lesion in only 6% to 9% of patients, whereas over 70% to 80% of patients also have multi-vessel CAD.<sup>4-10,15</sup> In our study isolated LMS did not occur, but LMS was associated with non-critical CAD in 8 patients (7.8%).

So, our results were similar to international studies regarding involvement of LMS with multivessel CAD and predominance of distal vessel involvement. Several studies comparing conventional angiography with adjunctive imaging modalities have shown LMCA lesions considered angiographically indeterminate to, in fact, be severely stenosed.<sup>16</sup>

So, there may be several important limitations, which lead to a small but significant number of false-positive and false negative results, as well as significant inter-observer variability.<sup>17</sup> Future studies are needed to show the effectiveness of other modalities like Intravascular ultrasound in diagnosis of LMS disease.

## CONCLUSION

Left main stem disease is a relatively common angiographic finding and is associated with multivessel CAD. Most of the patients are older males. It commonly occurs in distal part of vessel.

## REFERENCES

1. Ragosta M, Dee S, Sarembock IJ et al. Prevalence of unfavorable angiographic characteristics for percutaneous intervention in patients with unprotected left main coronary artery disease. *Catheter Cardiovasc Interv* 2006; 68:357-62.
2. Keogh BE, Kinsman R. Fifth National Adult Cardiac Surgical Database Report 2003. UK: Dendrite Clinical Systems; 2004.
3. De Lezo JS, Medina A, Pan M et al. Rapamycin-eluting stents for the treatment of unprotected left main coronary disease. *Am Heart J* 2004; 148:481-5.
4. Park SJ, Kim YH, Lee BK et al. Sirolimus-eluting stent implantation for unprotected left main coronary artery stenosis: comparison with bare metal stent implantation. *J Am Coll Cardiol* 2005; 45:351-6.
5. Valgimigli M, van Mieghem CA, Ong AT, et al. Short- and long-term clinical outcome after drug-eluting stent implantation for the percutaneous treatment of left main coronary artery disease: (RESEARCH and T-SEARCH). *Circulation* 2005; 111:1383-9.
6. Price MJ, Cristea E, Sawhney Net al. Serial angiographic follow-up of sirolimus-eluting stents for unprotected left main coronary artery revascularization. *J Am Coll Cardiol* 2006; 47:871-7.
7. Chieffo A, Morici N, Maisano F et al. Percutaneous treatment with drug-eluting stent implantation versus bypass surgery for unprotected left main stenosis: a single-center experience. *Circulation* 2006; 113:2542-7.
8. Kim YH, Park SW, Hong MK et al. Comparison of simple and complex stenting techniques in the treatment of unprotected left main coronary artery bifurcation stenosis. *Am J Cardiol* 2006; 97:1597-601.
9. Lee MS, Kapoor N, Jamal F et al. Comparison of coronary artery bypass surgery with percutaneous coronary intervention with drug-eluting stents for unprotected left main coronary artery disease. *J Am Coll Cardiol* 2006; 47:864-70.
10. Palmerini T, Marzocchi A, Marrozzini C et al. Comparison between coronary angioplasty and coronary bypass surgery for the treatment of unprotected left main coronary artery stenosis (the Bologna registry). *Am J Cardiol* 2006; 98:54-9.
11. Taggart DP, Kaul S, Boden WE et al. Revascularization for unprotected left main stem coronary artery stenosis: stenting or surgery. *J Am Coll Cardiol* 2008; 51:885-92.
12. Hitchcock JF, Robles de Medina EO, Jambroes G et al. Angioplasty of the main coronary artery for isolated left main coronary artery disease. *J Thorac Cardiovasc Surg* 1983; 85:880-4.
13. Smith SC, Feldman TE, Hirshfeld JW et al. ACC/AHA/SCAI 2005 guideline update for percutaneous coronary intervention: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (ACC/AHA/SCAI Writing Committee to Update 2001 Guidelines for Percutaneous Coronary Intervention). *Circulation* 2006; 113:e166-286.
14. Sadeghian S, Karimi A, Salarifar M et al. Using workload to predict left main coronary artery stenosis in candidates for coronary angiography. *J Teh Univ Heart Ctr* 2007; 3:145-50.
15. Trianti M, Xanthos T, Iacovidou N et al. Relationship between individual cardiovascular risk factors and localization of coronary atherosclerotic lesions. *Heart Lung* 2011; 40:201-7.
16. Mintz GS, Popma JJ, Pichard AD et al. Patterns of calcification in coronary artery disease. A statistical analysis of intravascular ultrasound and coronary angiography in 1155 lesions. *Circulation* 1995; 91:1959-65.
17. Cameron A, Kemp HG, Fisher LD et al. Left main coronary artery stenosis: angiographic determination. *Circulation* 1983; 68:484-9.

**Cite this article as:** Binay Kumar Rauniyar, Milan Gautam, Ranjit Sharma, et al. Pattern of left main stem stenosis at a tertiary cardiac center of Nepal. *Nepalese Heart Journal* 2017; 14(1): 29-30