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Pediatric Lopography Radiographic Examination In A Pre-Stoma Closure (Ileostomy) Case At The Radiology Department Of Rsud Dr. Soeselo Of Tegal Regency

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ABSTRACT

Background: Lopography is a radiographic examination performed to evaluate bowel conditions prior to stoma closure surgery. Previous studies have reported the use of water-soluble contrast media with anteroposterior (AP), lateral, and oblique projections, with contrast administered through the stoma. However, at the Radiology Department of RSUD (Regional General Hospital) dr. Soeselo of Tegal Regency, pediatric lopography for pre-stoma closure (ileostomy) cases is performed using barium contrast media, an AP projection, and contrast administration through both the stoma and anus. This study aims to determine the examination procedure, the rationale for using barium contrast media, and the reason for utilizing only the AP projection. Methods: This study employed a qualitative method with a case study approach conducted at the Radiology Department of RSUD dr. Soeselo, Tegal Regency, from October 2025 to April 2026. The study subjects consisted of three radiographers and one radiologist. Data were collected through observation, interviews, and documentation. The data were analyzed narratively through transcription, data reduction, comparison with theoretical references, and conclusion drawing. Results: The lopography examination was performed without special preparation other than cleaning the stoma area and removing metallic objects around the abdomen. Equipment and materials prepared included a CR X-ray unit, radiography computer, image reader, radiographic printer, a 34 × 43 cm cassette, a size 16 catheter, 110 grams of barium sulfate contrast mixed with 890 mL of warm water at a ratio of 1:8, a bowl, a 50 cc syringe, a clamp, markers, adhesive tape, gloves, and gel (jelly). The examination was conducted using an AP projection with the patient in a supine position. Barium contrast was administered gradually through the proximal stoma, distal stoma, and anus. Barium contrast was selected because it provides clearer visualization of the intestinal mucosa and anatomy compared with iodinated contrast media. The use of only the AP projection was considered sufficient to demonstrate the entire anatomy of the large intestine, from the ascending colon to the rectum. Conclusion: Pediatric lopography radiographic examination in pre-stoma closure (ileostomy) cases using an AP projection with barium contrast administered through the stoma and anus provides clear visualization of intestinal anatomy, demonstrates contrast distribution throughout the colon, and assists in evaluating bowel conditions before stoma closure surgery. The use of additional projections and watersoluble contrast media may be considered to complement anatomical information and enhance patient safety.

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1. INTRODUCTION

The colon or colon is the final part of the digestive tract that functions to absorb water and electrolytes from undigested food waste, as well as form and store feces before they are expelled from the body. Anatomically, the colon consists of the cecum, the colon ascendents, the transverse colon, the colon desends, the sigmoid colon, and ends in the rectum and anus. On radiographic examination, the colon has a characteristic form of haustra, which is a fold on the intestinal wall that distinguishes it from the small intestine (Lampignano, 2018).

Disturbances in the function or structure of the colon can hinder the elimination process so that it requires surgery, one of which is an ileostomy. Ileostomy is a surgical procedure by creating a stoma on the abdominal wall that connects the tip of the ileum to the surface of the body, so that the digestive residue comes out without passing through the colon and rectum. This is done in conditions such as colorectal cancer, inflammatory bowel disease, intestinal blockage, or severe injury, and can be temporary or permanent (Ma et al., 2022).

In pediatric patients, ileostomy is generally caused by congenital abnormalities, gastrointestinal disorders, or certain postoperative conditions. Anatomical and physiological differences in children require special attention in post-ileostomy management and evaluation, including radiological examinations tailored to pediatric conditions (Ma et al., 2022).

Assessment of the anatomy and function of the gastrointestinal tract is carried out through a radiological examination that utilizes ionizing radiation or other media to produce an overview of the structure of the body. In the digestive system, one of the tests used is colon logography or barium enema, which is an examination by inserting contrast media into the colon through the stoma or anus to assess the anatomy of the colon and detect abnormalities such as blockages, leaks, and preoperative evaluation before stoma closure (Wiwin et al., 2024). This is in line with the words of Allah SWT in Q.S. Ash-Shu'ara verse 80 which means:

"And when I was sick, He was the one who healed me."

The verse shows that every disease and healing process is the will of Allah SWT, while humans are commanded to strive through medical examinations and measures, including radiographic lopographic examinations to help establish the diagnosis and determine the right course of action for the patient.

In theory, a lopographic examination requires preparations such as dietary adjustments, increased fluids, and the administration of laxatives to cleanse the colon for optimal results (Lampignano, 2021). However, in terminal ileostomy patients, the colon is generally relatively clean so special preparation is not always necessary. Patients are usually only asked *informed consent* and removing metal objects, although a low-fiber diet may still be recommended to reduce the risk of contrast reflux (Kamila et al., 2025).

The use of contrast media in lopographic examination aims to clarify the anatomical picture of the colon. The contrast medium that is often used is a barium sulfate ($BaSO_4$) suspension with a concentration of about 20% *weight/volume,* that is, 20 grams of barium dissolved in water up to a volume of 100 ml, with the amount of solution adjusted to the length of the distal colon. Warm water is used to dissolve the barium to improve patient comfort and prevent *spasm* muscles. *Vaseline* or *Jelly* used to reduce pain during the insertion of a catheter into the stoma(Lampignano, 2021).

An alternative contrast medium that is often used is water-soluble contrast media type *iohexol* which is mixed with a NaCl solution in a certain ratio, such as 1:5 or 1:8, with a total volume of about 600 cc. The selection of water-soluble contrast media was made because it is safer, easier to absorb and excrete by the body, and reduces the risk of complications in postoperative patients, although the resulting image detail is not as good as barium sulfate (Gemilang et al., 2023; Kamila et al., 2025; Balinger, 2016).

The implementation of a lopographic examination requires several radiographic projections to obtain a complete picture of the colon. Commonly used projections include plain photographs of the abdomen, projections *Antero-Posterior* (AP) or *Postero-Previous* (PA), oblique projections such as *Right Anterior Oblique* (RAO), *Left Anterior Oblique* (Laos), *Right Posterior Oblique* (RPO), and *Left Posterior Oblique* (LPO), as well as projections *side* and *lateral decubitus* right and left, especially in examinations with techniques *double contrast*. Post-evacuation

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projections can also be performed to assess residual contrast media and ensure overall colon patency (Gemilang, Anjas F.; Believers, 2023; Kamila et al., 2025; Lampignano, 2021; Philip W Balinger, 2016).

The results of observations at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency, show that there is a difference between theory and practice. Theoretically, in the clinical lopographic examination of ileostomy, water-soluble contrast media with several projections such as AP, lateral, and oblik is used. however, at the hospital, pediatric lopographic examination in the case of the stoma closure pro was carried out without any special preparation other than stoma cleaning, using barium sulfate, and only AP projection, with contrast input through the stoma and anal pathway. This indicates that there is an adjustment of procedures based on clinical conditions and available facilities.

The purpose of this study is to find out the procedure for pediatric lopographic radiography examination in the case of pro stoma closure (ileostomy) at the radiology installation of dr. Soeselo Hospital, Tegal Regency, to find out the reasons for the use of barium contrast media and the insertion of additions through the anus, and to find out the reason for using only AP projections.

Based on this description, the author is interested in conducting further studies in a Scientific Paper entitled "Pediatric Robotic Radiography Examination in the Case of Pro Closed Stoma (Ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency".

2. LITERATURE REVIEW

1. Anatomi Colon

The colon is part of the human digestive system located between the small intestine and the anus. This organ consists of the cecum, colon, rectum, and anus. Its main function is to absorb the remaining fluids and electrolytes from food that are not fully digested in the small intestine, as well as to form and store feces before they are removed from the body. In addition, the colon plays a role in the fermentation process by intestinal bacteria that helps break down food waste, as well as being a place for good bacteria that produce vitamins B and K. The colon is divided into several parts, namely the ascendant colon, the transverse colon, the descent colon, and the sigmoid colon which is connected to the rectum. The cecum functions as a link between the small intestine and the large intestine and regulates the entry of food contents into the colon. The rectum serves as a temporary storage place for feces before they are excreted through the anus. The colon also plays a role in supporting the immune system and helping to recycle some nutrients from digestive waste (Azzouz, L. L.; Sharma, 2023).

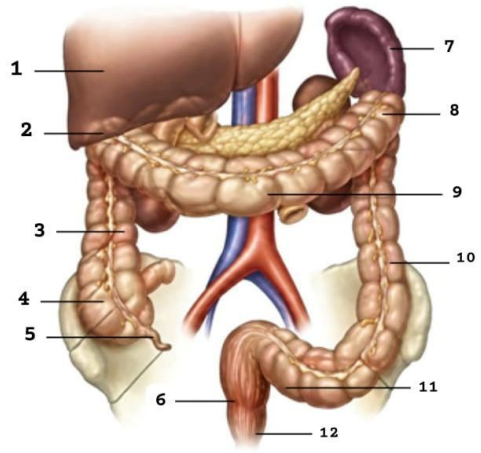

Image caption:

1.Liver	*7.Spleen*
2.Right colic flexure	*8.Left colic flexure*
3.Ascending colon	*9.Transverse colon*
4.Cecum	*10.Descending colon*
5.Vermiform appendix	*11.Sigmoid colon*
6.Rectum	*12.Anal canal*

Figure 1. Anatomy of the Colon
(Mahadevan, 2020)

2.Ileostomi

An ileostomy is a surgical procedure that is performed by removing the tip of the ileum, which is the end of the small intestine, through the abdominal wall to form an artificial hole called a stoma. This stoma serves as a stool excretion pathway, replacing the function of the colon that is no longer partially or completely functional. Normally, the ileum plays a role in the digestive process, namely digesting food, secreting enzymes and proteins, and absorbing various nutrients. The digestive results then enter the colon through the ileosecal valve to be absorbed by the water and formed into denser feces. In ileostomy patients, the flow does not pass through the colon so water absorption

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does not occur. As a result, the feces that come out through the stoma have a high moisture content with a liquid to slurry-like consistency, as well as a larger volume than normal conditions (Rajaretnam, Niroshini; Lieske, 2023).

3.Pediatrik

Pediatrics is a branch of medical science that focuses on children's health from infancy to adolescence. Pediatric patients are a group of patients with anatomical, physiological, and psychological characteristics that are different from adult patients so that they require special attention in medical examinations and management, including radiological examinations. Pediatric age categories include neonates (0–28 days), infants (1 month–1 year), children (1–10 years), and adolescents (10–19 years). In this study, patients were included in the category of pediatric adolescents because they were 16 years old (World Health Organization, 2017).

4. Indications and contraindications

Indications of a lopographic examination to assess the condition of the intestine after a surgical procedure such as ileostomy or colostomy. The difference between ileostomy and colostomy lies in the part of the intestine used. Ileostomy is made from the small intestine part of the ileum, so that the digestive residue that comes out is more fluid. Meanwhile, colostomy is made from the colon (colon), so that the feces that come out are denser because they have gone through the process of absorbing water in the colon. This examination aims to detect leaks, narrowings, blockages, fistulas, and ensure stoma function and intestinal readiness before stoma closure. When there is a suspicion of perforation, anastomosis leakage, or the risk of extravasation, the use of contrast media *water soluble* safer than barium. Contraindications to lopographic examination are intestinal perforation, acute inflammation of the stoma area, weak or unstable condition of the patient, and allergy to contrast media Lampignano(2021).

5. Lopographic Examination Technique

Lopografi It is a radiological procedure that aims to assess the structure and function of the colon through a stoma on the abdominal wall. This examination is performed by inserting a positive contrast medium into the colon through a stoma, thus allowing a clear visualization of the anatomy of the colon (Wiwin et al(2024).

a. Patient preparation

There is no special preparation for the patient, only they are asked to bring a spare stoma bag, wipes to clean the stoma and remove metal objects around the abdomen so as not to interfere with the radiograph results (Kamila et al., 2025).

b. Preparation of Tools and Materials

(Kamila et al., 2025; Lampignano, 2021; Wiwin et al., 2024)

The tools used are as follows:

1) Aircraft X-ray
2) Cassettes and films as needed
3) Marker
4) Irrigator set with catheter
5) Jelly
6) Handscoon
7) Clamps or clamps
8) Bent
9) Apron
10) Plaster
11) Where to stir contrast media
12) Ostomy tip
13) Tubes
14) Barium Measuring Bag
15) Self-adhesive holes
16) Cloth
17) Barium
18) Odyssey

The materials used are as follows:

The contrast media used in the lopographic examination consists of two types, namely barium sulfate and water soluble contrast.

Barium sulfate contrast media is generally used with a concentration of about 20% weight/volume (20 grams of barium added to water up to a volume of 100 mL). The amount of solution used is adjusted to the short length of the distal colon. Barium contrast media was chosen because it has the ability to produce a clearer

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picture of the intestinal mucosa and provides high radiographic contrast so that it facilitates the evaluation of colon structure (Lampignano, 2021).

Contrast media *water soluble* used is Iohexol. This medium is used mainly in conditions with suspicion of perforation, anastomosis leakage, or the risk of extravasation because it is safer, easily absorbed, and can be excreted by the body (Wiwin et al., 2024). In the lopographic examination, Iohexol is used by dilution, namely Iohexol 45 cc mixed with 360 cc NaCl (Kamila et al., 2025) This comparison aims to get enough concentration so that it still produces a good picture but is still safe for the patient.

c. Contrast Media Insertion Technique

The contrast media insertion technique was carried out in stages through a distal stoma using Iohexol-type water-soluble contrast media. The initial intake was carried out as much as 200 ml, then continued again as much as 200 ml, and the last stage was 200 ml accompanied by radiograph taking on the RPO and LPO projections to show the colon in more detail without superposition Wiwin et al(2024).

Contrast media insertion was carried out through the stoma hole using a size 16 catheter with a mixture of 175 cc of Iohexol and NaCl water-soluble contrast media, then post-contrast AP projection radiograph was taken. Furthermore, contrast media was inserted through the anus with the patient in an angled position to the left using a mixture of Iohexol and NaCl as much as 175 cc through the catheter that had been installed, then lateral projection radiography and post contrast AP were taken. After that, a contrast suspension and NaCl of 55 cc were added with the patient's position oblique to the right for RPO projection radiography. The examination was continued with the insertion of negative contrast media in the form of air twice using a 50 cc syringe, then an AP projection radiograph was taken. After the patient evacuates or defecates (BAB), a post-evacuation AP radiograph is taken Kamila et al(2025).

d. Radiography Examination Techniques

Plain abdominal photos aim to see whether the patient's preparation is maximal or not, Inform consent is carried out after it is confirmed that the examination can be continued.

1) AP Projections

The purpose of AP projection is to see a comprehensive overview of the colon, the distribution of contrast media, and to evaluate the shape, position, and patency of the colon including the stoma and distal intestinal sections. This projection also helps assess any narrowing, leakage, or other abnormalities before the stoma closure action is performed.

The AP projection check technique is as follows:

a) Patient Position: The patient is in the supine position, with a pillow on the head, both hands straight at the sides of the body and both legs straight down.
b) Object Position: The MSP of the patient's body is in the middle of the examination table, The object is set by determining the upper limit of the xypoideus process and the lower limit is symphisis pubis. Ensures there is no rotation.
c) CR: Vertical perpendicular to the cassette
d) CP: Second middle of the iliaca crista
e) FFD: 100 Cm
f) Criteria: Indicates the entire colon is visible, including the flexion and sigmoid colon.

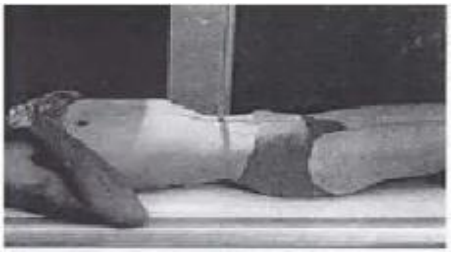

Figure 2.AP Position
(Lampignano, 2021)

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Figure 3. AP Radiography Results
(Lampignano, 2021)

2) PA Projection

The purpose of PA projection is to provide an overview of the colon and the overall distribution of contrast media with a clearer visualization of intestinal anatomy, as well as to help evaluate distal bowel condition, lumen patency, and the possibility of leakage or abnormalities prior to stoma closure.

The PA projection inspection technique is as follows:

a) Patient Position: The patient is in a prone position on the examination table. Both hands are straight on the sides above the body and legs straight down.
b) Object Position: The MSP of the patient's body is right in the middle of the examination table. The object is arranged on the examination table with the upper boundary of the xypoideus process and the lower boundary of the sympisis pubis not truncated.
c) CR: Vertical perpendicular to the cassette
d) CP: Second middle of the iliaca crista
e) FFD: 100 cm
f) Criteria: Shows the entire colon is visible, including the flexion and rectum.

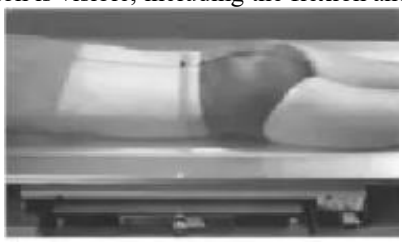

Figure 4. PA Position
(Lampignano, 2021)

Figure 5. PA Radiography Results
(Lampignano, 2021)

3) LPO projections

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The purpose of LPO projection is to show the colon obliquely so that the overlapping structures of the intestine can be seen more clearly, especially the flexion area and the colon of the decline, and to help assess the distribution of contrast media and abnormalities in the intestine.

LPO projection inspection techniques are as follows:

a) Patient Position: The patient is positioned supine and then rotated to the left approximately 35°-45° against the examination table. The left hand is used for the bearing and the right hand in front of the body is held on to the edge of the examination table. The left leg is straight while the right leg is bent for fixation.
b) Object Position: MSP body with examination table with abdominal margins left and right equally far from the midline of examination table
c) CR: Vertical straight against cassette
d) CP: 1-2 inches to the right lateral direction of the second midpoint of the iliaca crista
e) FFD: 100 cm

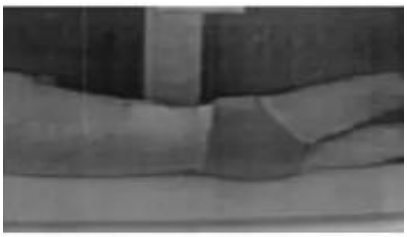

Figure 6. LPO Position
(Lampignano, 2021)

Figure 7. LPO Radiography Results
(Lampignano, 2021)

4) RPO projections

The purpose of RPO projection is to show colon ascendancy and hepatic flexion more clearly, reduce superimposition between intestinal structures, and help assess the distribution of contrast media and intestinal lumen condition.

RPO projection inspection techniques are as follows:

a) Patient Position: The patient is positioned supine and then rotated to the right approximately 35° 45° against the examination table. The right hand is straight at the side of the body and the left hand is flexion in front of the body holding on to the edge of the examination table. The right leg is straight down and the left leg is slightly bent for fixation.

b) Object Position: The body MSP with the examination table with the left and right abdominal margins equally far from the center line of the examination table.
c) CR: Vertical straight against cassette
d) CP: 1-2 inches to the left lateral direction of the second midpoint of the iliaca crista
e) FFD: 100 cm

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Figure 8. RPO Position
(Lampignano, 2021)

Figure 9. RPO Radiography Results
(Lampignano, 2021)

5) RAO Projection

The purpose of RAO projection is to show the sigmoid colon and ascendant colon more clearly, reduce superimposition of intestinal structures, and help evaluate the distribution of contrast media and abnormalities in the intestinal lumen.

The RAO projection inspection technique is as follows:

a) Patient Position: The patient is positioned prone on the examination table and then the patient is positioned 35°-45° against the examination table.
b) Object Position: The body MSP is right at the center line of the examination table. Both hands are straight on the upper side of the body and the legs are straight down. The right hand is straight at the side of the body and the left hand is crossed in front of the body holding on to the edge of the table. The right leg is straight down and the left leg is slightly bent for fixation. The upper limit of Proc. Xypoideus and the lower limit of Sympisis Pubis.
c) CR: Vertical straight against cassette
d) CP: 1-2 inches to the left lateral direction of the second midpoint of the iliaca crista
e) FFD: 100 cm

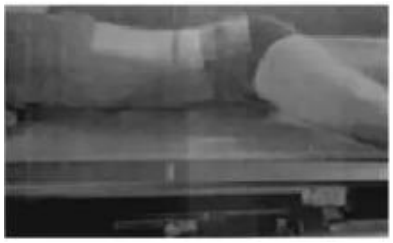

Figure 10. RAO Position
(Lampignano, 2021)

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Figure 11. RAO Radiography Results
(Lampignano, 2021)

6) LAO Projections
The purpose of LAO projection is to show colon decline and lienalis flexion more clearly, reduce superimposition of intestinal structures, and help assess contrast media distribution and intestinal lumen condition.
The LAO projection inspection technique is as follows:
a) Patient Position: The patient is positioned prone on the examination table and then the patient is positioned 35°-45° against the examination table.
b) Object Position: The body MSP is right at the center line of the examination table. Both hands are straight on the upper side of the body and the legs are straight down. The left hand is straight at the side of the body and the right hand is crossed in front of the body holding on to the edge of the table. The left leg is straight down and the right leg is slightly bent for fixation. Upper limit of Proc. Xypoideus and lower limit of Sympisis Pubis
c) CR: Vertical straight against cassette
d) CP: 1-2 inches to the right lateral direction of the second midpoint of the iliaca crista
e) FFD: 100 cm

Figure 12. LAO Position
(Lampignano, 2021)

Figure 13. LAO Radiography Results
(Lampignano, 2021)

7) Lateral Projection
The purpose of lateral projection is to show the rectum and rectosigmoid more clearly, assess the depth and relationship between intestinal structures, and help detect leaks, narrowings, or other abnormalities in the distal intestine.

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The technique of Lateral projection inspection is as follows:

a) Patient Position: The patient is positioned recumbent.
b) Object Position: The MSP of the patient's body is set in the middle of the tape. Genu is a little flexion for fixation. Upper limit of Proc. Xypoideus and lower limit of Sympisis Pubis
c) CR: Vertical straight against cassette
d) CP: As high as SIAS in the patient's MCP
e) FFD: 100 cm

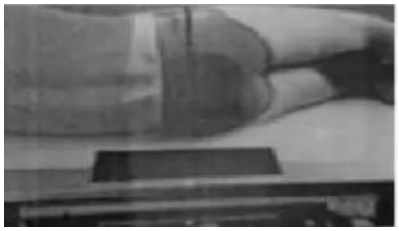

Figure 14. Lateral Position
(Lampignano, 2021)

Figure 15. Lateral Radiography Results
(Lampignano, 2021)

6. Radiation Protection

The application of radiation protection is carried out by referring to the principle of ALARA (*As Low As Reasonably Achievable*) namely by reducing the radiation dose to a minimum, collimating appropriately according to the area examined, and avoiding repeated radiograph collection. This effort aims to minimize radiation exposure in pediatric patients so that they remain safe without reducing the quality of the results of the examination in accordance with the statement *International Atomic Energy Agency (2018).*

3. METHOD

This study uses a qualitative method with a case study approach. The research location was carried out at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency, with the research implementation time lasting from October 2025 to April 2026. The study subjects consisted of three radiographers and one radiologist. The object of the study was a lopographic examination technique with a case of pro stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency. Data collection was carried out through direct observation, interviews, and documentation. Data is analyzed narratively through the process of transcription, reduction, and comparison with theory and then conclusions are drawn. This research has received approval from the Ethics Committee no.5387/KEP-UNISA/IV/2026.

Research Flow: The research began with a literature study regarding the procedure for pediatric lopographic radiography examination in the case of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency, AP lopographic projection examination technique, and the resulting radiography results. Furthermore, the researcher formulates the problem and prepares a qualitative research design with a case study approach. In the next stage, the researcher collected data at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency through direct observation, interviews with three radiographers, and one radiology specialist. The collected data is then transcribed, reduced, and

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analyzed qualitatively. The results of the analysis were used to draw conclusions and provide suggestions related to pediatric lopographic radiography examination in cases of pro-stoma closure (ileostomy).

4. RESULTS

In this study, data were obtained regarding pediatric lopographic radiography examination in cases of pro-stoma closure (ileostomy). Based on the results of observations, interviews, and documentation by the author of the lopographic examination on October 2, 2025, the following data were obtained:

1. Case Exposure

a. Patient Identity

Description	Patients
Name	An P****J***W*****
Age	16 Years
Gender	Male
No. RM	79***8
Date Inspection	02 October 2025
Inspection	Lopografi
Diagnosis	Pro Closing Stoma (Ileostomy)

b. Patient History

The patient on behalf of An. P came to the Radiology Installation of dr. Soeselo Hospital, Tegal Regency on Thursday, October 2, 2025 with a letter of request for a lopographic X-ray examination. The patient has a history of surgical insertion of a stoma on the left abdomen due to complaints of abdominal pain and cannot defecate. After undergoing the procedure, the patient comes for a check-up. The sending doctor then recommends a radiographic examination of the lopographic to evaluate the condition of the intestine before the stoma closure is performed.

2. Pediatric Robotic Radiographic Examination Procedure in Pro Case Closed Stoma (Ileostomy)

a. Purpose of Robotic Examination

Based on the results of interviews and observations, the lopographic examination is carried out with the aim of assessing the condition of the intestine before the closure of the stoma, as well as to identify whether there are abnormalities in the colon such as leakage, blockage, or narrowing, so that if the condition is declared safe, the stoma can be closed. The statement is supported by the statement of informant II as follows:

"The clinical purpose is to check the condition of the intestine before the stoma is closed, so to find out if it is safe or there are still problems in the colon such as leaking blockages or narrowing, which is important if it is safe to have the stoma closed" (II/doctor).

b. Patient preparation

It does not require special preparation, but patients are recommended to bring a spare stoma bag as well as dry wipes and wet wipes to help clean the stoma area. In addition, the patient is asked to remove metal objects around the abdominal area so as not to interfere with the results of the radiograph image. Before the examination is carried out, the patient or family is given an explanation of the examination procedure, the use of contrast media, the purpose of the examination, and possible discomfort that may be felt during the examination. After understanding the explanation, the patient or family is asked to provide *informed consent* as a form of approval for medical action. The stoma area is then cleaned so that the condition of the area becomes clean without any residual feces that can affect the quality of the examination results. The statement is supported by the statements of informants II, III and IV as follows:

"There is no special preparation, only I am told to bring a spare stoma bag, tissues to clean the stoma and remove metal objects around the abdomen so as not to interfere with the results of the radiograph" (I2/Radiographer).

"For the patient's preparation, there is no special preparation, only they are told to bring a spare stoma bag, dry wipes, wet wipes to clean the stoma first, remove metal objects around the abdomen so as not to interfere with the results of the radiography" (I3/Radiographer).

"Actually, there is no special preparation, it's just that the patient is told to bring a stoma bag, a spare tissue, so before the examination, the area of the stoma is cleaned first, so when we do the examination, the position is clean, there is no stool attached" (I4/Radiographer).

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c. Preparation of tools and materials

1) Tool Preparation

The preparation of tools and materials at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency in the pediatric lopographic radiography examination of the case of pro stoma closure (ileostomy) includes a CR X-ray plane, computer radiography, image reader, radiography printer, 34×43 cm cassette, size 16 catheter, bowl, 50 cc syringe, clamp clamps, markers, roll plaster, handscoon, and gel (jelly) as a lubricant in the procedure.

The statement is supported by the statements of informants II, III and IV as follows:

"Dr. In this case, we usually use a CR x-ray plane, Radiography computer, Image reader, Radiography printer, using a 34x43 catheter size 16 Barium catheter, bowl, marker, roll plaster, handscoon, jelly, 50 cc syringe, clamp" (I2/Radiographer).

"Tools and materials for CR x-ray aircraft, reader, printer, 34 x 43 size tape, 16 Barium size catheters, bowls, markers, plaster, handscoon, jelly, 50 cc syringes, clamps" (I3/Radiographer)

"CR, computer, radiology plane, Image reader, 34x43 catheter size 16 Barium catheter , bowl, marker, roll plaster, handscoon, jelly, 50 cc syringe, clamp clamp" I4/Radiographer).

2) Ingredient Preparation

The contrast medium used in this examination is barium sulfate. The process of mixing contrast media in the lopographic examination is carried out by preparing 110 grams of barium sulfate which is then mixed with 890 ml of warm water in a ratio of 1:8, then stirred until homogeneous, does not clump, and forms a smooth suspension that is ready to be used for examination.

The selection of barium is based on its ability to provide a clearer picture of the intestinal mucosa than iodine contrast media. Although the patient falls under the pediatric category, in this case the patient is 16 years old so the use of barium can still be considered. However, the use of barium also has side effects if there is perforation or leakage of the intestine, because barium that comes out into the peritoneal cavity can cause new pathologies such as barium peritonitis. The statement is supported by the statements of informants I, II, III and IV as follows:

"The contrast medium used in barium was chosen because it is clearer than the contrast of iodine, this is a pediatric patient but at the age of 16 years old must use barium, if the effect is I think now there is no effect for barium" (II/doctor)

"Mixing contrast media is usually done by preparing 110 grams of barium then adding 890 ml of warm water in a ratio of 1:8, then stirring until homogeneous (not clumping) until a smooth suspension is formed and ready to be used for examination"
(I2/Radiographer).

"For mixing the contrast media, it is done by preparing 110 grams of barium then warm water 890 ml in a ratio of 1:8, stirred until it does not clump until a smooth suspension is formed and ready to be used for examination" (I3/Radiographer).

"The mixing process here is mixed with water directly for a ratio of 1:8 barium 1 and water 800 then stirred until diluted mixed"
(I4/Radiographer).

The tools and materials used in the lopographic examination are as follows:

a) Ray x CR plane

Figure 16. Ray x CR plane
(dr. Soeselo Hospital, Tegal Regency, 2026)

b) Cassettes and Movies 34 × 43

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Figure 17. Cassette and Flm 34 × 43 (dr. Soeselo Hospital, Tegal Regency, 2026)

c) Komputer Radiography

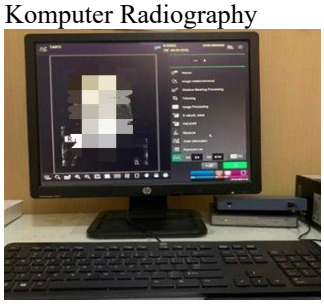

Figure 18. Computer Radiography (dr. Soeselo Hospital, Tegal Regency, 2026)

d) Image Reader

Figure 19. Image Reader (RSUD dr. Soeselo Tegal Regency, 2026)

e) Printer Radiography

Figure 20. Radiography Printer (RSUD dr. Soeselo Tegal Regency, 2026)

f) Catheter size 16

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Figure 21. Catheter size 16 (RSUD dr. Soeselo Tegal Regency 2026)

g) Bowl, 50 cc syringe, clamp, marker, roll plaster, hand scoon, and gel (jelly)

Figure 22. Bowl, syringe 50 cc, clamp, marker, plaster roll, hand spong, gel (RSUD dr. Soeselo Tegal Regency 2026)

h) Barium

Figure 23. Barium (dr. Soeselo Tegal Regency 2026)

d. Contrast Media Insertion Techniques

The technique of inserting contrast media in the Lopographic examination begins with taking a plain photo first, then the patient is placed a marker in the stoma area to distinguish the proximal and distal parts. Next, the input of contrast media is carried out in stages, starting at the distal part as much as 50 cc, continued with the proximal part of 50 cc, then distal 100 cc, distal 150 cc, distal 100 cc, and finally through the anus as much as 100 cc so that the total contrast media inserted is 550 cc. Although a mixture of contrast media was prepared as much as 1000 ml, not all contrast media was used during the examination. More volume of contrast media is made so that the contrast consistency remains thin and not too dense, making it easier to enter and resulting in more optimal contrast distribution. The remaining unused contrast media is then disposed of after the inspection is complete. The statement is supported by the statements of informants II, III and IV as follows:

"First the photo is plain, then the first entry is done on the 50cc distal hole, then the proximal 50cc, distal 100cc, distal again 150cc, distal 100cc, anus 100 cc, so the total barium inserted is 550 cc". (I2/Radiographer).

"First the plain photo first, the plain photo is given a marker in both holes, then the first entry is distal 50 cc, proximal 50 cc, distal 100cc, distal 150cc, distal 100cc, anus 100cc so the total is 550cc". (I3/Radiographer).

"The patient is put a marker first in the stoma which is proximal which is distal then in a plain photo first so that the position marker is found out, the first entry is distal 50 cc first, then proximal 50 cc, if it is

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lacking, add distal 100cc, continue distal 150cc, then add more distal 100cc, then the last one in the anus part 100cc so that the total is 550cc". (I4/Radiographer).

e. Examination Techniques

Based on the author's observations, the pediatric lopographic radiography examination in the case of prostoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency used a plain and post contrast AP projection of 550 cc with barium contrast media and contrast input through the stoma and anus, as follows: Patient Position: Supine on the examination table. Object Position: MSP body in the center of the examination table. CP: The second middle of the iliaca crista. CR: Upright tape. FFD:100 cm. Exposure Factor: kVp 68 mAs 10.

Figure 24.
Plain AP Radiography Results
(RSUD dr. Soeselo Tegal Regency 2026)

Figure 25.
50 cc Distal AP Radiography Results
(RSUD dr. Soeselo Tegal Regency 2026)

Figure 26.
50 cc Proximal AP Radiography Results
(RSUD dr. Soeselo Tegal Regency 2026)

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Figure 27.
100 cc Distal AP Radiography Results
(RSUD dr. Soeselo Tegal Regency 2026)

Figure 28.
AP Distal Radiography Results 150 cc
(RSUD dr. Soeselo Tegal Regency 2026)

Figure 29.
100 cc Distal AP Radiography Results
(RSUD dr. Soeselo Tegal Regency 2026)

Figure 30.

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AP Anal Radiography Results 100 cc
(RSUD dr. Soeselo Tegal Regency 2026)

f. Radiation Protection

Pediatric Robotic Radiography Examination in cases of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital has implemented radiation protection according to the principles of ALARA. The application is carried out by using the minimum radiation dose, limiting the area of the irradiation field through collimation according to the area of the examination object, and avoiding the repetition of photos to reduce radiation exposure in pediatric patients. The statement is supported by the statements of informants II, III and IV as follows:

"In pediatric patients, special protection is used with the ALARA principle, which is to reduce the radiation dose to a minimum, limit the area of collimation irradiation, and avoid repeating photos so that the child is not exposed to excess radiation" (I2/Radiographer).

"Special radiation protection is available in pediatric patients using special protection with the principle of alara, which is to reduce the radiation dose to a minimum, limit the area of irradiation and avoid repeating photos so that children are not exposed to excessive radiation" (I3/Radiographer).

"For radiation protection, we use radiation as little as possible, continue to apply the collimation according to the object, try not to repeat the photo" (I4/Radiographer).

g. Expertise Results

The results of *the expertise* of the pediatric Robotic Radiography Examination in the case of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency are:

The results of the proximal and distal lopographic radiography examination showed that the plain photo showed a shadow of gas in the intestine within normal limits and no osteolytic or blastic processes were found. On examination with contrast, both proximal and distal lopographs show that contrast barium inserted through a catheter into the ileostomy hole can fill and flow well through the intestinal system, covering the small intestine to the colon (ascendant, transverse, dessent, sigmoid, and rectum). The intestinal mucosa and colon look good without any *filling defects* or *additional defects*. Overall, the results of the examination showed no abnormalities in the proximal and distal lopography.

3. Reasons for Using Barium Contrast Media and Insertion Techniques Through Stoma and Anal

The contrast medium used in this examination is barium. The selection of barium is based on its ability to produce a clearer picture compared to iodine contrast. The addition of contrast media input through the anus is carried out when the administration of contrast through the stoma hole is not able to fill the intestine to the distal part optimally. This technique aims to speed up filling so that the anatomical picture of the colon, from the rectum, sigmoid, colon dessent, transverse colon, to the colon ascension, can be seen more clearly, while reducing the time of examination and radiation exposure in patients. The statement is supported by the statement of informant II as follows:

"The contrast medium used in barium was chosen because it was clearer than the contrast of iodine" (II/doctor).

"We see the influx from the anus because it feels from the top of the stoma hole that it does not fill up to the anus, finally we fill through the anus so that it fills quickly and the image of the intestine is seen distal from the rectum, anus, sigmoid, descending colon, transverse colon, visible up to the ascending colon so it is clearly visible there because if it takes a while to descend from above, so the intake is more and more radiation, pity the patient finally we put it through the anus to quickly fill the colon intestine" (II/doctor).

4. Reasons to Use AP Projection

The use of AP (anteroposterior) projections is considered sufficient because it is able to show the entire anatomy of the colon clearly, while other projections such as lateral have the potential to cause superposition so that they are not used, and have shown the results of the radiography needed by the radiologist to establish the diagnosis. The statement is supported by the statements of informants II, III as follows:

"I think why I use AP projection because it's better to check the colon intestine, the anatomical picture has been seen from Ap's position if the lateral may be superpositional, in my opinion Ap's condition has been seen, the diagnosis is clear, and the picture of his intestines from acending to the rectum of the anus looks like it has been" (II/doctor).

"The reason is that it is enough to use AP projections because it can display what radiologists need to establish a diagnosis" (I3/Radiographer)

5. DISCUSSION

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1. Pediatric Robotic Radiography Examination Procedure in Pro Case Closure Stoma (Ileostomy)

a. Patient preparation

Patient preparation for pediatric lopographic radiography examination in the case of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency does not require special preparation. Based on the Standard Operating Procedure (SOP) at the facility, patients do not require additional preparation before the examination, but it is recommended to bring a spare stoma bag as well as dry wipes and wet wipes to help keep the stoma area clean. In addition, the patient was asked to remove metal objects around the abdominal area so as not to interfere with the results of the radiographic image. The approval of the medical procedure is carried out before the examination through *informed consent* as a form of consent to the procedure to be carried out, and in this case the filling and signing of *the informed consent* is carried out by the family who is responsible as the patient's guardian because the patient is still a minor.

This examination does not use any special preparation, the patient is only asked to sign *informed consent* before the inspection and release of metal objects around the object to be inspected (Kamila et al., 2025; Lampignano, 2021; Wiwin et al., 2024)

According to the authors, the patient's preparation for pediatric robotic radiography examination in cases of pros-stoma closure (ileostomy) performed in radiology installations does not require special preparation and is in accordance with theory. This is shown by the SOP at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency where there is no additional preparation before the examination, but patients are encouraged to bring a spare stoma bag as well as dry wipes and wet wipes to maintain the cleanliness of the stoma area, as well as remove metal objects around the abdominal area so as not to interfere with the results of the radiographic image. In addition, the implementation of *informed consent* carried out by the family as the patient's guardian because the patient is still a minor is also in accordance with the provisions. Overall, this is in line with the theory that the lopographic examination does not require any special preparation, but only simple preparation to support the smooth and quality of the examination results.

b. Preparation of tools and materials

Preparation of tools and materials at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency on the radiography examination of pediatric lopographic cases of pro-stoma closure (ileostomy) includes CR X-ray planes, radiography computers, image readers, radiographic printers, 34×43 cm tapes, 16 size catheters, 110 grams of barium sulfate contrast media mixed with 890 ml of warm water in a ratio of 1:8, bowls, 50 cc syringes, clamps, markers, roll plaster, handscoon, and gel (jelly) as lubricants in the inspection procedure.

Preparation of tools and materials according to (Kamila et al., 2025) namely X-ray aircraft, 35×43 cm imaging plate, image reader, computer display, computer console, examination table, clamps, 16 size catheters, 50 cc and 20 cc syringes, contrast media containers, handscoon, gel, tissues, underpad, NaCl, and contrast media. The contrast media used is 45 cc of Iohexol brand water and 360 cc NaCl.

Preparation of tools and materials according to (Wiwin et al., 2024) namely DR aircraft, iohexol water-soluble contrast media, NaCl, 50 ml feeding syringe, catheter No. 18, clamps or clamps, patient clothes, markers, and gel.

There is a difference in the use of contrast media between the results of the study and the theory, where in this study barium is used, while the theory uses iodine-based water-soluble contrast media. The use of water-soluble contrast media is considered safer because it is easily soluble and can be absorbed by the body. According to the author, the use of water-soluble contrast media should be considered as an alternative in lopographic examination, especially to improve patient safety.

c. Contrast Media Entry Techniques

The contrast media insertion technique in pediatric lopographic examination in the case of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency begins with taking a plain photo first, then the patient is placed a marker on the stoma area to distinguish the proximal and distal parts. Next, the input of contrast media is carried out in stages, starting at the distal part as much as 50 cc, continued with the proximal part of 50 cc, then distal 100 cc, distal 150 cc, distal 100 cc, and finally through the anus as much as 100 cc so that the total contrast media inserted is 550 cc.

According to Wiwin et al (2024) The contrast media insertion technique is carried out through a distal stoma using a catheter, then a water-soluble contrast media (iohexol) is inserted in stages as much as **200 cc per entry**. This process is repeated until it reaches a total of about **600 cc,** Accompanied by a gradual evaluation through radiograph collection to ensure that the contrast distribution has filled the colon optimally.

According to Gemilang, Anjas F.; Believers(2023) The contrast media insertion technique in the lopographic examination is carried out through two paths, namely the anus and the proximal stoma using a foley catheter. Initial entry is carried out through the anus with a volume of about **35 ml,** then proceeded through the proximal stoma

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with a volume of about **50 ml.** Total input contrast media approx. **85 ml,** adapted to the condition of the patient's colon, where admission is stopped when reflux occurs.

There are similarities and differences between the contrast media input technique in the research results and the theory. The similarity lies in the method of entry that is carried out in stages. However, there are differences in the input path and the volume of contrast media used. In this study, admission was carried out through the stoma (distal and proximal) and anus with a total volume of 550 cc, while in theory there was a technique through a distal stoma with a volume of about 600 cc, and through a combination of anus and proximal stoma with a volume of about 85 ml. According to the author, the technique of entering contrast media should be adjusted to the patient's clinical condition and diagnostic needs in order to produce an optimal radiography picture.

d. Examination techniques

Pediatric lopographic radiography examination in the case of pro-closing stoma (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency was carried out by taking plain photographs of the abdominal AP without the use of contrast media to assess the initial condition of the abdomen. Next, the patient is fitted with markers on the stoma area to distinguish the direction of input of contrast media.

In this case, the patient's stoma is located on the left side of the abdomen. Anatomically, there are two intestinal pathways that are related to the stoma, namely the proximal pathway that functions as the outflow of feces and contrast media, and the distal pathway that leads to the lower colon. This division is the basis for determining the direction of input of contrast media during the lopographic examination.

The input of contrast media was carried out in stages through the stoma, starting with the insertion of 50 cc of the distal part, then the first stage of post-contrast AP radiograph was taken. Furthermore, a contrast medium was added to the proximal part of 50 cc and the second stage of post-contrast AP radiograph was taken. The next stage is the addition of contrast media to the distal part gradually, namely 100 cc, then the third stage of post-contrast AP radiograph is taken, followed by the addition of 150 cc in the distal part with the fourth stage of post-contrast AP radiograph, and the addition of 100 cc in the distal part with the fifth stage of post-contrast AP radiograph.

In the final stage, contrast media is also inserted through the anus as much as 100 cc to ensure complete filling of the distal colon, then a final post-contrast AP radiograph is taken with a total of 550 cc contrast media.

During the examination, the patient was positioned supine on the examination table with the mid sagittal plane (MSP) in the middle of the table, the central point (CP) in the middle of the crista iliaca, the central ray (CR) perpendicular to the tape, the film focus distance (FFD) of 100 cm, and the exposure factors were 68 kVp and 10 mAs.

Based on the examination stages, radiography results were obtained in stages ranging from plain photos to maximum contrast media filling. The following is a discussion of the radiographic picture at each stage of the examination:

Figure 24 is a plain AP radiograph of the abdomen before the administration of contrast media to assess the initial condition of the abdomen and to confirm the position of the marker in the stoma area before the insertion of contrast media.

Figure 25 is a distal AP radiograph with a contrast media input of 50 cc. On the radiograph image, it appears that the contrast media begins to fill the lumen of the distal intestine, but the distribution of contrast media has not spread optimally.

In Figure 26 is a proximal AP radiograph with a contrast media input of 50 cc. In the radiography image, it appears that the contrast medium begins to fill the secum so that the anatomy of the colon begins to appear clearer than in the previous stage.

Figure 27 is a distal AP radiograph with a contrast media input of 100 cc. In the radiograph image, it appears that the contrast media begins to fill the ascending colon so that the visualization of the colon appears wider.

Figure 28 is a distal AP radiograph with a contrast media input of 150 cc. In the radiographic image, it appears that the contrast medium fills the ascending colon and begins to fill the transverse colon and part of the descending colon.

Figure 29 is a distal AP radiograph with a contrast media input of 100 cc. On the radiograph image, it appears that the transverse colon and descending colon are almost completely filled by contrast media.

In Figure 30 is an AP radiograph with 100 cc of contrast media input through the anus, so that all parts of the colon appear to be filled with contrast media optimally ranging from the cecum, ascending colon, transverse colon, descending colon, to sigmoid.

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This shows that the distribution of contrast media has spread thoroughly so that the anatomy of the colon can be clearly visualized. Therefore, the addition of contrast media is no longer carried out because the radiograph results are already considered sufficient to evaluate the state of the colon, as seen in figure 30.

According to Kamila et al(2025) namely plain AP, post contrast AP through the stoma hole, three projections with contrast inserted through the anus, namely lateral, AP, and RPO, and the last post-evacuation AP projection. The patient's position for AP projection was the patient lying on his back, with the Mid Sagittal Plane (MSP) in the center of the examination table, the Central Ray (CR) vertical and perpendicular, the Central Point (CP) in the midpoint of the iliac crest, and the Focus Film Distance (FFD) of 100 cm with kV and mAs of 80 and 30 for the plain AP and post evacuation, respectively, and 85 and 36 for the contrast post AP.

Examination techniques according to Lampignano(2021) namely Plain Abdomen Photos, *Anteroposterior* (AP)/*Posteroanterior* (PA), *Right Anterior Oblique* (LOL), *Left Anterior Oblique* (LPO), *Left Lateral Decubitus* (LLD), *Right Lateral Decubitus*, and *Lateral.*

According to the author, there is a difference in examination techniques between the results of the research and the theory. In this study, the lopographic examination was performed using only Anterior Posterior (AP) projections, while the theory suggested the use of several additional projections such as oblique and lateral to obtain a more comprehensive anatomical picture.

According to the author, the examination should be supplemented with other projections such as *oblique* and lateral so that the resulting anatomical information is more complete and can increase accuracy in the enforcement of the diagnosis.

h. Radiation Protection

Pediatric lopographic radiography examination in the case of pro-closing stoma (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency has applied the principle of radiation protection well. The application of radiation protection is carried out by collimating according to the area examined and trying to reduce the frequency of radiograph taking to minimize radiation exposure in pediatric patients.

According to the theory, the principle of radiation protection used in radiological examinations refers to the principle of ALARA (*As Low As Reasonably Achievable*), which is an effort to reduce radiation exposure as low as possible while maintaining the quality of diagnostic images. This is done through setting the right exposure factors, collimating accordingly, and minimizing the repetition of the examination (International Atomic Energy Agency, 2018; Strauss & Kaste, 2006).

According to the author, the application of radiation protection in the examination is in accordance with the ALARA theory because the efforts made in the radiology installation have prioritized the safety of pediatric patients while maintaining the quality of the radiographic image results.

2. Reasons for Using Barium Contrast Media and Insertion Techniques Through Stoma and Anal

The contrast medium used in this examination at dr. Soeselo Hospital, Tegal Regency is barium. The selection of barium is based on its ability to provide a clearer picture of the mucosa and intestinal anatomy than iodine contrast media, so that the anatomical structure of the intestine can be well visualized in the radiograph results. The addition of contrast media input through the anus is carried out when the administration of contrast through the stoma hole is not able to fill the entire colon to the distal part. This technique aims to speed up the process of filling contrast media so that the anatomical picture of the colon, including the rectum, sigmoid colon, desdents colon, transverse colon, and ascendant colon can be seen more clearly and completely. In addition, the technique also helps to reduce the length of examination time and minimize radiation exposure in patients.

According to the theory Lampignano(2021) Barium contrast media was chosen because it has the ability to produce a clearer picture of the intestinal mucosa and provide high radiographic contrast so that it facilitates the evaluation of colon structure. This makes barium an effective contrast medium in colon radiographic examination because it can display the anatomical details of the intestine well Kamila et al(2025), Contrast media *water soluble* It is easier to remove from the body and more comfortable to use in postoperative patients. In addition, this type of contrast media is safer than barium sulfate because it is easily absorbed by the body, easy to excrete, and harmless if there are abnormalities in the colon. Because of this nature, the contrast media *water soluble* It is often used in certain conditions to reduce the risk of complications in patients.

According to the author, the selection of contrast media in lopographic examination should be more tailored to the patient's clinical condition, especially in determining the use of barium sulfate or *water-soluble contrast media.* In conditions where there is no suspicion of perforation or leakage, barium sulfate can be used because it is able to provide a more detailed picture of the intestinal anatomy and mucosa. Conversely, in conditions with a risk of complications such as perforation or anastomosis leakage, *water-soluble* contrast media is more recommended because it has a higher

level of safety. Thus, the selection of the right contrast media can help improve the quality of examination results while maintaining patient safety.

3. Reasons for Using AP Projections

The use of AP (anteroposterior) projection at dr. Soeselo Hospital, Tegal Regency is considered sufficient because it is able to display the entire anatomy of the colon clearly, while other projections such as lateral have the potential to cause superposition so that they are not used. And it has displayed the results of the radiography needed by the radiologist to establish the diagnosis, where the results of the radiography with AP projection show the distribution of contrast media filling all parts of the intestine to the rectum and anus, so as to show good intestinal function, a normal picture of the intestinal mucosa, and no *filling defects* were foundand other abnormalities, so that a lopographic examination can be used to evaluate the readiness of the intestine before the stoma closure action is carried out. Meanwhile, in pediatric patients, there is no special consideration in the implementation of the examination, because the procedure is carried out according to standards with a focus on intestinal filling and function.

According to Lampignano (2021), the robotic radiography examination technique can use several projections, namely plain photographs of the abdomen, projections of AP, PA, RAO, LAO, RPO, LLD, right lateral decubitus, and lateral projections. AP projections are used to see a comprehensive overview of the colon, the distribution of contrast media, and to evaluate the shape, position, and patency of the colon including the stoma and distal intestine, and to help assess any narrowing, leakage, or abnormalities prior to stoma closure. PA projections provide a clearer picture of the colon and contrast media distribution with better visualization of intestinal anatomy, and help evaluate distal bowel conditions and possible abnormalities. Oblique projections such as RAO, LAO, and RPO are used to reduce the superimposition of intestinal structures so that specific colon segments such as hepatic flexura, lienalal flexura, ascendant colon, descent colon, and sigmoid colon can be seen more clearly and help assess the distribution of contrast media. Meanwhile, lateral projections are used to show the rectum and rectosigmoid more clearly, assess the depth and relationship between intestinal structures, and help detect leaks, narrowings, or abnormalities in the distal intestine.

According to Kamila et al (2025), a radiography examination technique of pure AP photo lopography with the aim of seeing an image of the abdominal cavity before the insertion of contrast media, followed by the insertion of contrast media and a photo with a post-contrast AP projection of the ilesotomy stoma hole which aims to see the condition of the ileum, then the insertion of contrast media through the anus after which the patient is photographed with lateral projection and AP post contrast which aims to reveal the contrast media that fills the rectum, Sigmoid colons, colon descendens, transverse colons, colon ascendens, and caecum are viewed from lateral and anterior view. Next, an RPO photo was taken which aimed to open the flexura so that it would not overlap.

According to the author, there is a difference between the theory and the implementation of lopographic examinations in the field. In theory, the lopographic examination uses several projections such as AP, PA, oblique RAO, LAO, RPO, and lateral to obtain a more complete picture of intestinal anatomy. AP projections are used as the primary projection to see an overview of the colon, the distribution of contrast media, and the evaluation of intestinal shape and patency. Oblique and lateral projections are used to help clarify the anatomy of the intestine from various perspectives. However, in the implementation at dr. Soeselo Hospital, Tegal Regency, the examination was more focused on AP projections before and after the inclusion of contrast media, while additional projections such as oblique and lateral were not always used regularly. This shows that the selection of projections in the field is more tailored to clinical needs, patient conditions, as well as considerations of time efficiency and radiation exposure. Thus, despite differences with the theory, the use of AP projection can still provide sufficient diagnostic information in evaluating the condition of the intestine before the stoma closure action. As a suggestion, the use of projections in lopographic examinations should be adapted to the patient's clinical condition by considering the addition of oblique or lateral projections when necessary to clarify the anatomical picture of the intestine.

6. CONCLUSION

Pediatric lopographic radiography examination in cases of pro-stoma closure (ileostomy) at the Radiology Installation of dr. Soeselo Hospital, Tegal Regency was carried out without special preparation other than cleaning the stoma area and removing metal objects around the abdomen. The examination used AP projection with the position of the supine patient and the gradual insertion of barium contrast media through the stoma and anus with a total volume of 550 cc.

The use of barium contrast media was chosen because it is able to provide a clearer picture of the anatomy and intestinal mucosa than iodine contrast media. The addition of contrast media input through the anus is carried out to help fill the distal intestine so that contrast distribution is more optimal, speed up the examination time, and reduce radiation exposure in patients.

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The use of AP projection is considered sufficient because it is able to display the entire anatomy of the colon clearly so that it can be used to evaluate the readiness of the intestine before the stoma closure action is carried out.

It is best to consider the use of additional projections such as *oblique* and *lateral* to provide more complete anatomical information. In addition, the use of *water-soluble* contrast media can also be considered as an alternative to improve patient safety, especially if there is a risk of leakage or abnormalities in the colon.

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