IVUS GUIDED VERSUS MULTI-SLICE CT CORONARY ANGIOGRAPHY PLANNED PERCUTANEOUS CORONARY INTERVENTION COMPARED TO THE CONVENTIONAL CORONARY ANGIOGRAPHY GUIDED INTERVENTION.

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ABSTRACT:

Background: *Intra-vascular ultrasound (IVUS) and coronary computed tomography angiography (CCTA) are tools to guide percutaneous coronary intervention (PCI).*

Aim of the work: *This study aimed at comparing procedural outcome and MACCEs of IVUS, CCTA and angiography, guided PCI.*

Patients and methods: *Prospective, single centered study. 90 patients undergoing elective PCI distributed to 3 groups. Group A: IVUS guided PCI, group B: CCTA planned PCI and group C: angiography guided PCI. Procedural details and MACCEs were compared.*

Results: *Most of the patients in this study were males (84.4%). Group B used significant amount of contrast, 50 - 380 ml (161.67 ± 71.97, P = 0.042). Also group B had significant longer stents, 12 - 48mm (23.76 ± 7.47, P = 0.008). Group A had significant number of patients who needed post-stenting balloon dilatation, 28 patients (93.34%), P=0.009.Most of the patients had satisfactory results withTIMI 3 flow (94.37%). No MACCEs were detected during the hospital stay. At 30 days follow-up, no significant difference found between the 3 groups.*

Conclusion: *IVUS assed accurately the need of post-stenting balloon dilatation. CCTA is associated with larger amount of contrast use, longer lesion detection and subsequent longer stents deployed in comparison to IVUS and angiography alone.*

Keywords: IVUS - CCTA - angiography - guided - contrast - post-stenting - lesion length - procedural outcome.

INTRODUCTION:

Percutaneous coronary intervention (PCI) is an integral part of treatment of ischemic heart disease. The use of coronary catheterization in appropriate patients reduces morbidity and mortality[1&2].

Intravascular ultrasound (IVUS) is a reliable imaging tool to guide percutaneous coronary intervention. IVUS provides cross-sectional views of the coronary artery wall, and allows the assessment of stenosis severity, identification of plaque morpho-logy, optimization of stent implanta-tion, and understanding the mechanism of stent failure[3].

Coronary computed tomography angiography has been gaining popularity due to its ability to identify coronary artery disease, give information about coronary anatomy, plaque morphology, length, and

calcium content. All that will help planning coronary intervention, especially the complex ones[4&5].

AIM OF THE WORK:

Comparing the procedural outcome and MACCEs of IVUS guided PCI, multi-slice CT coronary angiography planned PCI, and conventional coronary angiography guided intervention, immediately and 1 month after the procedure.

PATIENTS AND METHODS:

The study was a prospective study. It was conducted on 90 patients having coronary artery disease, planned for elective PCI at the department of Cardiology, Ain Shams University Hospitals. Recruitment of patients occurred from May 2017 till September 2018.The study was done after obtaining a written informed consent from the patients, and after the approval of the Ethical Committee of the department of Cardiology, Ain Shams University.

The patients were divided into three equal groups. Group A, IVUS guided PCI, group B, multi-slice CT coronary angiography planned intervention and group C (control group), conventional coronary angiography followed by PCI. All patients were subjected to thorough history taking, clinical examination and routine laboratory investigations.

Exclusion criteria:

- Age: Less than 18 years.
- Patients presenting with acute coronary syndrome (ACS).
- Patients with debilitating disease (advanced malignancies, liver cirrhosis, decompensated heart failure, renal impairment with a serum creatinine ≥ 2.5mg/dl, etc ...)
- Patients with contraindication to CTA.
- Patients' refusal to sign the informed consent.

Group A: Intravascular Ultrasound (IVUS):

IVUS imaging was performed during manual pullback, then quantitative measures were taken. Stents were chosen together with the need of post stenting balloon dilatation according to the IVUS data. Also post stenting intra-coronary complications were noted.

Group B: Multi-slice CT coronary angiography:

The scans were performed using a Toshiba Aquilion 64slice CT scanner (Toshiba, Japan) and lesion analysis was done by the provided software package for lesion analysis (VITREA®).ECG gated reconstructions were done in the diastolic phase (75% of the R-R interval). The datasets were reconstructed at a slice thickness of 0.6 mm with 0.3 mm increments, then they were displayed and analyzed.

For patients with significant stenotic lesions>70%, the following were analyzed: lesion length, reference vessel diameter (measured in the healthy segment just proximal and distal to the site of stenosis), lesion specific calcium score. Following MSCT, PCI was performed, minimum after 1 week and maximum after 3 weeks. Stents were chosen according to the data obtained from the MSCT.

Group C (control group): Conventional coronary angiography:

Invasive coronary angiography was performed by expert interventional cardiologist. Both lesion length and vessel diameter were assessed by QCA, stents were deployed accordingly.

Procedural data of all the groups:

- Access either radial or femoral.
- Target vessel and number of stents.

- Need of post-stenting balloon dilatation, size of the balloon and pressure of inflation.
- Procedural success (Achieving TIMI III flow).
- Procedural complications.
- Amount of contrast used.
- Major adverse cardiovascular and cerebrovascular events (MACCES) during the hospital stay, and short term follow up after one month.

RESULTS:

I- Descriptive analysis.

1- Demographic data, risk factors, history, baseline clinical and laboratory findings of the study population.

Table 1: Demographic data, risk factors, history, baseline clinical and laboratory findings of the study population.

		IVUS group	CT group	Control group	Test value	P-value	Sig.
		No. = 30	No. = 30	No. = 30			
Age	Mean ± SD, range	55.00 ± 9.28 (36-72)	54.63 ± 8.87 (40-74)	55.43 ± 8.01 (40-69)	0.063	0.939	NS
Gender	Male	25 (83.3%)	27 (90.0%)	24 (80.0%)	1.184	0.553	NS
Smoking	Smokers	20 (66.7%)	20 (66.7%)	22 (73.3%)	0.415	0.813	NS
Family history	Positive	16 (53.3%)	18 (60.0%)	15 (50.0%)	0.627	0.731	NS
Past MI	Positive	9(30%)	7(23.3%)	8(26.7%)	0.341	0.843	NS
Past PCI	Positive	13(43.3%)	12(40%)	12(40%)	0.092	0.955	NS
Past CABG	Positive	3(10%)	6(20%)	2(6.7%)	2.222	0.329	NS
DM	Positive	17(56.7%)	15(50%)	11(36.6%)	0.356	0.837	NS
Hypertension	Positive	15(50%)	17(56.7%)	14(46.6%)	0.351	0.814	NS
Dyslipidaemia	Positive	21(70%)	12(40%)	19(63.3%)	1.148	0.563	NS
SBP	Mean ± SD, range	129.17 ± 15.74 (100-160)	132.00 ± 14.24 (110-160)	131.17 ± 15.52 (110-170)	0.037	0.963	NS
DBP	Mean ± SD, range	84.61 ± 6.48 (70-110)	80.67 ± 7.40 (60-90)	82.33 ± 6.29 (70-100)	0.171	0.843	NS
HR	Mean ± SD, range	79.73 ± 15.25 (55-110)	78.17 ± 10.87 (55-90)	77.73 ± 10.05 (60-95)	0.018	0.983	NS
BMI	Mean ± SD, range	29.12 ± 3.05 (26-40)	28.06 ± 1.80 (25-33)	28.42 ± 3.14 (27-40)	1.558	0.216	NS
Cardiac	NHS	25 (83.3%)	24 (80%)	26 (86.7%)	9.425	0.666	NS
	MR	3 (10%)	5 (16.7%)	4 (13.3%)			
	AS,MR	1 (3.3%)	0 (0.0%)	0 (0.0%)			
	MR,TR	0 (0.0%)	1 (3.3%)	0 (0.0%)			
	AF	1 (3.3%)	0 (0.0%)	0 (0.0%)			
Chest	HVB	11 (36.7%)	12 (40%)	14 (46.7%)	4.051	0.399	NS
Creat.	Mean ± SD, range	1.18 ± 0.26 (0.7-1.6)	1.17 ± 0.24 (0.8-1.5)	1.20 ± 0.26 (0.7-1.7)	0.049	0.952	NS
VM	Positive B	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.274	0.872	NS
	Positive C	3 (10.0%)	2 (6.7%)	3 (10.0%)			

Most of the patients in this study were males, (84.4%, 76 patients) 27 of them were in group B, while group A and C were 25 and 24 respectively.

Diabetes, hypertension and dyslipidemia were the most prevalent risk factors among the studied patients.

Patients' creatinine levels ranged from 0.7 to 1.7 mg/dl with a mean of 1.18 mg/dl, only 2 patients had CKD.

2- **Procedural details of group A:**

Table 2: Group A, IVUS lesion assessment pre and post stenting, size of the stents implanted, post-stenting dilatation, and coronary complications.

Group A (IVUS) 30 patients		
length	Mean ± SD, range	26.72 ± 5.98 (13 - 36)
Prox RVD	Mean ± SD, range	3.73 ± 0.74 (2.6 - 5)
Dist RVD	Mean ± SD, range	2.94 ± 0.52 (2.3 - 3.9)
MLA	Mean ± SD, range	1.92 ± 0.28 (1.3 - 2.5)
MLD	Mean ± SD, range	1.54 ± 0.13 (1.21 - 1.78)
Stent diameter	Mean ± SD, range	3.25 ± 0.43 (2.5 - 4)
Stent length	Mean ± SD, range	27.92 ± 8.42 (14 - 38)
NC Balloon Use	No., Percentage	28 (93.34%)
NC balloon size	Mean ± SD, range	3.2 ± 0.55 (2.75 - 4)
IVUS detected complications	Positive	4 (13.3%)

Group A, where 30 patients underwent IVUS guided intervention showed the following data:

- MLA ranged from 1.3 to 2.5 mm^2 and MLD ranged from 1.21 to 1.78 mm. Their mean value was 1.92 ± 0.28 and 1.54 ± 0.13 respectively.
- Implanted stent diameter ranged from 2.5 to 4 mm with a mean of 3.25 ± 0.43 mm and stent length ranged from 14 to 38 mm with a mean of 27.92 ± 8.42 mm.
- Post-stenting balloon dilatation with non-compliant balloon was used in 28 patients, 93.34%. Its size ranged from 2.75 to 4 mm, mean 3.2 ± 0.51 mm.
- IVUS guided the early detection of 4 patients having post-stenting distal edge dissection, which represented 13.3%.

3- Procedural details of group B:

Table 3: Group B, MSCT measurements pre-intervention together with stent size used during the PCI and post-stenting balloon dilatation.

Group B (MSCT) 30 patients		
Lesion specific calcium score	Mean ± SD, range	3.85 ± 5.02 (0 - 21)
Lesion length	Mean ± SD, range	22.56 ± 6.96 (12.3 - 40)
Prox RVD	Mean ± SD, range	3.36 ± 0.51 (2.8 - 4.5)
Dist RVD	Mean ± SD, range	2.51 ± 0.29 (1.9 - 3.0)
Stent diameter	Mean ± SD, range	3.24 ± 0.45 (2.75 - 4)
Stent length	Mean ± SD, range Range	29.90 ± 6.45 (12 - 48)
NC Balloon Use	No., percentage	9, 30.0%
NC balloon size	Mean ± SD, range Range	3.0 ± 0.35 (3 - 4)

Group B where 30 patients underwent MSCT planned intervention showed the following:

- Lesion specific calcium score ranged from 0 to 21, with a mean of 3.85 ± 5.02.
- Implanted stent diameter ranged from 2.75 to 4 mm with a mean of 3.24 ± 0.45 mm and stent length ranged from 12 to 48 mm with a mean of 29.90 ± 6.45 mm.
- Post-stenting balloon dilatation with non-compliant balloon was used in 9 patients, 30%. Its size ranged from 3 to 4 mm, mean 3.0 ± 0.35 mm.

4- Procedural details of group C:

		IVUS group	CT group	Control group	Test value	P-value	Sig.
		No. = 30	No. = 30	No. = 30			
Vascular access	Femoral	30 (100.0%)	28 (93.3%)	27 (90.0%)	-	-	-
	Radial	0 (0.0%)	2 (6.7%)	3 (10.0%)	-	-	-
Target vessels	LM	3 (10.0%)	0 (0.0%)	1 (3.3%)	16.828	0.397	NS
	LAD	18 (60.0%)	18 (60.0%)	14 (46.7%)			
	RCA	5 (16.7%)	6 (20.0%)	13 (43.3%)			
	LCX	5 (16.7%)	7 (23.3%)	7 (23.3%)			
Number of stents	1.0	21 (70.0%)	26 (86.7%)	16 (53.3%)	11.981	0.062	NS
	2.0	8 (26.7%)	2 (6.7%)	11 (36.7%)			
	3.0	1 (3.3%)	1 (3.3%)	3 (10.0%)			
Amount of contrast used	Mean ± SD, range	129.33 ± 37.41 (80-210)	161.67 ± 71.97 (50-380)	131.33 ± 48.76 (80-290)	3.298	0.042	S
Stents diameter	Mean ± SD, range	3.25 ± 0.43 (2.5-4)	3.24 ± 0.45 (2.75-4)	3.28 ± 0.43 (2.75-4)	0.063	0.939	NS
Stents length	Mean ± SD, range	27.92 ± 8.42 (14-38)	29.90 ± 6.45 (12-48)	23.76 ± 7.47 (14-48)	5.139	0.008	HS
NC balloon use	No., Percentage	28 (93.34%)	9 (30.0%)	4 (13.33%)	4.929	0.009	HS
NC balloon size	Mean ± SD, range	3.2 ± 0.55 (2.75 - 4)	3.0 ± 0.35 (3 - 4)	3.81 ± 0.24 (3.5 - 4)	0.078	0.879	NS

Table 4: Group C, QCA measurements pre-intervention, stent size used during the PCI and post-stenting balloon dilatation.

Group C (Control) 30 patients		
Lesion length by QCA	Mean ± SD, range	22.72 ± 4.78 (13 - 36)
Prox VD by QCA	Mean ± SD, range	3.21 ± 0.62 (2.8 - 4.2)
Dist VD by QCA	Mean ± SD, range	2.1 ± 0.49 (2.3 - 3.3)
Stent diameter	Mean ± SD, range	3.28 ± 0.43 (2.75 - 4)
Stent length	Mean ± SD, range	23.76 ± 7.47 (14 - 48)
NC Balloon Use	No., percentage	4 (13.33%)
NC balloon size	Mean ± SD, range	3.81 ± 0.24 (3.5 - 4)

Group C (control group), where 30 patients underwent angiography guided PCI, showed the following:

- Implanted stent diameter ranged from 2.75 to 4 mm with a mean of 3.28 ± 0.43 mm and stent length ranged from 14 to 48 mm with a mean of 23.76 ± 7.47 mm.
- Post-stenting balloon dilatation with non-compliant balloon was used in only 4 patients, 13.33%, ranging from 3.5 to 4 mm in diameter, mean 3.81 ± 0.24 mm.

Comparative analysis.

1- PCI procedural details:

Table 5: Comparison between the 3 groups regarding access site, target vessels and number and size of implanted stents,

amount of contrast used and post-stenting balloon dilatation.

Regarding contrast use, group B was significantly higher (P = 0.042) regarding the amount of contrast used during the procedure, which ranged from 50 to 380 ml (mean 161.67 ± 71.97) while group A and group C were 129.33 ± 37.41 and 131.33 ± 48.76 respectively. Post-hoc analysis showed that comparison between group B, and both groups A and C, was significant with a P value of 0.024 and 0.034 respectively.

Regarding the implanted stents length, group B had highly significant longer stents that ranged from 12 to 48mm (mean 23.76 ± 7.47) with a P value of 0.008.Post-hoc analysis showed that comparison between group B and group C was highly significant, with a P value of 0.002. Also comparison between group B and group A was significant, with a P value of 0.036.

Regarding the use of non-compliant balloons, group A had a highly significant number of patients who needed post-stenting balloon dilatation (28 patients, 93.34%), in comparison to both groups B and C (9, 30% and 4, 13.33% respectively), with a P value of 0.009.Post-hoc analysis showed that comparison between group A and group C was highly significant, with a P value of 0.007. Also comparison between group A and group B was significant, with a P value of 0.042.

2- Procedural results:

Table 6: Comparison between the 3 groups regarding procedural end results (TIMI flow and procedural complications including dissections, hematomas etc...).

		Control group	IVUS group	CT group	Test value	P-value	Sig.
		No. = 30	No. = 30	No. = 30			
TIMI	3.0	29 (96.7%)	28 (93.3%)	27 (93.1%)	0.447*	0.800	NS
Complications	Dissection	1 (3.3%)	4 (13.3%)	1 (3.3%)	2.594*	0.628	NS
	Fem hematoma	0 (0.0%)	1 (3.3%)	0 (0.0%)			

Most of the patients had satisfactory results with TIMI 3 flow (84 patients, 94.37%). Only one patient had access site complication (1.1%) and 6 patients had distal edge dissection (6 patients, 6.67%).

3- Major adverse cardiovascular and cerebrovascular events:

Table 7: Comparison between the 3 groups regarding MACCES during hospital stay and 1 month follow up.

MACCES		IVUS group		CT group		Control group		Test value*	P-value	Sig.
		No.	%	No.	%	No.	%			
During Hospital Sttay	None	30	100.0%	30	100.0%	30	100.0%	NA	NA	NA
1 month	None	30	100.0%	28	93.3%	30	100.0%	4.091	0.394	NS
	CIN	0	0.0%	1	3.3%	0	0.0%			
	Died	0	0.0%	1	3.3%	0	0.0%			

No MACCES were detected during the hospital stay. Three days a patient in group B developed CIN. At one month follow up, there was no significant difference between the 3 groups regarding MACCES, although group B showed one patient who died without a specific known cause, 18 days after a successful PCI to subtotal proximal LAD.

DISCUSSION:

Most of the patients in our study were males (84.4%, 76 patients). There was no significant difference between groups regarding gender distribution. Lee et al. compared 600 males and females patients regarding the procedural outcome immediately after and 12 months following PCI, there was no significant difference between males and females, P = 0.939[6].

Regarding the amount of contrast used during the procedure, group B was significantly higher in contrast use (mean 161.67 ± 71.97ml) in comparison to group A and C which used 129.33 ± 37.41ml and 131.33 ± 48.76ml respectively (P = 0.042). Post-hoc analysis showed that comparison between group B, and both groups A and C, was significant with a P value of 0.024 and 0.034 respectively.

Although group A used less contrast in comparison to group C, there was no significant difference between the 2 groups (P = 0.888).

Wolny et al. has compared the amount of contrast used in CTA versus angiography alone for guiding PCI. CT guided PCI was slightly higher in the amount of contrast used (mean 174ml) than the angiography guided PCI (mean 164ml). In contrast to our study, there was no significant difference between the two groups (P = 0.652)[7].

In our study, the significant difference in the amount of contrast used during the procedure between group B and group C could be attributed to more complex procedures in group B as 20% of patients were post CABG. Also it takes multiple injections in more than one view to confirm the lesions observed by CTA.

Due to cost issues, IVUS is usually reserved for complex cases in our center. In group A, the amount of contrast used tended to be less than the amount used in group C. This trend was in accordance with Mariani et al., who randomized 83 patients undergoing PCI to two groups, angiography guided PCI and IVUS guided PCI. IVUS guided PCI group (median 20ml) was significantly lower in contrast use compared to the angiography group (median 64.5ml) with a P value of 0.001[8].

Regarding the stents used in our study, there was no significant difference between the three groups regarding the stent diameter. In contrast, regarding stent length, group B had significantly longer stents with a P value of 0.008.Post-hoc analysis showed that comparison between group B, and both group A and C was significant, with a P value of 0.002 and 0.036 respectively. This could be due to the ability of the CT to demonstrate the whole vessel and to identify the plaque length, not like the angiography alone, which is a lumenography[9].

In accordance to our study, La Bounty et al. in 2008 concluded that stent length was significantly longer in the CT group in comparison to angiography group (27.0 ± 16.0 versus. 21.8 ± 13.3 mm, P = 0.006)[10].

Also, Pregowski et al. published a study in 2011 that randomized 60 patients into two groups, 30 patients with computed tomography guided PCI versus 30 patients with angiography guided PCI. The stent length was significantly longer in the CT group in comparison to the angiography group (mean 23.8 ± 6.7 versus 19.5 ± 6.5 mm, P = 0.01). In contrast to our study, the stent diameter also tended to be larger in the CT group (mean 3.27 ± 0.44 versus 3.09 ± 0.41 mm, P = 0.110)[11].

Several studies have demonstrated that results of lumen area and diameter measurements performed with IVUS and coronary CT angiography are correlated. CT, if available before the intervention, would be a surrogate of pre-procedural IVUS and would help with PCI planning[12,13].

In contrast to our results, Choi et al. enrolled 6,005 patients over 10 years. IVUS was used in 1,674 patients and showed significantly larger mean stent diameter compared to patients having angiography alone (mean 3.2 ± 0.4 versus 3.0 ± 0.4 mm, P = <0.001) but with no significant difference regarding the stent length[14].

In our study, 6 patients had distal edge dissection (6.67%) with no significant difference between groups. We noted that distal edge dissections were more prevalent in group A (4 patients), in comparison to group B and C, which had only 1 patient each. This could be attributed to IVUS greater power of detection of intracoronary complications (edge dissection and intra-mural hematomas)[15].

Pregowski et al. compared between CT guided PCI and angiography guided PCI. There was no significant difference in the occurrence of distal edge dissection between the CT group (6%) and the angiography group (9%), P = 0.795[10].

Räber et al. discussed the greater power of IVUS in the detection of edge dissection and intramural hematomas, in comparison to angiography alone, and their correlation with acute and subacute stent thrombosis[15].

In our centre, post-stenting balloon dilatation is not routinely done due to cost issues, but it is performed when indicated according to the operator. Group A had a significant number of patients who needed post-stenting balloon dilatation (28 patients, 93.34%). Post-hoc analysis showed comparison between group A and group C was highly significant, with a P value of 0.007. Also comparison between group A and group B was significant, with a P value of 0.042.

This could be attributed to the greater power of IVUS to detect stent under expansion and subsequently the need of post-stenting balloon dilatation. Costa et al. in his study examined 200 patients by IVUS after DES implantation, 30% of patients had under-expanded stents and needed non-compliant balloon dilatation[16].

Also Rana et al. results showed that only 21% of patients achieved adequate stent expansion after angiography guided deployment, and raised to 81% after IVUS guided post stenting dilatation with non-compliant balloons. He concluded that DES deployment leads to suboptimal deployment, which can be identified by IVUS to benefit from post-stenting dilatation[17].

In our study, no MACCES were detected during the hospital stay. At one month follow up, there was no significant difference between the 3 groups regarding MACCES (P = 0.394).Group B showed one patient who died 18 days after a successful PCI to subtotal proximal LAD, without a known cause of death.

Singh et al. concluded that significant predictor of reduced mortality was the use of IVUS guidance (OR 0.65, 95%, confidence interval 0.52 to 0.83, P <0.001). Also, Buccheri et al. published in 2017 that in a total of 31 studies, which included 17,882 patients, the use of IVUS significantly decreased the all cause mortality and MACCEs (OR 0.74, 95%) during the hospital stay and also during a median of 36 months of follow up[18,19].

Choi et al. also published in April 2019 that IVUS-guided PCI was associated with a significantly lower risk of cardiac death during 64 months of median follow-up compared with angiography guided PCI (10.2% vs. 16.9%, P <0.001). The risks of all-cause death, myocardial infarction, stent thrombosis, and MACCEs were also significantly lower in the IVUS guided PCI group[13].

This disagreement with our study regarding the role of IVUS in reducing the all cause mortality and MACCEs could be due to the small number of patients enrolled

in our study together with the short follow up.

Conclusion:

IVUS is the most accurate tool to assess the need of post-stenting balloon dilatation in PCI and also the early detection of intra-coronary complications.

Multi-slice CT coronary angiography is associated with larger amount of contrast use, longer lesion detection with the subsequent longer stents deployed in comparison to IVUS and angiography alone. This should be further studied for weighing its benefits against the risk of longer metal load.

The results of our study doesn't support the routine use of MSCT or IVUS in all cases undergoing PCI.

In view of the small number of patients, lack of long-term follow-up data, further studies including larger number of patients with a longer follow up of the clinical outcome is recommended.

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الموجات الصوتية الوعائية كمرشد للتدخل بالشرايين التاجية مقابل الأشعة المقطعية متعددة المقاطع بالصبغة على الشرايين التاجية لتخطيط التدخل، بالمقارنة بتصوير الشرايين التاجية التقليدي بالصبغة كمرشد للتدخل.

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قسم القلب، كلية الطب، جامعة عين شمس.

خلفية الموضوع والاهداف: الموجات الصوتية الوعائية او الاشعة المقطعية بالصبغة على الشرايين التاجية لإرشاد التدخل بالشرايين التاجية لنتائج أفضل. هذه الدراسة تهدف للمقارنة بين نتائج المجموعتين السابقتين والقسطرة العادية.

المرضي والوسائل: هذه الدراسة محتملة، في مركز واحد. تم توزيع ٩٠ مريض متقدمين اختيارياً لعمل قسطرة للشرايين التاجية، الى ٣ مجموعات. مجموعة (أ): الموجات الصوتية الوعائية لإرشاد التدخل، المجموعة (ب): الاشعة المقطعية بالصبغة لإرشاد التدخل، والمجموعة (ج): التدخل التقليدي بالشرايين التاجية. اشتملت المقارنة على تفاصيل ونتائج التدخل.

النتائج: معظم المرضى كانوا من الذكور (٨٤.٤%). المجموعة (ب) استخدمت أكبر نسبة صبغة ٥٠-٣٨٠ مل(١٦١.٦٧ ± ٧١.٩٧، P = ٠.٠٤٢). أيضاً المجموعة (ب) استخدمت أطول دعامات ١٢-٤٨ مل (٢٣.٧٦ ± ٧.٤٧، P = ٠.٠٠٨). المجموعة (أ) أكثر مجموعة من حيث استخدام باللونات غير مطاوعة ٢٨ مريض، ٩٣.٣٤%، مجموعة (ب) ٩ مرضى، ٣٠% ومجموعة (ج) ٤ مرضى، ١٣.٣٤%)، P = ٠.٠٠٩. معظم المرضي حصلوا على نتائج مرضية (تيمي ٣) بنسبة ٩٤%. لم تحدث أى من الأحداث الرئيسية المعاكسة للقلب والأوعية الدموية وللمخ في فترة التواجد بالمستشفى. بعد متابعة وجيزة لمدة شهر، لم يكن هناك اختلاف مؤثر بين الثلاثة مجموعات.

ختامة: الموجات الصوتية الوعائية هي الأداة الادق لتحديدالاحتياج الى توسيع بإستخدام باللونات غير مطاوعة، الأشعة المقطعية بالصبغة على الشرايين التاجية مرتبطة بالكشف عن ضيق أطول وبالتالي استخدام دعامات أطول بالمقارنة الموجات الصوتية الوعائية أو بالقسطرة وحدها.