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COMPARISON OF RADIAL VS FEMORAL APPROACH IN ELDERLY PATIENTS UNDERGOING PERCUTENEOUS CORONARY INTERVENTION

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Introduction The radial access might have less complications than the femoral access. **Objective:** In older individuals with changed vascular anatomy, it might potentially be more challenging. In contrast to the femoral method, we evaluated the success rates, technical details and complication rates of radial angiography in elderly patients. **Material & Methods:** This study was conducted at the Cardiology Department Saidu Group of Teaching hospitals between January 2019 and January 2020. In this study, we enrolled all patients referred to our center for in-patient invasive angiography who were 65 years of age or older and had a history of probable coronary artery disease or suspected progression of known coronary disease. Two groups of patients were equally divided. Each group consists of 500 patients. The femoral artery was accessed by group 2 patients, while the radial artery was accessed by group 1.**Results:** Major adverse cardiovascular events (MACE) observed in group1 in 2(0.4%) cases, and in group 2 in 17(3.4%) cases, all of which were complications at the arterial access site. Minor adverse events occurred in group2 was 29(5.8%) as opposed to 9(1.8%) in group 1.Overall duration was significantly longer in group 1 as compare to group 2 (31.1 min. vs. 23.5 min) Those in group 1 had a lower mean GRACE score (110±32 versus 128±41), improved renal function according to cretanine level (0.8±0.4 versus 1.0±0.8) and a reduced prevalence of indications of left ventricular failure (9% versus 23%) when compared to patients in group 2. Time of admission for the type of ACS heart rate (69±15 Vs 75±16), systolic arterial pressure (141±30 Vs 150±32), positive troponin 59(79.7%) Vs 51(68.9%), electrocardiographic ischemia 190(38%) Vs 179(35.8%). **Conclusion:** In elder patients over the age of 65, radial coronary angiography have a greater technological success rate and fewer complications than femoral approach.

Key words: coronary angiography; radial artery; complications; coronary intervention

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INTRODUCTION

A number of studies have demonstrated the therapeutic benefits of invasive management of coronary artery disease in older age patients.[1] In contrast; old age is one of the major risk factors for myocardial angiography complications. [2] In patients over 65 years of age, vascular entry complications are significantly more common than in younger patients.[3,4] Since the number of patients with old age-related coronary artery disease is increasing, it is essential to develop and implement therapeutically useful techniques for invasive detection and treatment while also minimizing arterial access problems.[5,6]

Radial access angiography is a substitute for the conventional femoral approach for cardiac angiography and surgery. The radial method has a learning curve, but with sufficient experience, it has a high success rate and it has been shown that the rate of arterial access complications is low.[7,8] It is possible to ambulate right away, which could be helpful for old patients in particular. If radial access is tried, the arterial alterations in the radial artery, the convoluted path of the subclavian artery and extension and enlargement of the ascending aorta may all present pertinent difficulties. However, especially in elderly patients, radial catheterization may theoretically be more challenging than the femoral approach.[9,10]

In this research, we evaluated operational effectiveness as well as procedural data like length, catheter and contrast use, fluoroscopy time and incident rates in patients who were at least 65 years old.

METHODS

This study was conducted at the Cardiology Department Saidu Group of Teaching hospitals between January 2019 and January 2020. In this study, we enrolled all patients referred to our center for in-patient invasive angiography who were 65 years of age or older and had a history of probable coronary artery disease or suspected progression of known coronary disease. Two groups of patients were equally divided. Each group consists of 500 patients. The femoral artery was accessed by group 2 patients, while the radial artery was accessed by group 1.

Also, participants had to meet the following inclusion criteria: provide inform consent to participate in the research, have a normal platelet count and plasmatic coagulation, have an average hemoglobin level of 9.0 g/dl, and be available for a follow-up visit 24 hours after the procedure. The exclusion criteria included cardiogenic shock, reduced renal function (creatinine >1.5 mg/dl due to the possibility of creating an AV fistula in the future) and simultaneous right and left heart catheterization.

Monoplane scans were used to conduct coronary angiography after 6F tubes were used to enter the coronary vessels. Two right coronary system projections and at least four left coronary projections were obtained. For all angiograms, the frame rate was 15/s. Following the cardiac angiography, left ventriculography was done if it was therapeutically necessary. BARC (Blinging Academic Research Consortium) classifications 3 or 5 were used to describe major hemorrhage. The risk of early hemorrhage was evaluated using the

CRUSADE score.

The SPSS 23.0 statistical research program was used for analysis. P value ≤0.05 was deemed significant.

RESULTS

Total 1000 patients of age ≥65 years were enrolled. Mean age of patients was 75 years. There were 590(59%) men and 410(41%) were female.

Invasive coronary angiography revealed that 498(49.8%) had single vessel disease, followed by 330(33%) triple-vessel disease or left coronary artery blockage while the rest 205(20.5%) patients had double vessel disease. Table-1

Major adverse cardiovascular events (MACE) observed in group1 in 2(0.4%) cases, and in group 2 in 17(3.4%) cases, all of which were complications at the arterial access site. Minor adverse events occurred in group2 was 29(5.8%) as opposed to 9(1.8%) in group 1.Overall duration was significantly longer in group 1 as compare to group 2 (31.1 min. vs. 23.5 min) Those in group 1 had a lower mean GRACE score (110±32 versus 128±41), improved renal function according to cretanine level (0.8±0.4 versus 1.0±0.8) and a reduced prevalence of indications of left ventricular failure (9% versus 23%) when compared to patients in group 2. Time of admission for the type of ACS heart rate (69±15 Vs 75±16), systolic arterial pressure (141±30 Vs 150±32), positive troponin 59(79.7%) Vs 51(68.9%), electrocardiographic ischemia 190(38%) Vs 179(35.8%). Table 2

Patients in group 2 had a higher risk of bleeding (37±16) than patients in group1 (30 ± 15) according to analysis of the CRUSADE score (p 0.04). These numbers indicate a 7% and 4% bleeding risk, respectively. Table-3

Co morbidities in both groups were analyzed as, diabetes mellitus 185(37%) vs 151(30.2%), smoking 119(23.8%) vs 134(26.8%), previous history of heart failure or bleeding in both groups was 12(2.4%) vs 15(3%), previous history of stroke in both groups was 110(22%) **vs 98(19.6%),** myocardial revascularization surgery 19(3.8%) vs 15(3%), Table-4

Table-1: Degree of vessel involvement

Vessel involved	Frequency	Percentage
Single vessel	465	49.8%
Double vessel	205	20.5%
Triple vessel	330	33%

Table-2: Study outcome

	Group1	Group2	P value
Major adverse events	2(0.4%)	17(3.4%)	0.005
Minor adverse events	9(1.8%)	29(5.8%)	0.001
Duration of procedure	31.1 min	22.5 min	0.002
GRACE score mean	110±32	128±41	0.003
Creatinine level	0.8±0.4	1.0±0.8	0.002
Lt ventricular failure	9%	23%	0.003
ACS heart rate	69±15	75±16	0.691
Systolic arterial pressure	141±30	150±32	0.601
Positive troponin	340(68%)	390(78%)	0.501
Electrocardiographic ischemia	190(38%)	179(35.8 %)	0.870

Table-3: CRUSADE score

CRUSADE score	Frequency	Percentage	P value
Group 1	30 ± 15	4%	0.04
Group 2	37±16	7%	

Table-4: Co morbidities & other characteristics

Co-morbidity	Group 1	Group 2	P value
Diabetes mellitus	185(37%)	151(30.2%)	0.600
Smoking	119(23.8%)	134(26.8%)	0.716
Heart failure or bleeding	12(2.4%)	15(3%)	0.801
History of stroke	110(22%)	98(19.6%)	0.601
Myocardial revascularization	19(3.8%)	15(3%)	0.810

DISCUSSION

In this study, we examined how frequently older patients having coronary angiography using the radial and femoral access experienced adverse results. Background data for this research included the finding that post-invasive coronary angiography complications, especially vascular access difficulties are more common in older age group as compare to younger. According to reports, radial access for coronary intervention has lower rates of local complications than femoral access.[11,12] Because of this, radial access is physiologically more difficult for older patients; for example arterial tortuosity make catheter passage more difficult, which might offset this advantage.[13]

An examination of procedural data revealed a substantially longer total duration for patients allocated to radial access. (31.1 min. vs. 22.5 min). Other significant elements, such as the duration of the fluoroscopy, the dose-area product or the amount of contrast agent, did not show any appreciable differences. Therefore, it can be said that the radial access is a more practically viable option than the femoral access even for older patients.

In terms of complication rate, we found that the radial access had significant benefits. Major adverse coronary events affect 2(0.4%) in group1, but 17(3.4%) in group2. Compared to 1.8% of patients in group 1, 5.8% of patients in group 2 had mild adverse coronary events. This is also in line with **Ruiz Rodriguez et al** study who found lower rates of unfavorable outcomes for the radial approach in patient populations that were more susceptible to such complications, such as obese patients, patients who were receiving intensive anticoagulation, or patients who had **recently suffered MI.[14]** Multiple previous research looked at the feasibility and safety of radial access in older age group.[15,16]

We observed that the vast majority of older patients can theoretically undergo radial access angiography. No appreciable variations were observed when **Enriquez JR et al** compared the efficacy and complication of radial access in 600 patients of age ≤70 and 250 patients who were over the **age of 70.[17] Kodaira M et al** compared the radial and femoral approaches in patients over the **age of 80.[18]** Similar benefits are found when comparing radial and femoral access in terms of complication rates. In the **Sueta D et al** study**,** vascular complications occurred in 6.5% patients in femoral access versus 1.6% patients in **radial approach[19].** Vascular complications were present in 5% of older patients in radial access and in 26% of those who underwent a femoral approach in a study by **Ando G et al** However, the choice of the access part was left to the operator's decision rather than being decided at random.[20]

CONCLUSION

The radial technique for older age group of ≥65 years has a high clinical success rate with respect to treatment time, radiation exposure, contrast agent use or other resources like catheters. However, the radial access has a considerably lower incidence of complications than the femoral approach, so

it should be firmly encouraged to be used more frequently, especially in individuals who are more prone to vascular complications.

Consent to Participate: written and verbal consent was taken from subjects and next of kin

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