UTILITY OF TRANSRADIAL CORONARY ANGIOPLASTY IN PATIENTS WITH CHRONIC STABLE ANGINA DISCHARGED ON SAME DAY

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ABSTRACT

Objective: *To study the utility of Transradial Coronary Angioplasty in Patients with Chronic stable Angina discharged on same day.*

Methodology: *This was a single center observational study with prospective data collection of 228 patients underwent transradial coronary angioplasty from January to December 2010, at Post Graduate Medical Institute, Lady Reading Hospital, Peshawar. Patients of both genders and all ages who had transradial coronary angioplasty for chronic stable angina and were discharged on same day were included in the study, using purposive non-probability sampling technique. Patients with unstable angina and acute coronary syndrome who had to stay for more than one day, were excluded from the study. Patients were followed at one month of hospital discharge in out patients department and clinical outcome data was recorded.*

Results: *A total of 228 patients were included in the study. Male were 64.9% and 35.1% were female with mean age of 56 ± 9years. All the patients had coronary intervention through right radial artery. Baseline characteristics of the patients were; diabetic 46.4%, hypertensive 45.6%, smokers 32.8%, dyslipidemic were 47.8% and mean values of serum creatinin and Hemoglobin were 1.2±0.5 and 12.8±2.4, respectively. The frequency of various complications were as follow; mild hematoma 1.7%, nausea and vomiting 1.3%, pain in hand 10.5%, readmission to hospital for chest pain 7.4%, need for revascularization 3%, hand ischemia 2.5%, minor bleeding 0.8%, and mortality was 1.3%.There was no access site major bleeding or hematoma.*

Conclusion: *The radial artery approach for coronary angiopalsty is found to be very useful with low degree of access site vascular complications and an early patient mobilization.*

Key Words: *Transradial Apparoach, Angioplasty, Chronic Stable Angina.*

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INTRODUCTION

Interventional cardiologists had traditionally used Common Femoral Artery (CFA) as access site for coronary angiography and angioplasty [1-4]. The reason for selecting this site for access was larger diameter of CFA, especially in the era of large diameter diagnostic and angioplasty guiding catheters. With advent of better coronary equipment and newer anticoagulation agents, the horizon for coronary intervention has broadened[5,6]. CFA approach for coronary intervention could be complicated by access site vascular complications like; bleeding, hematoma formation, tortuous Femoral Arteries especially in old age and late patient ambulation[7-10].

Vascular complications associated with femoral artery access for coronary artery procedures may increase morbidity especially in patients receiving anticoagulants, aspirin, clopidogril, prasugrel, and platelete glycoprotein IIb/IIIa receptor inhibitors[11-14] . The use of radial

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arterial access has the potential to reduce the access site bleeding complications[7-12,15]. Strategies for percutaneous coronary intervention are continually evolving, in order to reduce complications and to warrant better immediate, medium and long-term outecomes[16]. Campeau first reported 88% success rate with transradial approach (TRA) in 1989 without any significant access site complications[17]. TRA for diagnostic and therapeutic coronary angiography gained more and more popularity because of its advantages over the femoral approach, with no major access site vascular complications[14-16], and 2.3% in GRACE Registry[18], enhancing patient comfort and reducing duration of hospital stay[11,15,16].

The clinical outcome of patients who underwent Transradial Coronary interventions are more encouraging; Ruzsa et al reported 92% success rate in primary percutaneous coronary intervention(PCI) in patients presenting with acute STEMI[9]. TRA is safe for PCI even in Octa-genarian[2,3].

Despite these advantages radial artery is accessed in less than 10% of coronary cases globally[19]. The reasons might be the fear of long duration of procedure due to smaller vessel diameter, more chances of vessel spasm, thrombosis and subsequent hand ischemia [13,20-23]. The aim of this study was to evaluate the utility and early (first month) clinical outcome of coronary angioplasty via transradial approach in chronic stable angina patients in local population.

METHODOLOGY

This was a single center observational study with prospective data collection of 228 patients who underwent transradial coronary angioplasty from January to Dec. 2010, at Post Graduate Medical Institute, Lady Reading Hospital, Peshawar. Written informed consent was taken from all patients and the study protocol was approved by the hospital ethical review committee.

A Performa was designed to record patient demographics including age, gender, cardiac risk factors, telephonic contacts and full present and permanent residential addresses, and post-procedural complications. To look for early complication rates (first month), patients were clinically examined in out patients department and clinical data was recorded.

Patients of both genders and all ages who had transradial coronary angioplasty for chronic stable angina and discharged on same day of procedure were included in the study, using purposive non-probability sampling technique. Patients with unstable angina and acute coronary syndrome were excluded from the study who had to be monitored for more than 24 hours.

All the patients had Allen test to ensure ulnar artery patency. The 6F sheath was used in all of the study population. Patients were given nitrates 200µg and verapamil 5mg through radial artery soon after it was entered and were repeated if there was any spasm of radial artery. Spasm was diagnosed when catheter manipulation was difficult and painful. All patients had their radial artery checked manually before discharge to identify radial artery occlusion.

The collected data was recorded on Statistical Package for Social Sciences version 16.0 software. Continuous variables like age, dyslipidemia, serum creatinine and hemoglobin level were presented as Mean ± Standard Deviation. Categorical variables like gender, diabetes, hypertension, cigarette smoking, hematoma, nausea and vomiting, pain in hand, readmission to hospital for chest pain, need for revascularization, hand ischemia, bleeding, uncomplicated clinical course and mortality were presented as percentages.

RESULTS

A total of 228 patients, who had transradial coronary angioplasty through right hand, in the study period, were included in the study. The patients had successful angioplasty with low rate of complications and were comfortable enough to be sent home.Our study population comprised of 148 male (64.9%) and 80 (35.1%) females with mean age of 56±9SD years.

Mild hematoma developed in 1.7% of patients that resolved with conservative treatment. Pain in hand was most commonly due to vasospasm (8.5%) or due to puncture site injury(2%). Mild hand ischemia occurred in 2.5% and was due to vessel thrombosis, however, collaterals from ulnar artery maintained tissue perfusion and preserved functional ability. Only minor bleeding occurred, i.e., 0.8%, which resolved with manual pressure. No major bleeding occurred in our study population. 17(7.4%) patients were readmitted with chest pain during the study period,7(3%) of whom needed revascu-larisation.

Three patients(1.3%) died during the study period.

Table 1: Demographic Data of Patients Undergoing Transradial Angioplasty

Variable	
Age (Years)	56±9
Male	148 (64.9%)
Female	80 (35.1%)
Diabetes Mellitus	105 (46.4%)
Hypertension	104 (45.6%)
Cigarette Smoking	75 (32.8%)
Dyslipidemia	109 (47.8%)
S Creatinine (mg/dl)	1.2±0.5
S Hemoglobin (g/dl)	12.8±2.4

Table 2: Frequency of Different Parameters outcome

Parameter	
Hematoma	4 (1.7%)
Nausea and Vomiting	3 (1.3%)
Pain in Hand	24 (10.5%)
Readmission to Hospital for Chest Pain	17 (7.4%)
Need for Revascularization	7 (3%)
Hand Ischemia	6 (2.5%)
Minor Bleeding	2 (0.8%)
Major Bleeding	0 (0%)
Mortality	3 (1.3%)

DISCUSSION

Coronary artery Interventions through radial artery has shown to reduce access site complications, hospital stay and improved early ambulation and rehabilitation.[3,4,27] Radial access still accounts for less than 10% of procedures worldwide[19]. The reason might be, the fear of site access failure, prolonged procedure time, so more data is required to convince interventional cardiologists to change their practices.

Transfemoral route for coronary interventions is still the preferred access site worldwide in spite of increased incidence of access site bleeding complications ranging from 1.7 to 6%[15,22,24,28]. The ACCESS study[6] too, clearly demonstrated reduction of major access site complications from radial compared to femoral and brachial approaches (0% vs. 2.3% vs. 2% respectively). In a recent meta-analysis of 22 randomized control trials by Sanjit S Jolly et al [5], radial access reduced major bleeding by 73%

compared to femoral access (0.05% vs. 2.3%, p<0.001). Our study population has just 0.8% minor bleeding episode, the reason might be the selection of patients , as all of them were having chronic stable angina, thus minimizing the need of more anticoagulants in peri-and post-procedure period. Other reasons might be availability of better, small sizes and well maneuverable catheters and improved expertise. Our study has also supported the concept that transradial route reduces vascular access site complications considerably, as only four patient (1.7%) developed minor forearm hematoma which settled successfully with conservative treatment.

Radial artery thrombosis is a recognized complication after transradial coronary interventions. Incidence of RA occlusion is underestimated due often to asymptomatic clinical course. Vasospasm is more common with transradial approach reaching up to 58.5% [11] but this complication was just 8.5% in our study, probably due to nitrate and verapamil given into radial artery and also better coronary catheters. Hand ischemia secondary to radial artery thrombosis has been reported from 1.5% in Pakistan[20] to 10.5% abroad[25], in the later study, patients with repeated transradial intervention were included so those patients were more prone to develop hand ischemia. Six of our patients (2.5%) developed hand ischemia, almost equivalent to our local data but much better from international data. Radial artery occlusion is more common in complicated procedures[26] and most of our procedures went smoothly, so further dropping our complication rate. All the symptomatic patients with hand ischemia were admitted to hospital and treated with low molecular weight heparin (LMWH), as treatment with LMWH significantly increases patency rate after 4 weeks[29].

No revascularization procedure is final and Choussat et al[19] reported up to 15% of patients who were readmitted to hospital for chest pain, Caputo[25] put this figure at 4% and our 17 patients (7.4%) admitted to hospital for chest pain, of whom 6% were diagnosed as acute coronary syndrome and 1.4% as acute myocardial infarction. The number of patients who needed revascularization were 7 (3%) and all had repeat PCI through femoral approach. Three patients died during study period, one due to stroke and other two of cardiac arrest.

Limitations of the study were that radial route was not compared with femoral one for better safety profile, and a record of asymptomatic radial artery occlusion both of which would be included in the ongoing study process.

CONCLUSION

The radial artery approach for coronary angioplasty is found to be very useful with low degree of access site vascular complications, early patient mobilization and rehabilitation. Where facilities and expertise allows, transradial approach for coronary interventions should be preferred in patients with chronic stable angina.

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None Declared

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CONTRIBUTORS

SFAS conceived the idea and planned the study. AH, IS, HJ, AMG, MI, SBK & MH did the data collection and analyzed the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.