TRANSULNAR ACCESS FOR CORONARY ANGIOGRAOHY AND INTERVENTION

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Abstract

Objective: To assess the safety and efficacy of a transulnar approach for coronary cathetrization.
Study Design: Descriptive study.
Place and Duration of Study: Armed Forces Institute of Cardiology – National Institute of Heart Diseases (AFIC-NIHD), October 2009 to January 2010.
Patients and Methods: Twenty five patients underwent coronary catheterization by the transulnar approach. Patients were selected for ulnar approach coronary angiography if they had a weak radial pulse with a stronger palpable ulnar pulse with a positive reverse Allen's test (< 10 sec). No attempt was made at cannulating radial artery in the same sitting. A 6F sheath was placed inside the ulnar artery as per standard Seldinger technique, and cardiac catheterization or angioplasty was performed. The patients were examined before discharge from the hospital for any access site complications.
Results: Mean age of the patients was 48 years (range 30 to 62 years) and 80% (n= 20) were men and 20% (n=5) were females. Successful puncture was achieved in 100% (25/25). One out of twenty five patients had same sitting PCI with stenting to LAD and LCX. No case of arterial spasm, haematoma, pseudoaneurysm, vascular perforation or loss of pulse was observed.
Conclusion: We conclude that the transulnar approach is a safe and efficacious alternative for diagnostic and therapeutic coronary intervention in presence of weakly palpable radial artery and a stronger palpable ulnar artery with positive reverse Allen's test.

Keywords : Coronary catheterization, Transulnar, Transradial.

Article

INTRODUCTION

This descriptive study was carried out in AFIC – NIHD Rawalpindi from October 2009 to January 2010. Traditionally in the setting of a weak radial artery, cardiologists tend to use femoral artery access but this increases the chances of access site complications. In order to stay on the forearm for access site and keep the complications down, ulnar artery is a useful access site. Percutaneous coronary intervention and coronary angiography are increasingly being performed via radial artery access. This is on account of reduced local complications compared to femoral access1-3, as well as early patient mobilization4. However, radial access is not always successful and this is most often when radial pulse is weak. This study was designed to evaluate the safety and efficacy of the ulnar approach in appropriately selected patients.

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MATERIAL AND METHODS

All patients referred to AFIC-NIHD for coronary catheterization, from October 2009 to January 2010, were screened for radial access. If ulnar artery was palpable better than radial artery, then ulnar approach was attempted. All these patients had weak radial pulse but good ulnar pulse and normal reverse Allen test. Patients were prepared and sterilized in the same manner as for the transradial approach and no attempt was made at the radial artery in the same sitting for fear of inducing radial artery spasm, dissection or trauma thus compromising the blood supply to the hand. The arm was abducted at 70° with the wrist hyperextended over a gauze roll. The skin was infiltrated with 2% subcutaneous lidocaine in front of the ulnar artery pulse at 2 cm proximal to the pisiform bone. The

ulnar artery was punctured with a 19 gauge open needle to obtain a pulsatile blood flow. The artery was cannulated with a 45 cm, 0.019 inch straight wire. A 6 Fr Cordis radial sheath was then inserted. Our routine involved giving verapamil 2.5 mg via the sidearm of the arterial sheath followed by flushing fluid (Normal saline) and intravenous 5000 IU of unfractionated heparin. Adenosine and Glyceryltrinitrate(GTN) were kept in reserve for use only in case of arterial spasm. 6 Fr Cordis diagnostic catheters, Judkins right 4 and Judkins left 3.5 were used for the study. LV angiograms were done with Cordis Judkin right catheters. At the completion of the procedure, the sheath was withdrawn and pressure bandage was applied over the puncture site with a gauze roll and crape bandage dressing for approximately four hours . The pressure dressing was then replaced by a light dressing after checking the capillary refill and distal pulses and the patient was allowed to ambulate and to be discharged either the same day (4 hours after diagnostic angiography) or the following day (after angioplasty). No ulnar pulse loss was noted.

RESULTS

Mean age of the patients was 48 years (range 30 to 62 years) and 80% (n= 20) were men and 20% (n=5) were females.

Procedural success rate was 100%. The procedure time (20+10.5), fluoroscopy time (5+3.9) and amount of contrast used (95 + 20 ml). Complications such as arterial spasm, bleeding, aneurysm, loss of ulnar pulse, ulnar nerve injury or ischemic symptoms of the hand were not observed in any patient during the hospital course. Diagnostic angiographies in all twenty five cases and PCI with stenting in one case (only one case was attempted) were successfully completed.

DISCUSSION

Large series accessing coronary arteries through the transfemoral approach have reported a significantly high rate of vascular complications (2.9–12.8%), including retroperitoneal bleeding (0.1–2.6%), need for transfusion (0.8–2.6%), and surgical repair (0.2–2.6%)5–9. Series comparing the transradial approach with the transfemoral approach using glycoprotein IIb/IIIa inhibitors showed only a few local complications following the transradial approach10-12. Considering the advantages of the transradial approach over the transfemoral approach, our catheterization laboratory has progressively adopted the transradial approach as the preferred technique13-15. This study reports our initial experience with transulnar approach coronary interventions. We found that this approach is feasible and is associated with a high success rate and a low rate of access site complications. However in certain cases, an alternative route to the transradial approach is necessary. The ulnar artery has been described as the larger terminal branch of the brachial artery by some16. In one of the post-mortem studies, the ulnar artery was found to be larger or equal to the radial artery in 17% of right arms and 29% of left arms17. Some previous studies using the transulnar approach have reported high success rates and no complications16,18-19. Potential cases were selected based on a positive reverse Allen’s test and an easily palpable ulnar artery. We safely performed coronary angiograms and PCI with a high success rate (100%) with no complications. Similar to our experience with regard to the transulnar approach, others have also reported that the rate of local complications was very low20. It was therefore our intent to find a safe alternative to the transradial approach without reverting to the transfemoral approach.

Conclusion

We thus conclude that for coronary catheterization ulnar artery is a safe and efficacious technique in appropriately selected patients whose radial pulse is weaker than ulnar and be used for arterial access.

Reference

1.Kiemeneij F, Laarman GJ, Odekerken D, et al. A randomized comparison of percutaneous transluminal coronary angioplasty by the radial, brachial and femoral approaches: The Access study. J Am Coll Cardiol1997;29:1269–1275.

2.Louvard Y, Lefevre T, Allain A, Morice M. Coronary angiography through the radial or the femoral approach: The CARAFE study. Catheter Cardiovasc Interv 2001;52:181–187.

3.Mann T, Cubeddu G, Bowen J, et al. Stenting in acute coronary syndromes: A comparison of radial versus femoral access sites. J Am Coll Cardiol 1998;32:572–576.

4.Cooper CJ, El-Shiekh RA, Cohen DJ, et al. Effect of transradial access on quality of life and cost of cardiac catheterization: A randomized comparison. Am Heart J 1999;138:430–6.
5.Applegate RJ, Grabarczyk MA, Little WC, et al. Vascular closure devices in patients treated with anticoagulation and IIb/IIIa receptor inhibitors during percutaneous revascularization. J Am Coll Cardiol 2002; 40:78–83.
6.Assali AR, Sdringola S, Moustapha A, et al. Outcome of access site in patients treated with platelet glycoprotein IIb/IIIa inhibitors in the era of closure devices. Cathet Cardiovasc Intervent 2003;58:1–5.
7.Chandrasekar B, Doucet S, Bilodeau L, et al. Complications of cardiac catheterization in the current era: A single-center experience. Cathet Cardiovasc Intervent 2001;52:289–295.
8.Cura FA, Kapadia SR, L'Allier PL, et al. Safety of femoral closure devices after percutaneous coronary interventions in the era of glycoprotein IIb/IIIa platelet blockade. Am J Cardiol 2000;86:780–782,A9.
9.Dangas G, Mehran R, Kokolis S, et al. Vascular complications after percutaneous coronary interventions following hemostasis with manual compression versus arteriotomy closure devices. J Am Coll Cardiol 2001;38:638–641.
10.Choussat R, Black A, Bossi I, et al. Vascular complications and clinical outcome after coronary angioplasty with platelet IIb/IIIa receptor blockade. Comparison of transradial vs transfemoral arterial access. Eur Heart J 2000;21:662–667.
11.Mann T, Cowper PA, Peterson ED, et al. Transradial coronary stenting: Comparison with femoral access closed with an arterial suture device. Cathet Cardiovasc Intervent 2000;49:150–156.
12.Mann T, Cubeddu G, Bowen J, et al. Stenting in acute coronary syndromes: A comparison of radial versus femoral access sites. J Am Coll Cardiol 1998;32:572–576.
13.Barbeau GR, Carrier G, Ferland S, et al. Right Transradial Approach for Coronary Procedures: Preliminary Results. J Invas Cardiol 1996;8(Suppl D):19D–21D.
14.Bertrand OF, De Larochelliere R, Gleeton O, et al. Transradial coronary brachytherapy with the Novoste Beta-Rail system. Cathet Cardiovasc Intervent 2002;55:362–326.
15.Bertrand OF, De Larochelliere R, Tessier M. Complex transradial three vessel brachytherapy in a single session. J Invas Cardiol 2003;15:457–459.
16.Dashkoff N, Dashkoff PB, Zizzi JA, Sr., et al. Ulnar artery cannulation for coronary angiography and percutaneous coronary intervention: Case reports and anatomic considerations. Cathet Cardiovasc Intervent 2002; 55: 93–6.
17.Riekkinen HV, Karkola KO, Kankainen A. The radial artery is larger than the ulnar. Ann Thorac Surg 2003; 75: 882–4.
18.Terashima M, Meguro T, Takeda H, et al. Percutaneous ulnar artery approach for coronary angiography: A preliminary report in nine patients. Catheter Cardiovasc Interv 2001;53:410–414.
19.Alexis Vasiluk Knebel, MD, Cristiano Oliveira Cardoso, MD, MSc, La Hore Correa Rodrigues, MD,et al. Safety and Feasibility of Transulnar Cardiac Catheterization. Tex Heart Inst J. 2008; 35(3): 268–272.
20.Barbeau GR, Gleeton O, Roy L, et al. Transradial approach for coronary interventions: Procedural results and vascular complications of a series of 7049 procedures. Circulation 1999; 100: 1–306.