Pediatric Lopography Examination Procedure In Congenital Megacolon Cases In The Radiology Installation RSUD Dr. Soeroto Ngawi

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Abstract

Purpose: Pediatric lopography examination procedure in cases of congenital megacolon in radiology installation RSUD Dr. Soeroto Ngawi uses Anteroposterior (AP) and Lateral projections, the contrast media used is water soluble contrast media which is inserted through the anus and stoma. The study aimed to determine the pediatric lopography examination procedure in cases of congenital megacolon.
Method: The study aimed to determine the pediatric lopography examination procedure in cases of congenital megacolon.
Results: This research was conducted in the radiology installation RSUD Dr. Soeroto Ngawi,
using a qualitative descriptive method case study approach and interview. The result of the study showed Anteriorposterior (AP) and Lateral projections can show megacolon so there is no need for additional oblique projection, water soluble contrast media has been used since it is safe and has minimal complications.
Keywords: Congenital Megacolon, Lopography, Contrast Media

Introduction

The large intestine is part of the digestive system that extends from the ileocecal junction to the anus.The large intestine is divided into the following four parts, namely caecum and appendix, colon, rectum, and ana canal. The functions of the large intestine are: absorption of water from fluid contents in it to help form the feces, storage, lubrication, and expulsion of feces, synthesis of vitamin B complex by normal bacterial flora present its lumen, protection from invasion by microorganisms by its mucoid secretion which is rich in igA group of antibodies [1]. If food waste moves too slowly or holds in the large intestine for too long, it absorbs too much water, causing the feces become hard [2].

One of the indications, abnormalities or pathologies of disease that can occur in the large intestine is congenital megacolon. Congenital megacolon, also known as Hirschsprung disease is a functional obstruction when neural crest cells fail to migrate and from the myenteric plexus (parasympathetic ganglia) in the sigmoid colon and rectum during embryonic development. This condition results in absence of peristalsis. As a result, the normal proximal colon becomes grossly dilated due to the fecal retention causing abdominal distension [1]. The worldwide incidence of Congenital megacolon or Hirschsprung disease ranges from 1:5000 to 1:10 000 live births and varies among different ethnic groups (Northern European, 1.5:10 000; African American, 2.1:10 000; and Asian, 2.8:10 000)[3]. To determine further medical action supporting examinations such as lopography can be carried out to help the doctor. Lopography or barium enema colostomy is a radiographic examination of the large intestine or colon using contrast

media inserted through the colostomy [4], [5], [6]. The colostomy is the stoma of the colon with the aim of delivering the feces and flatus [6], [7]

The contrast media used in lopography examination or barium enema colostomy is barium sulfate. The usual barium contrast media combination for single contrast lopography is 15% to 25% w/v. The concentrated barium used for double contrast lopography has concentrations from 75% to 95% [8]. If the colon has perforated or there is a leak in the colon, the contrast media used is water soluble [9]. The projections for the lopography examination according to [8] are Antero Posterior (AP), Postero Anterior (PA), Right Posterior Oblique (RPO), Left Posterior Oblique (LPO), and Lateral.

Based in the background that has been explained, researchers are interested in conducting research with the aim of knowing the procedure for pediatric lopography examinations in cases of congenital megacolon.

Methods

This research is a qualitative descriptive case study approach in the radiology installation of RSUD Dr. Soeroto Ngawi. Data collection starts from 7th September 2023 – 28th October 2023. Data collection is carried out by observation, documentation, interviews and literature. The research subjects were one pediatric surgeon specialist, one radiologist, and one radiographer. Then the researcher presents the data in narrative form, then verified based on the theory that has been established and conclusions drawn.

Results

1. Exminations Procedure
   a. Tools and materials

Tools and material used in pediatric lopography examination in cases of congenital megacolon include: X-Ray (Indoray Ceiling), detector, examination table, apron, nierbeken, contrast media water soluble (ultravist-iopromide), underpad, syringe 60cc, tissue, nacl, catheter, jelly, alchohol, and informed consent. No patient preparation is required for this examination, although patient should dressed with hospital gown.

   b. Contrast Media Injection Technique

Contrast media injection in two ways, through the anus and the stoma. The examination table is covered using an underpad so the spill of the contrast media it will be absorbed by the underpad. Contrast media water soluble was mixed with aquades in a ratio of 1:3 with a total volume of 120cc. Contrast media injection through anal as much as 60 cc using a catheter and syringe in the sims position and through the stoma as much as 60 cc in the supine position. After injection the contrast media a radiograph is taken immediately.

   c. Examination technique

1) Plain Abdominal Radiograph Anteroposterior Projection
   Patient Position : the patient was positioned supine on the examination table, because the patient was a pediatrician and was uncooperative. The patient's hands and feet were held by bith parents who were equipped with apron.
   Part Position : the patient's MSP is set in the middle of the examination table
   CR : vertical perpendicular
   CP : MSP at the level of the iliac crest
   FFD : 100 cm
   Exposure factor : 70 kV and 25,6 mAs
   Radiograph Image :

Image 1. Plain abdominal Radiograph

2) Radiograph Anteroposterior Projection post anal contrast 60 cc
   Patient Position : the patient was positioned supine on the examination table, because the patient was a pediatrician and was uncooperative. The patient's hands and feet were held by bith parents who were equipped with apron.
   Part Position : the patient's MSP is set in the middle of the examination table
   CR : vertical perpendicular
   CP : MSP at the level of the iliac crest
   FFD : 100 cm
   Exposure factor : 70 kV and 25,6 mAs
   Radiograph Image :

Image 2. Radiograph AP Projection Post anal contrast 60 cc

3) Radiograph Anteroposterior Projection post contrast stoma 60 cc
   Patient Position : the patient was positioned supine on the examination table, because the patient was a pediatrician and was uncooperative. The patient's hands and feet were held by bith parents who were equipped with apron.
   Part Position : the patient's MSP is set in the middle of the examination table
   CR : vertical perpendicular
   CP : MSP at the level of the iliac crest
   FFD : 100 cm

Exposure factor : 70 kV and 25,6 mAs
Radiograph Image :

Image 3. Radiograph AP Projection Post contrast stoma 60 cc

4) Radiograph Lateral Projetion post contrast
Patient Position : recumbent with one side of the body on the table
Part Position : the patient's MCP is set in the middle of the examination table
CR : vertical perpendicular
CP : MSP at the level of the iliac crest
FFD : 100 cm
Exposure factor : 70 kV and 25,6 mAs
Radiograph Image :

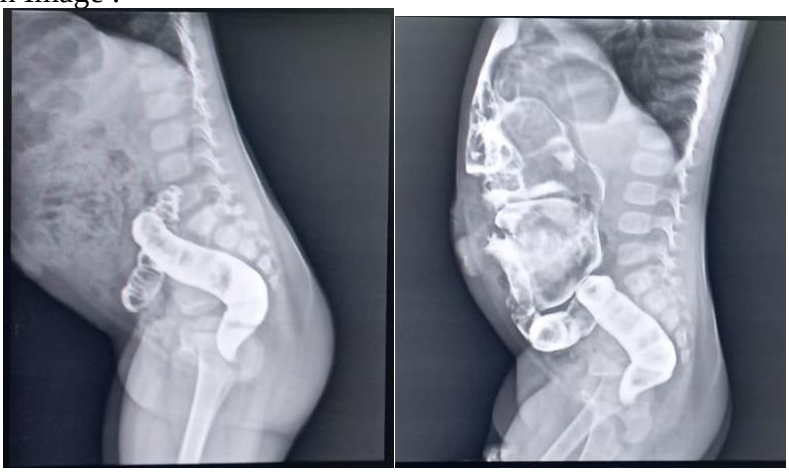

Image 4. Radiograph AP Projection Post anal contrast (left) and post contrast stoma (right)

Discussion

This research was conducted on an outpatient who came to the Radiology Installation at RSUD dr. Soeroto Ngawi brought a letter of request from the sending doctor for a proximal and distal lopography examination. As the patient is a 2-year-old kid, all approvals for the test will be completed by both of the patient's parents, thus the officer educates the parents prior to the examination.

The following stage is to get the patient and the equipment ready when the patient's parents consent to the examination continuing.. Preparation of patients for lopography examination with cases of congenital megacolon at the Radiology Installation of RSUD dr. Soeroto Ngawi, namely that there was no special preparation because the patient was still 2 years old, which is in line with the theory in [8]. According to [8], 2-year-old patients do not need special preparation. Meanwhile, in [5], [10] research, patient preparation was by changing their diet, drinking as much as possible, and fasting for 10 hours before the examination.

The preparation of tools and materials for lopography examinations in cases of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi consists of sterile and non-sterile tools and materials, namely x-ray machine, detector, examination table, water soluble contrast media, 60 cc syringe, nierbeken, handscoon, tissue, NaCl, catheter, jelly, alcohol, apron and underpad. In general, the tools and materials used in lopography examinations in cases of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi is the same as the theory in [4] but there are differences in the use of post operative colostomy kits and fluoroscopy. According to [5], the use of fluoroscopy can determine the extent to which contrast fills the colon so that abnormalities can be identified and appropriate radiographs can be taken. In a lopography examination study conducted by [11], the use of a post-operative colostomy kit can be more practical because the stoma does not have a sphincter so the contrast medium does not reflux into the patient's body. Tools and materials such as fluoroscopy planes and post-operative colostomy kits can save examination time and ensure patient comfort.

During a lopography examination with a case of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi, the contrast media used is water soluble mixed with around 120 cc of NaCl with a contrast media ratio of 1:3. The use of contrast media in lopography examinations in cases of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi is different from the theory in [8] which according to [8] the contrast media used in lopography examinations uses barium but there are similarities in the journals of [11],[5], [12] only the volume of contrast media used is different because in the research of [11],[5], [12] their patients were adult patients while the author's patients were pediatric patients where the length of the pediatric and adult colons were different so that the volume of contrast media used was adjusted to the length of the patient's colon. The reason for using water soluble contrast media in lopography examinations in cases of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi, namely because water soluble contrast media is easily absorbed by the body, is not dangerous, is safe for use by the body and has minimal complications. Use of barium sulfate may result in deposits in the colon because a megacolon prevents the colon from functioning correctly. Contrast media is delivered first through the anus, then through the stoma.

When the contrast medium has been filled, exposure is then carried out, during a lopography examination with a case of congenital megacolon at the Radiology Installation at RSUD dr. Soeroto Ngawi uses anteroposterior (AP), lateral projections and without using oblique projections (RPO and LPO). This is different from the theory in [8] where there are oblique projections (RPO and LPO) apart from anteroposterior (AP) and lateral. The reason for only using AP and lateral is because with these projections you can already get information about the megacolon so there is no need to add oblique projections (RPO and LPO). According to the radiographer at the Radiology Installation,

Dr. Soeroto Ngawi added an oblique projection to patients with colon tumors where there was a possibility that the tumor could be superposed on another organ. However, according to [11], the addition of oblique projections such as RPO and LPO can add diagnostic value because it can reveal the splenic fluexura and hepatic flexura areas.

Conclusion

Lopographic examination of patients with congenital megacolon cases at the Radiology Installation at RSUD Dr. Soeroto Ngawi started with parent education, followed by patient preparation considering there is no additional preparations were required. Preparation of equipment and materials consists of sterile and non-sterile, the contrast media used is water soluble contrast media with a ratio of 1:3. Insertion of contrast media through the anus and stoma with a total volume of 120 cc. Water soluble contrast media is used because it gets absorbed rapidly by the body, is safe to use, and left little deposits in the colon. The reason for not include oblique projections (RPO and LPO) is that AP and Lateral projections can provide diagnostic information and help the doctor with identifying the next steps.

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