



# POST-PERCUTANEOUS CORONARY INTERVENTIONS (PCI) COMPLICATIONS

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## ABSTRACT :

Andreas gruentzig first developed PCI in 1977, and the procedure was performed in Zurich Switzerland that same year by the mid 1980s many leading adopted this procedure through out the world as a treatment for coronary artery disease. PCI procedures are the surgical procedures involved in opening or widening the coronary artery which is blocked or stenosis due to atherosclerotic plaques. These PCI procedures are widely using all over the world as there are more benefits in treatment of coronary artery diseases. However there are some complications are occurred during the time of procedure or after the procedure (post –operative). In this study includes some of the complications such as arrhythmias, kidney damage etc..due to PCI procedures in detail.

Key words: PCI, angioplasty, kidney damage, coronary artery disease.

## INTRODUCTION :

Percutaneous transluminal coronary angioplasty is a minimally invasive procedure that opens blocked coronary arteries in order to improve blood flow to the muscle of heart. PCI done to restore arterial blood flow to heart tissue without open heart surgery. The blockage occurs due to lipid accumulated plaques formed within arteries resulted in decreased blood flow to myocardium such lipid-accumulated plaques in blood vessels is known as atherosclerosis. Thus atherosclerosis affects the coronary arteries such conditions known as coronary artery disease patients with coronary artery disease may experience symptoms like shortness of breath with exertion. Andreas gruentzig first developed PCI in 1977, and the procedure was performed in Zurich Switzerland that same year by the mid 1980s many leading adopted this procedure through out the world as a treatment for coronary artery disease. PCI is a hall mark procedure and basis of many other intracoronary interventions it is one of the most common procedure performed in the United States making up 3.6% of all operating room procedures performed in 2011.

## PROCEDURE :

Local anesthesia numbs the groin area



Doctor puts a needle into femoral artery



Inserts a guide wire through needle



Needle was then removed and replaced it with an introducer (an instrument having 2 ports for inserting flexible devices )



After original guide wire is replaced by a thinner wire



Doctor passes a diagnostic catheter through new wire ,through introducer into artery.



Then it guides it to aorta and removes the guide wire



With the help of catheter at the opening of a coronary artery ,doctor injects dye and takes an x-ray



If it shows a treatable blockage the doctor backs the catheter and replaces it with a guiding catheter before removing the wire



An even thinner wire is inserted and guided across the blockage



Then a balloon catheter is guided to blocked site



The balloon is inflated for a few seconds to compress the fatty tissue in artery for improved blood flow



This may repeated at each blocked/ narrowed site



The doctor may also keep a stent with in artery to keep it open



Once compression is done, a dye is injected and x-ray is taken to check for changes in the arteries



Then the catheter is removed and thus the procedure is completed

## COMPLICATIONS:-

The complications of PCI include :

- Arrhythmias
- Heart attack
- Stroke
- Kidney damage
- Excessive bleeding
- Injury to catheterized artery
- Infections
- Allergic reactions

## ARRYTHMIAS :-

Various contrast media have been used in coronary angiography and PCI (percutaneous coronary interventions). The ventricular arrhythmia from intra coronary dye is more with the injection of ionic contrast agents into coronary artery. The risk of ventricular fibrillation may occur if dye is allowed to remain static in coronary artery. In case of using low osmolarity non ionic contrast media lacking calcium binding additives, the risk of ventricular fibrillation during PCI can be significantly decreased. The ventricular fibrillation occurs during induction of hypothermia for surgical purposes. When immediate intra coronary flush may result in local hypothermia. Thus, to reduce the risk of ventricular fibrillation, warmed up iso-osmolar non ionic dyes must be preferred in patients undergoing PCI on right coronary artery.

## STROKE:-

SCC – stroke after cardiac catheterization .

The retrospective studies regarding coronary angiography and coronary angiography and coronary angioplasty procedures suggest that older patients, those who suffering from severe cardiovascular disease, are particularly prone to SCC. SCC may be hemorrhagic and ischemic types. Solid cerebral microemboli are nearly twice as common as with the trans radial procedure compared with the trans femoral procedure.

## HEART ATTACK:-

PCI procedure smoothens blood flow and keep our artery open but may be chances to get a heart attack even after PCI procedure if we behave care less with our life style and do not practice a healthy life style. PCI ensure that a blocked artery remains open and flow of blood through it regularly but if you follow sedentary life style there may be higher chances of block any other of our arteries and results a heart attack. Once a person (or) patient goes through a PCI procedure, he /she would be very cautious about his /her diet and life style. If not there is a chance of getting heart attack again. More over a person who already undergone a PCI procedure is more prone as compared to healthy person and if they get a heart attack again the complications can be severe and may lead to death of the person. If the person does not die may need another PCI/stent procedure is again

is not a good choice stents are indeed useful for heart patients but cannot replace natural blood capillaries. If in case, a stenting procedure goes wrong or the body of person refuses to accept it in their body the person may face fatal consequences and may lead to another cardiac arrest.

### EXCESSIVE BLEEDING :-

The PCI is most widely strategy for myocardial revascularization and in vast majority of the cases is accompanied with coronary stenting. In order to prevent the occurrence of stent thrombosis and its serious clinical consequences dual anti platelet therapy is recommended for at least 1 month when bare-metal stent (BMS) implantation and dual anti platelet therapy for 6-12 months after drug-eluting stent (DES) implantation. This difference in therapeutic approach is because of delayed endothelialization associated with DES, that extends the time window for the risk of stent thrombosis. Pre mature cessation of a dual anti platelet therapy is a strong reason of stent thrombosis the hypercoagulable state associated with surgery may increase over all ischemic risk. On the other hand, continuation of anti platelet therapy might increase the risk of peri-operative bleeding. The risk of peri-operative complication, depends upon other factors include patient condition, magnitude of surgery and comorbid conditions.

### INFECTION:-

Complications rarely arise during PCI but are life-threatening when they occur. Complications such as stent thrombosis occur in about 2% of cases and coronary stent infection (CSI) occurs in less than 0.1% of cases. The first report CSI case described a plasmaz-schatz-stent infection in a 66 year old woman in 1993. When foreign body implantation predisposes and favours the developing of infections by damaging (or) invading epithelial (or) mucosal barriers by supporting growth of micro-organisms and by impaired host defense mechanism. And implantation of medical devices represents most important risk for nosocomial infections. Drug eluting stents had a higher risk of infection than base metal stents. Aneurysms were the most frequent abnormalities observed in infected stents. *Staphylococcus aureus* and *Pseudomonas aeruginosa* are the bacteria most often cause CSI.

### KIDNEY DAMAGE :-

Across the world wide, increase in using contrast enhanced imaging services and many involving exposure to iodinated contrast media. Mild damage in renal function due to contrast media injected is a well recognized complication after coronary angiography, particularly for the patients suffering from CKD previously. Previous studies has proven that 12-14% of the patients who develop acute renal damage after procedures involving radiographic contrast.

RCIN (radio contrast induced nephropathy) also known as radio contrast induced acute kidney damage or injury. Increased health resource utilization, prolonged hospital stay and increased rate of progression of CKD. RCIN has increased attention particularly during cardiac intervention, but also in the other types of radiological procedures in which iodinated contrast media are used.

### CONCLUSION;

Percutaneous transluminal interventions are surgical procedures in treating the cardiovascular diseases. Angioplasty plays major role in the opening the blocked artery in order to allow the sufficient and proper blood flow to the myocardium of heart. There are some complications due to PCI procedures but benefits are more likely present. Hence be aware of complications such as arrhythmias, stroke, heart failure, infections etc. If any unwanted things happen after the PCI procedure, immediately consult the physician.

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