


Original Research Article

# Radiological investigations of imperforate anus

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## Abstract

**Introduction:** Imperforate anus is a defect that is present from birth (congenital) in which the opening to the anus is missing or blocked. In female infants, imperforate anus is typically characterized by the rectum, bladder and vagina sharing one large opening called a cloaca. The condition develops in utero during the 5<sup>th</sup> to 7<sup>th</sup> weeks of pregnancy. This condition often happens in conjunction with other defects of the rectum. Incidence is 1 in 5000. It is more common in males. Diagnosis is usually made shortly after birth.

**Aims and objectives:** To study the presentation of imperforate anus using various radiological modalities.

**Materials and methods:** 10 cases of either strong suspicion or symptoms related to imperforate anus were evaluated who came to Dhiraj hospital with different radiological modalities like plain radiograph lateral invertogram, cross table lateral radiograph, erect radiograph and contrast studies (MCUG). **Results:** Out of total number of 10 patients who were diagnosed and evaluated for imperforate anus 3 i.e. 33.3 % were diagnosed with plain radiograph lateral invertogram, 2 i.e. 20 % were diagnosed with prone cross table lateral radiograph, 2 i.e. 20 % were diagnosed with abdominal erect radiograph and 2 were found to have recto-vesical fistula with the help of micturating cystourethrogram.

**Conclusion:** It was concluded that plain radiograph lateral invertogram proves to be the most important modality in diagnosing imperforate anus. It is followed by prone cross table lateral radiograph and abdominal erect radiograph. Micturating cystourethrogram proves to be important in diagnosing associated anomalies such as recto-vesical fistula.

## Key words

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Imperforate anus, Invertogram, Cross table lateral radiograph, MCUG.

## Introduction

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Imperforate anus is a defect that is present from birth (congenital) in which the opening to the anus is missing or blocked. In female infants, imperforate anus is typically characterized by the rectum, bladder and vagina sharing one large opening called a cloaca [1]. The condition develops in utero during the 5<sup>th</sup> to 7<sup>th</sup> weeks of pregnancy. This condition often happens in conjunction with other defects of the rectum. Incidence is 1 in 5000. It is more common in males. Diagnosis is usually made shortly after birth.

### Patients presents with complaints of

- Non passage of stool since 24 hours
- Abdominal distension
- Excessive crying
- Passage of stool through any other opening than anus [2]

### Types of Imperforate anus

#### Low variety

- Blind end of rectum terminates below the level of puborectalis sling of levator ani muscle.
- Radiological – gas shadow is seen below the line drawn from end of coccyx to pubic symphysis.

#### High variety

- Blind end of rectum terminates above the level of puborectalis sling of levator ani muscle.
- Radiological – gas shadow is seen above the line drawn from end of coccyx to pubic symphysis

Imperforate anus is often part of the association of vertebral anomalies (V), anal atresia (A), tracheo-esophageal fistula with esophageal atresia (TE) and renal dysplasia (R) (VATER) or VATER plus cardiac (C) and limb (L) anomalies (VACTERL) association [3].

## Aims and objectives

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- To study the presentation of imperforate anus using various radiological modalities.

## Materials and methods

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### Study area

The study was carried out in the Department of Radiodiagnosis, S.B.K.S. Medical Institute and Research Centre, Waghodia, Vadodara.

### Study design

**Type of the study:** An Observational, Descriptive Hospital Based Study.

**Sample size:** 10 patients

### Selection of subject

#### Inclusion criteria

Patients referred by the clinician from our hospital and from outside, to radiology department of Dhiraj General Hospital in a time span of 6 months with complaints suggestive of imperforate anus and other positive findings are included in the study.

### Study protocol

10 patients were evaluated, which presented with complaints of non passage of stool since 24 hours, abdominal distension, excessive crying and passage of stool through any other opening than anus. Proper diagnosis of imperforate anus was evaluated by plain radiograph lateral invertogram, contrast studies (MCUG), erect radiograph and cross table lateral radiograph.

## Results

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Out of 10 patients which were diagnosed having imperforate anus

- 3 i.e. 33.3 % were diagnosed with plain radiograph lateral invertogram,
- 2 i.e. 20 % were diagnosed with prone cross table lateral radiograph

- 2 i.e. 20 % were diagnosed with abdominal erect radiograph,
- 2 were found to have recto-vesical fistula with the help of micturating cystourethrogram.

## **Discussion**

In the patients that are included in this study, plain radiograph lateral invertogram, cross table lateral radiograph, erect radiograph and contrast studies (MCUG) were studied and incidence of imperforate anus and fistulous tract formation was evaluated in them.

### **Plain film**

#### **Lateral invertogram**

- Used to investigate the extent of defect in the anal or rectal atresia. The anus is marked with radio opaque marker, the baby is inverted. A lateral radio graph is taken in the air, the rectum will rise to the highest point, giving an indication of the extent of the atresia.

#### **Abdominal radiograph**

- Can be variable depending on the site of atresia (e.g. high or low), level of impaction with meconium and physiological effects such as straining.
- May show multiple dilated bowel loops with absence of rectal gas

#### **Prone cross table lateral radiograph**

- Provides equal or sometimes better information, compared to the invertogram, for demonstration of the level of rectal atresia in neonates.
- Its advantages are - easy positioning, better cooperation of the patient, elimination of the effect of gravity, and better delineation of the rectal gas shadow.
- The infant would be placed in a prone position with the hip flexed and elevated up to 45 degrees. The radiographic center was placed around the greater trochanter. A radiologic marker was

routinely placed at the perineal area where there should be anal dimpling.

### **Fluoroscopy - contrast study**

- To detect recto-vesical, recto-vaginal or rectoperineal fistula.
- The fistula is considered low (below levator ani plane) if it is below the pubo-coccygeal line and considered high fistula if above the pubo-coccygeal line.

### **Ultrasound**

- The anus may be seen as an echogenic spot at the level of the perineum and in an atresia this echogenic spot may be absent.
- May show bowel dilatation
- An infra coccygeal or transperineal approach may allow differentiation between a high or low sub-type [4]

## **Conclusion**

It was concluded that plain radiograph lateral invertogram proves to be the most important modality in diagnosing imperforate anus [5]. It is followed by prone cross table lateral radiograph and abdominal erect radiograph. Micturating cystourethrogram proves to be important in diagnosing associated anomalies such as recto-vesical fistula

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