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Fistuography Examination Procedure with Clinical Perianal Fistula at Radiology Installation RSPAL Dr. Ramelan Surabaya

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ABSTRACT

The fistuography examination technique theoretically uses fluoroscopy and anteroposterior (AP), Lateral and Oblique projections. However, at the radiology installation of RSPAL dr. Ramelan Surabaya, fistuography examination was carried out using a mobile unit x-ray and Lateral and Oblique projection. The purpose of this study is to examine the procedure for fistuography examination with clinical perianal fistula at the radiology installation of RSPAL dr. Ramelan Surabaya in producing optimal diagnostic information. This research was carried out at the radiology installation of RSPAL dr. Ramelan Surabaya with a qualitative method through a case study approach. Data collection was obtained by conducting direct observations, interviews with radiographers, and documentation. Data analysis was carried out descriptively through a comparison of the results of observations in the field with relevant theories. The results of the study related to the fistuography examination procedure with clinical perianal fistula were carried out without the patient's preparation, using a mobile x-ray unit, detector, iodine contrast media, syringes, and abocath, the examination technique used consisted of a preliminary photo with oblique projection, then continued with projection oblique and lateral post media contrast. There are no additional projections, as the results of oblique and lateral projections already provide the necessary diagnostic information.

Keywords: fistulography; perianal fistula; examination procedure

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INTRODUCTION

Radiology is a branch of medical science that uses radiation to help establish a diagnosis and perform therapeutic actions, such as x-ray examinations and the use of radioactive substances (1). The use of contrast media is often applied in hospitals to help doctors obtain diagnostic information making it easier to establish diagnosis and determine medical measures. Fistulography is one of the radiological examinations that is performed using contrast media to see the condition and fistula pathway. This examination uses iodine-based positive contrast media and is often performed in clinical perianal fistulas or perianal abscesses that are commonly found in patients in hospitals (2). Imaging accuracy before surgery is needed to determine the fistula path, determine external and internal estuaries, and develop appropriate surgical action strategies to prevent recurrence (3).

A perianal fistula is an abnormal duct that connects the epithelium and anal duct with the surface of the skin around the anus. This condition is characterized by the accumulation of pus that can cause pain, and is generally caused by an infection of the small glands (4). The formation of fistulas begins with an aptotic ulcer that extends into a deep transmural fissure, until it eventually penetrates or connects to other organs and structures. This condition causes an abnormal hole outside the sphincter muscle complex, so that only a small amount of sphincter muscle fibers surround it (5). Patients with perianal fistulas generally seek medical attention due to the continuous discharge of pus fluid from the anal area, thus staining the underwear (6). If the fistula has no symptoms and does not secrete pus, then medical treatment is not necessary (7). According to Parks, there are several types of perianal fistulas, namely intersphingteric, transphingteric, suprasphingteric, and extrasphingteric (8). The subtypes of perianal fistula are categorized based on the shape of the path, the presence of branches or extra holes, and the patient's medical therapy history (9). The description of the perianal fistula should map the main pathway to the sphincter complex in detail to prevent complications during surgery (10). In addition to these types, there are also types of subcutaneous fistulas that are relatively shallow. Other classifications divide fistulas into simple, complex, multiple, high, and repetitive categories to describe the direction of the ducts, the presence of secondary estuaries, as well as a history of previous medical interventions. Understanding these characteristics is crucial in designing the most appropriate therapeutic approach (11).

The prevalence of this perianal fistula case tends to be higher in men, especially at the age of about 40 years. In some countries such as the United Kingdom, Sweden, Spain, and Italy, the annual incidence rate is in the range of 10.4 to 40 per 100,000 adult population. Based on research by Kurniawan et al., at Dr. Sardjito Hospital in a period of 5 years, there were 48 cases of perianal fistula with a percentage of 81.2% male and 18.8% female. In addition, statistical data show that about 75% – 85% occur as postoperative complications (4). The frequency of this disease reaches 8.6 cases per 100,000 population. In men, the incidence rate is around 12.3 per 100,000 population, while in women it is around 5.6 per 100,000 population. This shows that the disease is more common in men than women. The average age of fistula sufferers was 38 years (12). These results are supported by Yolanda Smith's research which shows that perianal fistulas occur more in men (1.8:1), allegedly due to stronger anal sphincter muscles so they are more at risk of duct obstruction and anal gland inflammation (13).

Perianal fistula can be caused by several factors, including inflammation or trauma (14). Patients generally come with complaints of perianal pain that are chronic or recurrent. In addition, patients may also complain of lumps and purulent discharge from the perianal area. This condition is often accompanied by a history of perianal abscesses that recurrent or do not heal after incision and drainage of anorectal abscesses (15). Abscesses can cause low back pain that can interfere with patients sitting or doing physical work. Fever can appear as an accompanying symptom, although its occurrence is relatively rare (16). In addition, the appearance of a fistula in the perianal region can also indicate hidradenitis suppurativa (HS), which is a chronic autoimmune skin disease that is rarely diagnosed (17).

Cases of perianal fistula require further examination, namely by performing a fistuography examination using contrast media to obtain an accurate diagnosis and appropriate treatment. A fistuography examination can help in evaluating as well as providing information about the direction of the hole, how big the fistula is and how it branches in any

direction. For clinical evaluation of fistulas, fistulographic procedures can be performed using fluoroscopy and iodine contrast aircraft so that the visualization of the fistula canal becomes clearer and optimal in real-time in support of the enforcement of the clinical diagnosis of perianal fistula. The projections used are Posterior Antero (AP), Lateral, and Oblique (18). Meanwhile, at the RSPAL radiology installation, dr. Ramelan Surabaya uses a mobile x-ray unit with oblique and lateral projection. After performing a fistuography examination, further treatment can be carried out with examination or follow-up treatment based on the doctor's advice such as ligation of intersphincteric (LIFT), fistulotomy or fistulectomy (surgical therapy). Surgical removal has traditionally been the primary method of healing perianal fistulas, an approach that evolved since Parks described the anatomical relationship between the fistula and the anorectal muscle (19). However, in general, what is often done is fistulotomy because it has a success rate of more than 90% (20). Referring to this background, the author was encouraged to write a case report with the title Fistulographic Examination Procedure with Clinical Perianal Fistula at the radiology installation of RSPAL dr. Ramelan Surabaya.

METHODS

The research design used is qualitative using the case study approach method. The data collection time is January-April 2026 and the data collection place is at the radiology installation of RSPAL dr. Ramelan Surabaya. The population is patients for fistuography examination. The sampling technique used a survey method and a sample was used by 3 respondents.

The data collection method in writing this case report uses the triangulation method, namely direct observation, interviews, and documentation. The research instruments used consisted of observation guidelines, interview guidelines, smartphone cameras, stationery, and recording devices.

The data was analyzed by a descriptive method of data obtained through research instruments and documentation studies. The data or facts obtained are then compared with the relevant theory.

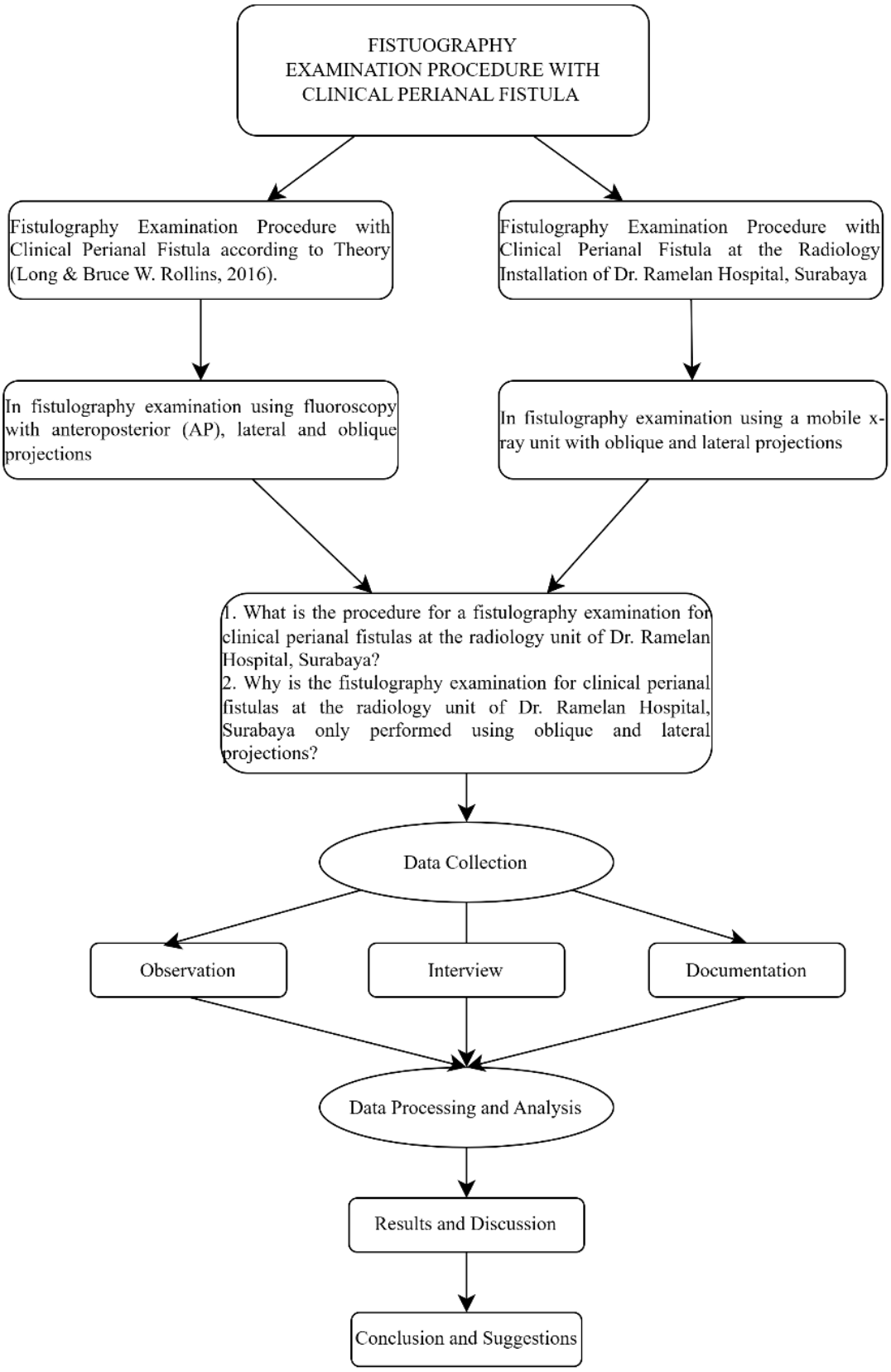
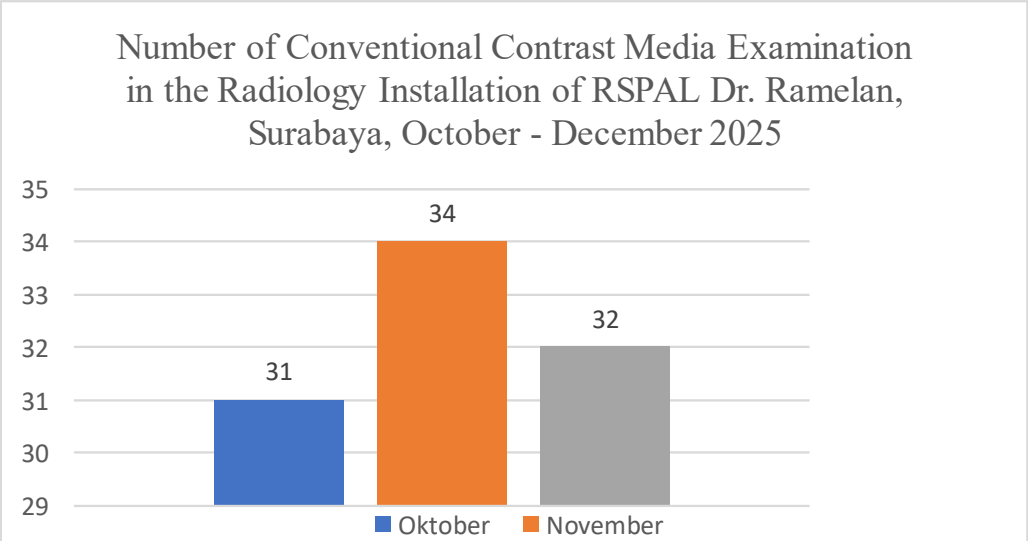


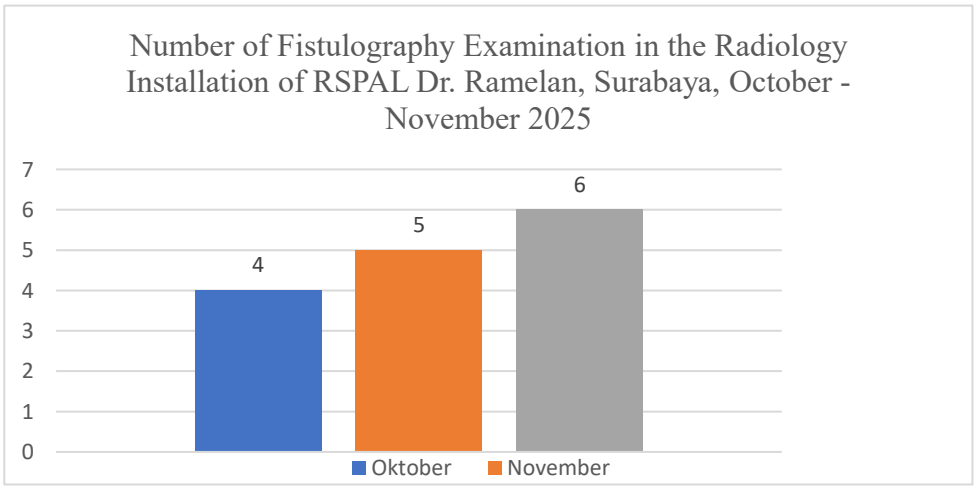
Image 1. Research Flowchart

RESULTS

One of the examinations with contrast media is *a fistuography* examination which is used to evaluate the *fistula duct*, especially in cases of *perianal fistula*. At the radiology installation of RSPAL dr. Ramelan Surabaya, the number of *fistuography examinations with* perianal fistula *clinics* was recorded as many as 15 cases out of a total of 97 conventional examinations of contrast media. The data shows that *fistuography* examinations are still often carried out to support the diagnosis in *cases of perianal fistula*.



Graph 1. About the Conventional Examination Frequency of Contrast Media



Graph 2. About Fistuography Examination Frequency

Table 1. Contrast Media Conventional Inspection Frequency

Period	Conventional Contrast Media Inspection	%
October-25	31	31,96%
November-25	34	35,05%
December-25	32	32,99%
Total	97	100%

Table 2. Fistuography Examination Frequency

Period	Fistulographic *Examination*	%
October-25	4	26,67%
November-25	5	33,33%
December-25	6	40%
Total	15	100%

Implementation of the inspection Fistulography with Clinical perianal fistula at the radiology installation of RSPAL dr. Ramelan Surabaya is described in this study. The 45-year-old male patient was referred from the bonerate room - room 8 and accompanied by a nurse who carried a letter requesting a radiological examination. The radiographer then checks the type of examination, giving informed consent to be filled in by the patient as a form of approval for action, conduct a brief anamnasis, position the patient, and carry out the examination until it is completed. After the examination was completed, the patient returned to the room accompanied by a nurse.

At the inspection Fistulography with Clinical perianal fistula at the radiology installation of RSPAL dr. Ramelan Surabaya, patients only need to remove metal objects such as buttons and pants zippers before taking action, without any special preparation. The tools and materials prepared are mobile x-ray aircraft, inspection tables, detector, apron, bowl, gloves, syringe, contrast media Iodine Hexiol 350 mg I/ml, Abocath, cash register, markers, plaster, and scissors. The inspection technique starts from making markers that are placed on the hole fistula and Anal. The installation of these markers is intended as an anatomical marker on the radiograph results, helping to clarify the location, direction, and relationship fistula with the surrounding structure so that it facilitates the interpretation of the examination results. After that it is done Expo Plain photo with projection Oblique LPO, then continued with exposure projections Oblique GO AND Lateral Post contrast and expose are done at the same time during the injection of contrast media so as not to lose momentum.

Fistuography Examination Techniques

Some of the fistuography examination techniques with perianal fistula clinics carried out at the radiology installation of RSPAL dr. Ramelan Surabaya, namely:



Image 2. Results of LPO Oblique Projection Radiography (Plain Photo). The white arrow indicates the location of the perianal fistula hole and the marker in the anal area

Patient position supine on the examination table. Setting the position of the object, namely: (1) The arm that is close to the detector placed under the head as a cushion and the other arms crossed in front of the body. (2) Feet that are on the near side detector Straight attached to the examination table, while the other leg is flexed to support the position. (3) The pelvis is tilted about 45 degrees on the examination table. (4) Place the marker close to the hole fistula and on Anal. For beam direction and exposure setting, namely: (1) CR: Vertical perpendicular detector, (2) CP: On the hole fistula (3) SID: 100 cm, (4) Exposure Factor: 70 kV and 12 mAs. The results of the research at the radiology installation of RSPAL dr. Ramelan Surabaya, according to figure 2.

Input of Contrast Media

The contrast media injection technique begins with the installation of markers in the fistula hole and anal hole as a marker, after which the injection of iohexol contrast media 350 mg I/ml as much as 3 cc with the patient prone position. This is done so that the incoming contrast media is not easy to come out, and for the comfort of the patient when inserting the contrast media so that it is easy for the officer to position the patient. The injection process is carried out until reflux occurs and the expose process is carried out simultaneously with the input of contrast media.

Photo of oblique projection of LAO post contrast. Contrast was inserted as much as 3 cc, patients prone. The positioning of the object includes: (1) The arm near the detector is placed under the head as a cushion, while the other arm is positioned crosswise in front of the body. (2) The leg on the side near the detector is positioned attached to the examination table, while the other leg is flexed as a support for the body. (3) The pelvis is tilted about 45 degrees on the examination table. For the direction of the beam and the exposure factors, namely: (1) CR: Vertical perpendicular to the detector, (2) CP: At the fistula hole, (3) SID: 100 cm, (4) Exposure factor: 70 kV and 12 mAs. The results of the research at the radiology installation of RSPAL dr. Ramelan Surabaya, as shown in figure 3.

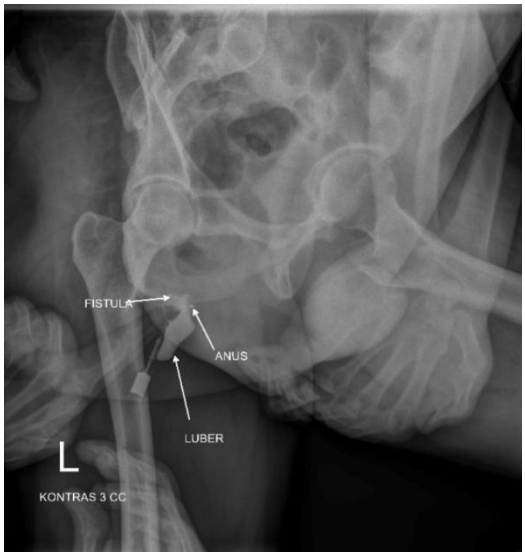


Image 3. Results of Radiograph of Oblique Projection LAO Post Contrast. The white arrow indicates a fistula track filled with contrast media

Photo of lateral projection post contrast. Contrast is inserted as much as 3 cc. Prone patients on the examination table. The position of the object, namely: (1) The MCP is positioned in the middle of the examination table. (2) Set the pelvis trus lateral with SIAS on the same vertical line. (3) Place one knee on top of the other. For the direction of the beam and the exposure factor, it includes: (1) CR: Vertical perpendicular to the detector. (2) CP: In the perianal area. (3) SID: 100 cm. (4) Exposure factor: 90 kV and 16 mAs. The results of the research at the radiology installation of RSPAL dr. Ramelan Surabaya, as shown in figure 4.

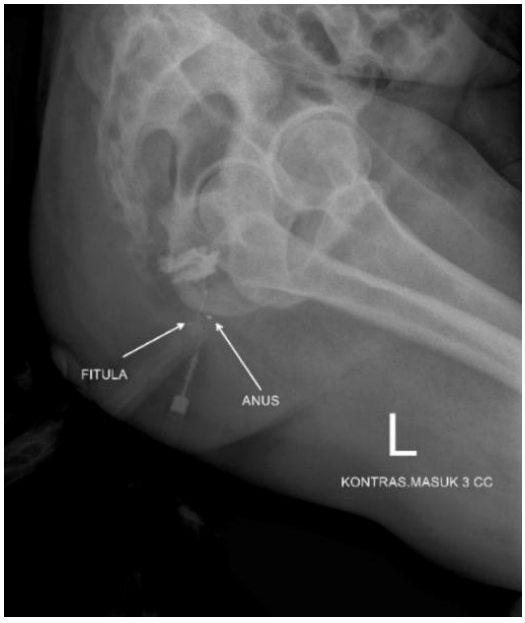


Image 4. Radial Post Contrast Projection Radiography. A white arrow indicates the direction and depth of the perianal fistula canal filled with contrast media

Expertise Results
Plain photo:
Two markers appear to be attached to the fistal hole and in the anus
Bones look good
Contrast study:
Contrast water soluble is gradually introduced with shurflo
Visible fistal track from the cut-off is +/- 3.27 cm long partially towards the rectum and partially reflux into the anal canal
Conclusion: The above findings impress the rectocutan fistula

Reasons for Using Oblique and Lateral Projection

The use of oblique and lateral projections was chosen because it can provide clearer diagnostic information than AP projections. Although the theory mentions the use of AP, lateral, and oblique projections, in practice AP projections are rarely used because the gluteus folds can cover the fistula area so the results are less informative. Fistulas are generally on the right or left side and are also difficult to visualize properly on AP projections. In contrast, oblique projections are able to display the fistula path more clearly according to location, while lateral projections are used to assess the depth and direction of the fistula. Therefore, these two projections are more effective and used frequently.

DISCUSSION

The fistulographic examination procedure does not require any special preparation for the patient. However, the officer still gives instructions to the patient regarding the stages of the examination to be carried out, including asking the patient not to use metal objects during the examination process (18). Meanwhile, at the radiology installation of RSPAL dr. Ramelan Surabaya, it is carried out without special preparations such as fasting or certain other procedures. Patients are simply encouraged to remove metal objects, such as buttons or zippers of pants. The author argues that the preparation for this examination at the radiology installation of RSPAL dr. Ramelan Surabaya is in accordance with the theory, where the fistuography examination is carried out without special preparation, such as fasting for 24 hours or other preparatory measures. The patient is only instructed to remove metal objects.

The preparation of the tools and materials used, namely: the mobile x-ray unit is equipped with an examination table, detector, apron, bowl, gloves, syringe, iohexol contrast media 350 mg I/ml, abocath, gauze, marker, plaster, and scissors. Meanwhile, according to the theory (18), using a ready-to-use x-ray and fluoroscopy plane, film and tapes measuring 14 x 17 inches (35 x 43 cm), as well as other equipment such as markers, sterile doppelgangers, catheters, 5-25 ml syringes, gloves and others that are ready to be used. Fistulas can be detected using CT-Scan because they are able to show the anatomy of the body more clearly than conventional imaging using contrast media. However, CT-Scan examination results in relatively high radiation exposure and is not yet able to display the condition of fistula directly (21). The author argues thats, the one used in the radiology installation of RSPAL dr. Ramelan Surabaya is partly not in accordance with the theory (18). Because the fluoroscopy plane is waiting for the repair process. However, the use of x-ray mobile units is still effective because it is equipped with an image sharpening feature even without bucky or grid. For other preparations, it has been in accordance with the theory, such

as the detetctor, iohexol contrast media 350 mg I/ml, gauze, markers and plasters, syringes and abocath, and others that have been prepared before the examination is carried out.

The contrast media injection technique is carried out slowly and the patient is prone. The injection is performed in an oblique position to increase patient comfort while making it easier for the officer to insert contrast into the fistula canal. This examination uses iohexol contrast media 350 mg I/ml which is watersoluble with the help of 3 cc and 5 cc syringes with abocath size 18 or 22. The injection process is carried out until reflux occurs, and the exposure process is carried out simultaneously with the input of contrast media. Meanwhile, according to theory (22), there can be several methods in the input of contrast media, one of which is through the per-anal pathway by using iodine contrast inserted through the fistula hole. This procedure aims to evaluate the contrast flow from the fistula hole until the contrast fills the desired area, then proceeds with an examination technique. A 20 cc container media solution is made from a mixture of iodine and aqua bidest in a ratio of 1:1 (23). Sharma's opinion states that the iodine contrast medium that has been mixed with water is inserted into the fistula pathway using a syringe through a cannulation process, either through external or internal holes in the blind fistula, then radiographs are taken to show the fistula track (2) Meanwhile, the author argues that the contrast media input technique used in the radiology installation of RSPAL dr. Ramelan Surabaya is in accordance with the theory. This examination used iohexol contrast media 350 mg I/ml which is watersoluble and used the contrast media input method through the per-anal pathway.

The fistuography examination technique can differ according to the location of the fistula. The radiography projections used in fistuography examination include anteroposterior (AP), lateral, and oblique (24). The fistuography examination technique varies according to the location of the fistula. With the help of fluoroscopy and iodine contrast allows visualization of the fistula duct in the anal area directly, resulting in a clearer and more optimal picture in support of the enforcement of the clinical diagnosis of perianal fistula. The projections used are anteroposterior (AP), lateral, and oblique (18). Meanwhile, at the radiology installation of RSPAL dr. Ramelan Surabaya, the radiographer gave an explanation in advance related to the examination procedure to the patient and gave informed consent. After that, patients are directed not to use metal objects that have the potential to interfere with the image. The officer then made a marker and placed it on the fistula and anal holes and took plain photos. The examination technique was carried out using the mobile unit x-ray modality and iohexol contrast media 350 mg I/ml. The photo projection used is the LPO oblique (plain photo), then followed by the LAO oblique and lateral post contrast. The reason for not using anteroposterior (AP) projection, is that the gluteus folds and superimposition of the structure can cover the fistula area, so the visualization of the fistula track is less than optimal. So that using oblique and lateral projections is considered to have been able to provide clearer diagnostic information and make it easier for officers when entering contrast media and adjusting patient positions. The author argues that there is a difference between the theory and that used in the radiology installation of RSPAL dr. Ramelan Surabaya, especially in the use of projections. According to the projection theory, the projections used in fistulographic examinations include anteroposterior (AP), lateral, and oblique. However, in practice at the radiology installation of RSPAL dr. Ramelan Surabaya, the examination begins with a plain photo using LPO oblique projection, then continues with a post-contrast LAO oblique, and lateral post-contrast oblique. Fistulography has differences and similarities with lopography. Logography is used to assess the lumen of the intestine through the stoma,

covering the continuity, patency, and condition of the intestinal segments. In contrast, fistulography focuses on the abnormal fistula duct to determine its direction, length, branching, as well as its relationship to the surrounding structures. Nonetheless, lobbyography and fistuography are both contrast radiological examinations that evaluate the tubular ducts. Both function to describe the anatomy of the ducts and detect abnormalities, such as obstruction, leakage, stricture, or abnormal communication, as the basis for determining therapy or surgical action (25).

CONCLUSION

At the radiology installation of RSPAL dr. Ramelan Surabaya, it is carried out without the need for special preparation, there is the preparation of tools and materials such as x-ray mobile unit, detector, iohexol contrast media 350 mg I/ml with a volume of 3 cc, syringes, and abocath and other equipment that are ready to use. The examination technique used was oblique and lateral projection. The use of oblique and lateral projections is more effective than anteroposterior projection (AP) because it is able to provide more optimal diagnostic information, namely it can clarify the visulization of fistula tracks, showing the direction and inside of the fistula.

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REFERENCES

1. Kepala Badan Pengawas Tenaga Nuklir Republik Indonesia. 2020.
2. Sharma A, Yadav P, Sahu M, Verma A. Current imaging techniques for evaluation of fistula in ano: a review. Egyptian Journal of Radiology and Nuclear Medicine. Springer Science and Business Media Deutschland GmbH; 2020.doi:10.1186/s43055-020-00252-9
3. Khanduri S, Shahbaz M, Habib A, Singhal S, Aggarwal A, Kanojia A, et al. Seeing Beyond the Tract: The Superiority of 3 Tesla (3T) MRI Over X-ray Fistulography in Perianal Fistula Evaluation. 2025. doi:10.7759/cureus.93825
4. Hulmansyah D, Mutiara Zanisman P, Purnamasari D. Penatalaksanaan Teknik Pemeriksaan Fistulografi Dengan Klinis Fistula Perianal Di Instalasi Radiologi Rumah Sakit X Fistulography Examination Techniques With Perianal Fistula Clinic At Radiological Installation Of X Hospital. Medika Trada : Jurnal Teknik Elektromedik Polbitrada. 2024.
5. Sohrabi M, Bahrami S, Mosalli M, Khaleghian M, Obaidinia M. Perianal Fistula; from Etiology to Treatment - A Review. Middle East J Dig Dis. 2024;16(2):76. doi:10.34172/MEJDD.2024.373 PubMed PMID: 39131109.
6. Sandor M, Horgos MS, Borza IL, Negrean R, Botea M, Bimbo SE, et al. Laser Therapy in Perianal Fistulas. Applied Sciences 2022, Vol 12, Page 12433. 2022 Dec 5;12(23):12433. doi:10.3390/APP122312433

7. Adamczyk T, Kluczewska E, Waniczek D, Bożek P, Kozińska-Marek E. Perianal fistulas – diagnostic imaging techniques and their applications [Internet]. [cited 2026 Jul 25]. Available from: http://www.polradiol.com/fulltxt.php?ICID=893719
8. Hendra Kastiaji1 ZH. Fistula Perianal:Laporan Kasus [Internet]. Vol. 7. 2023 [cited 2026 Jul 21];7:1–11. Available from: https://journal.umuslim.ac.id/index.php/ltr2/article/view/1779/1347
9. Waniczek D, Adamczyk T, Arendt J, Kluczewska E, Kozińska-Marek E. Usefulness assessment of preoperative MRI fistulography in patients with perianal fistulas [Internet]. [cited 2026 Jul 29]. Available from: http://www.polradiol.com/fulltxt.php?ICID=882143
10. Liang C, Lu Y, Zhao B, Du Y, Wang C, Jiang W. Imaging of Anal Fistulas: Comparison of Computed Tomographic Fistulography and Magnetic Resonance Imaging. Korean J Radiol. 15(6):712–23. doi:10.3348/kjr.2014.15.6.712
11. Dr. Illuru Anusha, 1, LastName, Dr. J. Vamshi Priya, 2, LastName, et al. Role of conventional fistulography and magnetic resonance fistulography in pre-operative evaluation of fistula in ano - Journal of Rare Cardiovascular Diseases [Internet]. 2025 [cited 2026 Jul 25]. p. 1–9. Available from: https://www.jrcd.eu/article/view/role-of-conventional-fistulography-and-magnetic-resonance-fistulography-in-pre-operative-evaluation-of-fistula-in-ano-1169/
12. Kastiaji, H., & Hayati Z. Jurnal Ilmiah Sains, Teknologi, Ekonomi, Sosial Dan Budaya, 7(1). 2023.
13. Muhammad Sayuti, Sofia Rizka, Moh Arief Kresna. Karakteristik Dan Manajemen Pasien Dengan Fistula Perianal Di RSU Cut Meutia Kabupaten Aceh Utara Tahun 2018 - 2021. Jurnal Ilmu Kesehatan dan Gizi. 2023 Jun 29;1(3):165–71. doi:10.55606/jikg.v1i3.1422
14. Kawecki MP, Kruk AM, Drążyk M, Domagała Z, Woźniak S. Exploring Perianal Fistulas: Insights into Biochemical, Genetic, and Epigenetic Influences—A Comprehensive Review. Gastroenterology Insights 2025, Vol 16, Page 10. 2025 Mar 7;16(1):10. doi:10.3390/GASTROENT16010010
15. Vogel JD, Johnson EK, Morris AM, Paquette IM, Saclarides TJ, Feingold DL, et al. Clinical Practice Guideline for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula. Dis Colon Rectum. 2016 Dec 1;59(12):1117–33. doi:10.1097/DCR.0000000000000733 PubMed PMID: 27824697.
16. Artiani Tresna Imut Exhasna1* BRSW, Syihabul Muttaqin1 RW, Pintaningrum1 2. Getting to Know More About Anal Fistula: A Literature Review [Internet]. Vol. 13. 2024 [cited 2026 Jul 21];13(3):1–7. Available from: https://journal.unram.ac.id/index.php/jku/en/article/view/4502/2811
17. Ardon CB, Molenaar C, van Straalen KR, Scholtes VC, Prens EP, van der Zee HH. High prevalence of hidradenitis suppurativa in patients with perianal fistula. Int J Colorectal Dis. 2019 Jul 1;34(7):1337–9. doi:10.1007/s00384-019-03313-2 PubMed PMID: 31093736.
18. Long, Bruce W. Rollins JHSB. Merrill's vol 2 2016. 2016.
19. Lu MY, Wang J, Wang ZC, Cai ZL, Liang N, Shi R. Diagnosis and treatment for anal fistula: a systematic review of clinical practice guidelines and consensus statements. Front Surg. 2025;12. doi:10.3389/fsurg.2025.1566130

20. Włodarczyk M, Włodarczyk J, Maryńczak K, Waśniewska-Włodarczyk A, Doboszewska U, Wlaź P, et al. Role of Adipose Tissue Hormones in Pathogenesis of Cryptoglandular Anal Fistula. International Journal of Molecular Sciences 2024, Vol 25, Page 1501. 2024 Jan 25;25(3):1501. doi:10.3390/IJMS25031501 PubMed PMID: 38338780.
21. Adityan R, Jerald Paul I. The Role of Diagnostic Medical Imaging Techniques in the Evaluation of Perianal Fistula: A Review. International Journal of Radiology and Imaging Techniques. 2021 Dec 31;7(2). doi:10.23937/2572-3235.1510084
22. Rahmanita D. Penatalaksanaan Teknik Pemeriksaan Fistulografi dengan Klinis Fistula Perianal di Instalasi Radiologi Rumah Sakit Prima Pekanbaru. 2025 Jul 7.
23. Annisa N, Anggraeni A. Case Study of Fistulography Examination Procedures in Cases Perianal Fistula in the Radiology Installation RSUD DR. Loekmono Hadi Kudus. Journal of Indonesian Anesthesiology Nursing. 2024 Dec 1;1(1). doi:10.31101/JIAN.V1I1.3935
24. Kendrick JPLampignano dan LE. Textbook of Radiographic Positioning and Related Anatomy. ninth. amerika:Elsevier. In. 2018.
25. Azhari RA, Sulaksono N, Prastanti AD. Prosedur Pemeriksaan Lopografi dengan Klinis Suspect Colon Carsinoma