



ORIGINAL ARTICLE

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Assess the Exposure of Patients and Personnel tests and CT angiography in Interventional Cardiovascular training centers and training of Tabriz in Iran

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ABSTRACT

Fluoroscope for long periods of cardiology tests and imaging as well as a large number of parts needed, without the patient's dose is very high. CT angiography is a diagnostic method emits a high dose to the patient. So good performance and improved imaging techniques and optimization of dose reduction resulting from such tests.

Keywords; Angiography, Angioplasty, dosimetry, Tabriz – Iran

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INTRODUCTION

Coronary angiography is a procedure to check the heart's blood vessels using x-rays. Coronary angiography, cardiac catheterization, also known. Catheterization refers to a method in which a thin and long, flexible plastic tube into your body. Cardiac catheterization can be performed with the purpose of diagnosis and treatment. Most of catheterization, cardiac catheterization. During angiography contrast agent is a type of X-ray machine X-rays is injected into the coronary artery to speed sequential images (series) provides vessels. Most dilatation catheter angiography to examine blood vessels narrowing and blockage detection and diagnosis of internal bleeding. Other examples include:

- View narrowing or blockage of the carotid arteries in the neck that can restrict blood flow to the brain and cause a stroke.
- Show dilatation of intracranial vascular disorders
- Demonstrate renal vascular disease and helping to prepare for a kidney transplant surgery
- Determine the rate of dilatation of the aorta.
- Showing center of the body, such as bleeding, abdominal bleeding
- Helping to prepare for surgery defective blood vessels in the legs of patients who suffer from pain in the legs when walking up.
- The development and extent of coronary artery stenosis.

Sometimes surgery is scheduled for coronary artery bypass surgery (coronary artery bypass graft surgery) of the results of angiography can choose the best surgical procedure, angiography doing. Cardiologists artery stent placement in patients with small tools and small vessel stent treatment that makes the vessel is always open.

Coronary artery disease is the most common and most deadly diseases in the world, so that in America there are 11 million people suffer from coronary artery disease. The disease causes of death and disability than any other disease and costs more.

The importance of patient dosimetry: The process of using the techniques of interventional cardiac procedures being performed And yet it can have a considerable share in Dosimetry patients and staff. Patient dose in cardiac angiography using radiation dose received by the patient is considerably high as 2 Gy dose to the patient's skin has been reported.

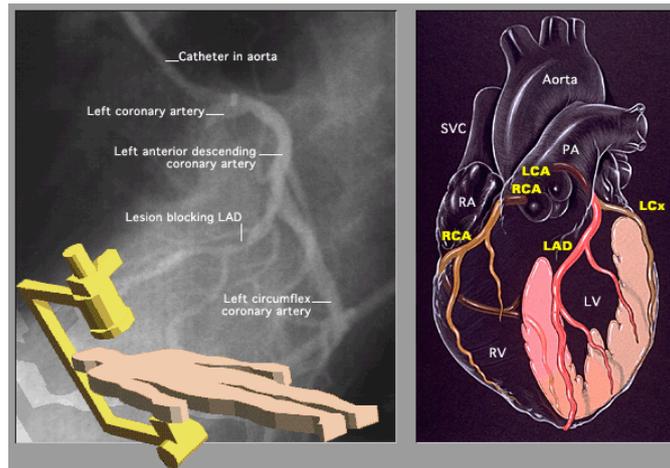


Figure 1: How to use the method of Cardiology of the heart and coronary arteries show.

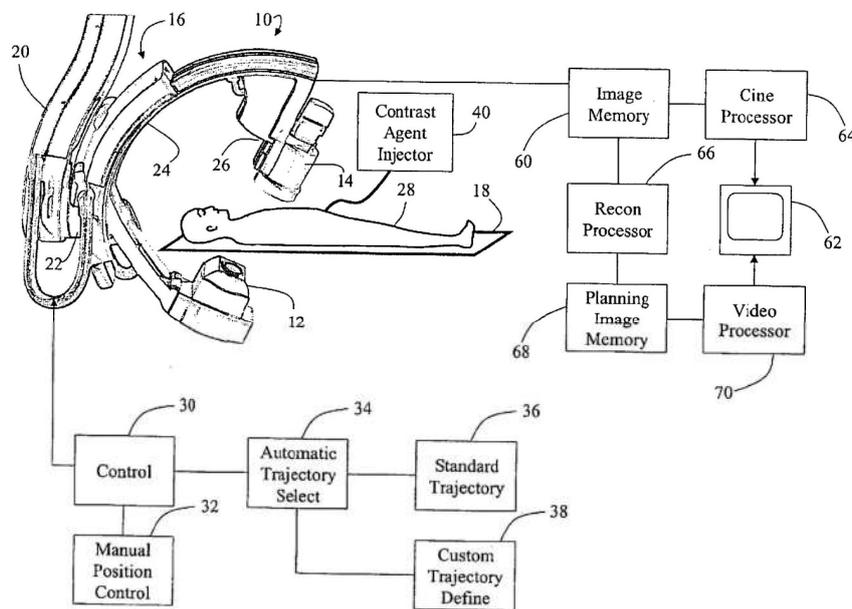


Figure 2: Schematic view of the device using dosimetry

MATERIALS AND METHODS

Dose of Staff: Angiography is also high doses of personnel, particularly physicians cardiologist. An experimental method for reducing the dose of personnel stand at a distance of one meter from the patient, in which case the radiation scattered from the patient fluoroscope roughly 1000/1 receives. Coronary angiography to determine the dose received by patients in hospitals and civic martyr august Tabriz:

In this study, patients received doses of test angiography and angioplasty in three martyr in the civil hospital and a hospital were studied august. Devices in hospitals, civil and august martyr in the Siemens and Philips device and a device Shymatso that all these devices are able to perform continuous pulse fluoroscope. Philips in Holland is the BH3000 model for this device using a digital camcorder with 25 pulses per second takes place. The default pulse rate, pulse 5/12 sec and high-quality imaging to 25 pulses per second. X-ray tube and a maximum power of 200 kW at 150 kV is KVp. The apparatus for automatically controlling the dose of irradiation of control and uses special filters. Both devices made in Germany and Siemens AG and its model is a Flat panel detector. Method as digital video and pulses 10, 15 and 30 pulses per second takes place. The default is 15 pulses per second pulse. High quality imaging to 30 pulses per second. Range from 125 KV to 60 KV and MA range is from 60 to 125 mA.



Figure 3: A view of the dosimetry system

Shymatso the SP model is also made in Japan. The device is able to perform continuous pulsed fluoroscopy. Also filmed by a number of pulses 15 and 30 pulses per second takes place. Pulse rate of 15 pulses per second, and the default image quality And children up to 30 pulses per second and the X-ray tube 40 and the KV 150 and MA 125 machine is 10. Since the diagnosis and treatment of routine quality control program for fluoroscopy devices do not have the systems in terms of accuracy exposure factors were quality control testing.

Evaluation of patient doses

The dosimetry data on 320 patients admitted to the civil hospital cardiac catheterization and angiography and angioplasty procedures august Tabriz for a period of 5 months was recorded. This information includes the quantity of product in the area of DAP for fluoroscopy and The fluoroscopy time during angiography by internal dosimetry system was measured by monitoring the control room. In addition, the parameters of weight - height - BMI, and issues relating to the application of safeguards to reduce the dose of the patient's cardiologist And staff, including the use of wave filter and the continuously localize the site of irradiation procedure and the use of pulse and other protective Protective equipment such as protective glasses and overalls lead and other items to reduce the dose to the patient and hospital personnel martyr civil and august Angiography were evaluated.

Of the 150 patients, 170 patients underwent coronary angiography and angioplasty. To estimate the sample size formula is used to estimate a mean taking $\alpha = 0.05$ and a standard deviation of 17 and 33 In order for CA and PTCA and precision accuracy 5Gy.cm² G.cm² 3 for CA 170 and 123 respectively for PTCA sample that is used to increase the validity of the selected samples, respectively, 150 and 170 Will be. SPSS software was used to analyze data from To collect and record the amount of radiation dose to staff and patients at the end of the procedure proposed by the average dose received by patients During fluoroscopy and filming as well as the average exposure time per patient for all the devices in fluoroscopy Angiography and angioplasty procedures in different sectors of education and training for a variety of diagnostic and therapeutic techniques, respectively.

RESULTS AND DISCUSSION

A comparison of quality control angiography devices in hospitals, civil and august martyr Tabriz following tables have been reported:

Angiography devices	Time difference in percent	The voltage difference between the percentage
Siemens hospital august	%8	3/63
Siemens madani civil hospital	1/22	4/32
Philips madani civil hospital	1/52	6/73
Shymatsv madani civil hospital	2/2	10/77

Table 1: Differences in hospital angiography devices august and civil rights martyr.

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (in minutes)	The film in seconds	Patient dose in fluoroscopy time mGy	Patient dose in mGy film	The overall patient dose mGy	The total dose received by the patient mGym ²
28.5	58.9	2.6	24.86	67.6	146.4	192.2	1545.7
5.1	10.9	1.65	7.5	53.37	68.1	89.78	912

Table 2: Angiography Siemens device martyr civil hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (in minutes)	The film in seconds	Patient dose in fluoroscopy time mGy	Patient dose during film preparation mGy	The total dose received by the patient mGy	The total dose received by the patient mGym ²
28.3	58	13.5	45.6	641.5	315	961.8	6091
3.9	13.9	8.5	22.1	547.1	188	657.4	4103.5

Table 3: Siemens device angioplasty martyr civil hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (In minutes)	Dose fluoroscopy Gy ^{cm} ²	Dose film Gy ^{cm} ²	Total dose Gy ^{cm} ²
27.9	60.2	2	8.5	17.2	26.2
5	6.4	1.2	10.7	5.7	12.9

Table 4: Angiography Philips device martyr civil hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (In minutes)	Dose fluoroscopy Gy ^{cm} ²	Dose film Gy ^{cm} ²	Total dose Gy ^{cm} ²
26.7	57.5	13.3	52.1	31.7	83.1
4.6	15.4	8.3	41.9	19	57.5

Table 5 : angioplasty devices martyr Phillips Civil Hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (In minutes)
26.9	59.1	3.5
4.2	13.1	2.2

Table 6: angiography devices martyr Shymatso civil hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (In minutes)
27	59.3	11.8
3.7	10.5	9.7

Table 7: angioplasty devices martyr Shymatso civil hospital

BMI Kg/m ²	The mean age of the patients	Fluoroscopy time (in minutes)	The film in seconds	Patient dose in fluoroscopy time mGy	Patient dose during film preparation mGy	Total dose mGy	Total dose mGym ²
27.8	55	1.7	25.4	37.4	158.8	188.5	1509.7
3.8	11.5	1.5	7.2	32	83.9	101.5	813.7

Table 8: Siemens device angiography hospital august

CONCLUSION

Using the information contained in tables within the text can be Performance and the differences between devices with different brands found Dosi yards assessment of patients in hospitals and civic martyr august Tabriz to assess the patient's dose meter Imam Reza Hospital in Tehran, Imam Reza Hospital, Mashhad consistent and significant differences are not significant.

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