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ANALYSIS OF PATIENT POSITION SHIFTING BETWEEN THE USE OF ISOCENTER MARKERS ON SKIN AND MASK FIXATION IN BREAST CANCER CASES

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ABSTRACT

The background of this research is the use of high-dose radiation in breast cancer radiotherapy, which may have damaging effects on the surrounding normal tissues (Organs at Risk). These normal tissues should be avoided as much as possible from the radiation area. For that reason, verification is a crucial component in breast cancer radiotherapy, as large uncorrected geometrical errors can result in a decrease in the effectiveness of radiation therapy, especially in external setup errors. The design of this research implements a quantitative analytical approach. As for the data and information obtained are further analyzed statistically using the Mann-Whitney test and Descriptive Statistics in SPSS. The result of research concludes that on Y-axis, the skin marker method has better accuracy compared to the mask method, with a significant difference. In Z-axis, the skin marker method has better accuracy compared to the mask method, with a significant difference. Furthermore, on X-axis, the mask marker method has better accuracy compared to the skin method; however, there is no significant difference in the average shift between the two methods.

Keywords: *breast cancer, verification, isocenter markers*

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INTRODUCTION (Times New Roman, 12 pt, Bold, UPPERCASE)

Verification is an activity that aims to obtain data regarding the variations that occur while the patient is undergoing radiation therapy (1). This verification can use EPID (Electronic Portal Imaging Devices) or OBI (On-board Imager) devices as image guides to match the image from the TPS (Treatment Planning System) and the actual or actual position. The shift between the TPS calculation and the actual position cannot be more than 3 mm, if the shift that occurs is more than 5 mm then a repositioning is carried out (2–4). Verification is an important component in breast cancer radiotherapy, uncorrected geometrical errors can result in a decrease in the effectiveness of radiation therapy, especially in external setup errors and internal organ movements. The geometric error is represented as a deviation between the radiation plan (*plan*) and the geometry when the radiation therapy is taking place (*actual*). The two deviations consist of systematic errors and random errors (5).

Geometric errors can occur due to loss of consistency of the isocenter mark on the skin or on the thermoplastic mask used. One aspect of quality assurance in verification is the availability of isocenter marks that remain unchanged in topography for the patient, both marks on the skin and marks on the mask. Even with routine exposure to the patient, the isocenter mark applied using a pen can shift slowly (6). In addition, deviations in the position of the isocenter point can occur due to changes in breast volume between 5-8 fractions and have the consequence of dosimetric errors.

Based on the above background, the formulation of the problem in this study is "how is the difference in shifting the patient's position between the use of isocenter dots on the skin and mask fixation with breast cancer cases using the Intensity Modulated Radiation Therapy technique *in* the Radiotherapy Installation of Pasar Minggu Hospital ".

MATERIAL & METHODS

The research design used in this study uses a research method with a quantitative analytic approach in its implementation. Aims to analyze differences in isocenter point accuracy between the use of isocenter marks on the patient's skin and the fixation of thermoplastic masks. This research was conducted at the Radiotherapy Installation of Pasar Minggu Hospital. Data collection in this study was carried out in February - May 2023.

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The sample in this study was taken from primary data which is the result of verification of breast cancer patients using the IMRT technique using isocenter marks on the skin surface and on thermoplastic masks at the Radiotherapy Installation of Pasar Minggu Hospital in February - May 2023. The number of samples in this study were 20 respondents with 4 times verification using primary data.

The data used is primary data resulting from verification with OBI in breast cancer cases using the IMRT technique which uses isocenter marks on the skin and on a thermoplastic mask at the Radiotherapy Installation at Pasar Minggu Hospital. From the data and information obtained, the average value of the isocenter shift of the x, y, and z axes in fractions 5, 10, 15, and 20 will be compared, then analyzed further statistically using the Mann-Whitney test and the Descriptive Statistics *test* in SPSS version 25 uses the average shift of the x, y, and z axis points at the 5th, 10th, 15th, and 20th fractions to see how big a shift occurs between using the isocenter mark on the skin surface and fixing the thermoplastic mask.

RESULT & DISCUSSION

Based on the observations that have been made by researchers, namely collecting routine patient verification data in breast cancer cases using the Intensity Modulated Radiation Therapy (IMRT) technique from the ARIA application at the Radiotherapy Installation at Pasar Minggu Hospital on a total of 20 samples with 10 samples verifying only the isocenter dot on the surface of the skin and 10 samples verified only the isocenter mark on the thermoplastic mask fixation , the average verification results were obtained with a multiple of 5 fractions on the X, Y, and Z axes . The data in Table 1 is the result of verification of 10 samples using isocenter dots on the patient's skin on the X, Y, and Z axes for fractions 5, 10, 15, and 20.

Table 1. Verification results of 10 samples using isocenter marks on the skin with multiples of 5 fractions on the X, Y, and Z axes

Sample	Isocenter Mark Shift Results on Skin (cm)			
	Fraction 5	Fraction 10	Fraction 15	Fraction 20

	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)
A	0.1	0.4	0.6	0.1	0.7	0.8	0.0	0.6	0.6	0.1	0.1	0.0
B	0.3	0.0	0.0	0.0	0.5	0.3	0.1	0.4	0.3	0.0	0.2	0.3
C	0.1	0.2	0.4	0.2	0.4	0.4	0.2	0.2	0.1	0.1	0.4	0.1
D	0.1	0.6	0.2	0.2	0.6	0.4	0.2	0.3	0.5	0.4	0.7	0.5
E	0.0	0.8	0.1	0.0	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.5
F	0.0	0.4	0.3	0.3	0.0	0.3	0.0	0.2	0.0	0.0	0.2	0.2
G	0.0	0.3	0.5	0.0	0.3	0.3	0.0	0.8	0.3	0.0	0.0	0.7
H	0.5	0.3	0.4	0.0	0.1	0.4	0.1	0.1	0.8	0.0	0.6	0.2
I	0.0	0.1	0.4	0.0	0.5	0.4	0.0	0.6	0.5	0.1	0	0.3
J	0.0	0.3	0.5	0.1	0.1	0.2	0.1	0.1	1,2	0.0	0.3	0.1
Average	0.11	0.34	0.34	0.09	0.33	0.36	0.08	0.37	0.45	0.08	0.26	0.29
Standard Deviation	0.16	0.22	0.18	0.10	0.23	0.17	0.07	0.22	0.34	0.12	0.23	0.21

Source: *Microsoft Office Excel Output*

Then the data in Table 2 was also obtained from the results of observations that the researcher made. This data is the result of verification of 10 samples using the isocenter point mark to fixate the mask on the x, y and z axes in fractions 5, 10, 15 and 20.

Table 2. Verification results of 10 samples using the isocenter point mark in mask fixation in multiples of 5 fractions on the X, Y and Z axes

Sample	Result of Isocenter Mark Shift on Mask (cm)											
	Fraction 5			Fraction 10			Fraction 15			Fraction 20		
	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)	Y (Vrt)	Z (Lng)	X (Lat)
K	0.1	1,2	0.3	0.7	0.2	0.1	0.2	0.8	0.1	0.3	0.5	0.1
L	0.0	0.9	0.5	0.1	0.5	0.1	0.1	1,1	0.6	0.0	0.5	0.2
m	0.3	0.2	0.2	0.3	0.6	0.6	0.3	0.6	0.1	0.7	0.1	0.1
N	0.0	0.7	0.0	0.2	0.9	0.0	0.4	0.9	0.0	0.6	0.1	0.0
O	0.2	0.5	0.2	0.1	0.5	0.0	0.1	0.5	0.2	0.1	0.7	0.9
P	0.0	0.2	0.1	0.2	0.2	0.4	0.2	0.1	0.3	0.1	0.4	0.0
Q	0.0	0.3	0.2	0.1	0.1	0.1	0.0	0.3	0.1	0.2	0.1	0.0
R	0.3	1,2	0.5	0.5	0.5	0.5	0.1	0.6	0.6	0.0	0.0	0.4
S	0.0	0.1	0.2	0.2	0.7	0.5	0.0	0.4	0.5	0.1	0.5	0.1
Q	0.0	0.7	0.0	0.0	0.4	0.8	0.2	0.5	0.4	0.0	0.4	0.4
Average	0.09	0.60	0.22	0.24	0.46	0.31	0.16	0.58	0.29	0.21	0.33	0.22
Standard Deviation	0.12	0.39	0.17	0.20	0.23	0.27	0.12	0.28	0.21	0.24	0.22	0.27

Source: *Microsoft Office Excel output*

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To find out the comparison of the results of the average shift of the isocenter point on the patient's skin surface and on the fixation of the *thermoplastic mask*, then describe it with *Descriptive Statistics* to see a general overview of the data such as the average value, standard deviation and difference of each variable, namely the isocenter mark in the skin and isocenter marks in the mask at fractions 5, 10, 15, and 20 in each x, y, and z axis as in Table 3, Table 4, and Table 5.

Table 3. *Descriptive Statistics* test verified the Y-axis shift in multiples of 5 fractions on the skin and on the mask

Y axis (Vertical)

Method	N	On Skin		On Mask		Mean difference
		Mean	std. Dev	Mean	std. Dev	
Fraction 5	10	0.11	0.17	0.09	0.13	0.02
Fraction 10	10	0.09	0.11	0.24	0.21	-0.15
Fraction 15	10	0.08	0.08	0.16	0.13	-0.08
Fraction 20	10	0.08	0.12	0.21	0.25	-0.13
Final score	40	0.09	0.12	0.17	0.19	-0.08

Source: *SPSS 25 output*

Table 4. *Descriptive Statistics* test results verify the shift of the Z axis in multiples of 5 fractions on the skin and on the mask

Z Axis (Longitudinal)

Method	N	On Skin		On Mask		Mean difference
		Mean	Std. Dev	Mean	Std. Dev	
Fraction 5	10	0.34	0.23	0.60	0.41	-0.26
Fraction 10	10	0.33	0.25	0.46	0.25	-0.13
Fraction 15	10	0.37	0.24	0.58	0.29	-0.21
Fraction 20	10	0.26	0.24	0.33	0.24	-0.07
Final score	40	0.33	0.23	0.49	0.31	-0.16

Source: *SPSS 25 output*

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Table 5. *Descriptive Statistics* test results verify shift of the X axis in multiples of 5 fractions on the skin and on the mask

X Axis (Lateral)						
Method	N	On Skin		On Mask		Mean difference
		Mean	Std. Dev	Mean	std. Dev	
Fraction 5	10	0.34	0.19	0.22	0.18	0.12
Fraction 10	10	0.36	0.18	0.31	0.28	0.05
Fraction 15	10	0.45	0.36	0.29	0.22	0.16
Fraction 20	10	0.29	0.22	0.22	0.28	0.07
Final score	40	0.36	0.24	0.26	0.24	0.10

Source: *SPSS Output 25*

After knowing the average value, standard deviation, and the difference in shift verification of the isocenter point mark on the patient's skin surface and fixing the thermoplastic mask using the *Descriptive Statistics test*, then a decision is made using *the Mann-Whitney test* for each variable, namely the isocenter mark on the skin. and isocenter marks in the masks at fractions 5, 10, 15, and 20 in each x, y, and z axis as in Table 6, Table 7, and Table 8.

The Mann-Whitney test, if the value of *Asymp. Sig. (2-tailed)* ≤ 0.05, then H_0 is rejected and H_1 is accepted, meaning that there is a significant difference in average shift when verifying the irradiation field in breast cancer cases between the use of isocenter marks on the patient's skin and on thermoplastic masks at Pasar Minggu Hospital. Conversely, if the *Asymp. Sig. (2-tailed)* > 0.05, then H_0 is accepted and H_1 is rejected, meaning that there is no significant difference in the average shift during field verification of radiation in breast cancer cases between the use of isocenter marks on the patient's skin and on thermoplastic masks at Pasar Minggu Regional Hospital.

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Table 6. *The Mann-Whitney* test verified the Y-axis shift in multiples of 5 fractions in the skin and in the mask

Y axis (Vertical)

Method	N	Mean Rank		Mann-Whitney U	Asymp . Sig. (2-tailed)
		On Skin	On Mask		
Faction 5	10	10.85	10,15	46.50	0.77
Faction 10	10	8,10	12.90	26.00	0.06
Faction 15	10	8.60	12.40	31.00	0.13
Faction 20	10	8.85	12.15	33.50	0.19
Final score	40	34.90	46,10	576.00	0.02

Source: SPSS 25 output

Table 7. *Mann-Whitney* test results verify the shift of the Z axis in multiples of 5 fractions on the skin and on the mask

Z Axis (Longitudinal)

Method	N	Mean Rank		Mann-Whitney U	Asymp . Sig. (2-tailed)
		On Skin	On Mask		
Faction 5	10	8.80	12.20	43.00	0.20
Fraction 10	10	9.00	12.00	35.00	0.25
Fraction 15	10	8.40	12.60	29.00	0.11
Faction 20	10	9.65	11.35	41.50	0.52
Final score	40	34,26	46,74	550.50	0.02

Source: SPSS Output 25

Table 8. *The Mann-Whitney* test verify the shift of the X axis in multiples of 5 fractions in the skin and in the mask

X Axis (Lateral)

Method	N	Mean Rank		Mann-Whitney U	Asymp . Sig. (2-tailed)
		On Skin	On Mask		

Faction 5	10	12.30	8.70	32.00	0.17
Fraction 10	10	11.00	10.00	45.00	0.70
Faction 15	10	11.75	9,25	37.50	0.34
Faction 20	10	11.95	9.05	35.50	0.27
Final score	40	45.53	35,58	599.00	0.05

Source: SPSS Output 25

The procedure carried out on samples A to J was to verify the isocenter point mark on the skin surface, namely by positioning the patient supine on a couch with both of the patient's hands up holding the grip pole, and the knees supported using a knee rest. Align the couch with the longitudinal and lateral axis coordinates on the Linac monitor. Adjust the center of the laser in the sagittal and axial planes right at the Anterior isocenter point mark on the patient's skin surface, then adjust the couch to the vertical axis coordinates and the Lateral isocenter point mark. Make sure the patient's position is comfortable so that the patient does not move much during verification and irradiation. Then attach the thermoplastic mask, pay attention to the thermoplastic mask that is installed not too loose or too narrow for the patient. Next, on the Linac console computer, verify using OBI to re-ensure the accuracy of the irradiation area to be carried out with radiation, the same as the verification activity during the first irradiation. On the other hand, the procedure carried out on samples K to T is similar to that carried out on samples A to J, but by verifying the isocenter dots on the thermoplastic mask.

In Table 1 it is known that there are 15 verification shift data that exceed the tolerance limit, namely sample A in the 5 x-axis fraction of 0.6 cm, the 10 z-axis fraction of 0.7 cm and the x-axis of 0.8 cm, the 15 z-axis fraction 0.6 cm and 0.6 cm for the x-axis, 0.6 cm for the 5 z-axis fraction, 0.6 cm for the 10 z-axis fraction, 0.7 cm for the 20 z-axis fraction, sample E for the 5th z-axis fraction is 0.8 cm, the G sample is 0.8 cm in the 15th z-axis fraction, the 20th-axis fraction is 0.7 cm, the H sample is 0.8 cm in the 15th-axis fraction, the 20th z-axis fraction of 0.6 cm, sample I in the 15 z-axis fraction is 0.6 cm, and sample J in the 15 x-axis fraction is 1.2 cm. From the results of the data that has been processed, it is known that there

is no average value of the verification shift of the isocenter point mark on the patient's skin surface that exceeds the tolerance limit of 5 mm or 0.5 cm (7).

In Table 2 it is known that there are 22 verification shift data that exceed the tolerance limit, namely sample K in the 5 z-axis fraction of 1.2 cm, 10-axis y fraction of 0.7 cm, 15 z-axis fraction of 0.8 cm, sample L in the 5 z-axis fraction of 0.9 cm, in the 15th z-axis fraction of 1.1 cm and 0.6 cm in the x-axis, sample M in the 10-axis z fraction is 0.6 cm and the x-axis is 0.6 cm, the 15th z-axis fraction is 0.6 cm, the 20th-axis fraction is 0.7 cm, the N sample in the 5th z-axis fraction is 0.7 cm, the 10th-axis z fraction is 0.9 cm, the 15th z-axis fraction is 0, 9 cm, 20 y-axis fraction of 0.6 cm, O sample in z-axis 20 fraction of 0.7 cm and 0.9 cm x-axis, R sample in 5 z-axis fraction of 1.2 cm, 15-axis fraction z is 0.6 cm, and the x-axis is 0.6 cm, sample S in the 10 z-axis fraction is 0.7 cm, and sample T is in the 5-axis z fraction of 0.7 cm, the 10 x-axis fraction is 0. 8cm. From the results of the data that has been processed, it is known that there are 2 average values of the verification shift of the isocenter dot on the thermoplastic mask fixation that exceed the tolerance limit, namely the 5 z-axis fraction of 0.60 cm and the 15 z-axis fraction of 0.58 cm.

Descriptive Statistics that has been carried out aims to see a general description of the data such as the average value, standard deviation and difference of each variable, namely the isocenter mark on the skin and the isocenter mark on the mask at fractions 5, 10, 15, and 20 on each axis x, y, and z as shown in Table 3, Table 4, and Table 5. After obtaining a general description of the data using *Descriptive Statistics*, a comparative analysis of the average results of verification shifts is carried out by conducting the *Mann-Whitney test* to find out the average relationship the mean shift of the verification of the isocenter point marks in both methods, namely on the patient's skin surface and in the fixation of the *thermoplastic mask* as shown in Table 6, Table 7, and Table 8.

In Table 3, the average value, standard deviation, and difference in average values of the verification shift on the Y axis are obtained. It is known from the two methods that the skin method has better accuracy in the 10th, 15th, and 20th fractions. Whereas in fraction 5, the method on the mask has better accuracy than the method on the skin. The difference in mean values also proves that there is a difference between the two methods. A negative value

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indicates that the average verification on the skin is smaller than the average verification value on the mask. Overall, the verification shift on the Y axis using the method on the skin has an average value of 0.09 and a standard deviation value of 0.12, while the method on the mask has an average value of 0.17 and a standard deviation value of 0.19. With the difference in the average value between the two methods of -0.08. The relationship between the two methods can be clarified by looking at the results of the *Mann-Whitney statistical test*.

The basis for decision making is obtained by looking at the significance value and in Table 6 it is obtained that the significance value is greater than 0.05 for fractions 5, 10, 15, and 20, then, H 0 is accepted, which means that there is no significant difference in the average shift when verifying irradiation field in cases of breast cancer between the use of isocenter marks on the patient's skin and on thermoplastic masks at Pasar Minggu Hospital. But then, the final Mean Rank values were obtained from the two methods where the Mean Rank values showed that there was a significant difference between the two methods on the Y axis. The data from *the Mann-Whitney* test strengthens *Descriptive Statistics* evidence, that on the Y axis the verification method is on the patient's skin more accurate than using the mask fixation method with a significant difference in average shift between the two methods.

When setting up the patient's position, the Y axis or vertical movement of the patient tends not to have much difference between the skin and mask methods, however the use of the isocenter point mark in mask fixation has its drawbacks, namely that the mask fixation has loosened so that it does not stick to the lateral parts of the body. patient causing a discrepancy between the planning point and the actual point. On the other hand, the use of isocenter points on the patient's skin surface for the Y axis does not change much because the lateral side of the patient's body has minimal movement (3).

Furthermore, the processing results of the Z-axis in Table 4 show that in all the fractions tested, the skin method has better accuracy than the skin method, as indicated by the negative mean difference. In addition, in the mask method there are 2 fractions that produce an average value that exceeds the tolerance limit value of 0.5 cm (5). In fraction 5, that is equal to 0.60 cm and in fraction 15, that is equal to 0.58 cm. Overall, the verification shift on the Z axis using the method on the skin has an average value of 0.33 and a standard deviation value of

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0.23, while the method on the mask has an average value of 0.49 and a standard deviation value of 0.31. With the difference in the average value between the two methods of -0.16. The relationship between the two methods can be clarified by looking at the results of the *Mann-Whitney statistical test*.

The basis for decision making is obtained by looking at the significance value and in Table 7 it is obtained that the significance value is greater than 0.05 for fractions 5, 10, 15, and 20, then, H_0 is accepted, which means that there is no significant difference in the average shift when verifying irradiation field in cases of breast cancer between the use of isocenter marks on the patient's skin and on thermoplastic masks at Pasar Minggu Hospital. But then, the final Mean Rank values were obtained from the two methods where the Mean Rank values showed that there were significant differences between the two methods on the Z axis. The data from *the Mann-Whitney* test strengthens *Descriptive Statistics* evidence, that on the Z axis the verification method is on the patient's skin more accurate than using the mask fixation method with a significant difference in average shift between the two methods.

Often there are geometric errors in the Z axis or longitudinal movement of the patient, due to the immobilization position of *the Knee Rest* that does not fit properly. An incorrect *Knee Rest* position can cause the patient's head to be positioned incorrectly on the pillow and the patient's hands cannot reach *the Grip Pole* correctly. The method of marking the isocenter point on the skin surface is more accurate because in practice, the isocenter point follows part of the irradiated area. Even if the *Knee Rest* position is not right, the radiotherapist will immediately know the setup error with the help of the isocenter point mark on the skin. On the other hand, the use of the isocenter point mark on the mask gets a higher average value which tends to exceed the tolerance limit of 0.5 cm because if the condition of the mask has loosened, the radiotherapist will not be aware that the longitudinal isocenter point is not correct (5). However, if the condition of the mask narrows, the patient will tell because of pain or discomfort due to the improper setup position.

In Table 5 it is known that the average value of all the fractions tested on the mark on the skin method is greater than the mark on the mask, as shown by the results of the average difference which is positive. Overall, the verification shift on the X axis using the method on

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the skin has an average value of 0.36 and a standard deviation value of 0.24, while the method on the mask has an average value of 0.26 and a standard deviation value of 0.24. With a difference in average value between the two methods of 0.10. The relationship between the two methods can be clarified by looking at the results of the *Mann-Whitney statistical test*.

The basis for decision making is obtained by looking at the significance value and in Table 8 it is obtained that the significance value is greater than 0.05 for fractions 5, 10, 15, and 20, then, H_0 is accepted, which means that there is no significant difference in the average shift when verifying irradiation field in cases of breast cancer between the use of isocenter marks on the patient's skin and on thermoplastic masks at Pasar Minggu Hospital. then, the overall significance value of the two methods is obtained where the final significance value is equal to 0.05 which indicates that there is no significant difference between the two methods on the X axis. The data from *the Mann-Whitney* test strengthens the *Descriptive Statistics* evidence, that on the X method of verification in mask fixation is more accurate than using the method on the patient's skin with a significant difference in average shift between the two methods. Nevertheless, there is no significant difference in the average shift between the two methods.

Errors in the lateral movement of the patient during position setup often occur due to the patient's position not being perpendicular to the couch or the laser in the Linac room (8). The use of the isocenter mark on the mask is more accurate because in practice, the position of the mask that has been locked with the couch will not change much, especially on the lateral isocenter mark. On the other hand, in the skin marking method, setup errors can occur due to the patient's position being incorrect, for example the patient's position is oblique or not perpendicular to the laser.

CONCLUSION

The average value of all verification shifts of the isocenter point mark on the patient's skin surface is 0.26 cm, in the 5th fraction the Y axis is 0.11 cm, the Z axis is 0.34 cm, and the X axis is 0.34 cm, in the 10th fraction on the Y axis is 0.09 cm, the Z axis is 0.33 cm and the X axis is 0.36 cm, the 15th fraction on the Y axis is 0.08 cm, the Z axis is 0.37 cm, and the X

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axis of 0.45 cm, and the 20th fraction of the Y axis is 0.08 cm, the Z axis is 0.26 cm, and the X axis is 0.29 cm.

The average value of all verification shifts of the isocenter point mark in fixation of the thermoplastic mask is 0.31 cm, in the 5th fraction the Y axis is 0.09 cm, the Z axis is 0.60 cm, and the X axis is 0.22 cm, the fraction the 10th Y axis is 0.24 cm, the Z axis is 0.46 cm, and the X axis is 0.31 cm, the 15th fraction is the Y axis is 0.16 cm, the Z axis is 0.58 cm, and the X axis is 0.29 cm, and the 20th fraction on the Y axis is 0.21 cm, the Z axis is 0.33 cm, and the X axis is 0.22 cm.

The results of the comparison of the average verification shift of the isocenter point mark on the patient's skin surface and the fixation of the thermoplastic mask on the Y, Z and masks have an average value of 0.17, with an average difference of -0.08. on the Z axis, the mark on the skin method has an average value of 0.33 and the mark on the mask has an average value of 0.49, with an average difference of -0.16. And on the The data is strengthened by the presence of a significance value, on the Y axis the *Asymp. Sig. (2-tailed)* is 0.02, so it can be concluded that on the Y axis the skin marking method has better accuracy compared to the mask method with significant differences. On the Z axis, *the Asymp. Sig. (2-tailed)* of 0.02, it can be concluded that on the Z axis the skin marking method has better accuracy compared to the mask method with significant differences. And on the X axis we get the *Asymp. Sig. (2-tailed)* of 0.05, it can be concluded that on the X axis the mark method on the mask has better accuracy than the method on the skin however, there is no significant difference in the average shift between the two methods.

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