



مجلة القلزم للدراستات التطبيقية



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علمية دولية مُحكمة - تصدر بالشراكة مع جامعة دنقلا - السودان

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موجهات النشر

تعريف المجلة:

مجلة (الْقَلْزَم) للدراسات التطبيقية، مجلة علمية مُحَكِّمة تصدر عن مركز بحوث ودراسات دول حوض البحر الأحمر - السودان بالشراكة مع جامعة دنقا- السودان. تهتم المجلة بالبحوث والدراسات العلمية والمواضيع ذات الصلة بدول حوض البحر الأحمر.

موجهات المجلة:

1. يجب أن يتسم البحث بالجودة والأصالة، وألا يكون قد سبق نشره قبل ذلك.
 2. على الباحث أن يقدم بحثه من نسختين. وأن يكون بخط (Traditional Arabic) بحجم 14 على أن تكون الجداول مرقمة وفي نهاية البحث وقبل المراجع على أن يشار إلى رقم الجدول بين قوسين دائريين ().
 3. يجب ترقيم جميع الصفحات تسلسلياً بالأرقام العربية بما في ذلك الجداول والأشكال التي تلتحق بالبحث.
 4. المصادر والمراجع الحديثة يستخدم أسم المؤلف، اسم الكتاب، رقم الطبعة، مكان الطبعة، تاريخ الطبعة، رقم الصفحة.
 5. المصادر الأجنبية يستخدم اسم العائلة (Hill, R).
 6. يجب ألا يزيد البحث عن 30 صفحة، وبالإمكان كتابته باللغة العربية أو الإنجليزية.
 7. يجب أن يكون هناك مستخلص لكل بحث باللغتين العربية والإنجليزية على ألا يزيد على 200 كلمة بالنسبة للغة الإنجليزية. أما بالنسبة للغة العربية فيجب أن يكون المستخلص وافيّاً للبحث بما في ذلك طريقة البحث والنتائج والاستنتاجات، مما يساعد القارئ العربي على استيعاب موضوع البحث وبما لا يزيد عن 300 كلمة.
 8. لا تلزم هيئة تحرير المجلة بإعادة الأوراق التي لم يتم قبولها للنشر.
 9. على الباحث إرفاق عنوانه كاملاً مع الورقة المقدمة (الاسم رباعي، مكان العمل، الهاتف، البريد الإلكتروني).
- نأمل قراءة شروط النشر قبل الشروع في إعداد الورقة العلمية.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

الحمد لله رب العالمين، والصلاة والسلام على سيدنا محمد
وعلى آله وصحبه أجمعين

وبعد:

القارئ الكريم ..

السلام عليكم ورحمة الله وبركاته.. نطل على حضراتكم من نافذة
جديدة من نوافذ النشر العلمي، وهي **مجلة القلزم للدراسات
التطبيقية**، ونحن في غاية السعادة والمجلة تصل عددها السابع بفضل
الله تعالى ومنتته.

القارئ الكريم:

هذه المجلة تصدر بالشراكة مع جامعة دنقلا، وهي إحدى الجامعات
السودانية الفتية التي وضعت بصمات مميزة في مسيرة البحث العلمي،
وهذا العدد هو السابع في إطار هذه الشراكة العلمية التي تأتي في
إطار استراتيجية مركز بحوث ودراسات دول حوض البحر الأحمر، في
تفعيل الحراك العلمي والبحثي داخل السودانى وخارجه.

القارئ الكريم:

هذا العدد يشتمل على العديد من البحوث والدراسات المهمة ذات
البعد النظري والتطبيقي، ولضمان نجاح واستمرارية هذه المجلة بإذن
الله تعالى، نأمل أن يرفدنا الباحثون بمزيد من إسهاماتهم العلمية
المميزة.

مع خالص الشكر والتقدير للجميع

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The effect of current and voltage values on the quality of the diagnostic x-ray image of the foot

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Abstract:

This study dealt with the effect of current and voltage values on the quality of the diagnostic X-ray image of the foot. This study was conducted in the state of North Kordofan - Al-Obeid City - Laboratories of the Medical Weapon Hospital - Department of Diagnostic Radiology during the period 2022-2023 AD, where five different samples were taken of the foot from visitors to The laboratory has different voltages and currents, so the first sample was with a voltage of (44kv) and a current of (4mAs) and the image was not clear, while the second sample was with a voltage of (53kv) and a current of (4.5mAs) the image was white, while the third sample was with a voltage of (55kv) and a current of (5mAs) The image was clear, while the fourth sample had a voltage of (60kv) and a current of (5.6mAs), the image was blurred, while the fifth sample had a voltage of (64kv) and a current of (6.3mAs), the image was black, Then one sample was taken and five readings were made with different voltages and currents, so the first reading was at a voltage of (44kv) and a current of (4mAs) the image was not clear, while the second reading was at a voltage of (53kv) and a current of (4.5mAs) the image was white,

while the third reading was at a voltage of (55kv) And the current (5mAs) the image was clear, while the fourth reading was not clear, with a voltage (60kv) and the current (5.6mAs) the image was, while the fifth reading with a voltage (64kv) and the current (6.3mAs) the image was black, Through the results of different samples and one sample, we notice that the clearest image was at (55kv) voltage and (5mAs) current, This confirms to us that the voltage (55kv) and current (5mAs) can be relied upon as input to obtain a high-quality image when we use the traditional method. Thus, the values of both current and voltage have an impact on the quality of the X-ray image of the foot using the traditional method. This study recommends conducting More research on different variables using the traditional method.

Key words: voltage, current, quality, diagnostic, foot and image.

أثر قيم التيار والجهد على جودة صورة الأشعة التشخيصية للقدم

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المستخلص:

تناولت هذه الدراسة أثر قيم التيار والفولتية علي جودة صورة الأشعة السينية التشخيصية للقدم، أُجريت هذه الدراسة في ولاية شمال كردفان - مدينة الأبيض - معامل مستشفى السلاح الطبي - قسم الأشعة التشخيصية خلال الفترة (2023-2022م)، حيث أُخذت خمس عينات مختلفة للقدم من المتردين الي المعمل بجهود وتيارات مختلفة، فكانت العينة الأولى بفولتية (44kv) وتيار (4mAs) وكانت الصورة غير واضحة، أما العينة الثانية كانت بفولتية (53kv) وتيار (4.5mAs) كانت الصورة بيضاء، أما العينة الثالثة كانت بفولتية (55kv) وتيار (5mAs) كانت الصورة

واضحة، أما العينة الرابعة كانت بفولتية (60kv) والتيار (5.6mAs) كانت الصورة غير واضحة، أما العينة الخامسة كانت بفولتية (64kv) والتيار (6.3mAs) كانت الصورة سوداء، ثم أُخذت عينة واحدة وأُجريت لها خمس قراءات بجهود والتيارات مختلفة، فكانت القراءة الأولى بجهد (44kv) والتيار (4mAs) كانت الصورة غير واضحة، أما القراءة الثانية بجهد (53kv) والتيار (4.5mAs) كانت الصورة بيضاء، أما القراءة الثالثة بجهد (55kv) والتيار (5mAs) كانت الصورة واضحة، أما القراءة الرابعة بجهد (60kv) والتيار (5.6mAs) كانت الصورة غير واضحة، أما القراءة الخامسة بجهد (64kv) والتيار (6.3mAs) كانت الصورة سوداء، من خلال نتائج العينات المختلفة والعينة الواحدة الثابتة نلاحظ أن أوضح صورة كانت بجهد (55kv) والتيار (5mAs)، وهذا يؤكد لنا أن الجهد (55kv) والتيار (5mAs) يمكن الإعتماد عليهما في الإدخال للحصول علي صورة ذات جودة عالية عندما نستخدم الطريقة التقليدية، وبهذا تعتبر قيم كل من التيار والجهد لها أثر علي جودة صورة الأشعة السينية للقدم بالطريقة التقليدية، تُوصي هذه الدراسة بإجراء المزيد من البحوث لمتغيرات مختلفة باستخدام الطريقة التقليدية .

1.Introduction:

X-rays are a penetrating form of high-energy electromagnetic radiation. We find most kilovolts. It is known that the wavelengths of X-rays are shorter than those of ultraviolet rays and usually longer than those of gamma rays. X-rays are referred to in many languages as Roentgen radiation, named after the German scientist Wilhelm Conrad, who discovered them on November 8, 1895 [1]. It was called x-ray radiation to indicate an unknown type of radiation [2]. X-rays in English include the variable x-ray(s). The most common use of X-rays is to check for fractures (broken bones), but X-rays are also used in other ways. For example, a chest X-ray can detect pneumonia. Mammography also uses X-rays to look for breast cancer [1].

1.1.What is x-ray imaging?

X-ray imaging is one of the common diagnostic radiology tests that contribute to detecting and monitoring a group of diseases and health problems. This is done by enabling the doctor to see the internal structures of the body, specifically

the bones and teeth, without the need for any surgical procedure,[2]. X-rays are a form of electromagnetic radiation that has proven its ability to penetrate the tissues of the human body with varying densities, and use this to form an image of the bones and metal objects that have penetrated it, and then show it on a strip of radiological images [3].

1.2.Uses of X-rays:

X-ray imaging is considered an essential part of the diagnostic process, as it contributes to the process of detecting many problems and monitoring the body's response to treatment,[5] in addition to a number of other uses:

- 1- Locating fractures and infections in bones and teeth.
- 2- Evaluation and diagnosis of the structure of the oral cavity and jaw.
- 3- Detection of bone tumors.
- 4- Diagnosing osteoporosis by measuring bone density.
- 5- Diagnosis of pneumonia, tuberculosis, or lung cancer.
- 6- Diagnosis of heart failure or blood flow changes to the heart and lungs.
- 7- Diagnosing breast cancer, as the mammogram relies on X-rays to detect any changes in the breast, including masses and tumors.
- 8- Diagnosing some digestive system disorders, such as kidney stones.
- 9- Determine the location of foreign objects in the body in cases of ingestion (such as toys and coins) [4][5].

2. X-ray detection:

X-rays are a type of electromagnetic radiation, and other types of electromagnetic radiation are radio waves, microwave rays, infrared rays, visible light, ultraviolet rays, and gamma rays. Types of radiation are characterized by the amount of energy carried by individual photons. They

are all electromagnetic, and radiation consists of photons. They are individual packets of energy. For example, a household light bulb emits about 1,021 photons of light (non-ionizing radiation) per second, and the energy carried by individual photons, measured in electron volts (eV), is related to the frequency of the different types of radiation [6].

In 1895 Wilhelm Conrad Röntgen discovered that a high-voltage discharge between electrodes in a gas at very low pressure produces penetrating radiation that causes visible light to fluoresce in some materials. He observed that if the voltage exceeded about 30 kilovolts, the radiation, which he called x-rays, could Penetrating the hand, casting bone shadows on the fluorescent screen, it soon became understood that electrons emitted from the negative electrode (cathode) of a discharge tube, accelerated by an applied voltage, emit electromagnetic radiation (x-rays) when they collide with the positive electrode. (anode) or the walls of the tube.

The consequences of Roentgen's discovery for physics were profound. Six years ago, Hertz discovered electromagnetic radiation (gigahertz radio waves) with wavelengths a million times longer than visible light. Roentgen's work showed how to generate electromagnetic radiation with wavelengths ten thousand times shorter. These wavelengths are comparable to atomic dimensions and as a result, X-rays proved to be a powerful means of probing the atomic structure of matter as well as the structure of atoms themselves. Over the next 30 years, the discovery and measurement of X-ray phenomena played a central role in the development of the modern quantum theory of matter and radiation [7] .

3.X-ray vision:

Although X-rays are located outside the field of view, it is possible to see the ionization of the air molecules surrounding the emitted beam of rays. Recent studies have shown that these rays are seen as a blue-gray glow [8].

4. X-ray damage:

its harms can be highlighted, as radiation exposure should be avoided if there is no need to do so, and pregnant women should not be exposed to X-rays unless the benefits outweigh the risks and only in emergency situations, as the exposure of the fetus to X-rays - especially during early pregnancy - may increase the risk of the baby developing leukemia later, and one of the most important measures to be sure of is to protect the parts of the body that are not within the diagnostic area when exposed to radiation. Using a radiation insulator made of lead, especially the genitals and thyroid glands. If the radiograph is associated with the contrast factor injection, which is a barium or iodine dye injected into the area under research, which makes the internal body parts more visible on the X-ray film, the individual may need to stay under medical care for a short time to make sure there is no allergic reaction to the contrast substance and complete healing [9].

It is possible that the ionizing electric charge leads to abnormal chemical reactions within the cells which in turn lead to the breakage of DNA chains and therefore either the cell with broken chains dies or DNA develops, but the death of many cells in the body affects the body with various diseases, and in the case of DNA deformity, the cell may become cancerous, and this cancer may spread, and it is very dangerous that this mutation is in sperm or egg cells may lead to defects Congenital.

Thus, dental X-rays have a detrimental effect but are minimal or non-existent if exposure to them for limited periods, and the amount of damage that occurs depends on the dose received and the length of exposure to the rays, but it certainly leaves a safer option than surgery as it has made it easier for doctors to diagnose many diseases and medical problems[10].

5. X-ray Uses:

X-rays will be used for many purposes, including the following [11].

5.1. Diagnosis of broken bones:

Patients with a bone injury are required to undergo X-rays; X-rays can also visualize whether the bone has moved out of place or caused the bone to break or break into pieces, based on the results of the X-ray, the doctor can determine how to treat the fracture in the most appropriate way until it heals properly.

5.2. Mammography:

Mammography is a very popular application of X-ray and is required for patients who want to have a test for abnormal growth in the breast, it is used to detect abnormal growth so that it can be determined if more tests are needed, breast radiographs since 1990 and to our days have significantly reduced deaths associated with breast cancer because they allow for early diagnosis.

5.3. Diagnosis of urological diseases:

A common use of X-rays is also to examine the organs of the body for problems, an IVP examination in a vein involves injecting a substance into the body before an X-ray to help highlight problems with the bladder, ureters and kidneys, the contrasting material helps to highlight abnormalities more clearly in X-ray images, as this examination shows the cause if you have blood in your urine or if you have unexplained lower abdominal pain.

5.4. Airport Security:

Every airport on the planet is equipped with some type of X-ray security system that scans luggage to check its contents for the presence of dangerous items, and in the past few years, full-body X-ray scans have emerged as an additional security measure.

5.5. Radiation Therapies:

X-rays play an important role in combating cancer, as high-energy rays are used to kill cancer cells and reduce the size of tumors. Therefore, patients

undergo treatment outside the body known as external beam radiotherapy, or from a radioactive substance present in the body near the cancer cells, and this is called treatment. Internal radiation. Radiation therapy can be dangerous, yet it is still used by about 50% of cancer patients during treatment [12].

5.6. Arthritis:

The specialist can find the joint changes that reveal arthritis using a joint diagram, the joints can face many difficulties, such as cartilage wear, ligament rupture, or bone fracture, ligament mapping is a specialized X-ray that helps identify the problem [13]. X-ray: x-rays are defined as: a type of radiation, also called electromagnetic waves, X-ray imaging creates images of the inside of the human body, the images appear in different shades of black and white, this is because different tissues absorb calcium in the bones, so the bones look white, absorb fat and other tissues less so they look gray in color, and for lack of air absorption, the lungs look black [14].

6. X-ray sources:

Sources of x-rays, since their discovery to this day, are limited to two groups:

3.5.1 Natural sources

3.5.2 Industrial sources

Natural sources are represented by blazing stars located in separate parts of the universe, such as: the stars in Scorpio (Scorpius X-1), located towards the center of the Milky Way in the southern hemisphere, which was discovered in 1962 [15], The industrial sources of X-rays are in special man-made devices. To stop with different life purposes, Resistors obtaining X-rays have three source of electrons, and a means to increase the energy of movement of those electrons, in addition to a solid object that the electrons collide with after being accelerated, and it is called the target. These three components are in their simplest form inside vacuum tubes as far as possible; Therefore, these tubes represent the main part in X-ray production devices [16].

7. Mechanisms of X-ray emission from matter:

There are two different mechanisms for producing X-rays from matter, where the first is called: the braking mechanism, relative to the German word Bremsstrahlung, and results in continuous X-rays, also called braking rays, As for the second mechanism: it results in distinctive x-rays.

7.1. Continuous x-rays:

Continuous X-rays are produced when high-energy accelerated electrons interact with a tube of target material atoms; When the accelerated electron passes near the nucleus, an interaction occurs between the electric field of both, resulting in a sudden deviation of the electron path, and the loss of part of its energy due to the decrease and acceleration of movement, which is called the braking process [17].

7.2. Characteristic X-Rays:

All of the accelerated electrons that bombard the target material experience decreasing motion acceleration; As a result of its approach to the tube of atoms, but part of these electrons collide with the electrons in the orbits of the nucleus, As a result of this collision, some electrons are ejected from their orbits outside the atom, and then the atom ionizes, While reducing the energy of each electron from the original accelerated electrons by the amount that was lost in the collision, which is equal to what the energy ejected electron has confused, and part of this energy is spent by the ejected electron in volatility on its association with the nucleus of the atom and moves in the remaining part of the energy away from the atom, leaving a gap in the orbit that he was busy, Once a gap is formed in the orbit, one of the electrons falling from the outer orbits far from the nucleus fills the vacant place, Distinctive X-rays are produced when an electron moves from orbits far from the nucleus to fill the gap left by the expelled electron [18].

8. Types of X-ray Imaging in the Medical Field:

X-ray imaging is one of the fastest and easiest ways for the doctor to examine the tissues and internal organs of the body, because it is an excellent tool that helps assess the condition of the bones, teeth and jaws. It is also used in examining the thoracic cavity, including through the lungs and heart, and examining the breast, alimentary canal and ureters, by obtaining high-resolution images. It is also used in measuring bone density, orthopedic surgery, and treating various sports injuries. X-ray imaging is also an essential pillar in the detection, diagnosis and treatment of cancer. Diagnostic X-ray imaging continues to be the most used diagnostic procedure annually in the world, such as: computed tomography (COMUTED TOMOGRAPHY), interventional radiology, ultrasound imaging, magnetic resonance imaging, and nuclear medicine [19].

9. X-ray imaging can be divided into two main groups:

Ordinary radiography and tomography, where we get a fixed image of the imaged area and it is displayed on a film, or on a computer screen, Fluoroscopy, where we obtain a real time (instant) image of the organ directly on a monitor or computer screen, in order to reduce the internal functions of the body.

10. The importance of the X-ray image:

It is a tool to help assess the patient's condition, that is: a means of proving a case, which not only affects the diagnosis, but extends its impact on estimating the possible possibilities of the patient, and then testing the optimal method of treatment. And the x-ray process must be done in a timely manner, the stages of the patient's condition, in order for the x-ray image to play its desired role. The X-ray image must also conform to the necessary technical specifications before the image examination process, in order to elicit in formation [20, 21].

11. Stages of X-ray Imaging:

There are four main stages in the X-ray imaging system

1. The production stage of the X-ray beam
2. The stage of X-ray reactions that collide with the patient's body; to produce the Zen absorption and attenuation modes, they will produce the visual information on the photographic film.
3. The stage of the image capture and recording systems (film or electronic media) to capture the pattern of photons that passed through the patient's body to produce the diagnostic image.
4. The stage of processing the interactions that resulted from the barreled photons; to make the information contained in an image visible, whether it is electronically scanned or film processed.

12. Limitations and Limitations of X-Ray Imaging:

1. Obtaining the image in only two dimensions of a three-dimensional body, which means that the internal details of the body will appear piled on top of each other.
2. Ordinary X-ray imaging is unable to differentiate between soft tissues, especially when they are close in density and position.
3. There are no absolute measurements about the degree of transparency and blackness of the films, and the shaking of the restrictions encouraged the search for serious alternatives that help in detection [22,23].

13. Previous studies:

13.1. Effects of voltage ripple and current mode on diagnostic x-ray spectra and exposures 1991 Sep-Oct:

M Matsumoto ,H Kubota,H Hayashi, H Kanamori

ABSTRACT: The voltage-ripple dependence relationship on x-ray energy-spectral values (energy fluence per unit interval of photon energy) and exposures at 70-kV peak were obtained theoretically by using the semi empirical formula of emission spectra. The calculations were performed with and without various thicknesses of aluminum. As the ripple increases, the energy-spectral values decrease as expected. When the ripple is large, however, energy-spectral values (per mAs) take the minimum values; therefore, the exposure (per mAs) also reaches the minimum value for the un saturating current modes, contrary to expectation. The reasons for this phenomenon were clarified. Exposures clearly take the minimum value in 2-pulse units. This phenomenon was experimentally verified.

13.2. Effect of x-ray tube potential on image quality and patient dose for lumbar spine computed radiography examinations 2005 Dec:

A Brindhaban , K Al Khalifah, G Al Wathiqi, H Al Ostath

ABSTRACT: A study was conducted to investigate the effect of increasing x-ray tube voltage on patient dose and image quality during computed radiography (CR) examination of the lumbar spine. Images of a pelvis - lumbar spine phantom were obtained at three different tube voltages using two CR systems. The images were evaluated by image scores (IS) using the image quality criteria proposed by the Commission of the European Communities (CEC), by measuring the signal-to-noise ratio and the contrast-to-noise ratio. The entrance surface dose (ESD) to the phantom was also measured using

ionization chambers and the resulting gonad dose (G) and effective dose (E) were calculated. The CEC recommended tube voltages can be exceeded with CR systems for lumbar spine radiography. The ESD, G and E decreased by 25%-50% with both CR systems when tube voltage was increased. Although the decrease in IS was statistically significant ($P < 0.05$) the images obtained with the 3 tube voltages were diagnostically acceptable. The balance between image quality and patient dose can be optimized by using higher x-ray tube voltages for lumbar spine CR examinations.

13.3. Analysis of the effect of the x-ray tube current on uniformity image noise values December 2022:

Anastasya Jessning Gamalita Mberato Mberato, Ni Nyoman Ratini, I Made Yuliara, Rozi Irhas

ABSTRACT: This research aimed to evaluate the effects of the X-ray current tube on the uniformity value of CT image noise. This research used the CT images of Siemens head water phantom. The phantom was scanned with a Siemens Soma tom Scope CT scanner for various current tubes (i.e., 180 mAs, 200 mAs, 220 mAs, 240 mAs, and 260 mAs) on tube voltage 110 kV, slice thickness 3 mm, and FOV 240 mm. The uniformity values in CT image noise were analyzed using the standard deviation value (SD). The SD was measured by the ROI process in 5 different locations, in the center and at 3 o'clock, 6 o'clock, 9 o'clock, and 12 o'clock on the images CT. Based on the result of a simple linear regression test using IBM SPSS ver 25, it was found that the current tube significantly affected the uniformity value of image noise ($r^2=0,9768$, $p<0,05$). This result showed that increasing the current tube can reduce image noise uniformity. The highest image noise uniformity value was at a current at 180 mAs with 0,217 HU, and the lowest was at 260 mAs with 0,031 HU. This result also shows that all the values are less than 2 HU and still within the acceptable limit by the BAPETEN standard regulation.

14. Research problem:

We find that there is sometimes a lack of clarity in some X-ray images that are photographed in the traditional way, so this study resorted to knowing the best values of current and voltage to obtain a high-quality image.

15. Objective:

- Familiarize yourself with the x-ray machine
- Determine current and voltage values to obtain a clear image, when developed in the traditional way with respect to the foot.

16. Materials and Devices:

X-ray (SHIMADZU CORPORATION), 2014November, Made in Japan, cassette, film holder, film, table, hanker, brand, length scale, bulletproof, patient, timer clock, water, fixer, developer.

17. Method:

1. The sample is placed on a cassette.
2. Measure the length and width of the sample.
3. The distance between the sample and the incident ray tube was measured.
4. Set the voltage and current values.
5. The image was taken from the sample with a different exposure time each time.
6. The image is placed in a developer solution for 1 minute, then placed in water for 10 seconds, then placed in a fixative solution for 10 seconds, then placed in water again for 10 seconds and left to dry.

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18. Table of Results:

Table (1) shows the readings in case of different voltage and current, length and width of the foot:

Sample	Length (cm)	Width (cm)	The height from the device to the sample (cm)	voltage difference (kv)	the current (mAs)	exposure time	Acidification time (s)	Examination
1	28	11	88	44	4	8	60	foot
2	26	10		53	4.5	9		
3	23.5	8		55	5	10		
4	22	9		60	5.6	11		
5	24	9		64	6.3	12.5		

Table (2) shows the readings at constant voltage and current and the length and width of the foot:

No	voltage difference (kv)	the current (mAs)	exposure time	Length (cm)	Width (cm)	The height from the device to the sample (cm)	Acidification time (s)	Examination
1	44	4	8	25	9	88	60	foot
2	53	4.5	9					
3	55	5	10					
4	60	5.6	11					
5	64	6.3	12.5					

19. Discussion:

From the table (1) five samples were taken with different voltages and currents of the feet from the frequency of the laboratory, the first sample was with a voltage of (44) kilovolts and a current of (4) milliamp seconds, the picture was unclear, while the second sample was with a voltage of (53) kilovolts and a current of (4.5) milliamp seconds, the picture was White, while the third sample had a voltage of (55) kilovolts and a current of (5) milliamperes, and this picture is very clear. As for the fourth sample, it had a voltage of (60) kilovolts and a current of (5.6) milliamperes, The image is not clear, while the fifth sample had a voltage of (64) kV and a current of (6.3) milliamperes, and the image was black.

And from the table (2) one sample was taken with different voltages and currents, and the first reading was at a voltage of (44) kilovolts and a current of (4) milliamperes, the picture was unclear, while the second reading was at a voltage of (53) kilovolts and a current of (4.5) milliamperes, the picture was white, while the picture was white, The third reading with a voltage of (55) kilovolts and a current of (5) milliamp seconds, the picture was very clear, while the fourth reading with a voltage of (60) kilovolts and a current of (5.6) milliamp seconds, the picture was not clear, while the fifth reading with a voltage of (64) kV, current (6.3) mA sec. The picture is black.

Through the table (1) with different samples and the table (2) with one sample, we notice that the clearest picture was with a voltage of (55) kilovolts and a current of (5) milliamp seconds, and this confirms that the voltage is (55) kilovolts Volts, current (5) milliamperes can be counted on the input to get a high quality image when you use the traditional development method.

Thus, the values of each of the current and voltage have an impact on the quality of the X-ray image of the foot acidified in the traditional way.

20. Recommendations:

1. The radiation beam should be directed at the material only and then hit the wall without going through a door or window near a place where people are.
2. Providing a paper and electronic library in the complex.
3. We recommend further studies in the field of X-ray diagnostics.

21. Conclusion:

Through this study, it became clear to us that there is a clear effect of the values of both voltage and current on the quality of the diagnostic X-ray image that was developed in the traditional way.

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Appendix:



(a)



(b)



(c)(a),(b) and (c) X-ray device



water, fixer, developer



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