

## A Comparison between PTCA alone and Stent Implantation in Multi-Vessel Disease

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### Abstract

**Background-** Stent implantation has emerged as an effective method of treatment for multi-vessel coronary disease and has reduced the need for coronary artery bypass graft surgery in many of these cases.

**Methods-** From April 1995 to December 2001, 221 candidates for coronary intervention with multi-vessel disease were entered in this study. 212 patients had two-vessel and 9 patients had three-vessel involvement. They were divided into three groups: A (only PTCA), B (PTCA/Stent) and C (Direct Stenting). Age, sex, involved vessels, stent brand, immediate and long-term failure rates and complications were assessed.

**Results-** Thirty-five women and 186 men were entered. Mean (SD) of age was  $52 \pm 9.59$  in group A,  $51.56 \pm 8.42$  in B and  $53.21 \pm 6.45$  in C. The involved vessels were LAD, LCX, OM and RCA. Nexus, AVE, Wiktor, Unicath and Multilink were the applied stents. There were three cases of procedural complications and five cases of immediate failure in all three groups. Ten cases of restenosis occurred in group A, 7 in B and 1 restenosis occurred in C.

**Conclusion-** Stent implantation with or without predilatation is of great value in the treatment of patients with multi-vessel coronary diseases and can reduce the long-term risk of restenosis compared to groups who had PTCA alone ( $p < 0.001$ ). Furthermore, stent implantation without predilatation can be safely performed in multi-vessel disease patients as a new, cost-effective, low radiation exposure procedure in comparison to stent implantation with predilatation (*Iranian Heart Journal 2003; 4 (4):22-24*).

**Key words:** Multi-vessel coronary disease ■ PTCA ■ Stent implantation

The development of interventional cardiology (PCI) started with the introduction of catheterization, but was pushed forward by A. Gruentzig with percutaneous transluminal coronary angioplasty (PTCA) in 1977.<sup>1</sup> In the beginning, very slow progress could be observed, but an ever-increasing number of patients with more complex coronary artery disease such as two or three-vessel involvement who were encountered by interventional cardiologists resulted in further studies.<sup>2,3</sup> The issue of whether to recommend coronary artery bypass

grafting (CABG) or percutaneous coronary intervention (PCI) in multi-vessel disease was significantly influenced by some randomized trials comparing CABG and PCI, including ARTS, BARI, EAST and SOS.

Recently, PCI has been well accepted as an efficient treatment option for many of these patients and has been performed in many centers worldwide.<sup>4,5,6</sup> This study was conducted to compare PTCA alone and PTCA with stent implantation in multi-vessel disease.

**Materials and Methods**

The study population consisted of 221 consecutive patients undergoing coronary angioplasty for symptomatic multi-vessel coronary artery disease from April 1995 to December 2001. 212 patients were two-vessel, and 9 patients were three-vessel disease patients. They were divided into three randomized groups according to their procedures. Procedures were PTCA alone (group A), PTCA and stent implantation (group B) and direct stenting (group C). Detailed information can be seen in Table I.

**Table I: Frequency of each group based on the procedure.**

Procedure Vessel	PTCA	PTCA/Stent	Direct Stenting
Two- vessel	69	99	44
Three- vessel	3	5	1
Total	72	104	45

Age, sex, target vessels, stent brand, immediate and long-term failure rates and procedural complications were assessed descriptively using SPSS software. A comparison between the restenosis rates was carried out in the three groups with t-test. Long term failure was evaluated by complete history taking and physical exam. According to its result, indicated patients were referred for thallium scans, exercise tests and angiography.

**Results**

Of the 221 patients, 35 were women and 186 were men. Mean (SD) of age was 52±9.59 in group A, 51.56±8.42 in B and 53.21±6.45 in C. The results of involved vessels and stent brands are shown in Tables II and III.

**Table II: Frequency of each target vessel.**

Procedure Target	PTCA	PTCA/ Stent	Direct Stenting	Total
LAD	53	65	29	147
LCX	1	22	12	35
OM	9	7	1	17
RCA	9	10	3	22
TOTAL	72	104	45	221

**Table III: Frequency of each applied stent.**

	PTCA	PTCA/Stent	Direct Stenting
AVE	-	23	13
Nexus	-	27	15
Wiktor	-	38	-
Unicath	-	12	4
Tetra	-	4	13
Total	72	104	45

There were no major in-hospital complications or immediate failure in group A. In group B, there were 5 immediate failures leading to CABG, and two complications (one case of tamponade and one case of ventricular fibrillation those were all treated successfully with conventional treatment). In group C, there were no failures, but there was one case of ventricular fibrillation which was treated successfully. During a 6-month follow-up period, thallium, exercise or coronary angiography tests were performed for indicated cases. Ten cases of restenosis were seen in group A, seven cases in group B and 1 case in group C. These cases were referred for re-PTCA or CABG based on their conditions. Paired t-test studies showed a significant difference ( $p<0.001$ ) between the stent implantation (group B and group C) and reduction in the restenosis rate after the follow-up period. On the other hand, there were no significant differences between PTCA and stent implantation and direct stenting in the rate of restenosis ( $p<0.001$ ).

### Discussion

The results of the current study, with a literature survey, indicated that percutaneous transluminal angioplasty with stent deployment (with or without predilatation) is of great value in the treatment of patients with multi-vessel coronary diseases and can reduce long-term risk of restenosis compared to the group which had PTCA alone ( $p < 0.001$ ). It can be concluded that direct stenting should be considered as a new available cost-effective choice for the treatment of multi-vessel patients because of its low radiation exposure in comparison with stent implantation with predilatation.

### References

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