# Early Results of Percutaneous Coronary Interventions on Chronic Total Occlusion

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## Abstract

***Background-*** PTCA has been performed for more than 25 years as a treatment for coronary artery disease and now exceeds the annual volume of CABG. The first reported PTCA of a total occlusion was in 1982. Procedural success and restenosis rates have gradually improved since then.

***Methods-***We studied 150 patients who underwent PTCA for recanalization of total occluded coronary artery from 2000 to 2003. The mean age of the subjects was 25-67 years. The locations of total occlusions were 50% in LAD, 38% in RCA and 12% in LCX. 65% of the patients had single vessel disease.

***Results-*** The success rate was 65%, and stenting was done for 85% of the patients.

***Conclusion-*** It is now recognized that opening the chronic total occlusions of coronary arteries has proven benefits for patients, including an improvement in global and regional LV function, exercise capacity and reduced need for late CABG (by 50%). Angioplasty of total occlusions seems to be a safe and effective procedure in selected patients ***(Iranian Heart Journal 2004; 5(1,2):43-45).***


Chronic total occlusion (CTO) is a common finding during diagnostic coronary angiography, and more than one third of patients with significant coronary artery disease (CAD) have at least one chronic total occlusion.[1,2]

Compared to coronary angioplasty of subtotal stenosis, chronic occlusion angioplasty has a reduced primary success and higher restenosis rate.[3-7] Today, 60-70% of CTO can be successfully crossed by newer devices and techniques like hydrophilic guide wires, ball-ended wires and laser wires in occlusions of less than 6 months' duration, and by no-balloon catheter techniques like the ROTACS and the LASTAC.

However, the easier and most common technique for the treatment of CTO is the conventional wire/balloon technique, possibly in combination with stent placement.

Recent histological studies of CTO have confirmed that tapered or short lesions, with a progressive tapering of the lumen, are made up of loose fibrous tissue or contain small lumen recanalized areas that appear favorable for conventional angioplasty.[8]

The primary aim of the present study was to evaluate the procedural success with angiography, which is predictive of clinical success with a conventional angioplasty technique.

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## Definition

Total occlusion was defined as 100% preangioplasty narrowing of the artery without artegrade flow or antegrade filling only occurring via collateral vessels (TIMI 1-grade 0-1). Technical or procedural or early success results were defined as crossing the lesion with a wire and a balloon and restoring antegrade flow regardless of the percentage of the residual stenosis.

## Material and methods

We studied 150 patients who underwent recanalization for totally occluded coronary arteries from 2000 to 2003. The mean age of the subjects was 25-67 years. The locations of occlusions were 50% in LAD, 38% in RCA, 12% in LCX, and 65% of the patients had single vessel disease.

All coronary angioplasties were attempted through the femoral artery using 7 or 8F guiding catheters. The patients were pretreated with aspirin (300 mg) and administered 10000 U of heparin intravenously at the beginning of the procedure.[9-11]

Special care was taken to choose a guiding catheter that provided optimal back up support with a stable ostial position. Intermediate and floppy guide wires were used for crossing all the coronary lesions.[12,13] No attempt was made to use another guide wire in these procedures, nor were any special recanalization devices used.

Total occlusions were typically approached with a 2.5mm balloon catheter over the cross wire. Once the occluded segment was crossed by the guide wire tip and confirmed to be intraluminal, it was advanced distally as far down the vessel as possible. After these dilatations, the predilated segment was crossed with larger balloon catheters as appropriate. Finally, stent implantation was performed in 85%.[14-16]

## Results

The success rate was 65%, and the duration of total occlusion was more than 3 months in 55% of the cases. Our cross failure was without complications both in successful and failed cases. Crossing the wire took between 10-45 minutes.

There was bridging collaterals in 10% and calcification in 5% of all the cases. The shape of the lesion stump was tapered in 70% and rounded in 30%.

## Conclusion

It is now recognized that occluded infarct-related coronary arteries identified during convalescence from myocardial infarction are associated with progressive LV dilatation and dysfunction, reduced cardiac electrical stability and higher long-term rates of cardiac death. Proven benefits of opening the CTO include an improvement in global and regional LV function and exercise capacity and a reduction in the need for late CABG (by 50%). Angioplasty of total occlusions seems to be a safe and effective procedure in selected patients.

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