
بسم الله الرحمن الرحيم

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Medical physics MSc

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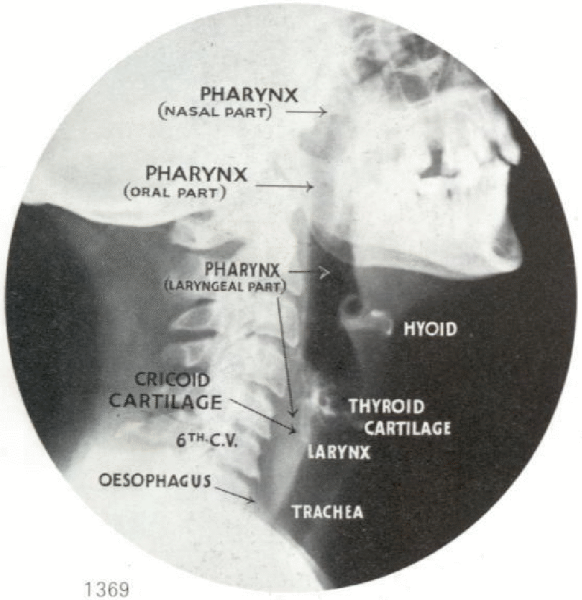
Radiographic Positions

Digestive system



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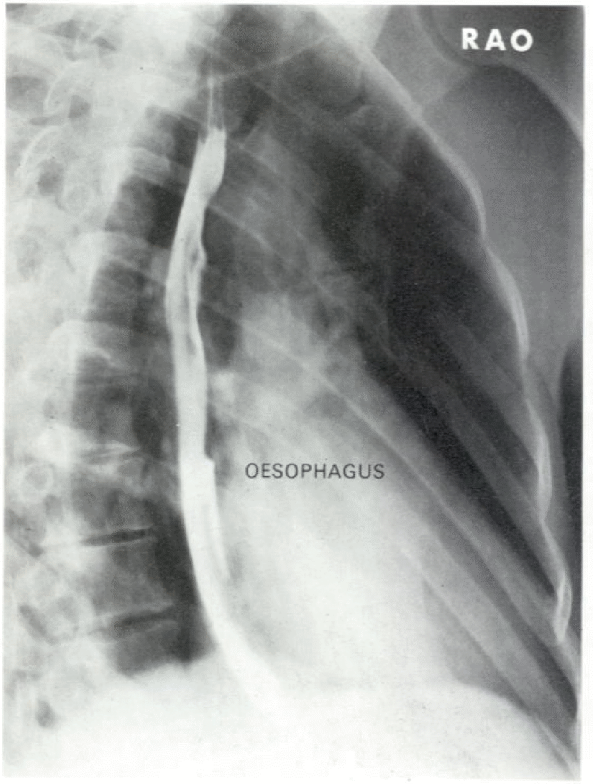

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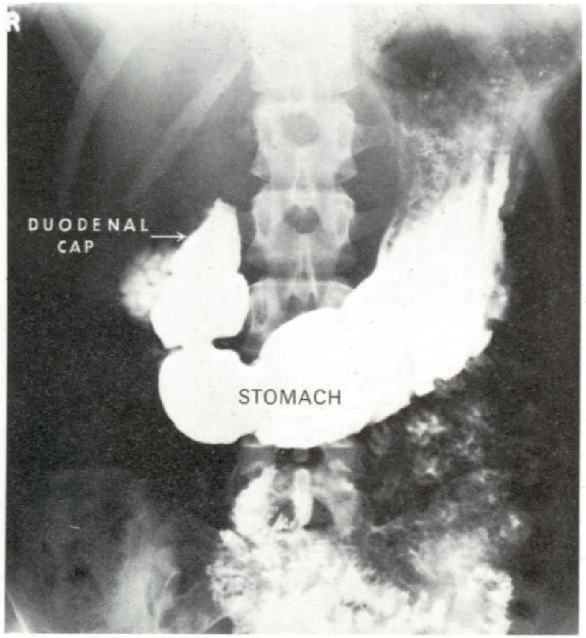

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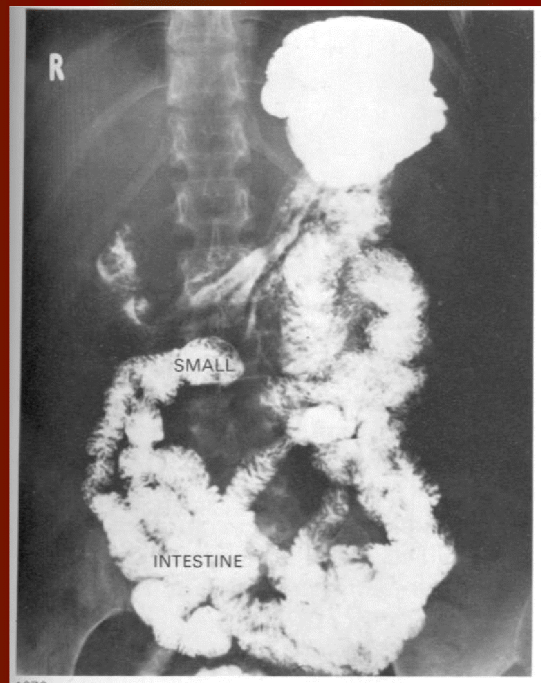

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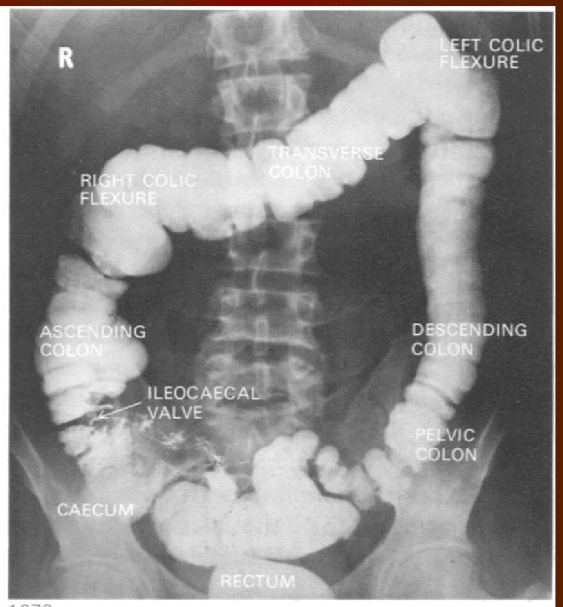

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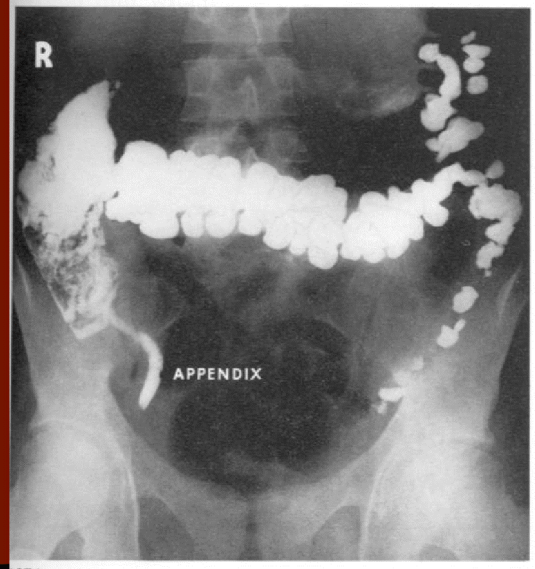

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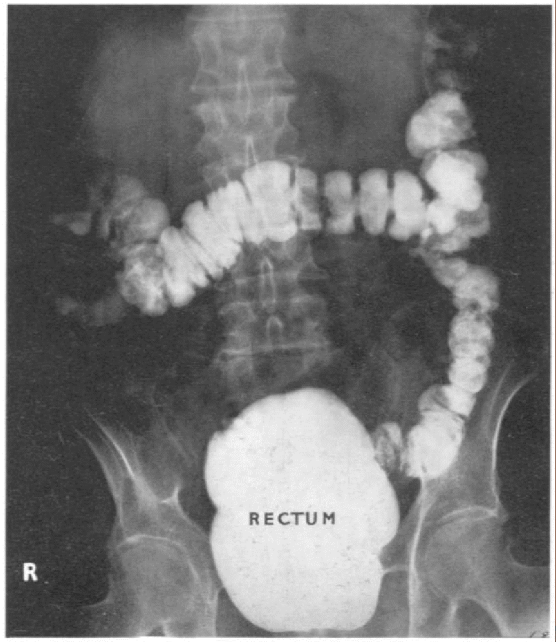

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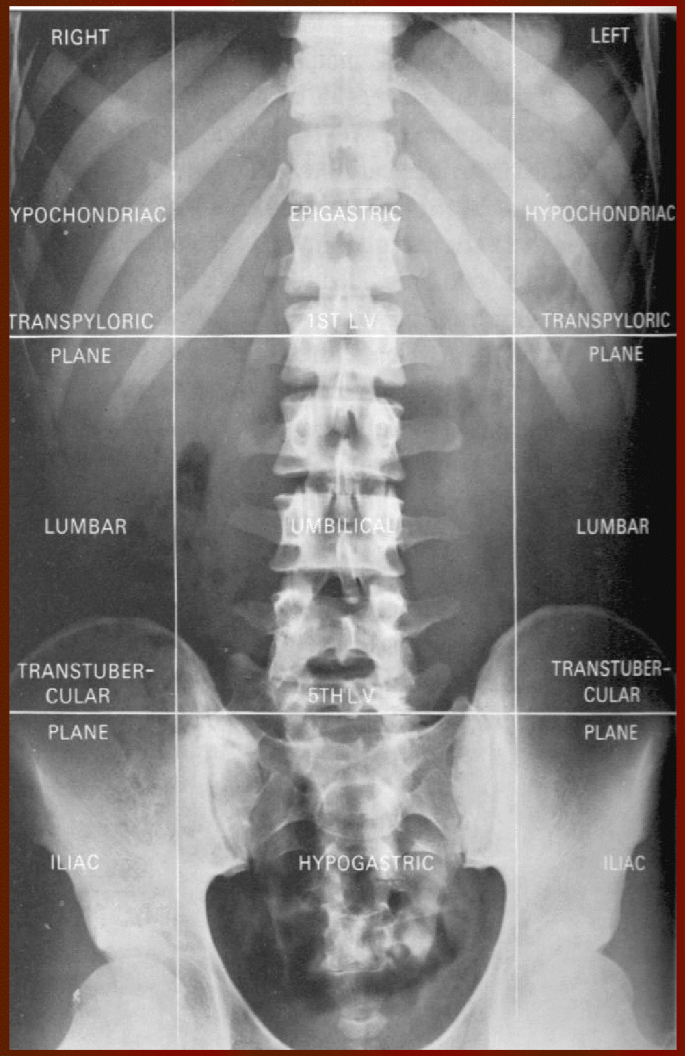
RIGHT
LEFT
YPOCHONDRIAC
EPIGASTRIC
HYPOCHONDRIAC
TRANSPYLORIC
1ST L.V.
TRANSPYLORIC
PLANE
PLANE
LUMBAR
UMBILICAL
LUMBAR
TRANSTUBER-
CULAR
5TH L.V.
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CULAR
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ILIAC
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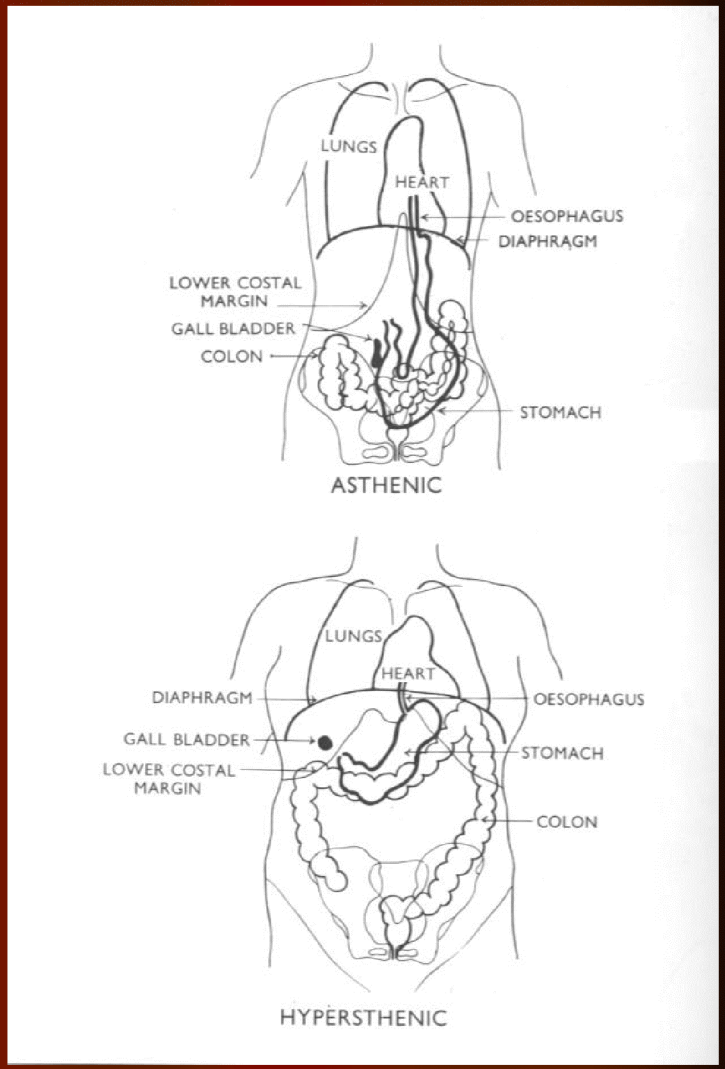
ILIAC


LUNGS
HEART
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DIAPHRAGM
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GALL BLADDER
COLON
STOMACH
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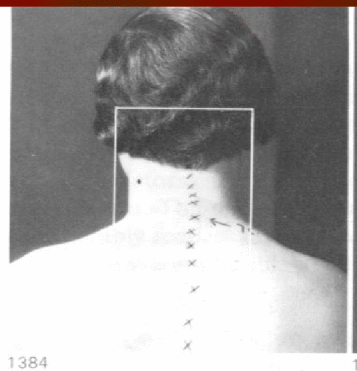
LUNGS
HEART
DIAPHRAGM
OESOPHAGUS
GALL BLADDER
STOMACH
LOWER COSTAL MARGIN
COLON
HYPERSTHENIC

fluid is taken for six hours before the examin
essentially similar to that described on the previo
films being taken during fluoroscopy.



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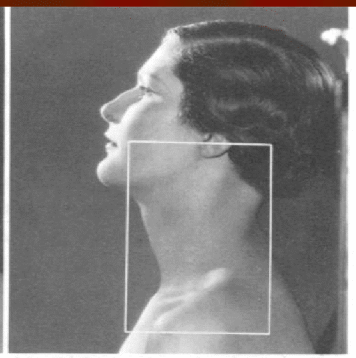

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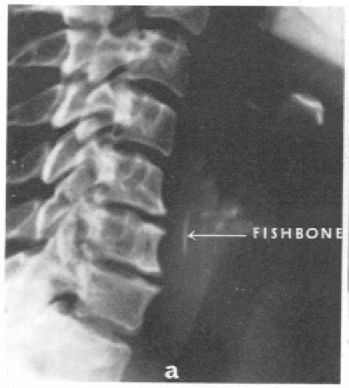
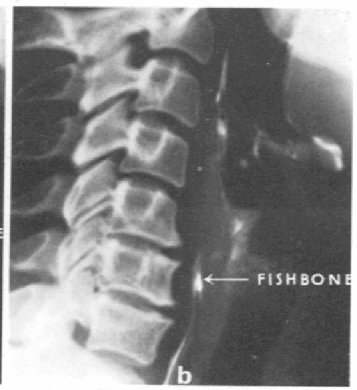


BEFORE OPAQUE SWALLOW

1386a



AFTER OPAQUE SWALLOW

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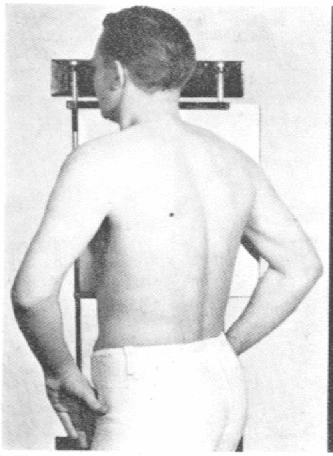

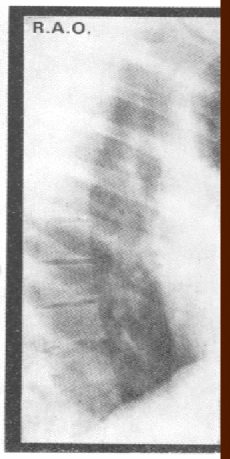

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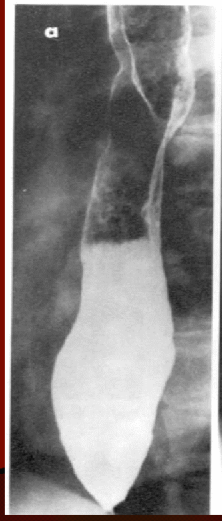
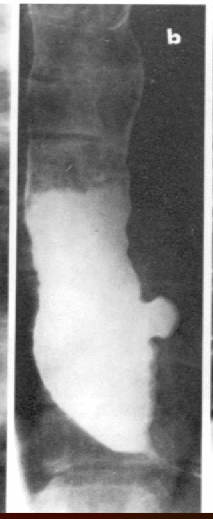
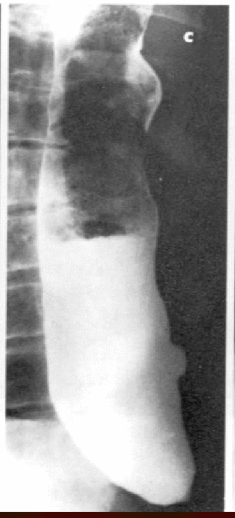
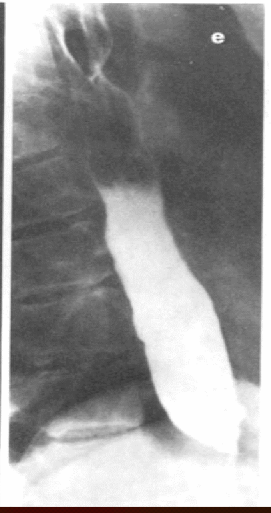








Pharynx, Larynx AP

AP PROJECTION

Radiographic studies of the pharyngolaryngeal structures are made during breathing, phonation, stress maneuvers, and swallowing. To minimize the incidence of motion, the shortest possible exposure time must be used in the examinations. For the purpose of obtaining improved contrast on the AP projections, use of a grid is recommended.

Center the IR at the level of or just below the laryngeal prominence. Extend the patient's head only enough to prevent the mandibular shadow from obscuring the laryngeal area.

Central ray

Perpendicular to the laryngeal prominence

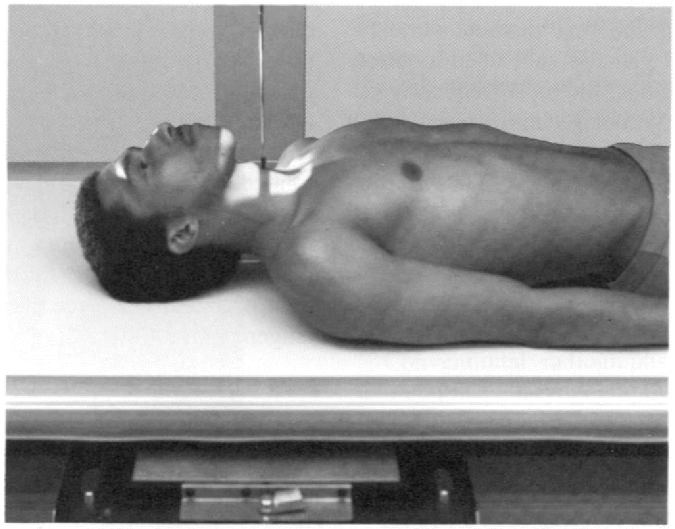


Fig. 15-28. Recumbent position for tomography.

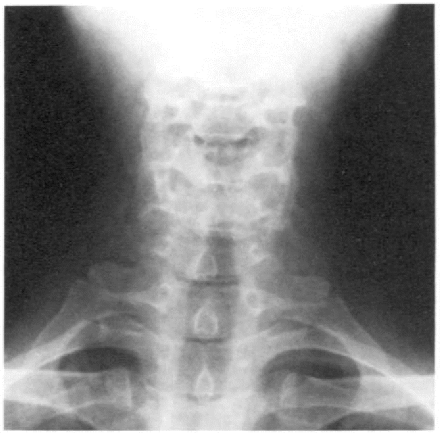


Fig. 15-29. Quiet breathing.

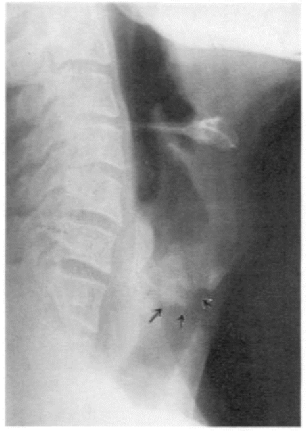


Fig. 15-30. Polypoid mass of right false hanging into subglottic larynx.

LATERAL PROJECTION

Adjust the patient so that the coronal plane that passes through or just anterior to the temporomandibular joints is centered to the midline of the IR.

Extend the patient's head slightly.

Immobilize the head by having the patient look at an object in line with the visual axis.

Central ray

Perpendicular to the IR, centering the IR (1) 1 inch (2.5 cm) below the level of the external acoustic (auditory) meatuses for demonstration of the nasopharynx and for cleft palate studies, (2)at the level of the mandibular angles for demonstration of the oropharynx, or (3) at the level of the laryngeal prominence for demonstration of the larynx, laryngeal pharynx, and upper end of the esophagus .

The studies of the pharyngolaryngeal structures are made during the inhalation phase of quiet nasal breathing to ensure filling the passages with air

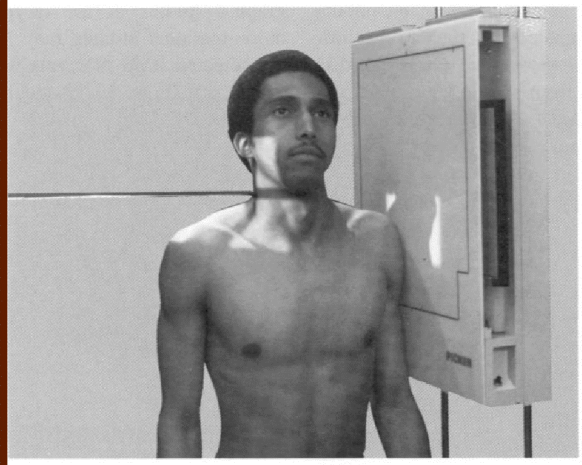


Fig. 15-34. Lateral.

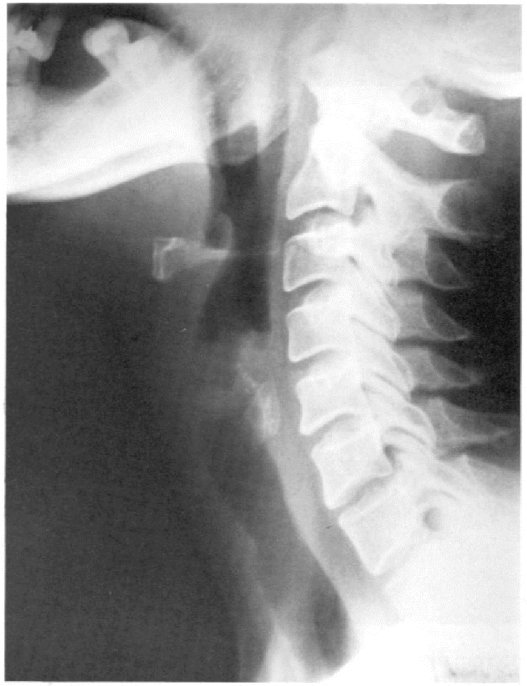


Fig. 15-35. Normal breathing.

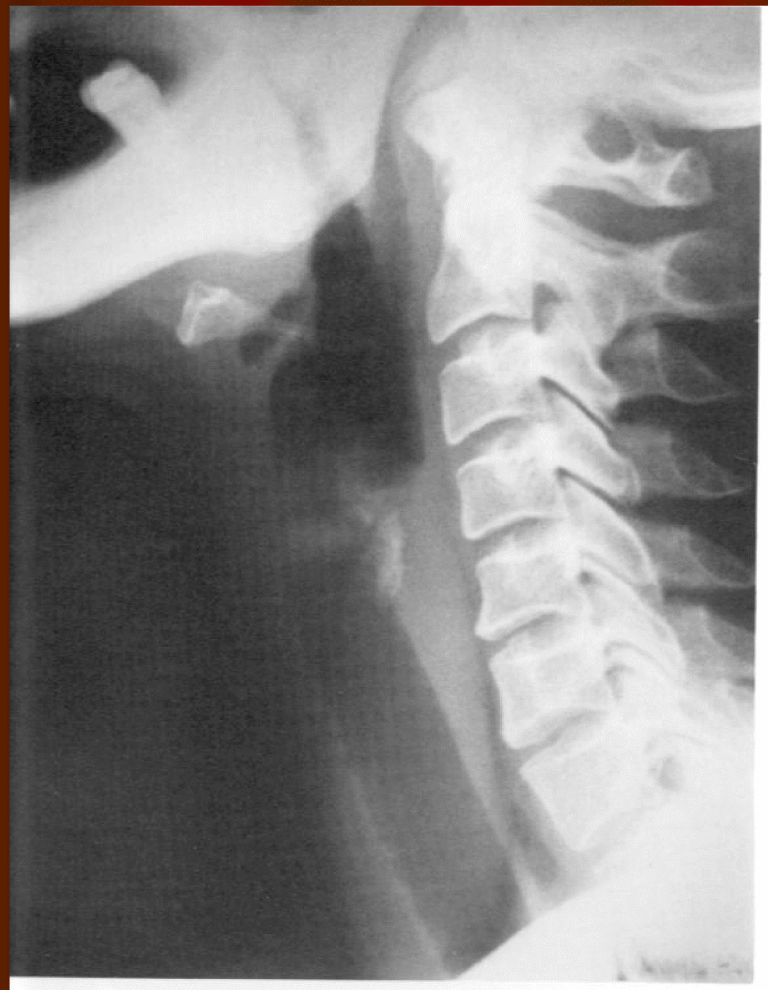


Fig. 15-36. Phonating "e-e-e."

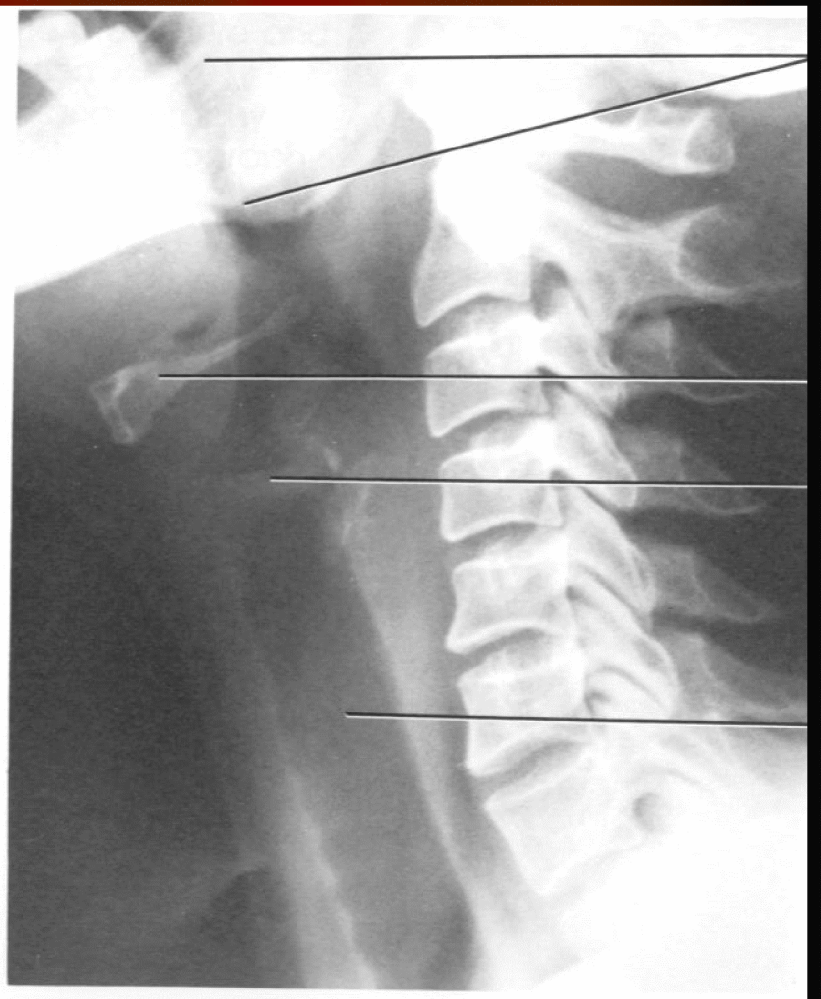


Fig. 15-37. Valsalva maneuver.

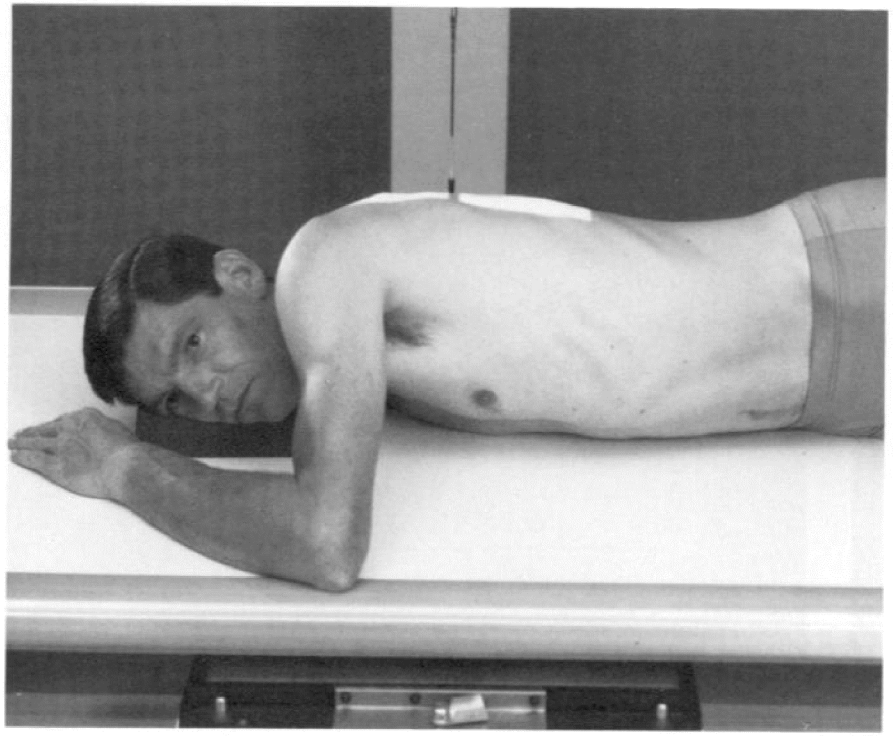


Fig. 17-20. RAO position (right PA oblique).

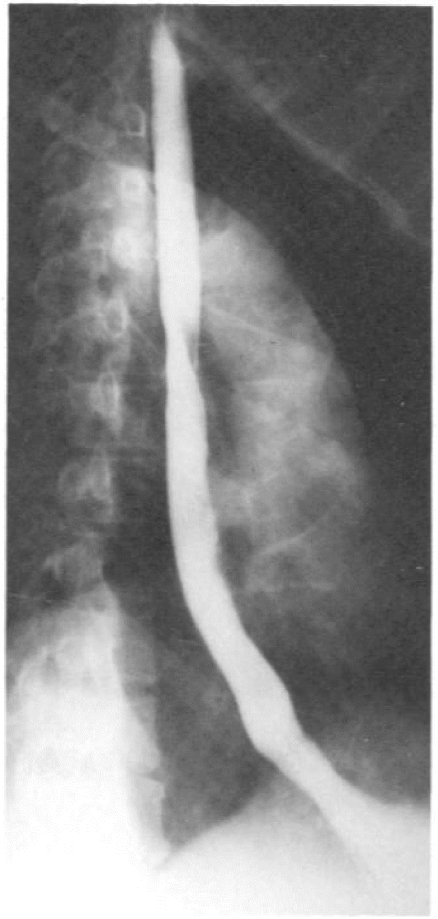


Fig. 17-21. Erect RAO position (right PA oblique).

Esophagus

- **Position of patient**
- Position the patient as for chest radiographs (AP, PA, oblique, and lateral. Because the RAO position of 35 to 40 degrees makes it possible to obtain a wider space for an unobstructed image of the esophagus between the vertebrae and the heart, it is usually used in preference to the LAO position.
- RAO or LPO position
- The steps are as follows:
- Position the patient in the RAO or LPO position with the midsagittal plane forming an angle of 35 to 40 degrees from the grid device.
- Adjust the patient's arms in a comfortable position with the shoulders lying in the same plane.
- Center the elevated side to the grid through a plane approximately 2 inches (5 cm) lateral to the midsagital plane
- **Central ray**
- Perpendicular to the midpoint of the IR (the central ray will be at the level of T5-T6)
-

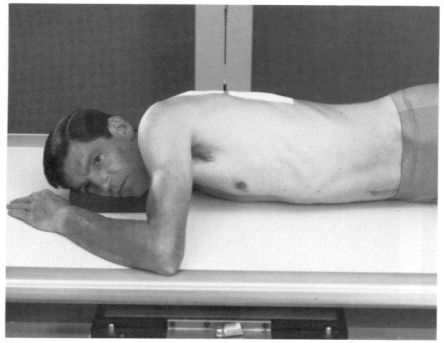


Fig. 17-20. RAO position (right PA oblique).

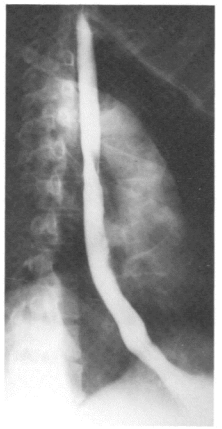
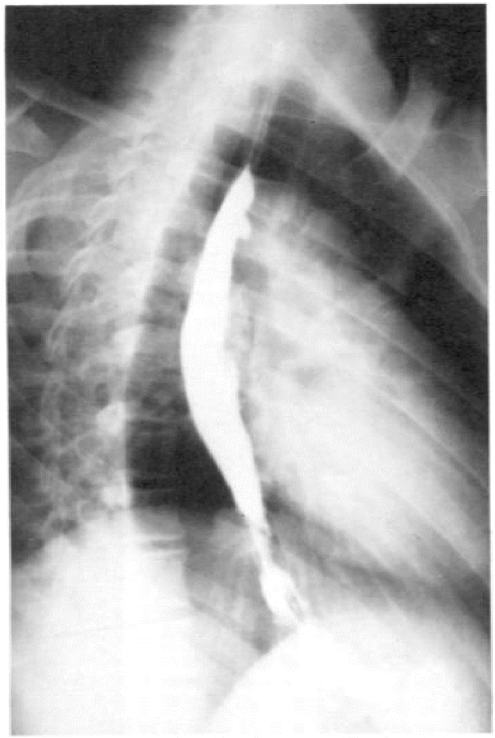


Fig. 17-21. Erect RAO position (right PA oblique).



-18. RAO single-constrast esophagus radiograph.

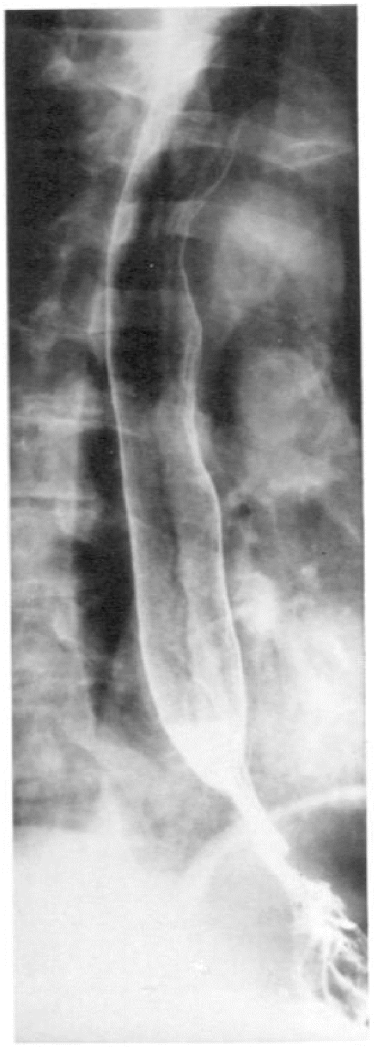


Fig. 17-19. RAO double-constrast disto
esophagus fluoroscopic spot-radiogra
(Courtesy Deborah Saunders, R.T.)

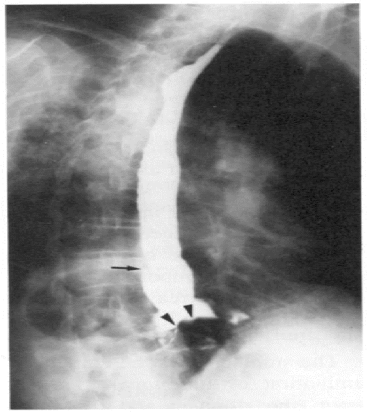


Fig. 17-22. RAO single-contrast esophagus radiograph showing tear in esophageal lumen *(arrow)* and lesion partially obstructing esophagus *(arrowheads)*.

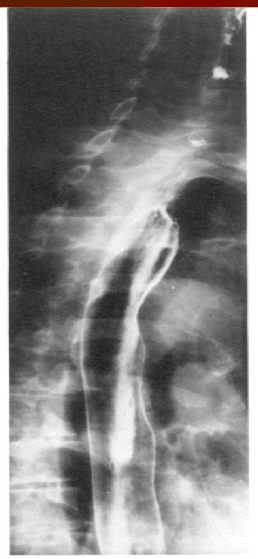


Fig. 17-23. RAO double-contrast pr
esophagus fluoroscopic spot-radiog

(Courtesy Deborah Saunders, R.T.)

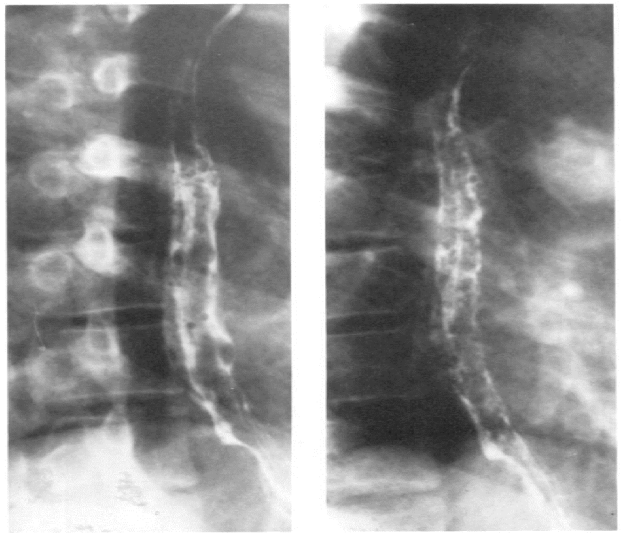
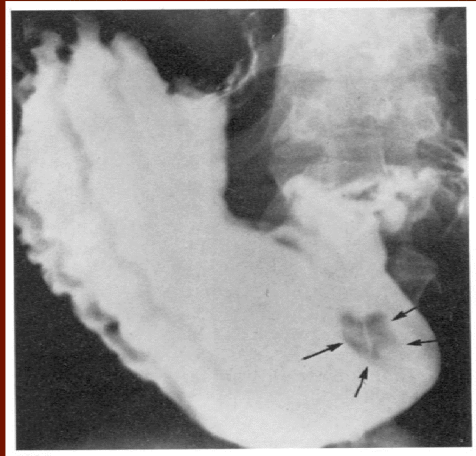


Fig. 17-24. Spot-radiograph studies showing esophageal varices.

(Courtesy Dr. Robert L. Pinck.)



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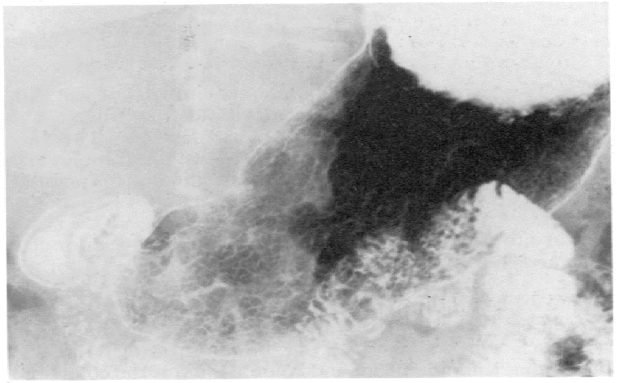

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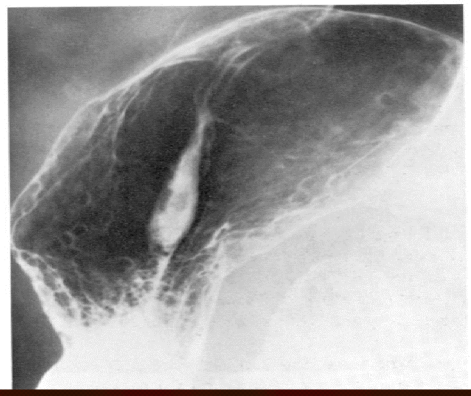
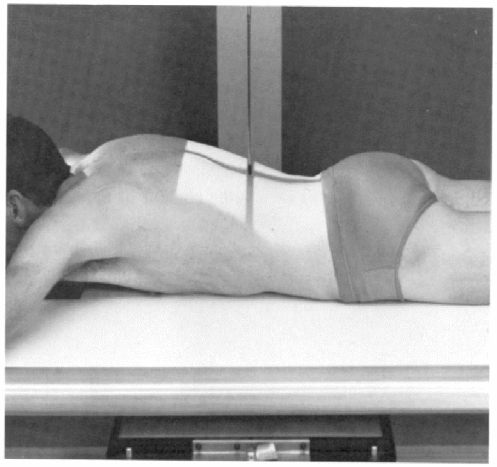


PA PROJECTION

- Adjust the patient's position, either recumbent or upright, so that the midline of the grid coincides with a sagittal plane passing halfway between the vertebral column and the left lateral border of the abdomen
- Center the IR about 1-2 inches above the lower rib margin at the level of LI-L2 when the patient is prone. For upright images, center the IR 3 to 6 inches (7.6 to 15 cm) lower than LI-L2.
- *Respiration:* Suspend at the end of expiration unless otherwise requested.
- The following should clearly be demon-strated:
- Entire stomach and duodenal loop
- Stomach centered at the level of the pylorus.
- No rotation of the patient
- Exposure technique that demonstrates the anatomy



and because it interferes with the e
ing and filling of the duodenal
which is important in serial studies.
Respiration is suspended at the e
exhalation unless otherwise requeste

Central ray

Direct the central ray perpendicu
to the midpoint of the cassette a
level of L2.

Fig. 17-31. PA.

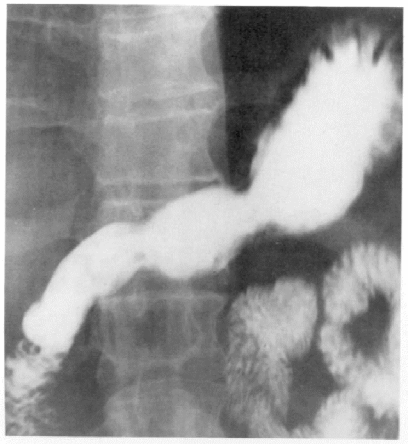


Fig. 17-32. Single-contrast PA projection.

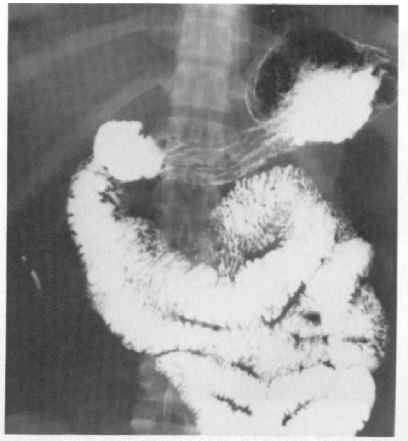


Fig. 17-33. Double-contrast PA projection.

(Courtesy Sharon Peterson, R.T.)

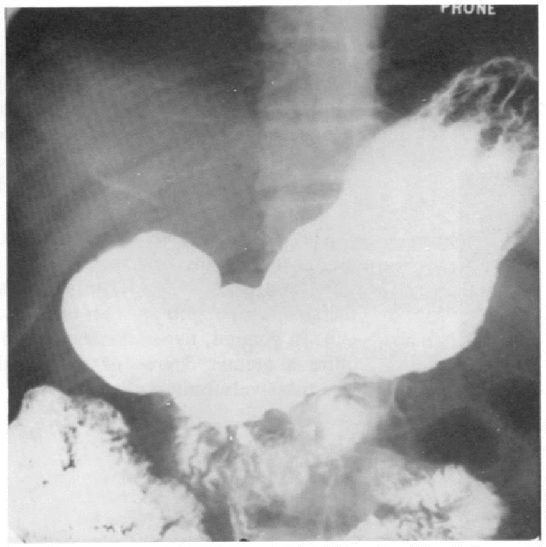


Fig. 17-34. Hypersthenic patient.

(Courtesy Dr. Francis H. Ghiselin.)

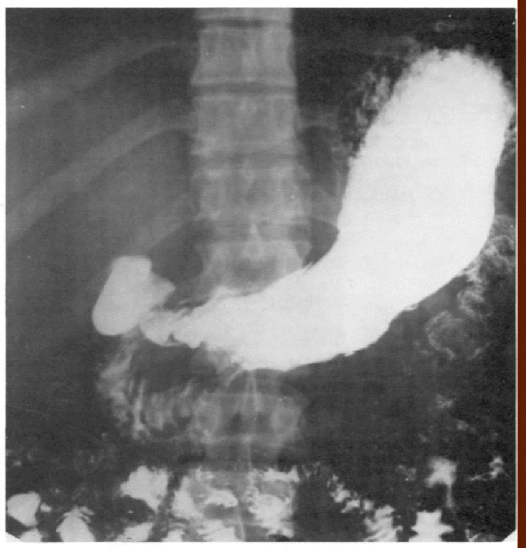


Fig. 17-35. Sthenic patient.

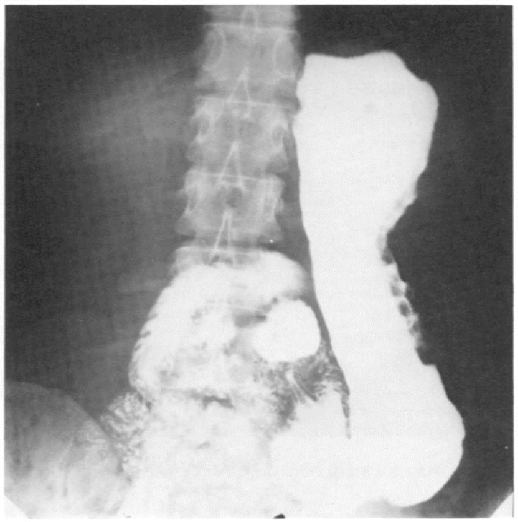


Fig. 17-36. Hyposthenic patient.

(Courtesy Dr. Francis H. Ghiselin.)

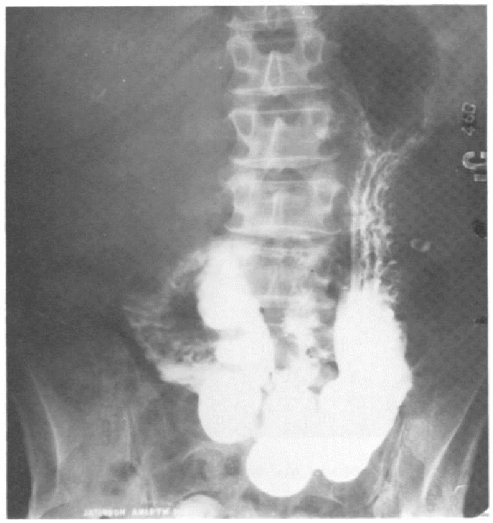


Fig. 17-37. Asthenic patient.

(Courtesy Dr. Marcy L. Sussman.)

PA AXIAL PROJECTION

- Place the patient in the prone position
- For the sthenic patient, center the IR at the level of L2
- Directed to the midpoint of the IR at an angle of 35 to 45 degrees cephalad.

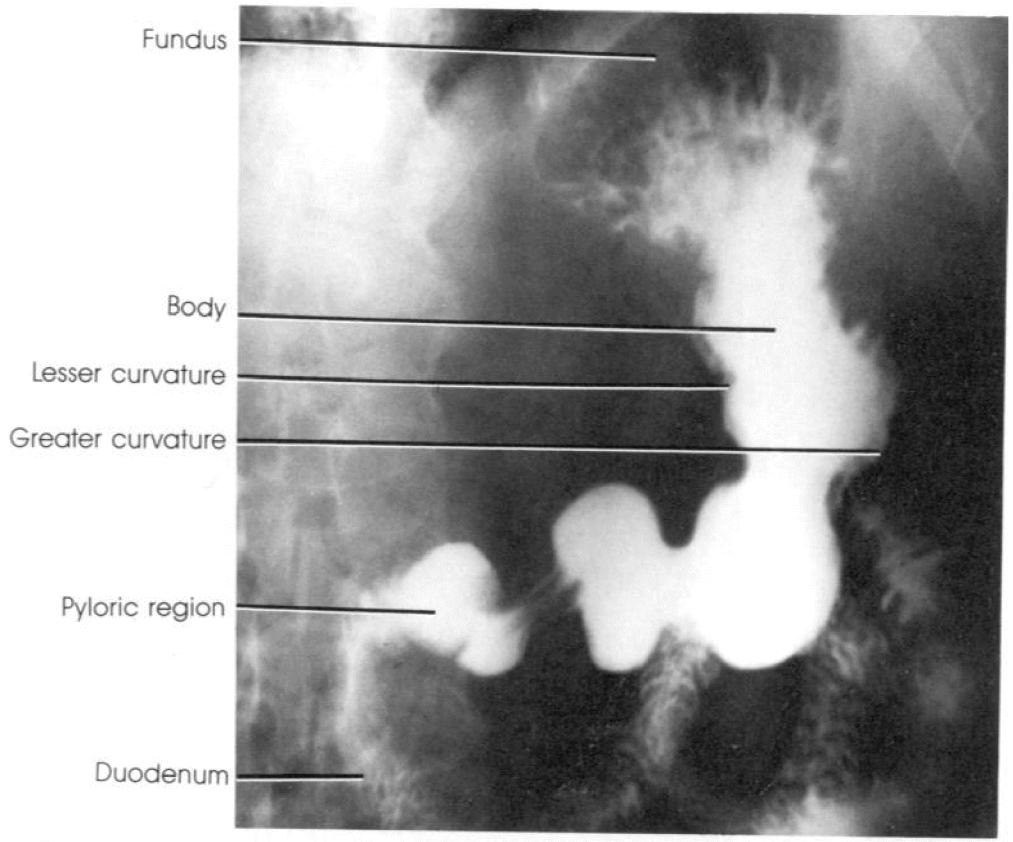


Fig. 17-38. PA axial position on same patient as in Fig. 17-32.

(Courtesy Dr. Sewell S. Gordon.)

PA OBLIQUE PROJECTION

RAO position

- Have the patient raise his or her left side and support the body on the left forearm and flexed left knee. Make the final adjustment in body rotation. The approximately 40 to 70 de-grees of rotation required to give the best image of the pyloric canal and duodenum depend on the size, shape, and position of the stomach.
- Center the IR about 1 to 2 inches above the lower rib margin at the level of L I - L2 when the patient is prone.
- The RAO position is used for serial studies of the pyloric canal and the duodenal bulb because gastric peristalsis is usually more active when the patient is in this position.

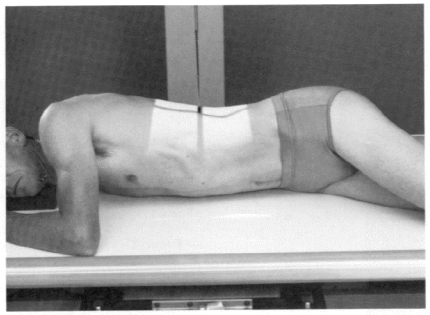


Fig. 17-39. RAO (right PA oblique).

17-41).

Evaluation criteria

- Entire stomach and duodenal should be included.
- Pylorus and duodenal bulb shoulc be superimposed.
- Duodenal bulb and loop should b sualized in profile.
- Stomach should be centered at level of the pylorus.
- Exposure must penetrate the bariu

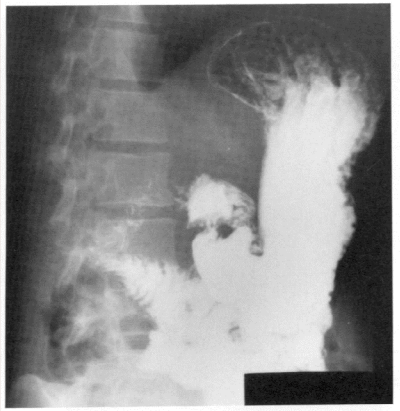


Fig. 17-40. Single-contrast RAO position (right PA oblique).

(Courtesy Timothy Hill, R.T.)

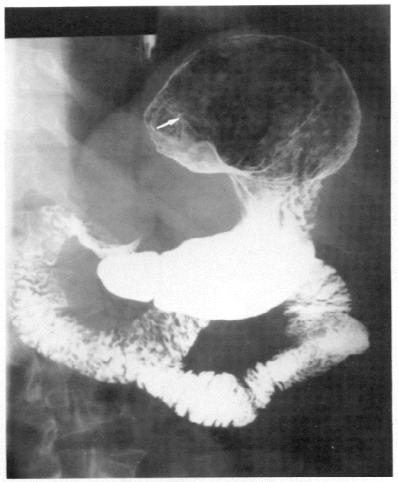


Fig. 17-41. Double-contrast RAO position (right PA oblique). Note esophagus entering stomach *(arrow).*

(Courtesy Betsy Delzeith, R.T.)

AP OBLIQUE PROJECTION

LPO position

➢Have the patient turn toward the left, resting on the left posterior body surface. Flex the patient's right knee, and rotate the knee toward the left for support. Place a positioning sponge against the patient's elevated back for immobilization. An average angle of 45 degrees should be sufficient for the sthenic patient, but the degree of angulation can vary from 30 to 60 degrees.

➢Adjust the center of the IR at the level of the body of the stomach. The centering will be at a point midway between the xiphoid process and the lower margin of the ribs

➢The AP oblique projection demonstrates the fundic portion of the stomach

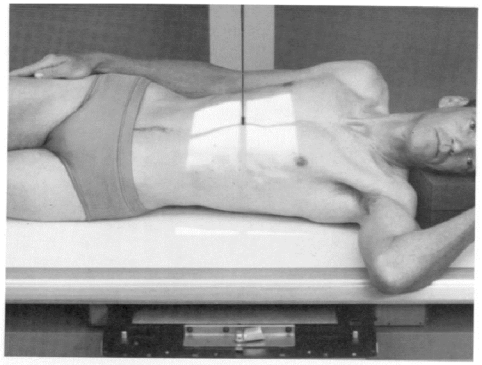


Fig. 17-42. LPO (left AP oblique).

ium as they are in the oppos
plementary position (the R
[right PA oblique], as previ
Figs. 17-39 to 17-41).

Evaluation criteria

- Entire stomach and du should be included.
- Fundic portion of stomach cluded and clearly demons
- Pylorus and duodenal bull be superimposed.
- Body of the stomach sho tered to the radiograph.
- Exposure must penetrate th
- Body and pylorus should strated with double-contra tion.

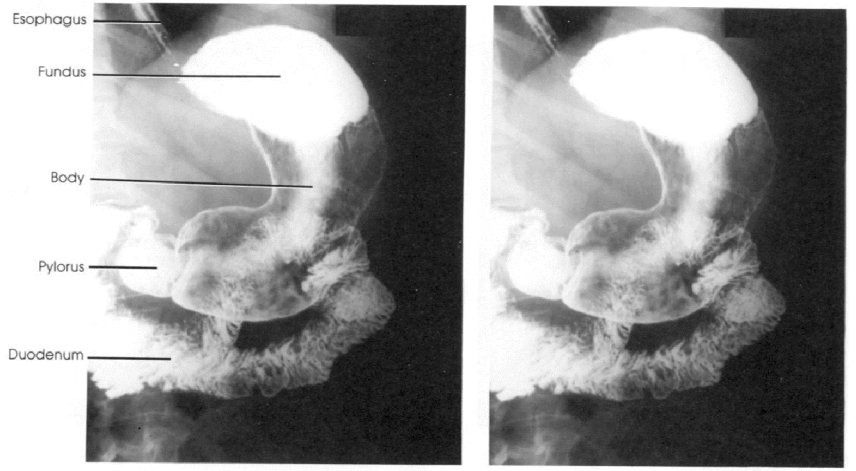


Fig. 17-43. Double-contrast LPO (left AP oblique).

(Courtesy Betsy Delzeith, R.T.)

LATERAL PROJECTION

- Place the patient in the *upright leftlateral position* for demonstration of the left retrogastric space and in the *recumbent right-lateral position* for demonstration of the right retrogastric space, duodenal loop, and duodenojejunal junction.
- adjust the body so that a plane passing midway between the midcoronal plane and the anterior surface of the abdomen coincides with the midline of the grid.
- Center the IR at the level of L 1-L2 for the recumbent position (about 1-2 inches above the lower rib margin) and at L3 for the upright position

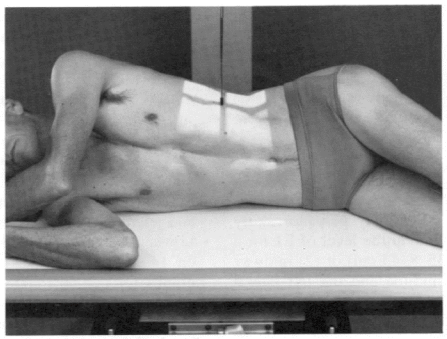


Fig. 17-44. Right lateral .

Structures shown

A lateral position shows the anterior and posterior aspects of the stomach, the pyloric canal, and the duodenal bulb (Figs. 17-45 and 17-46). The right lateral position frequently affords the best image of the pyloric canal and the duodenal bulb in patients of hypersthenic habitus.

Evaluation criteria

- Entire stomach and duodenal loop should be included.
- Vertebrae should demonstrate that the patient is not rotated.
- Stomach should be centered at the level of the pylorus.
- Exposure must penetrate the barium.

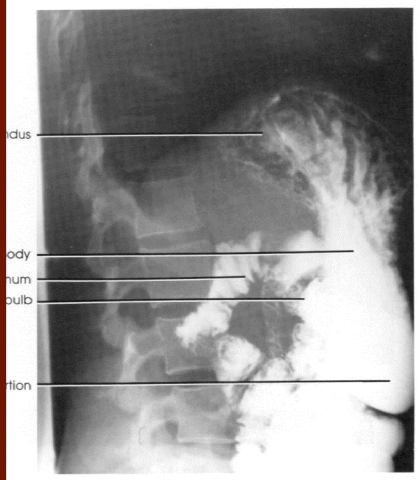


Fig. 17-45. Single-contrast right lateral position.
(Courtesy Timothy Hill, R.T.)

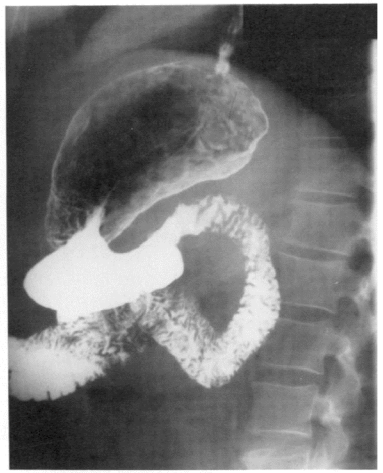


Fig. 17-46. Double-contrast right lateral position.
(Courtesy Betsy Delzeith, R.T.)

WOLF METHOD

- The Wolf method requires the use of a semicylindrical radiolucent compression device measuring 22 inches (55 cm) in length, 10 inches (24 cm) in width, and 8 inches (20 cm) in height.
- Place the compression device horizon-tally under the abdomen and just below the costal margin.
  Adjust the patient in a 40- to 45-degree RAO position, with the thorax centered to the midline of the grid.
- Instruct the patient to ingest the barium suspension in rapid, continuous swallows.
- Perpendicular to the long axis of the patient's back and centered at the level of either T6 or T7. This position usually results in a 10 to 20 degree caudad angulation of the central ray.
- The Wolf method demonstrates the relationship of the stomach to the diaphragm and is useful in diagnosing a hiatal hernia

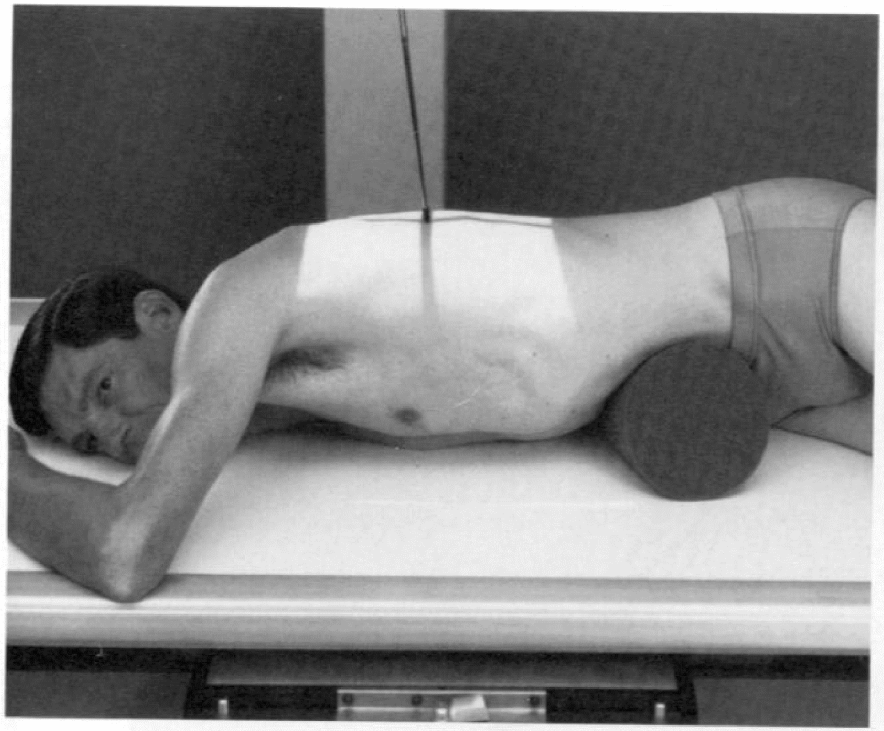
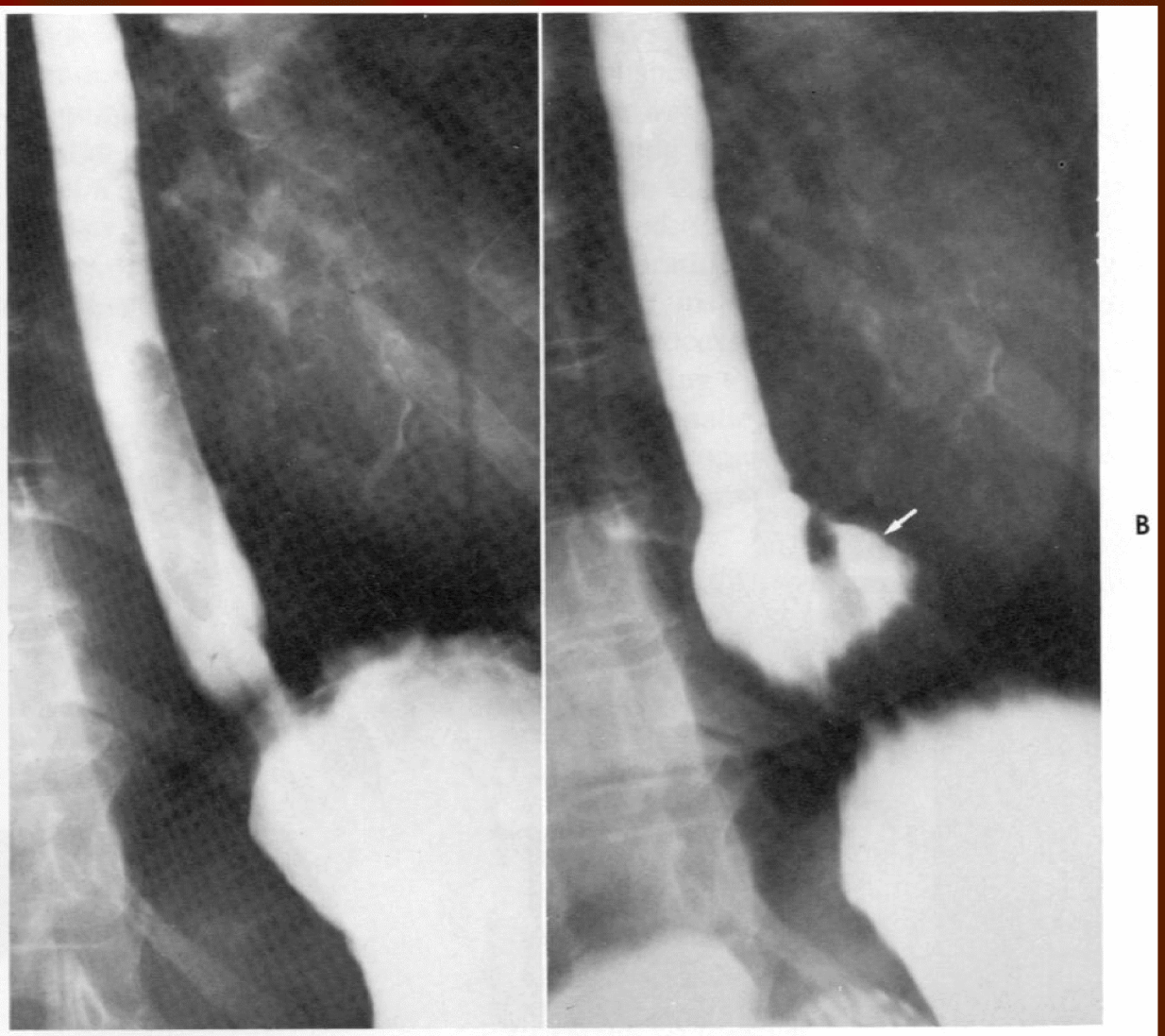


Fig. 17-53. RAO (right PA oblique) with compression sponge.



g. 17-54. Comparison RAO positions on one patient. **A,** Without abdominal compression; evidence of hernia. **B,** With abdominal compression; large sliding hernia obvious *(arrow)*

ourtesy Dr. Bernard S. Wolf.)

PA OR AP PROJECTION

- Adjust the patient so that the midsagittal plane is centered to the grid.
For the sthenic patient, center the IR at the level of L2 for radiographs taken within 30 minutes after the contrast medium is administered. For delayed radiographs, center the IR at the level of the iliac crests.

- Perpendicular to the midpoint of the IR (L2) for early radiographs or at the level of the iliac crests for delayed sequence exposures

- When the barium has reached the ileocecal region, fluoroscopy may be performed and compression radiographs obtained (Fig. 17-66).
- The examination is usually completed when the barium is visualized in the cecum.

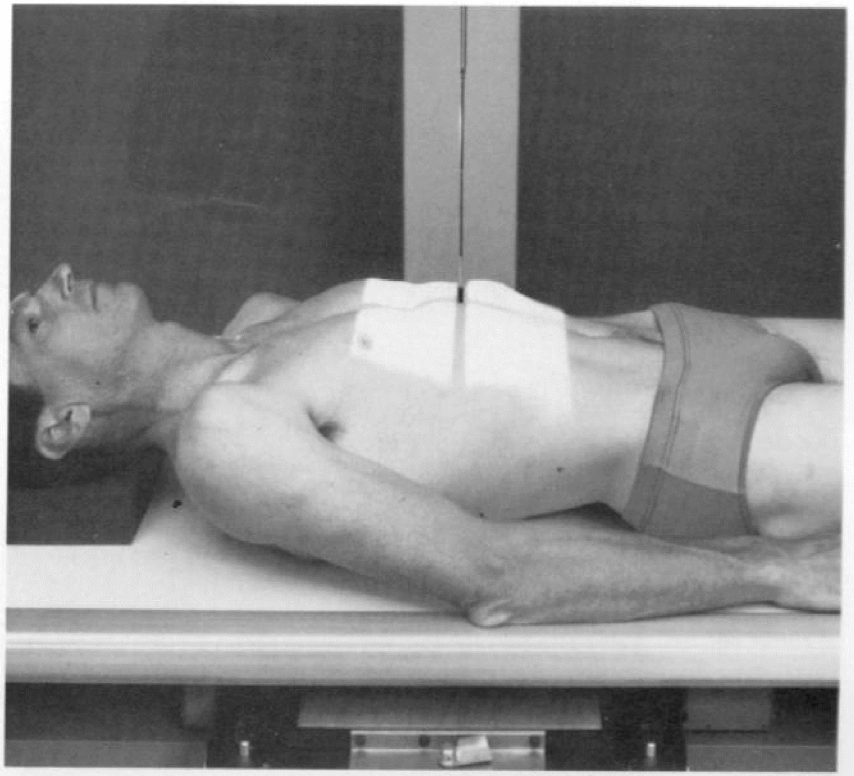


Fig. 17-48. AP.

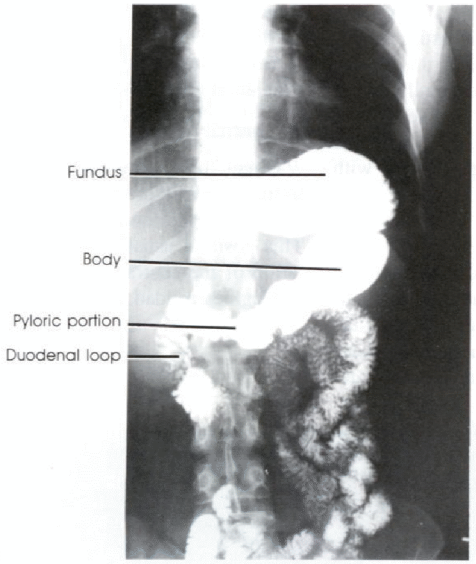


Fig. 17-49. AP projection.

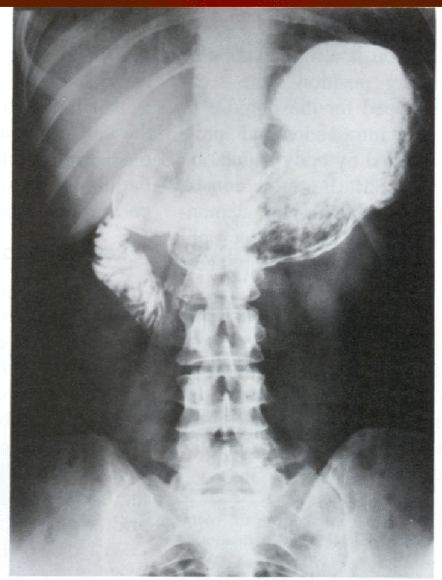


Fig. 17-50. AP projection.

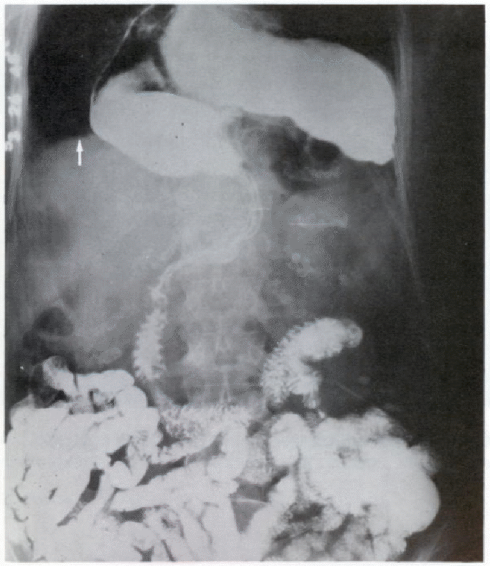


Fig. 17-51. AP projection showing hiatal hernia above the level of the diaphragm *(arrow)*.

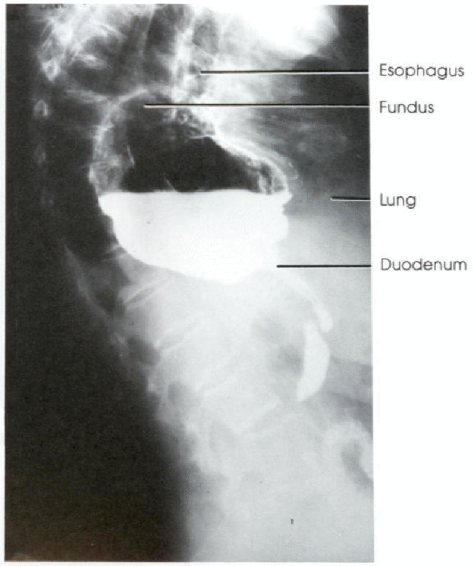
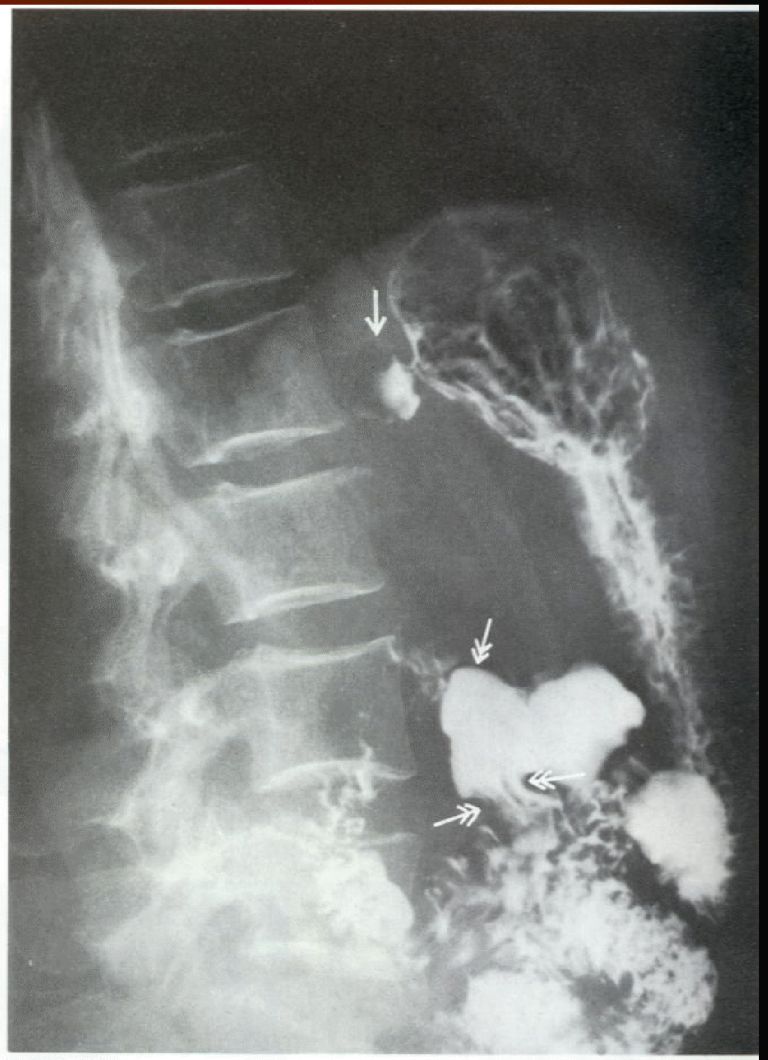


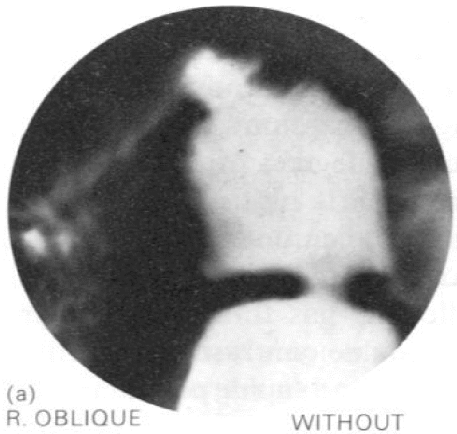
Fig. 17-52. Upright lateral position showing hiatal hernia.

POSTERO-ANTERIOR
1409



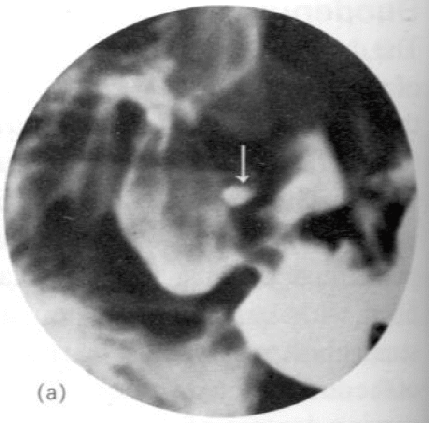
LATERAL
1410

Radiograph (1409) is a postero-anterior overcouch view of the stomach and duodenum showing a duodenal diverticulum (arrow) and (1410) is a right lateral view in the same patient.

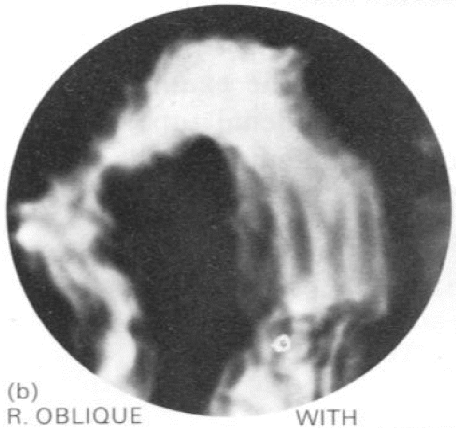


(a)
R. OBLIQUE

WITHOUT
COMPRESSION

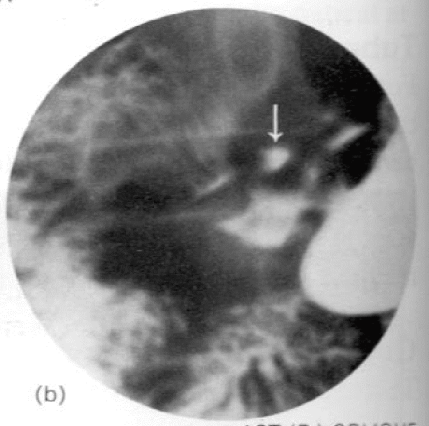


(a)
1ST (R.) OBLIQUE

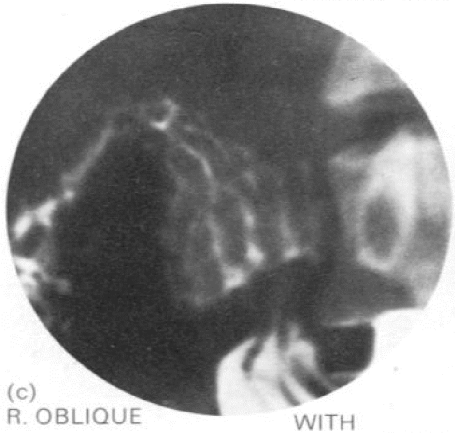


(b)
R. OBLIQUE

WITH
COMPRESSION

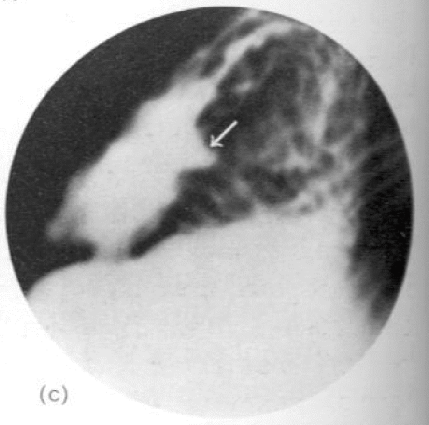


(b)
1ST (R.) OBLIQUE



(c)
R. OBLIQUE

WITH
COMPRESSION



(c)
2ND (L.) OBLIQUE

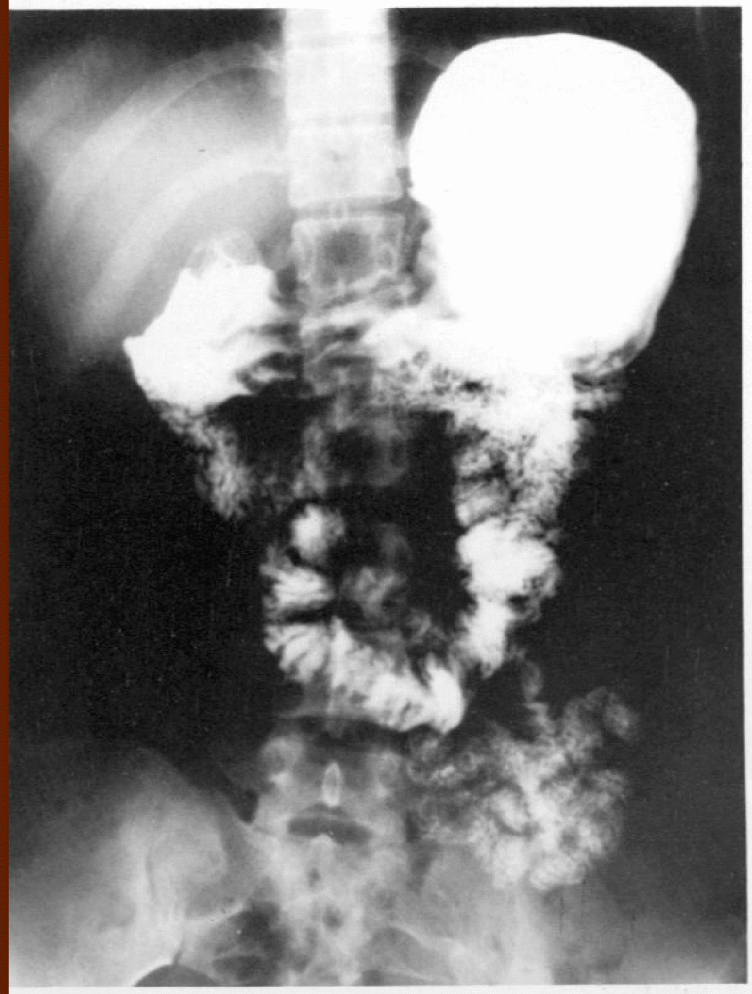


Fig. 17-58. Immediate radiograph.

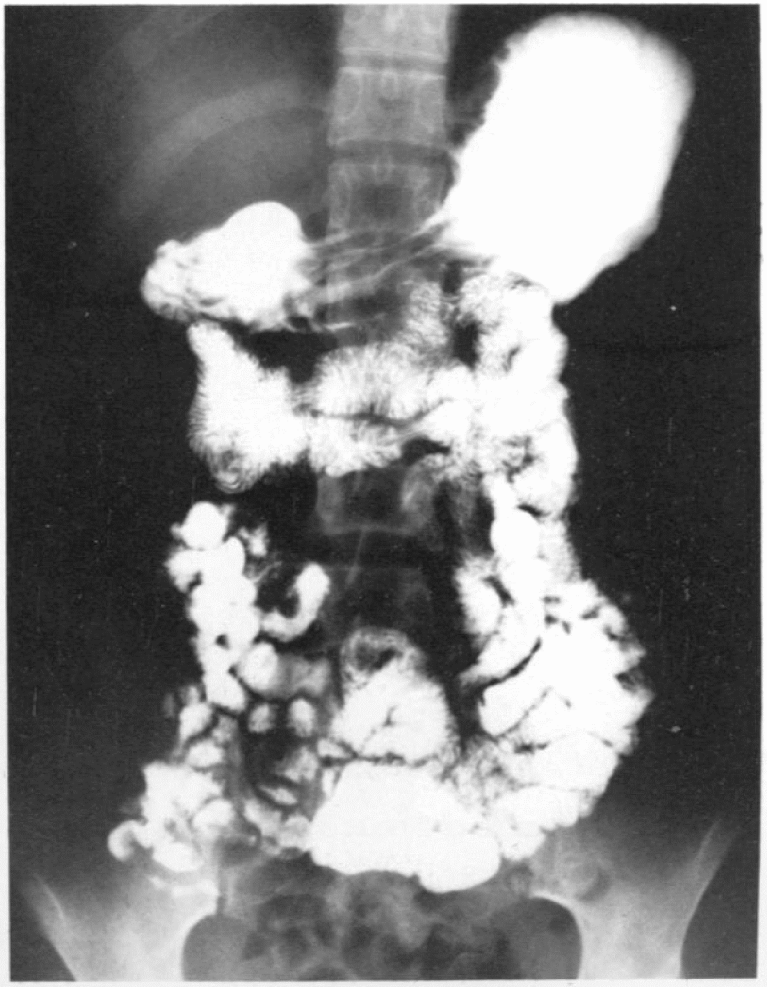


Fig. 17-59. Exposure at 15 minutes.

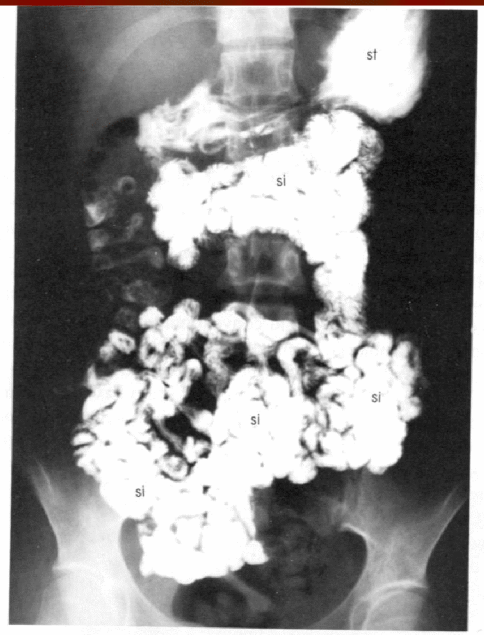


Fig. 17-60. Exposure at 30 minutes showing stomach *(st)* and small intestine *(si)*.

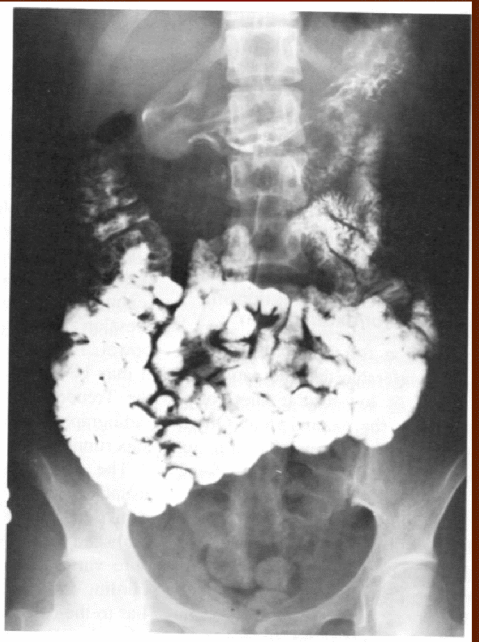


Fig. 17-61. Exposure at 1 hour.

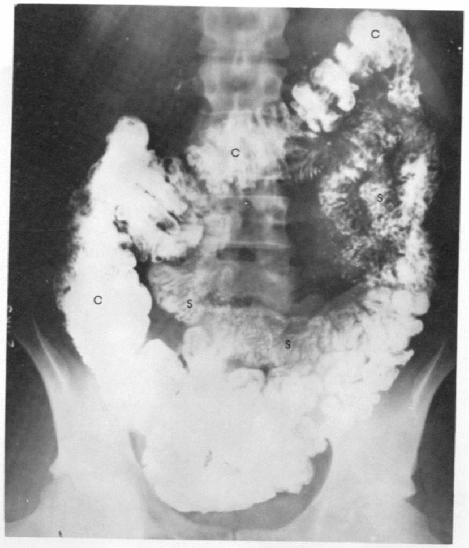


Fig. 17-62. Exposure at 2 hours showing small intestine *(s)* and colon *(c)*.

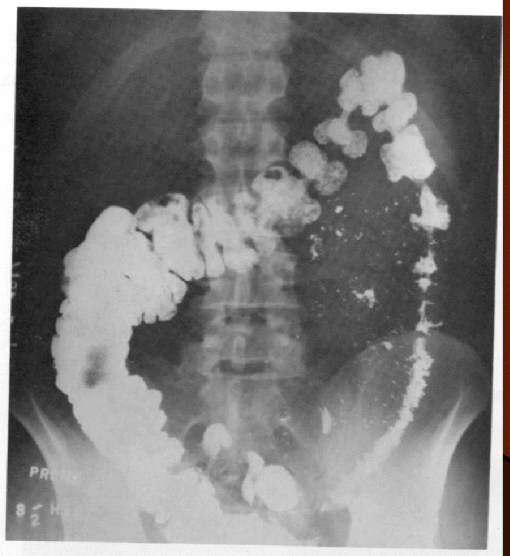


Fig. 17-63. Exposure at 3½ hours with barium in colon.

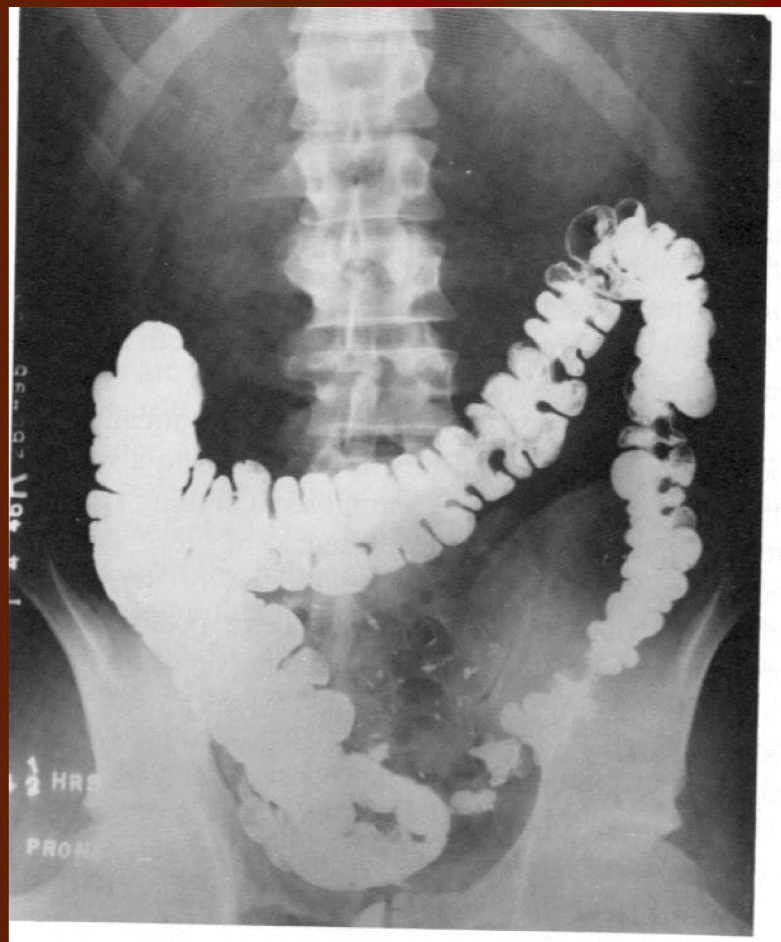


Fig. 17-64. Exposure at 4½ hours.

(Courtesy Dr. Francis H. Ghiselin.)

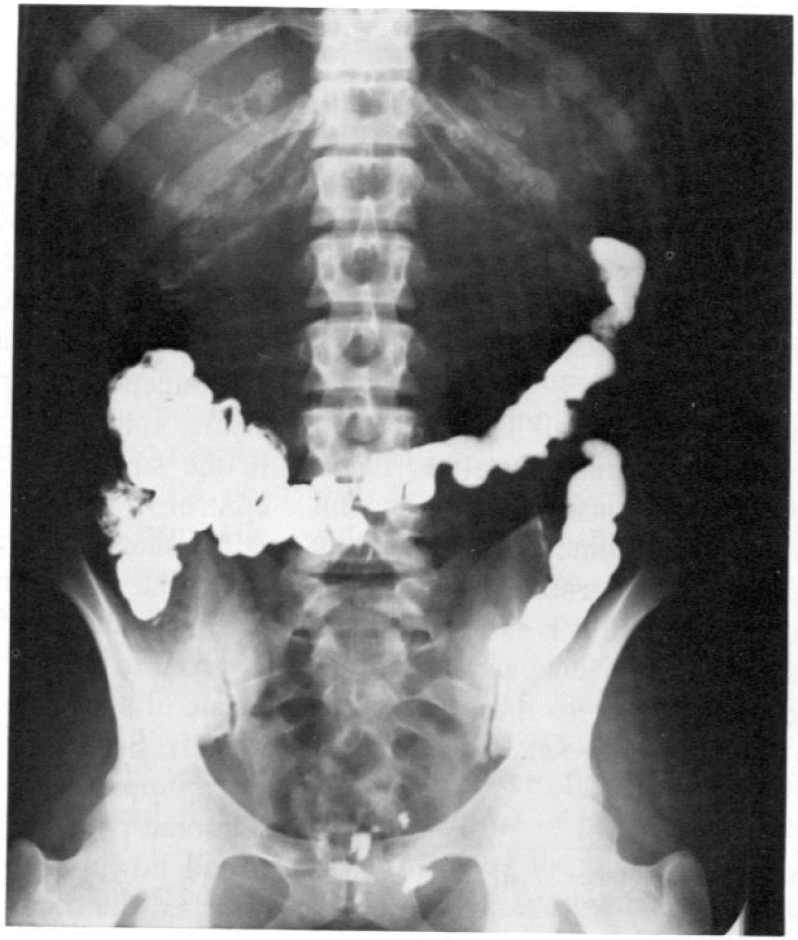


Fig. 17-65. Exposure at 24 hours.

(Courtesy Dr. William H. Shehadi.)

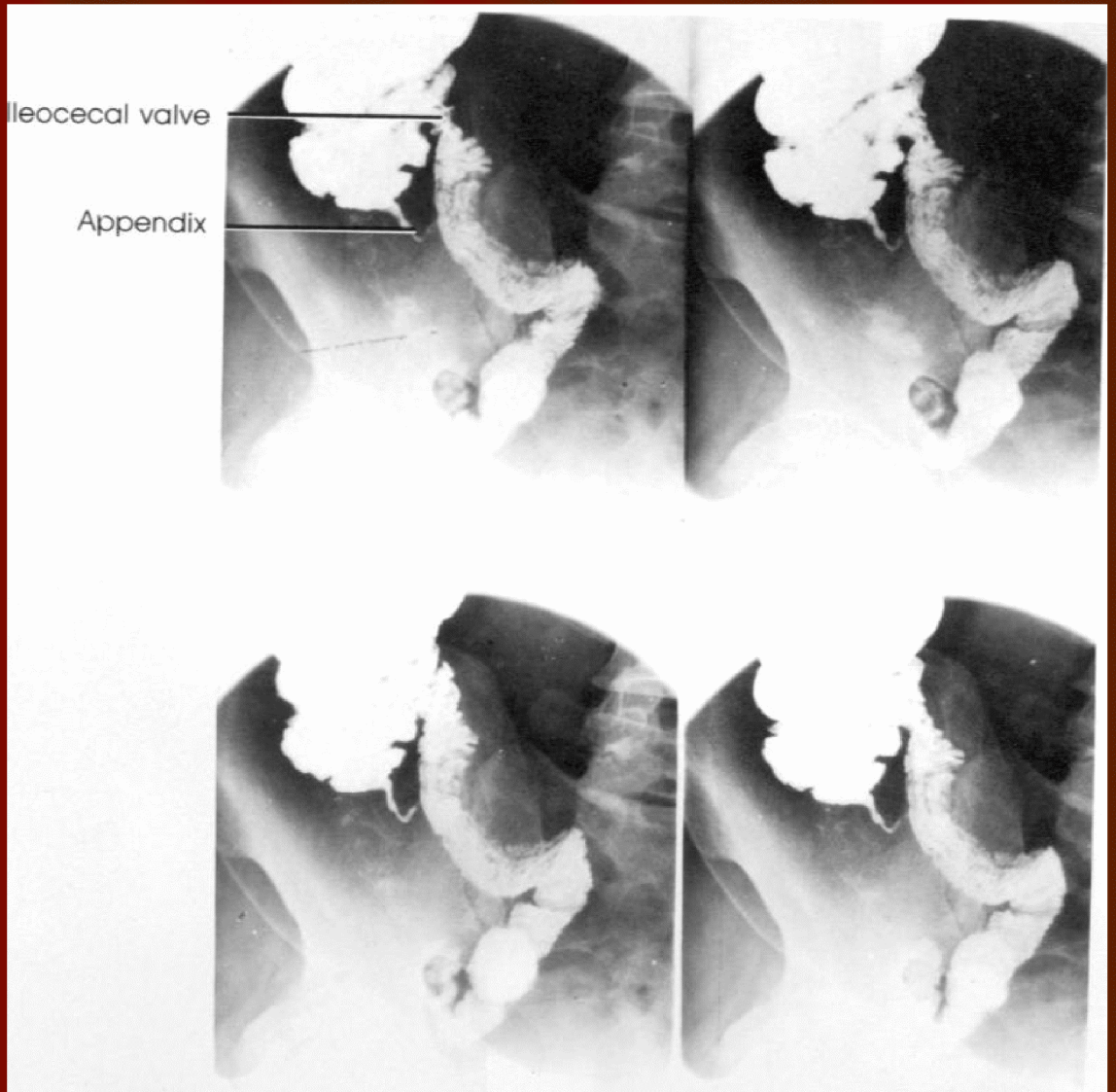
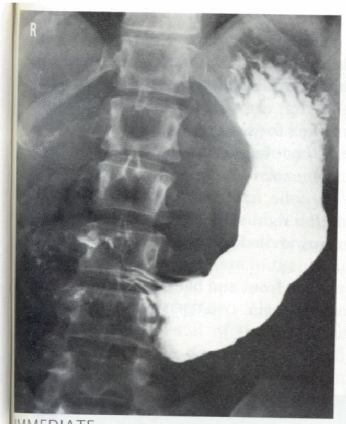
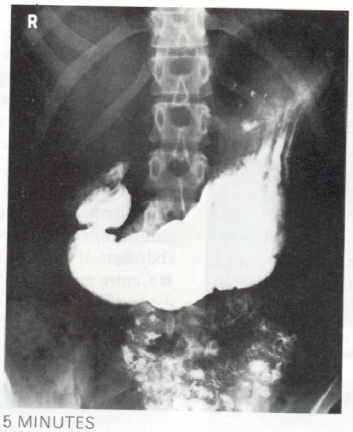


Fig. 17-66. Ileocecal studies.

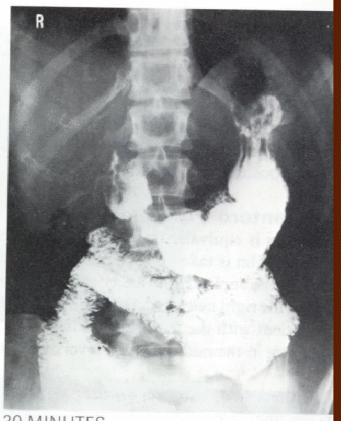
(Courtesy Dr. Marcy L. Sussman.)



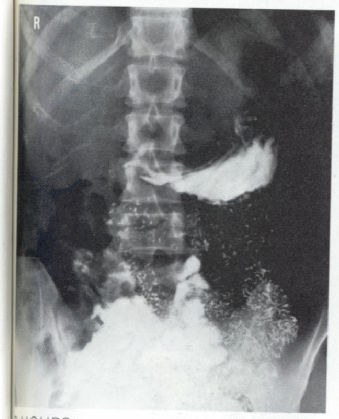
IMMEDIATE
1400



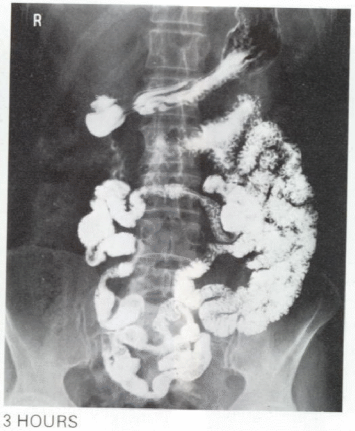
5 MINUTES
1401



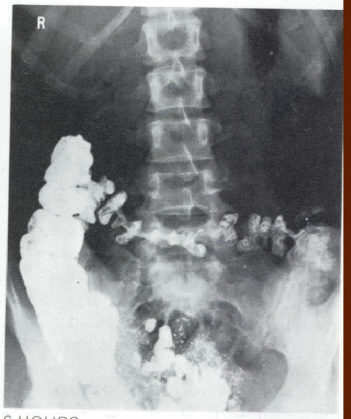
20 MINUTES
1402



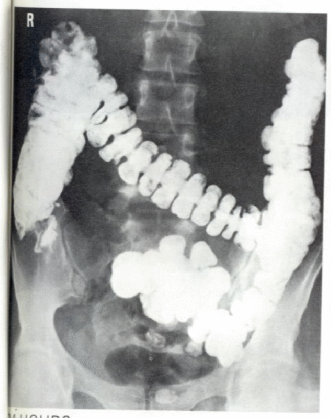
2 HOURS
1403



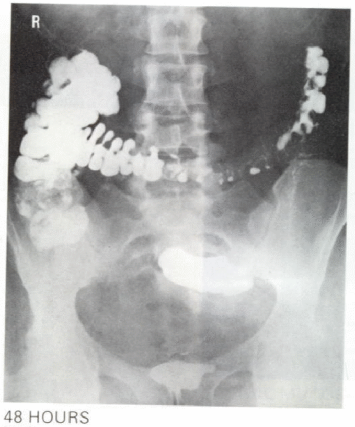
3 HOURS
1404



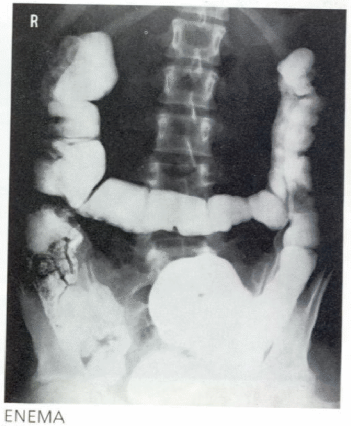
6 HOURS
1405



24 HOURS
1406



48 HOURS
1407



ENEMA
1408

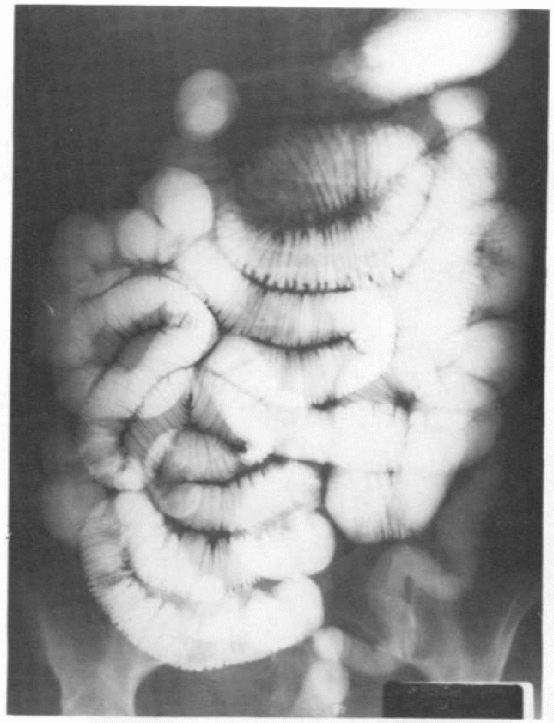


Fig. 17-67. Normal retrograde small bowel.

(Courtesy Dr. Roscoe E. Miller.)

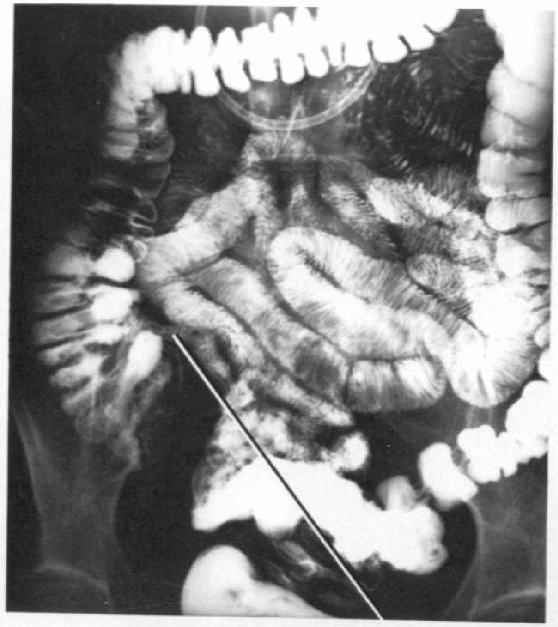


Fig. 17-68. Enteroclysis with barium visualized in colon.

(Courtesy Dr. Roscoe E. Miller.)

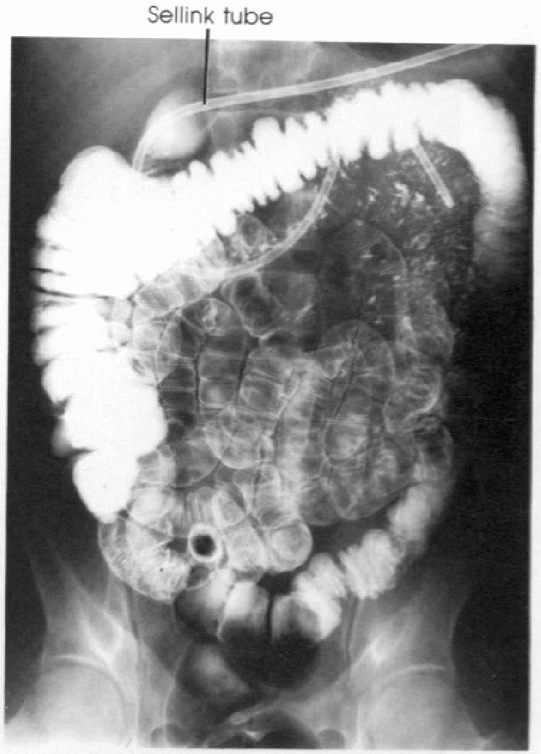


Fig. 17-69. Air-contrast enteroclysis.

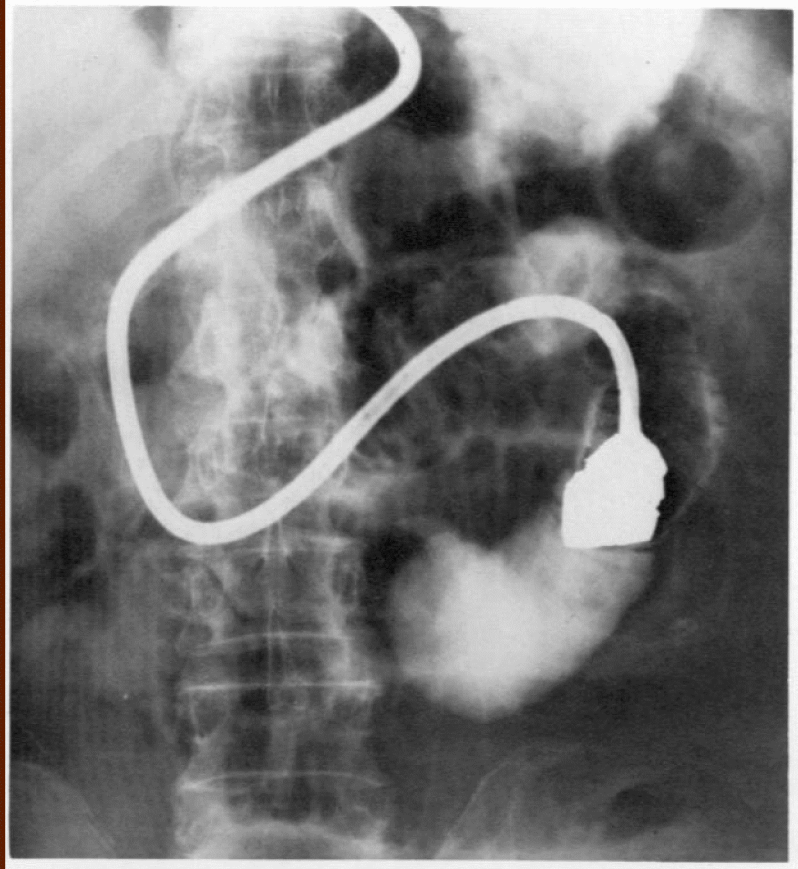


Fig. 17-70. Miller-Abbott (M-A) tube study with water-soluble medium.

(Courtesy Dr. William H. Shehadi.)

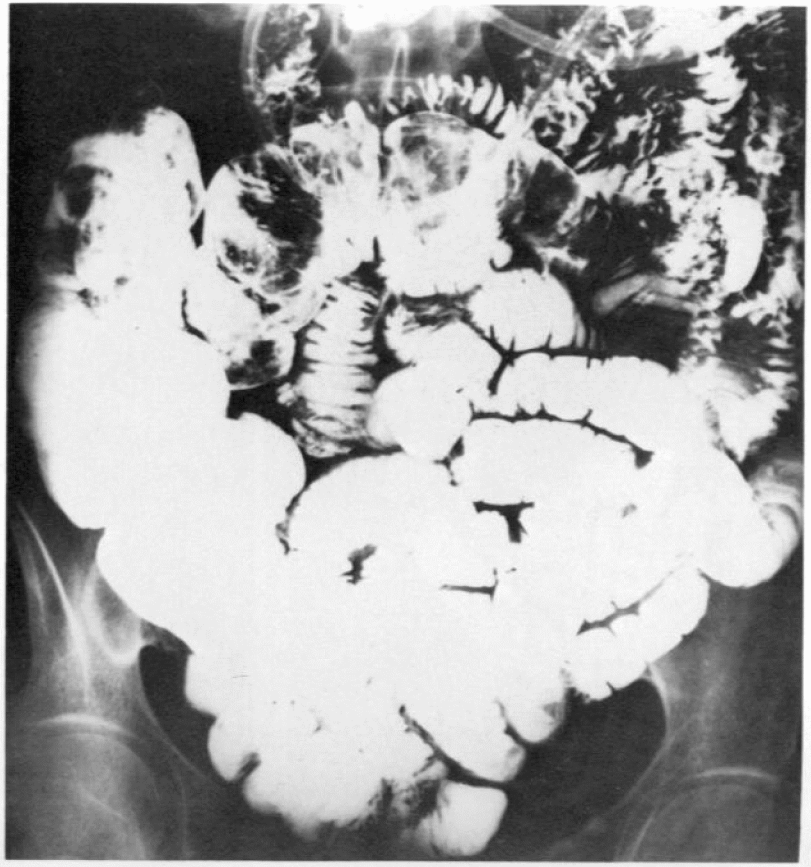


Fig. 17-71. Small bowel examination via M-A tube using barium sulfate.

(Courtesy Dr. Stanley M. Wyman.)

LARGE INTESTINE BOWEL

scribed and illustrated (pp. 118 to 136).

agents are administered orally to the patient to study the colon when retrograde filling of the colon with barium is not

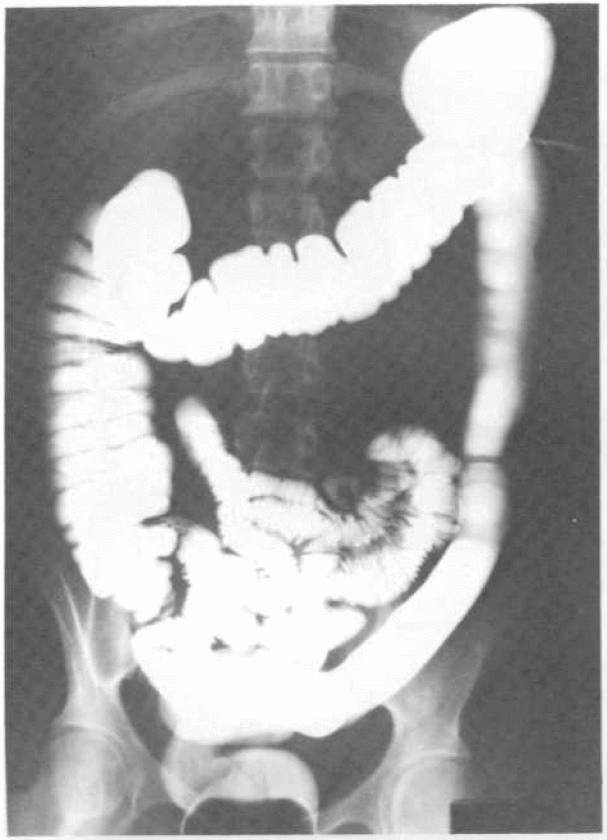


Fig. 17-72. Single-contrast examination.

(Courtesy Betsy Delzeith, R.T.)

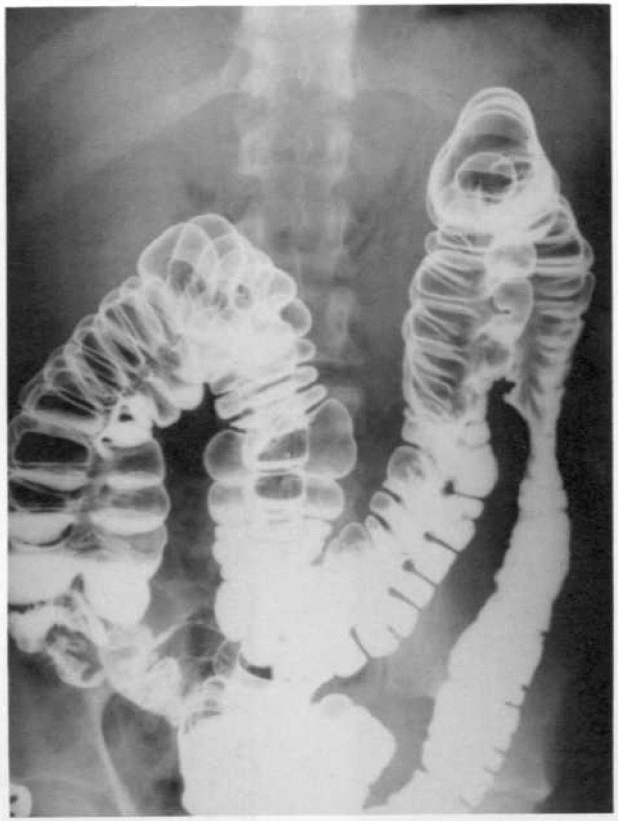


Fig. 17-73. Double-contrast examination.

(Courtesy Betsy Delzeith, R.T.)

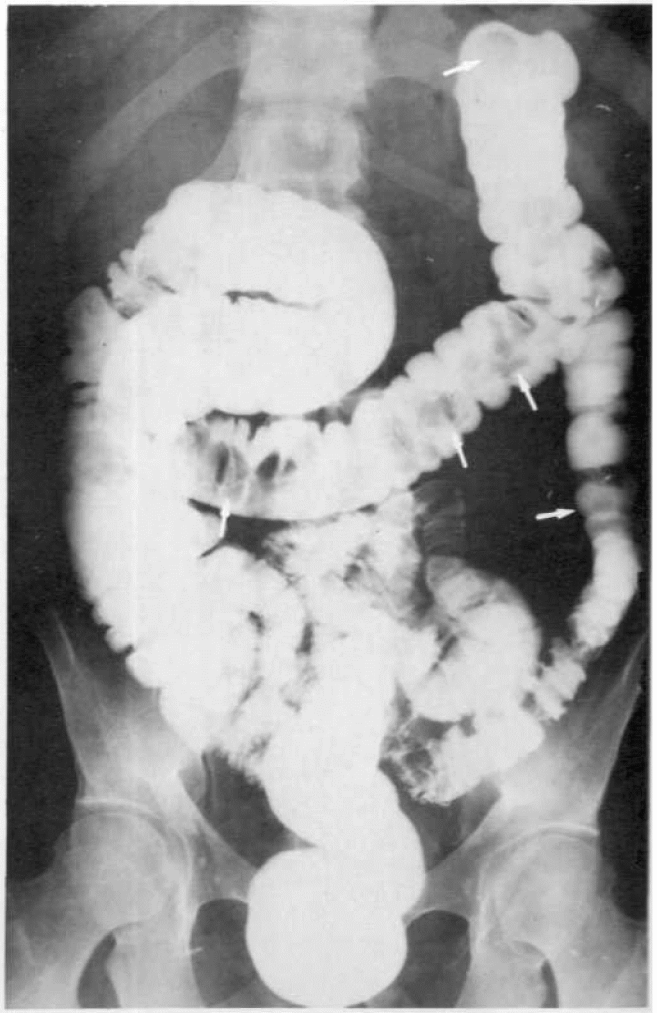


Fig. 17-74. Single-contrast barium-filled colon showing fecal material that simulates or masks pathologic condition *(arrows)*.

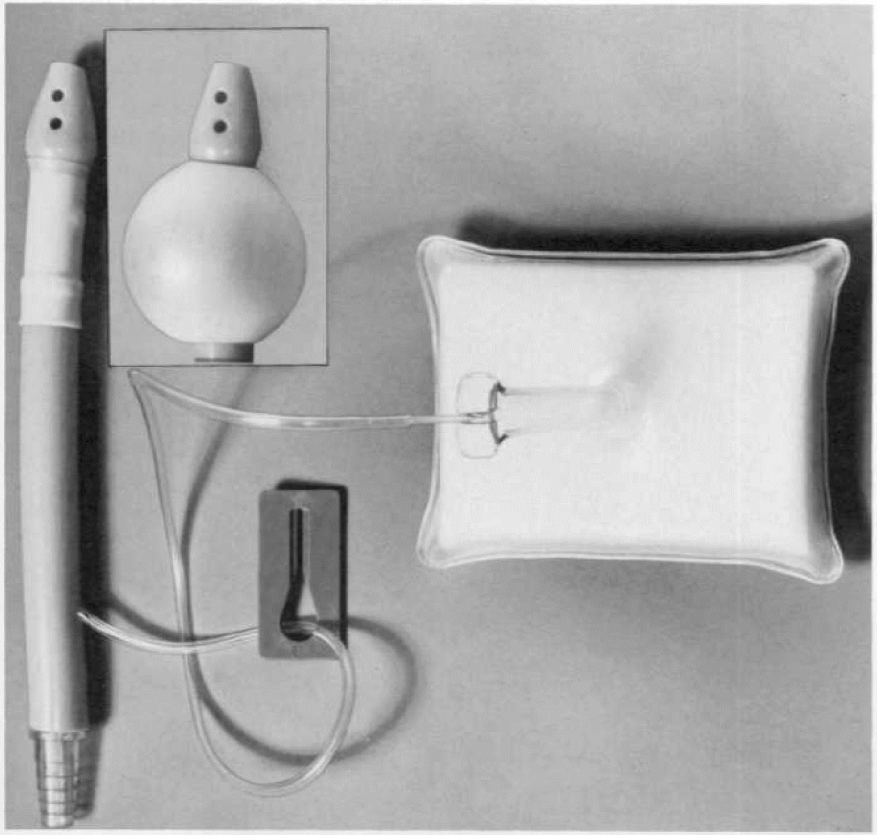


Fig. 17-75. Disposable retention enema tip. Uninflated balloon fits snugly. *Inset,* Balloon inflated with 90 cc of air, one complete squeeze of inflator.

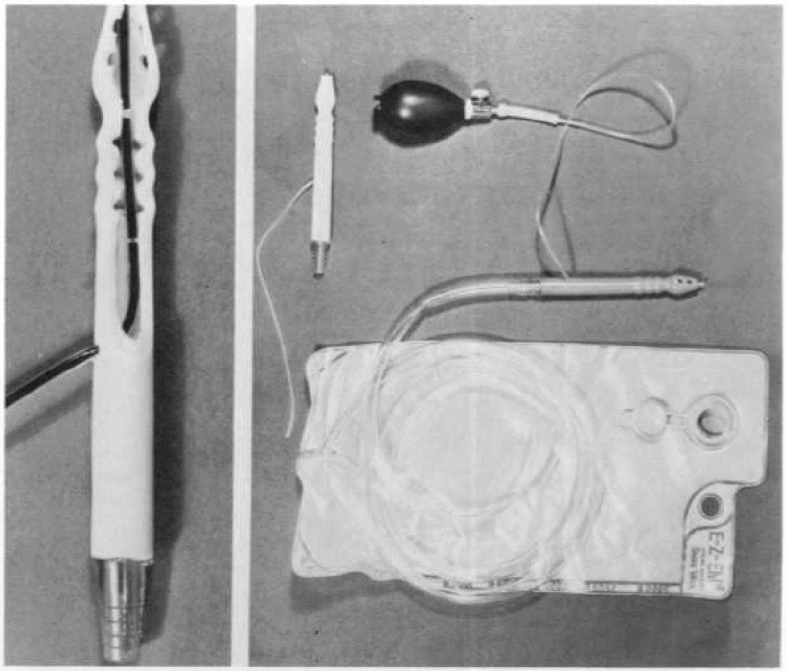


Fig. 17-76. Air-contrast enema tip shown with air tube filled with ink to demonstrate position.

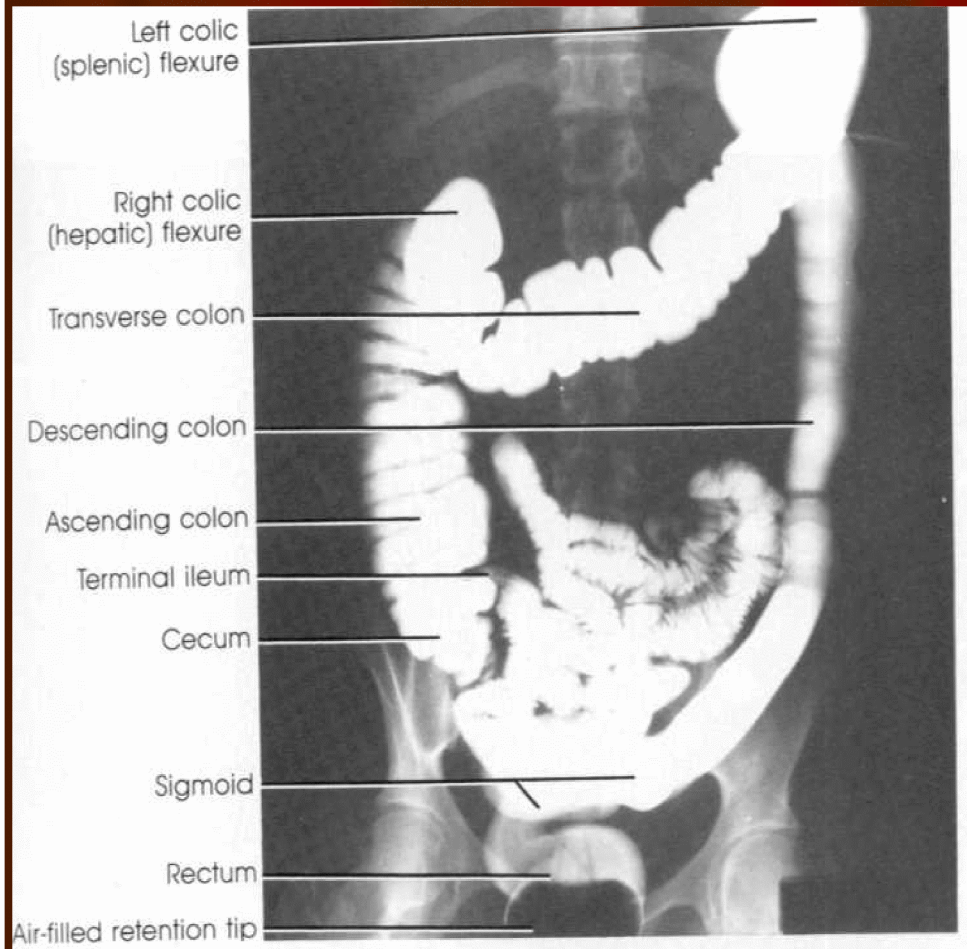


Fig. 17-78. Representative single-contrast barium enema projection.

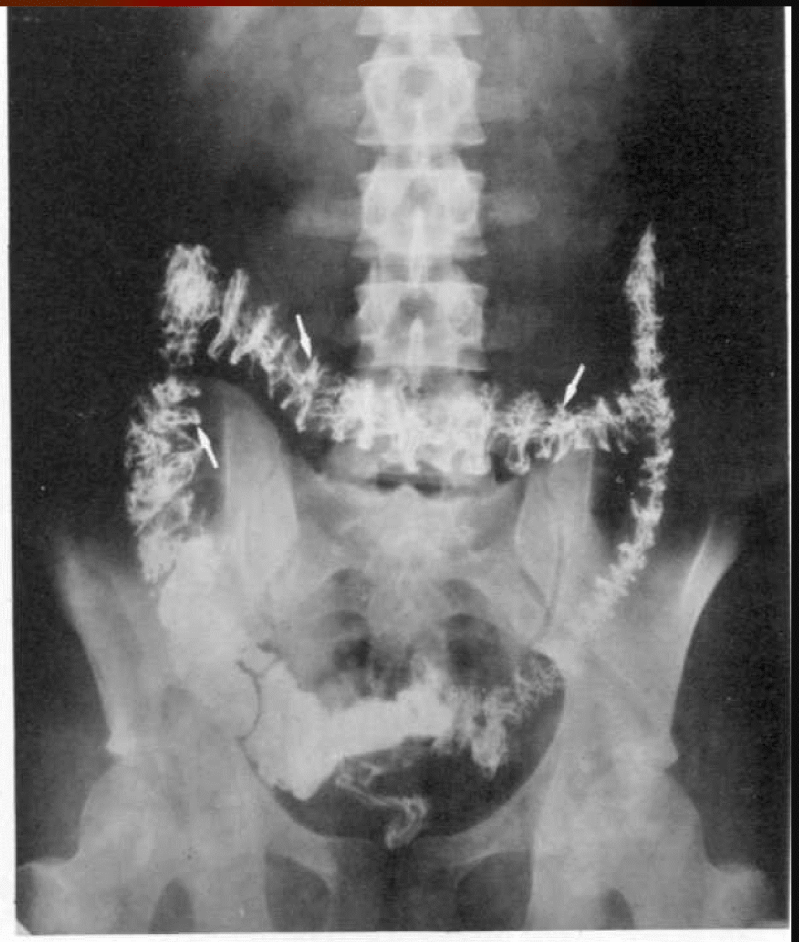


Fig. 17-79. Postevacuation radiograph demonstrating

tum: a simple maneuver to improve the accuracy of
colon examinations, Radiology 128:506-507, 1978.

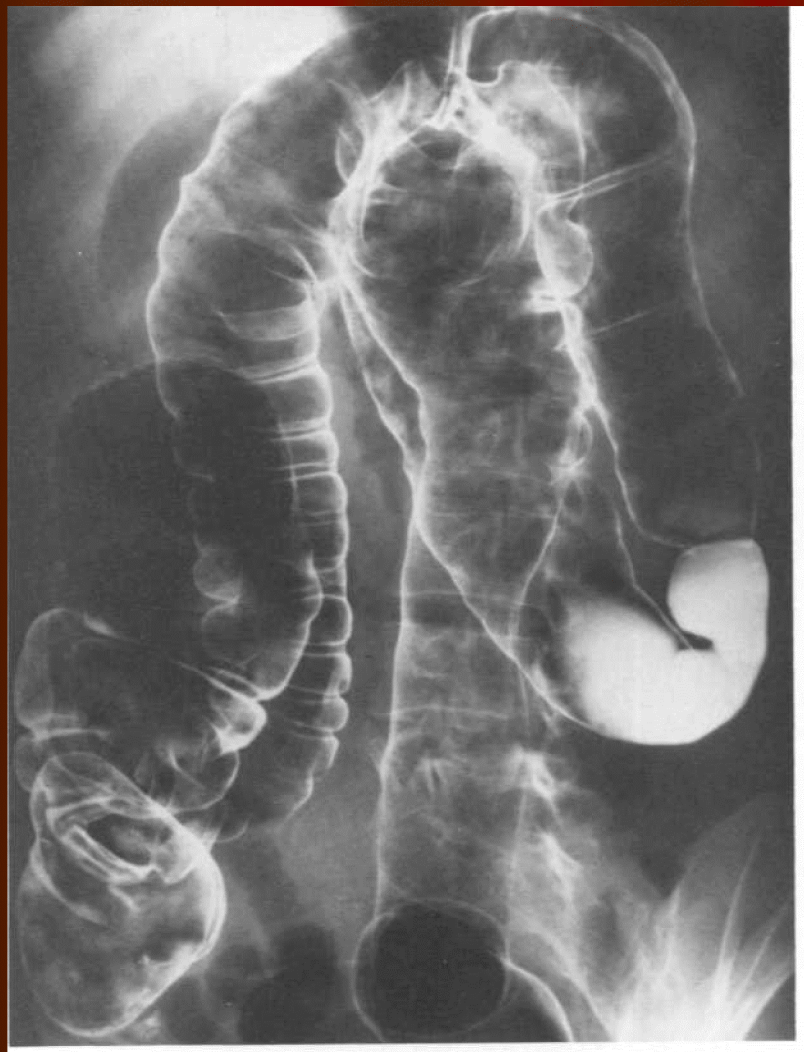


Fig. 17-80. Right lateral decubitus position.

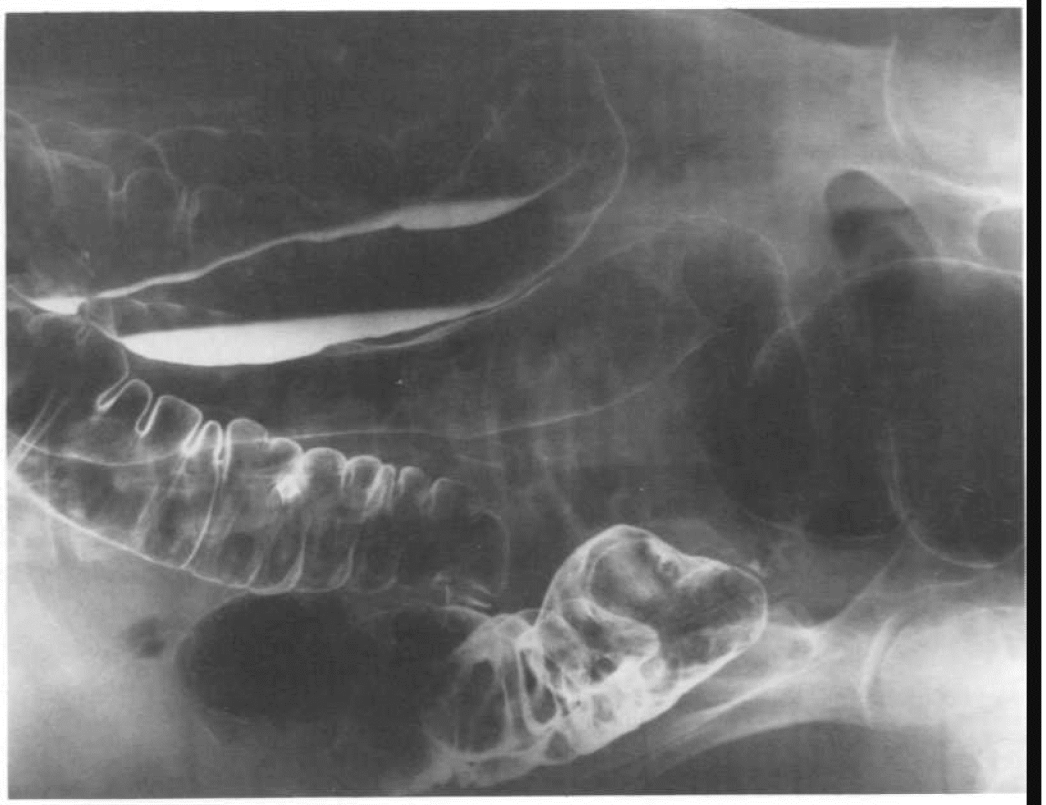


Fig. 17-81. RPO position (right AP oblique).

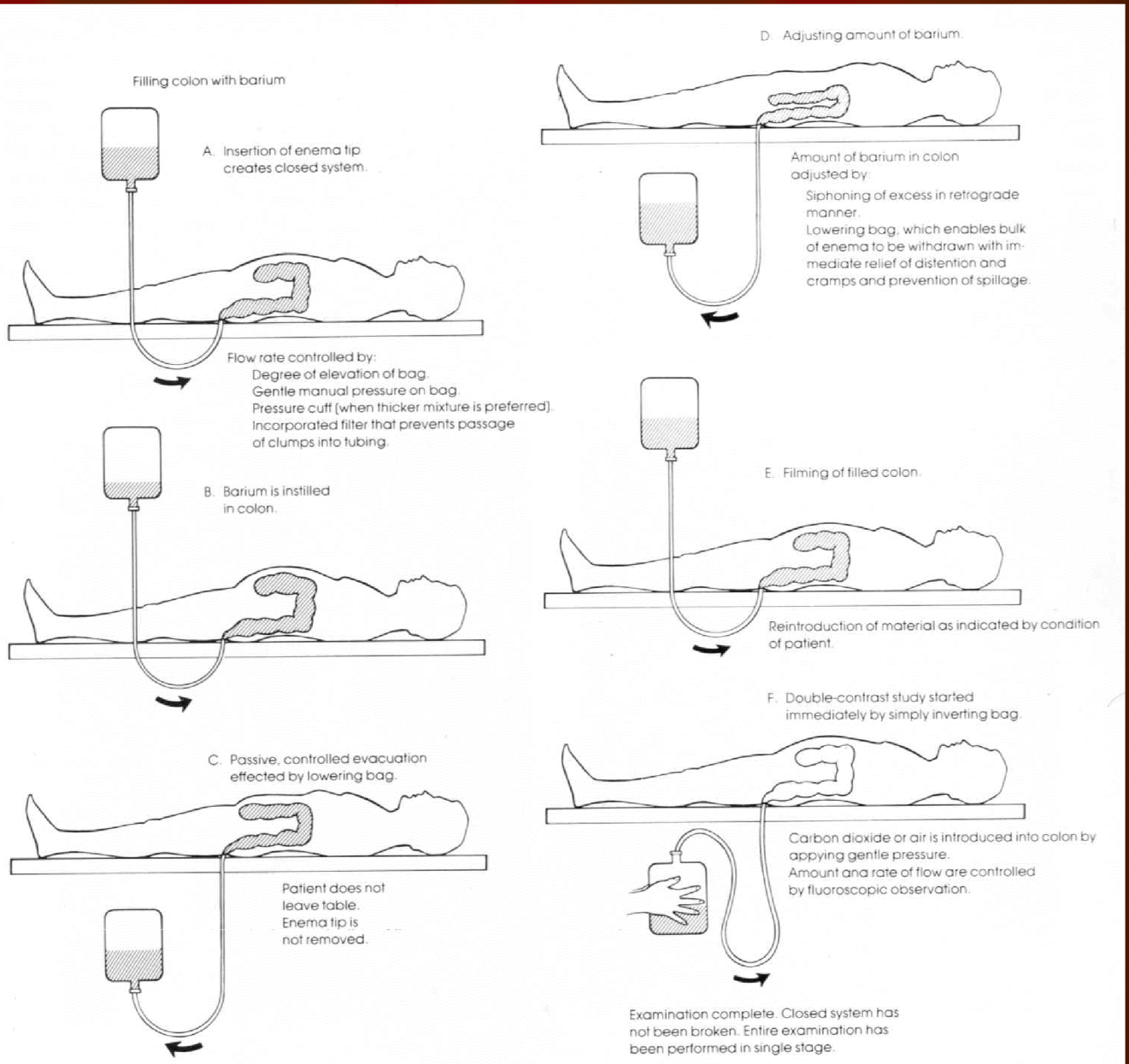


Fig. 17-82. Conduct of single-stage, closed-system, double-contrast examination.

Adapted from Pochaczevsky R and Sherman RS: A new technique for roentgenologic examination of the colon. AJR 89:787-796, 1963.

PA PROJECTION

- Center the midsagittal plane to the grid. Adjust the center of the IR at the level of the iliac crests .
- The PA projection demonstrates the entire colon with the patient prone .
- Entire colon, including the flexures and the rectum. (Two IRs may be needed for hypersthenic patients.)
- Vertebral column centered so that the ascending and descending portions of the colon are included.

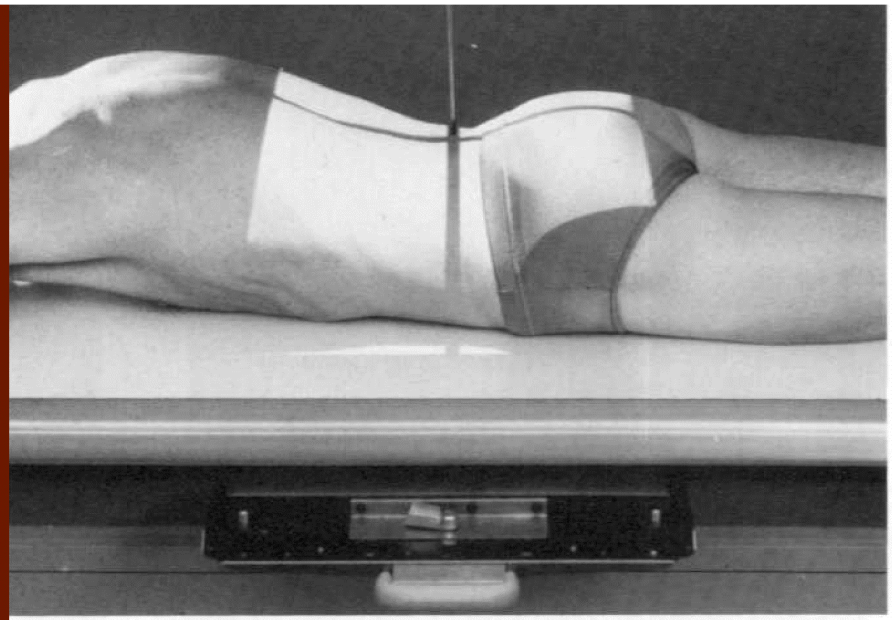


Fig. 17-90. PA.

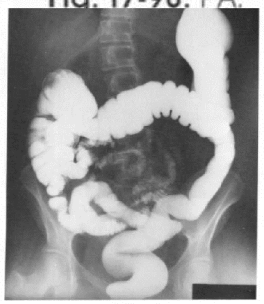
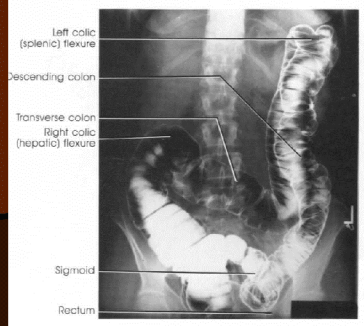
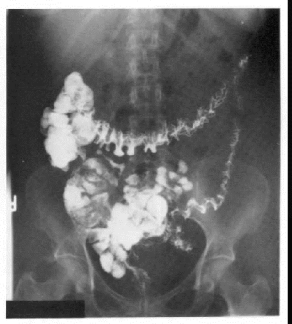


Fig. 17-91. Single-contrast PA projection.
(Courtesy Cindy Swords, R.T.)





PA AXIAL PROJECTION

- Center the midsagittal plane to the grid. Adjust the center of the IR at the level of the iliac crests .
- Directed 30 to 40 degrees caudad to enter the midline of the body at the level of the anterior superior iliac spines.
- The PA axial projection best demonstrates the rectosigmoid area of the colon

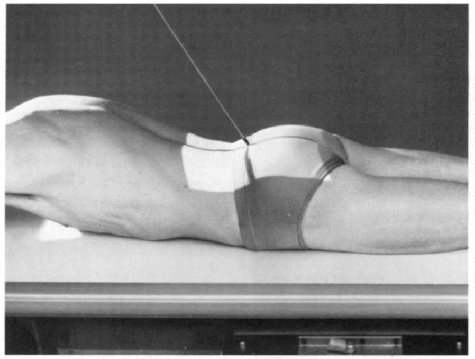


Fig. 17-94. PA axial.

PA axial position. With the p
prone, the PA axial position is
with the central ray directed 30 to
grees caudad. To demonstrate th
tosigmoid area, the central ray ent
midline of the body at the appro
level of the anterior superior iliac
(Figs. 17-94 to 17-96). A similar
tion is obtained when the patient
pine as described for the AP axia
tion in this section.

Evaluation criteria

- Rectosigmoid area must be cente
  10 × 12 in (24 × 30 cm) radiog
- Rectosigmoid area should be see
  less superimposition than in th
  projections because of the angu
  of the central ray.
- Transverse colon and both fl
  need not be included as routine.

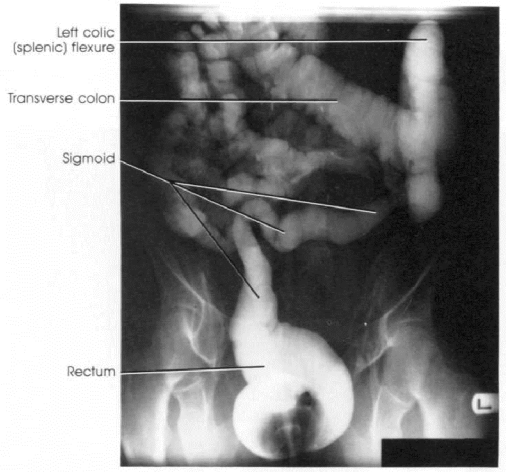


Fig. 17-95. Single-contrast PA axial (30-degree angulation) position.
(Courtesy Betsy Delzeith, R.T.)

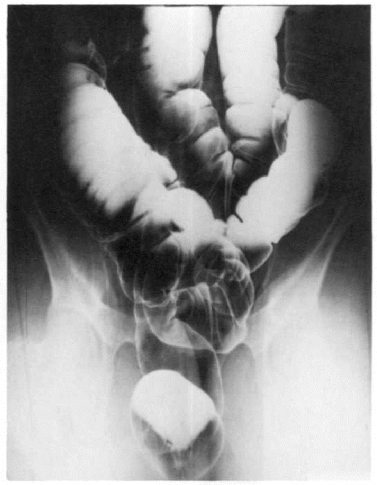


Fig. 17-96. Double-contrast PA axial (40-degree angulation) projection.

PA OBLIQUE PROJECTION

RAO position

- With the patient's right arm by the side of the body and the left hand by the head, have the patient roll onto the right hip to obtain a 35- to 45-degree rotation from the radiographic table
- Adjust the center of the IR at the level of the iliac crests
- Perpendicular to the IR and entering approximately 1 to 2 inches (2.5 to 5 cm) lateral to the midline of the body on the elevated side at the level of the iliac crest

The RAO position best demonstrates the right colic flexure, the ascending portion of the colon, and the sigmoid portion of the colon.

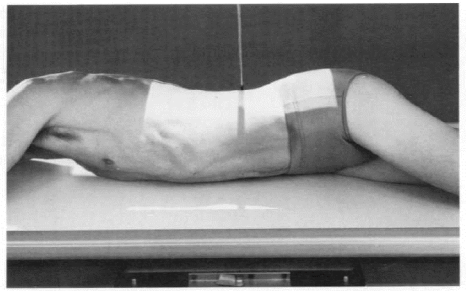


Fig. 17-97. RAO (right PA oblique).

RAO position (right PA oblique). A 35- to 45-degree RAO position (right PA oblique) is taken primarily to demonstrate the right colic (hepatic) flexure, the ascending portion of the colon, and the sigmoid portion of the colon (Figs. 17-97 to 17-99).

Evaluation criteria

- Entire colon should be included.
- Right colic (hepatic) flexure should be less superimposed or open when compared to the PA.
- Ascending colon, cecum, and sigmoid colon should be demonstrated.

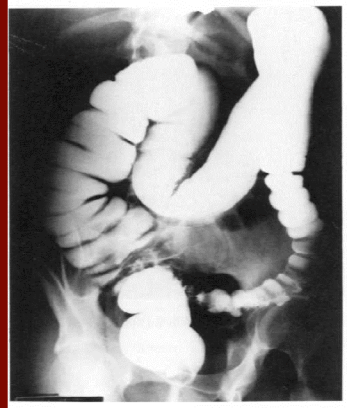


Fig. 17-98. Single-contrast RAO position (right PA oblique).

(Courtesy Dr. Herbert F. Hempel.)

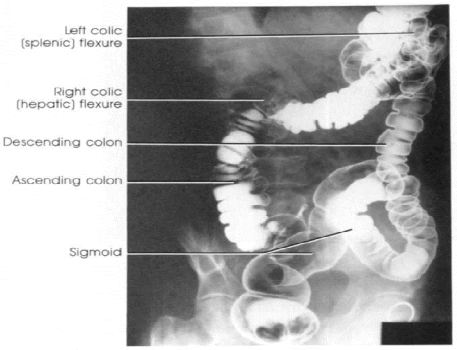


Fig. 17-99. Double-contrast RAO position (right PA oblique).

(Courtesy Gail A. Fischer, R.T.)

PA OBLIQUE PROJECTION

LAO position

- With the patient's left arm by the side of the body and the right hand by the head, have the patient roll onto the left hip to obtain a 35- to 45-degree rotation from the radiographic table.
- Perpendicular to the IR and entering approximately 1 to 2 inches (2.5 to 5 cm) lateral to the midline of the body on the elevated side at the level of the iliac crest.
- The LAO position best demonstrates the left colic flexure and the descending portion of the colon

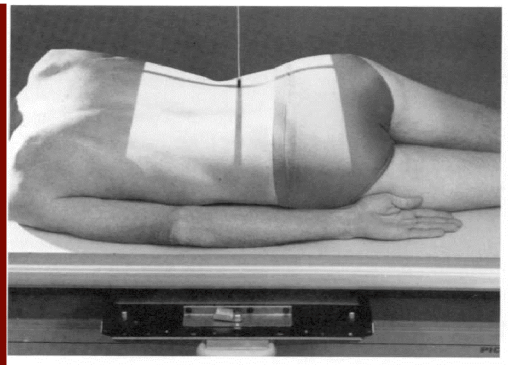


Fig. 17-100. LAO position (left PA oblique).

LAO position (left PA oblique). A 35- to 45-degree LAO position (left PA oblique) is used primarily to demonstrate the splenic flexure and the descending portion of the colon (Figs. 17-100 to 17-102).

Evaluation criteria

- Entire colon should be included.
- Left colic (splenic) flexure should be less superimposed or open when compared to the PA.
- Descending colon should be demonstrated.

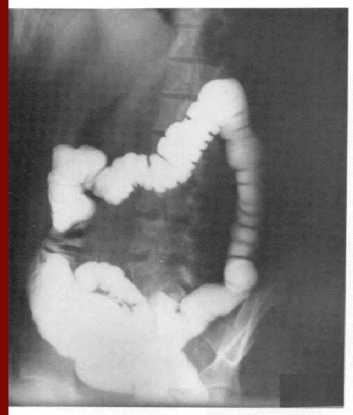


Fig. 17-101. Single-contrast LAO position (left PA oblique).

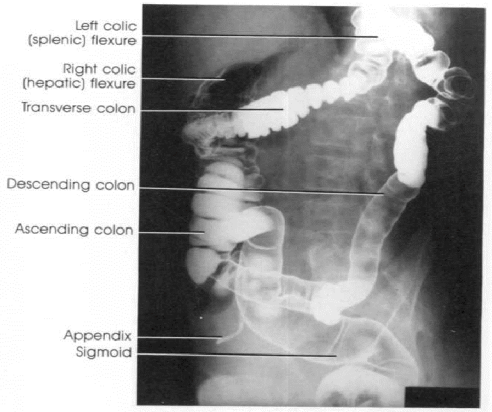


Fig. 17-102. Double-contrast LAO position (left PA oblique).
(Courtesy Gail A. Fischer, R.T.)

LATERAL PROJECTION

- Center the midcoronal plane to the center of the grid.
- Perpendicular to the IR to enter the mid*coronal plane at the level of the* ASIS
- The lateral projection best demonstrates the rectum and distal sigmoid portion of the colon

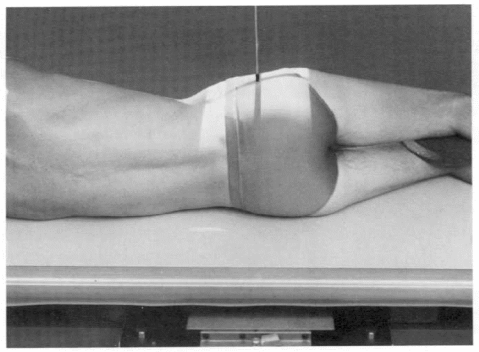


Fig. 17-103. Left lateral rectum.

Left and/or right lateral position. Left and right lateral positions are taken with the patient lying on the respective left or right side. When the position is taken for the rectum, a 10 × 12 in (24 × 30 cm) film is centered lengthwise approximately 5 to 7 cm above the level of the pubic symphysis in the mid-axillary plane (Figs. 17-103 to 17-105).

Evaluation criteria

- Rectosigmoid area should be in the center of the radiograph.
- Patient should not be rotated; hips and femurs should be superimposed.
- Superior portion of colon need not be included when the rectosigmoid region is the area of interest.

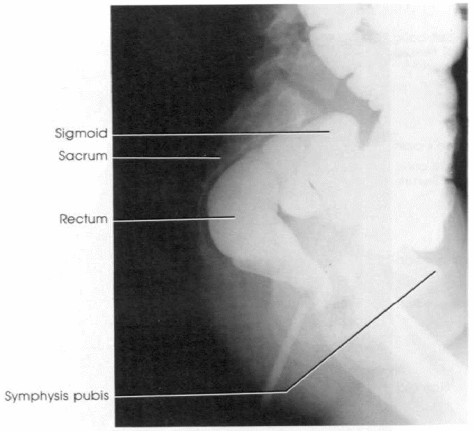


Fig. 17-104. Single-contrast left lateral rectum position.

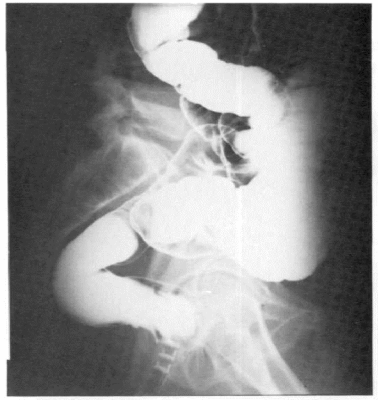


Fig. 17-105. Double-contrast left lateral rectum position.

AP PROJECTION

- Perpenicular to the IR to enter the midline of the midline of the body at the level of the iliac crests

- The AP projection demonstrates the entire colon with the patient supine

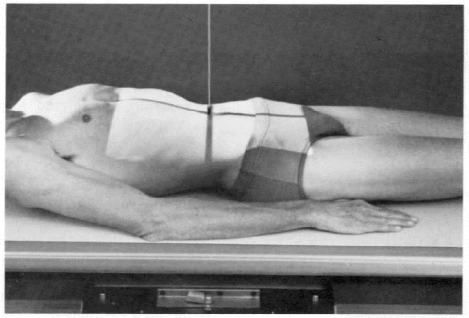


Fig. 17-106. AP.

AP projection. With the patient supine, the AP projection is taken with the patient centered to the film and the film at the level of the iliac crest. The AP projection demonstrates the colon in its entirety (Figs. 17-106 to 17-108).

Evaluation criteria

- Entire colon should be demonstrated including the splenic flexure and the rectum. Two films may be needed for hypersthenic patients.
- Vertebral column should be centered so the ascending colon and the descending colon are completely included.

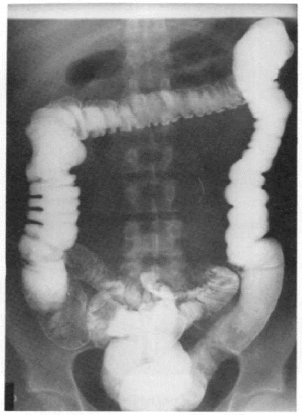


Fig. 17-107. Single-contrast AP projection.

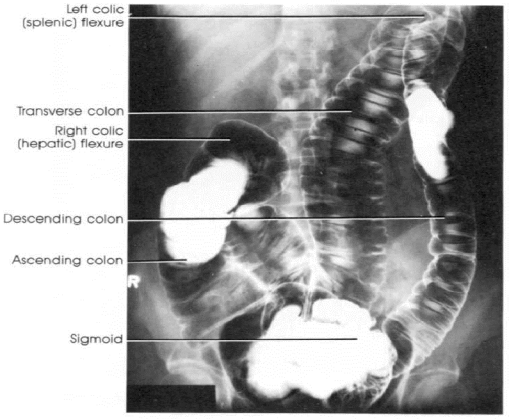


Fig. 17-108. Double-contrast AP projection.

AP AXIAL PROJECTION

- Directed 30 to 40 degrees cephalad to enter the midline of the body approxi-mately 2 inches (5 cm) below the level of the ASISs
- Directed to enter the inferior margin of the pubic symphysis when a collimated image is desired for demonstration of the rectosigmoid region

- Adjust the center of the IR at a level approximately 2 inches (5 cm) above the level of the iliac crests

- The AP axial projection best demonstrates or the rectosigmoid area of the colon.

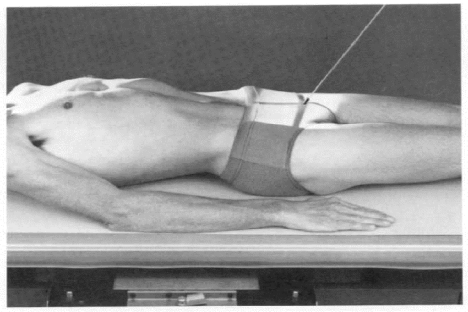


Fig. 17-109. AP axial.

AP axial position. With the patient supine, an AP axial position is obtained by directing the central ray from 30 to 40 degrees cephalad. For a 14 × 17 in (35 × 43 cm) film, the central ray enters approximately 2 inches (5 cm) below the level of the anterior superior iliac spines. When a coned-down image of the retrosigmoid region is desired, the central ray enters the inferior margin of the symphysis pubis (Figs. 17-109 to 17-111). This angled AP position is primarily used to demonstrate the retrosigmoid areas. A similar image is obtained when the patient is prone, as described in the PA axial position discussed previously.

Evaluation criteria

- Rectosigmoid area must be included (centered to a 10 × 12 in [24 × 30 cm] radiograph).
- Rectosigmoid area should be seen with less superimposition than in the AP projection because of the angulation of the central ray.
- Transverse colon and both flexures need not be included as routine.

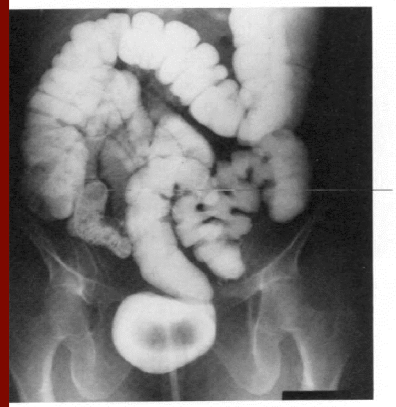


Fig. 17-110. Single-contrast AP axial position.

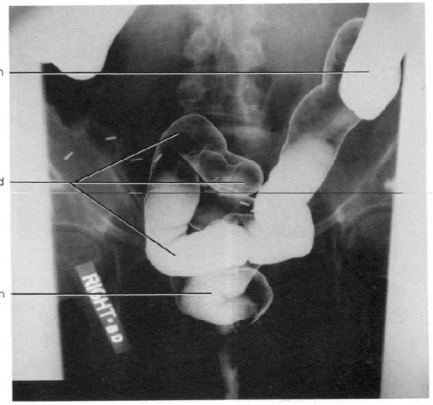


Fig. 17-111. Double-contrast AP axial position.

AP OBLIQUE PROJECTION

LPO position

- With the patient's left arm by the side of the body and the right arm across the superior chest, have the patient roll onto the left hip to obtain a 35- to 45-degree rotation from the table.
- Perpendicular to the **IR** to enter approximately 1 to 2 inches (2.5 to 5 cm) lateral to the midline of the body on the el-evated side at the level of the iliac crest
- The LPO position best demonstrates the right colic flexure and the ascending and sigmoid portions of the colon

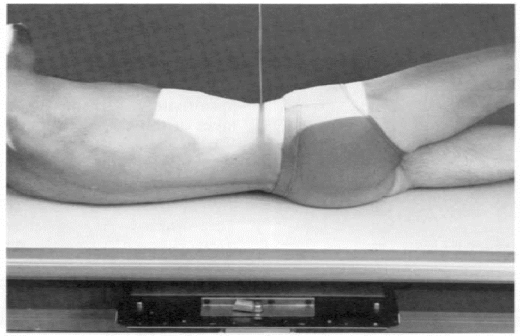
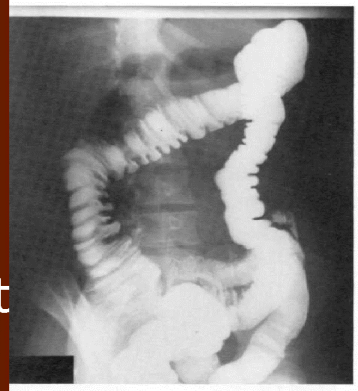


Fig. 17-112. LPO (left AP oblique).

LPO position (left AP oblique). A 35- to 45-degree LPO position (left AP oblique) is taken primarily to demonstrate the right colic (hepatic) flexure and sigmoid portion of the colon (Figs. 17-112 to 17-114).

Evaluation criteria

- Sigmoid, rectosigmoid area, and right colic (hepatic) flexure should be seen with less superimposition than in the AP projection because of the angulation of the central ray.
- Superior part of colon need not be included.



ig. 17-113. Single-contrast LPO position (left
P oblique).
Courtesy Cindy Swords, R.T.)

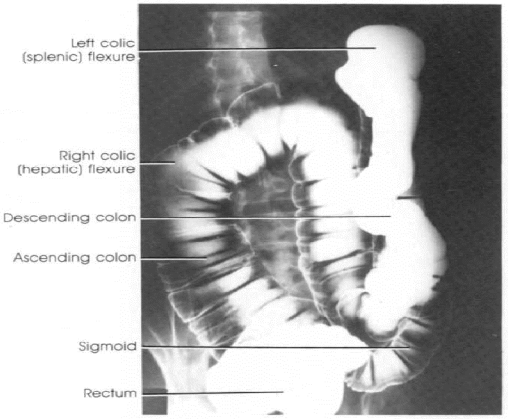


Fig. 17-114. Double-contrast LPO position (left AP oblique).

AP OBLIQUE PROJECTION

RPO position

- With the patient's right arm by the side of the body and the left arm across the superior chest, have the patient roll onto the right hip to obtain a 35- to 45-degree rotation from the radiographic table.
- Perpendicular to the IR to enter approx-imately 1 to 2 inches (2.5 to 5 cm) lat-eral to the midline of the body on the el-evated side at the level of the iliac crest
- The RPO position best demonstrates the left colic flexure and the descending colon

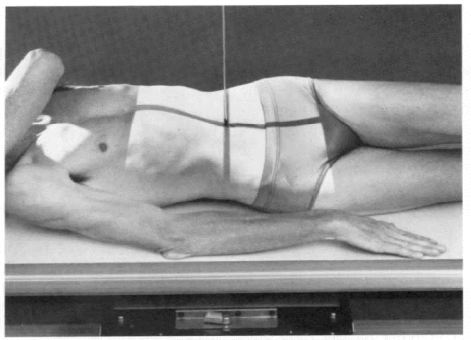


Fig. 17-115. RPO (right AP oblique).

RPO position (right AP oblique). A 35- to 45-degree RPO position (right AP oblique) is taken primarily to demonstrate the left colic (splenic) flexure and the ascending portion of the colon (Figs. 17-115 to 17-117).

Evaluation criteria

- Entire colon should be included.
- Left colic (splenic) flexure and ascending colon should be visualized.

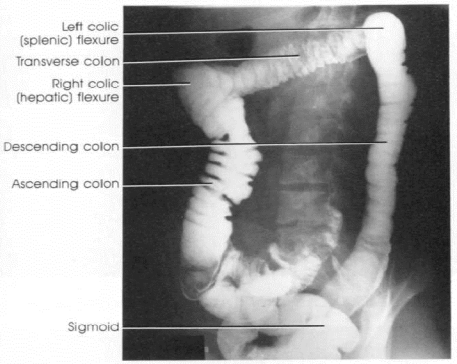


Fig. 17-116. Single-contrast RPO position (right AP oblique).
(Courtesy Cindy Swords, R.T.)

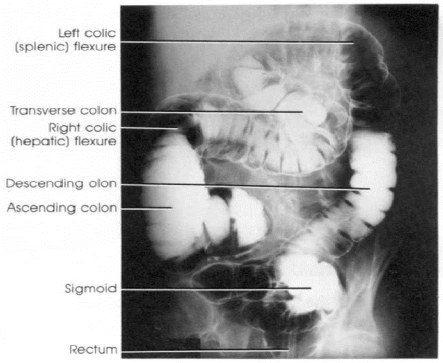


Fig. 17-117. Double-contrast RPO position (right AP oblique).
(Courtesy Dr. Robert Harris.)

Right lateral decubitus position

- With the patient lying on an elevated radiolucent support, center the midsagittal plane to the grid.
  Adjust the center of the IR to the level of the iliac crests

- *Horizontal* and perpendicular to the IR t enter the midline of the body at the level of the iliac crests

- The right lateral decubitus position demon-strates an AP or PA projection of the con-trast-filled colon. This position best demonstrates the medial side of the ascending colon and the lateral side of the descending Colon when the colon is inflated with air

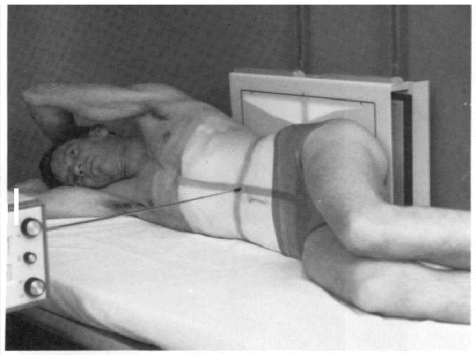


Fig. 17-118. Right lateral decubitus position.

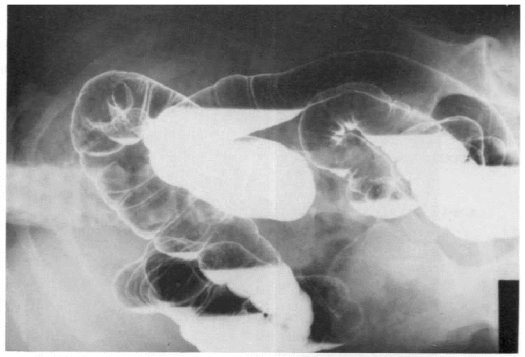


Fig. 17-119. Double-contrast right lateral decubitus position.
(Courtesy Tracy Taylor, R.T.)

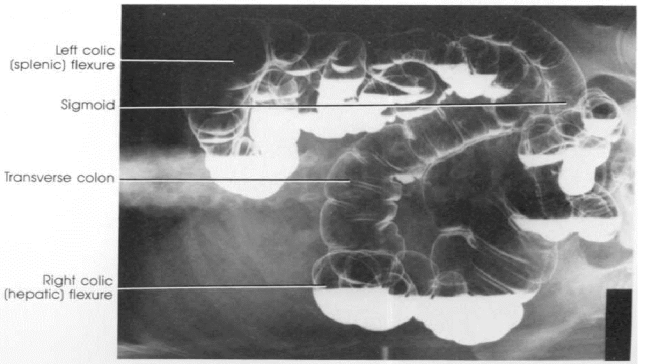


Fig. 17-120. Double-contrast right lateral decubitus position.
(Courtesy Jonathan Miller, R.T.)

Left lateral decubitus position

- Place the patient on the left side with the abdomen or back in contact with the vertical grid device.
- *Horizontal* and perpendicular to the IR to enter the midline of the body at the level of the iliac crests.
- The left lateral decubitus position demonstrates a PA or AP projection of the contrast-filled colon. This position best demonstrates \the "up" lateral side of the ascending colon and the medial side of the descending colon when the colon is inflated with air

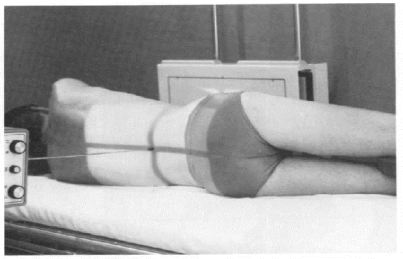


Fig. 17-121. Left lateral decubitus position.

Left lateral decubitus position. The left lateral decubitus position is obtained by having the patient lie on the left side. The horizontally directed central ray enters the midline of the patient at the level of the iliac crest (Fig. 17-121). The left lateral decubitus position best shows the "up," medial side of the descending colon and the lateral side of the ascending colon (Figs. 17-122 and 17-123).

Evaluation criteria

- Area from the left colic (splenic) flexure to the rectum should be demonstrated.
- Patient should not be rotated, as evidenced by checking the ribs and pelvis.
- For single-contrast examinations, the barium must be adequately penetrated. For double-contrast examinations, the air-inflated portion of the colon is of primary importance and should not be overpenetrated.

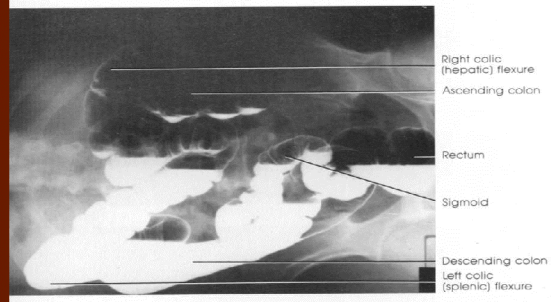


Fig. 17-122. Double-contrast left lateral decubitus position.

(Courtesy Jonathan Miller, R.T.)

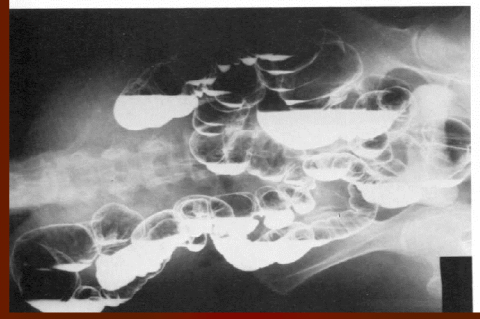


Fig. 17-123. Double-contrast left lateral decubitus position.

R or L ventral decubitus position

- Place the patient in the prone position with either the right or left side against the vertical grid device.
- *Horizontal* and perpendicular to the IR to enter the midcoronal plane of the body at the level of the iliac crests
- The ventral decubitus position demonstrates a lateral projection of the contrast-filled colon. This position best demon-strates the "up" posterior portions of the colon and is most valuable in double-contrast examinations

Ventral decubitus position. With the patient in the prone position, a ventral decubitus body position results in a lateral radiographic image. This position is taken to demonstrate the rectum and is most valuable in double-contrast examinations (Fig. 17-124).

Evaluation criteria

- Area from the flexures to the rectum should be seen.
- Patient should not be rotated.
- For single-contrast examinations, the barium must be adequately penetrated. For double-contrast examinations, the air-inflated portion of the colon is of primary importance and should not be overpenetrated.
- Enema tip should be removed for an unobstructed image of the rectum.

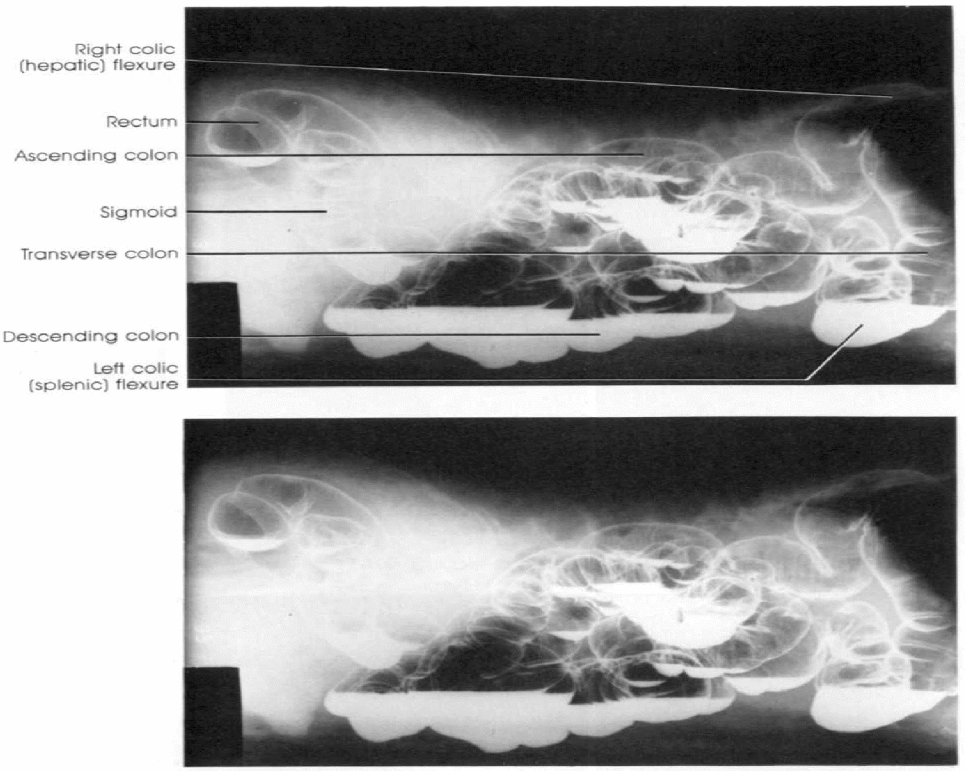


Fig. 17-124. Ventral decubitus body position resulting in a lateral radiographic image.

Upright position

➢Upright AR, PA, oblique, and lateral pro-jections may be taken as requested. The positioning and evaluation criteria for upright radiographs are identical to those required for the recumbent positions. However, the IR is placed at a lower level to compensate for the drop of the bowel because of the effect of gravity

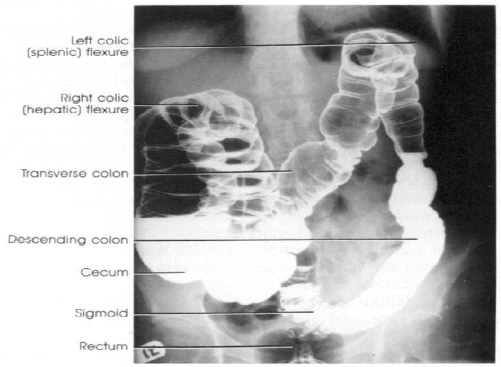


Fig. 17-125. Double-contrast AP upright projection.
(Courtesy Betsy Delzeith, R.T.)

Upright positions

Upright frontal, oblique, and lateral positions. Upright frontal, oblique, and lateral positions may be taken as requested. The positioning and evaluation criteria for upright radiographs are identical to those required for the recumbent position. However, the film should be placed at a lower level to compensate for the drop of the bowel because of the effect of gravity (Figs. 17-125 to 17-127).

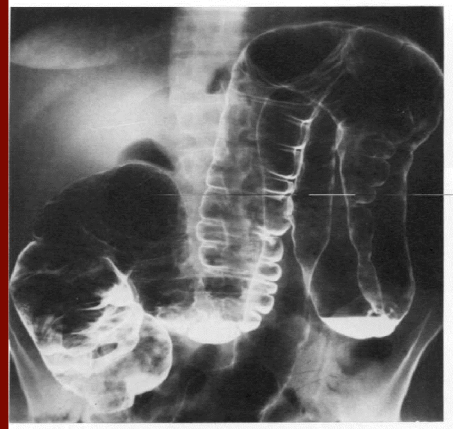


Fig. 17-126. Double-contrast PA upright projection.
(Courtesy Dr. Sölve Welin.)

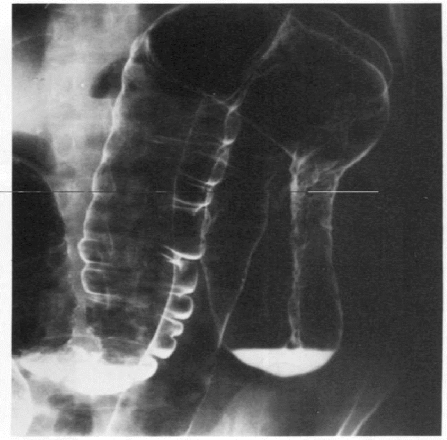


Fig. 17-127. Double-contrast RPO position (right AP oblique).

AXIAL PROJECTION
CHASSARD-LAPINE METHOD

The Chassard-Lapine method is used to demonstrate the rectum, rectosigmoid junction, and sigmoid. This projection, which is made at almost a right angle to the AP projection, demonstrates the anterior and posterior surfaces of the lower portion of the bowel and permits the coils of the sigmoid to be projected free from overlapping." The projection may be exposed after evacuation of the large intestine, although a preevacuation radiograph can be exposed when the patient has reasonable sphincteric control.

Axial position

Chassard-Lapiné method. The Chassard-Lapiné method is used for the demonstration of the rectum, the rectosigmoid junction, and the sigmoid. It has been found[1-3] that this position, being made at almost a right angle to the frontal position, demonstrates the anterior and posterior surfaces of the lower portion of the bowel and permits the coils of the sigmoid to be projected free from overlapping. This position may be made after evacuation, although, as Raap[1] states, a preevacuation radiograph can be made when the patient has reasonable sphincteric control.

Chassard-Lapiné position. The patient is instructed to sit well back on the side of the table so that the midaxillary plane of the body is as close as possible to the midline of the table. If necessary, the transversely placed 11 × 14 in (30 × 35 cm) film should be shifted forward in the Bucky tray so that its transverse axis will coincide as nearly as possible with the midaxillary plane of the body.

The patient is instructed to abduct the thighs as far as the edge of the table permits, so that they will not interfere with flexion of the body. The film is centered to the midline of the pelvis, and the patient is asked to lean directly forward as far as possible.

The patient is directed to grasp the ankles for support. *Respiration* is suspended for the exposure.

The exposure required for this postion is approximately the same as that required for a lateral position of the pelvis.

The central ray is directed perpendicularly through the lumbosacral region at the level of the greater trochanters (Figs. 17-128 and 17-129).

Evaluation criteria

- Rectosigmoid area should be in the center of the radiograph.
- Superior area of colon should not obscure rectosigmoid area.
- Rectosigmoid area should have minimal superimposition.
- Exposure should penetrate the lumbosacral region and the barium.

[1]Raap G: A position of value in studying the pelvis and its contents, South Med J 44:95-99, 1951.
[2]Cimmino CV: Radiography of the sigmoid flexure with the Chassard-Lapiné projection, Med Radiogr Photogr 30:44-45, 1954.
[3]Ettinger A and Elkin M: Study of the sigmoid by special roentgenographic views, AJR 72:199-208, 1954.

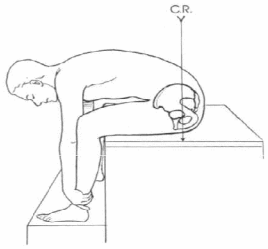


Fig. 17-128. Chassard-Lapiné method.

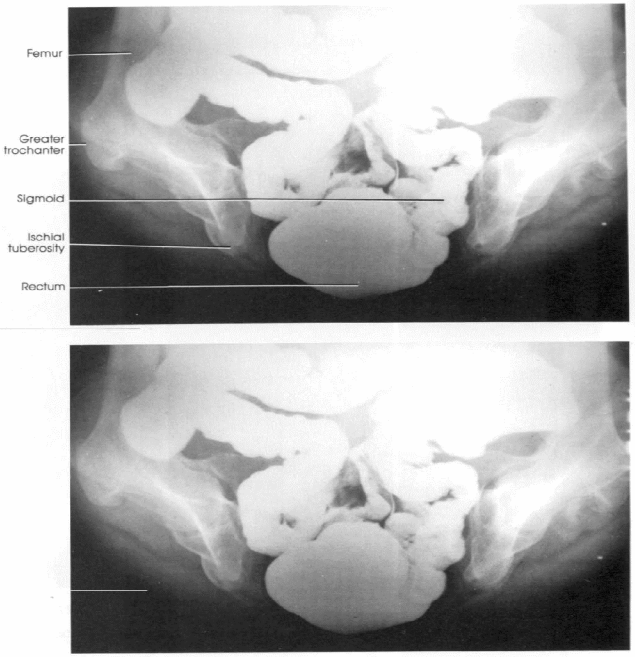


Fig. 17-129. Chassard-Lapiné method.
(Courtesy Dr. William Shehadi.)

References

- 1-Philip W Ballinger, Eugene D Frank" Merrill's Atlas of Radiographic Positions and Radiologic Procedures" Volume 3, 1999