Internal Medicine Clerkship

Chest X-ray STUDY GUIDE 2014-2015

10 Steps/ABC’s for Reading Chest X-Rays

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0 Normal Film:
  0-1-1 Normal Chest X-Ray ; PA film
  Before even viewing the film, we need to look for and ensure proper patient name, numbers and
dates, as well as the sign that shows us right or left. The latter is typically in the upper corner of
the film. Such identifiers are not present on a film used for public display or for teaching
purposes, such as these films, to ensure patient confidentiality.
  0-1-2 Normal Chest X-ray; Lateral film
  Again, the very first important step is to look for and ensure proper patient name, numbers and
dates, as well as the sign that shows us right or left.

1 Technique:
  1-1 Penetration
    1-1-1 Normal Penetration
    On this film you can make out the interspaces between the vertebrae in the midline. Over-
penetration would be where they’re too clearly seen, ie, too dark. Under-penetration makes the
film too white, ie, you are unable to see the interspaces through the heart.
  1-2 Inspiration
    1-2-1 Inspiration
    This film shows a good inspiration with the diaphragm on the right and left between rib 10 and
11. That’s the normal for good inspiration - at least down to the 10th rib posteriorly.
    1-2-2 Expiration
    This films shows the diaphragm up higher than in the normal inspiration film, in fact, the one on
the right is at the 8th rib. Expiration films are done primarily to look for pneumothorax; this brings
out the difference between the chest wall edge and the lung edge. That is not present in this
film. Expiration films make the lung parenchyma look more cloudy, i.e., with more lung markings
due to the lung being compressed into a smaller amount of thoracic space.
  1-3 Rotation
    1-3-1 Rotation: PA film.
    Rotation is best judged by lining up a posterior structure i.e., the spinous process, with an
anterior structure, i.e., the medial head of the clavicle. Normally these should fall into alignment
with each other. This film shows slight rotation to the left.
    1-3-2 Rotation: an infant film
    The clavicular heads and the spinous processes are not as easily seen in this film, but one can
see that all of the heart takes up most of the left chest and this again is rotated to the left.
    1-3-3 Rotation: This film shows severe rotation to the right, certainly best seen by the tracheal air
shadow moving to the right side. One can see a lot more heart shadow between the edge of the
vertebrae and the lung tissue, with much more heart on the right. Incidental note is made of
multiple mass lesions and a foreign body, i.e., portacath, in the left chest wall.
  1-4 Position
    1-4-1 Position: Normal PA View
    This film is a normal PA view, that is, the anterior aspect of the chest wall is up against the
cassette when the film is shot. This is the standard view when a chest X-ray is ordered, ie, a “PA
and lateral” film.
    1-4-2 Position: Normal Lateral View
    In the normal lateral view the film cassette is on the patient’s left when the film is taken. On this
film we see nice diaphragmatic shadows, with shadows of the right being higher than the left;
the anterior aspect of the left is in continuity with the heart border which rests on the left
diaphragm.
    1-4-3 Position: Right decubitus view, i.e., right side down. The patient is lying on his right side. In this
film you can see pleural effusion layering out and this is often the reason to do a decubitus film
to double check to see if indeed there is pleural effusion when you suspect it. Layering more
than 1.0 cm thick on the decubitus film is considered a significant effusion.
    1-4-4 Position: Normal AP View
    An AP view is the standard view taken in a portable film when the patient is lying in bed and the
film cassette is put behind the patient’s back and the film is shot from the front. This will magnify
anterior structures such as the heart shadow. It should be labeled “AP” or “portable” on the film, to differentiate it from the PA view. Incidental note is made of free air under the right diaphragm (see 7-1-1 thru 7-1-4).

2 Airway:
  2-1 Deviation
    2-1-1 Demonstrating deviation of the airway
      In this film there has been a pneumonectomy, i.e., the left lung is now missing and there is volume loss with deviation of the mediastinal contents including the tracheal air shadow to the left. Incidental note is made of a portacath in the right chest wall.
    2-1-2 Hemothorax; this shows an opacification of the left chest as in the past example, but there is deviation of the tracheal air shadow and mediastinal structures to the right due to fluid accumulation on the left. Incidental note made again of a portacath in the left chest wall.
  2-2 Air Bronchograms
    2-2-1 This film shows barium aspiration which highlights a contrast between the background and bronchus. In this case there was aspiration of barium into the bronchus which lights it up. Of note in this film is the barium going through the esophagus in the middle of the mediastinum and down into the stomach.
    2-2-2 This film demonstrates the concept of an air bronchogram. An air bronchogram occurs when there is contrast between the air in the bronchus (dark) and water density surrounding the bronchus (whiter). This one shows it in mediastinal structures which are water densities. It ideally is seen further out in the lung parenchyma itself, when there is a fluid density in the lung (such as pneumonia) surrounding air in the bronchus.

3 Bones/Soft Tissues:
  3-1 Scapulae out of the way
    3-1-1 The film shows good position of the scapulae which are out of the way bilaterally, i.e., they’re away from the lung parenchyma completely and they are not confused with any other lines in the lung.
  3-2 Rib Fractures, Clavicular Fractures, etc.
    3-2-1 This shows a left rib fracture. The most obvious one which shows a discontinuity of the rib is the 8th rib on the left. In the setting of trauma such as this, one should look for a pneumothorax as well. One is not visualized on this film.
    3-2-2 This film shows old fractures medially on the right and posteriorly. Some callous formation around them tells us they are old, not acute. Ribs 5, 6, and 7 show this to best advantage.
    3-2-3 This film shows a fairly severe left clavicular fracture.
    3-2-4 This film shows fairly severe rib fractures in the left hemithorax. There is density in the left chest and the diaphragm is not visualized; this would suggest trauma and with the rib fractures, hemothorax would be a consideration.
  3-3 Compression Fracture, Vertebrae
    3-3-1 Compression fracture. The PA film does not always easily demonstrate the vertebrae, which are posterior structures, because the mediastinal structures obscure them. Often a lateral film is more helpful to visualize vertebral compression fractures.
    3-3-2 This film therefore shows the lateral projection of the same patient with an obvious compression fracture of the vertebrae in about the mid chest level.
  3-4 Scoliosis
    3-4-1 This film demonstrates scoliosis with some twisting of the spine to the left.
    3-4-2 Is another example of scoliosis, but to the right. This film also shows the head of the clavicle to the left suggesting rotation.
  3-5 Calcifications; spleen, diaphragm, etc.
    3-5-1 This film shows calcifications; a fairly subtle calcification on the right diaphragm. The most common cause of diaphragmatic calcification being asbestosis. Sternal wires are noted in this film as well suggesting previous cardiac surgery.
    3-5-2 This film shows some calcification in the aortic knob in the left chest wall. Air fluid levels are noted in the mediastinum at the base of cardiac silhouette.
3-5-3 Another example of diaphragmatic calcification, this time bilateral diaphragmatic calcification as well as pleural calcification bilaterally. Again very typical of asbestos exposure.
3-5-4 Shows fairly prominent calcification of the tracheal rings in the lateral projections. This occurs primarily in the elderly; it is more related to age than anything else.
3-5-5 This shows calcification in the PA view, again calcification of the trachea.
3-5-6 Reveals calcification over the breast shadows and suggests breast implants. Likewise there are sternal wires again seen. Incidental note of a pulmonary nodule in the right mid-lung field.
3-5-7 This film shows the calcification in the breast implants and again sternal wires on the lateral projection. The nodule is again demonstrated; we do a lateral view of a nodule to help ascertain that it is within the lung rather than exterior to it.

4 Cardiac Silhouette:

4-1 Cardiomegaly
4-1-1 This is a PA view showing severe heart enlargement.
4-1-2 This film is a lateral projection of the same patient, again very significant cardiomegaly.
4-1-3 Another patient with cardiomegaly, this one demonstrating some right pleural effusion and again sternal wires from prior cardiac surgery.
4-1-4 This is a lateral projection of the patient in 4-1-3 showing some fluid in the fissure lines, noting that the minor fissure and the major fissure of the right lung are well seen because there is fluid in them. There is a right pleural effusion seen posteriorly and the sternal wires are seen to good effect anteriorly.

5 Diaphragm/Pleural Surfaces:

5-1 Elevation of Diaphragm
5-1-1 Shows elevation of the right hemidiaphragm. Using a standard film, the right hemidiaphragm should be higher than the left, but should be no more than 5 cm higher than the left diaphragm.
5-1-2 Lateral projection again showing the right hemidiaphragm quite elevated compared to the left.
5-1-3 PA view showing left diaphragmatic elevation; the gastric bubble follows the diaphragm and has risen in the chest much higher than on the right side. Sternal wiring is again seen and some calcification in the aorta, secondary to an aortic graft.
5-1-4 Lateral view of the patient in 5-1-3 shows the calcification and graft throughout the aorta and the left hemidiaphragm significantly elevated with the gastric bubble following it up.

5-2 Pleural Fluid/Costophrenic Angle
5-2-1 This shows pleural effusion on the right with obliteration of the normal costophrenic angle. Again sternal wires are noted.
5-2-2 Lateral projection shows again the pleural effusion. A clear easily seen left diaphragmatic shadow can be seen posteriorly, but the right hemidiaphragm is obscured by the fluid. Again fluid in the minor and major fissures is nicely delineated.
5-2-3 This film shows an effusion on the left. It is an unusual one in that the left hemidiaphragm or at least part of it is still visualized, meaning that the effusion probably is not completely covering all of the diaphragm.
5-2-4 Lateral projection of the same patient showing a clear right hemidiaphragm on the lateral view, and an effusion posteriorly. This also shows a good “spine sign” in that the effusion overlying the spine makes the spine look too white as you move inferiorly. There is also fluid in the left major fissure.

5-3 Flat vs. Rounded Diaphragms
5-3-1 This film shows normal rounded hemidiaphragms, right being higher than the left, which is its normal position. Seen to good advantage here is the shadow from the breast bilaterally.
5-3-2 This film shows very nice, normally rounded hemidiaphragms on the right and left.
5-3-3 A lateral projection showing very flattened diaphragms suggesting hyperinflation most commonly from chronic obstructive pulmonary disease. The AP diameter is increased in size, noting there is an increase in the retrosternal airspace, ie, the airspace between the posterior aspect of the sternum and the right ventricle of the heart. Obliteration of this airspace would indicate right ventricular enlargement.
5-3-4 PA view shows the diaphragm is flattened as well but as you can see, the lateral view actually shows the flattening to better advantage than the PA view.
5-3-5 Blebs. This film shows blebs in the lung parenchyma particularly to good advantage in the right upper lobe where you can see the wall of the bleb that is calcified somewhat. The diaphragms are flat and this would suggest a patient with hyperinflation and specifically emphysema.

5-3-6 A lateral projection of a patient showing again flattened hemidiaphragms.

5-4 Pneumothorax

5-4-1 This film shows almost a complete pneumothorax on the right with a collapse of the entire right lung. The right costophrenic angle is slightly blunted, probably from some fluid.

5-4-2 This is a portable film showing a large inferior pneumothorax on the left. There is a subclavian central line coming in on the left suggesting that the pneumothorax may have been secondary to placement of the central line. The lung is not collapsed in its normal fashion, but is collapsed nonetheless. Endotracheal tube is noted in the trachea.

5-4-3 This shows a striking pneumothorax on right side. This patient has disseminated blastomycosis, which makes for diffusely increased density of the lung tissue and thus increases its contrast against air, making this easily seen. Internal jugular line is seen and is the likely cause of the pneumothorax.

5-4-4 Gotcha! This film suggests there could be a pneumothorax on the right, but this is actually the arm shadow coming down. As you can see it comes down further than lung tissue which is one sign that it is probably not in the lung. If you look closely there are lung markings outside of (ie - lateral to), the vertical line, which again tells you pneumothorax is not present. On the left there is a little bit of arm shadow as well, right up against the pleural surface. Again, we need to get the arms up and out of the way to prevent this type of film error.

6 Equal Lung Parenchyma:

6-1 Comparing Sides

6-1-1 This patient has had a mastectomy on the right and as you can see the lung density is a lot less in the right base because there is absence of the overlying breast tissue. If you did not notice the absence of the right breast, you might erroneously conclude that there is increased lung density on the left (which could be misinterpreted as an infiltrate on that side), and normal appearing lung parenchyma on the right.

6-1-2 This lateral film demonstrates an absence of bilateral breast shadows, post mastectomy.

6-1-3 This is a normal variant called an azygous fissure. It is a normal variant in that the azygous vein has caused increased pleural density.

6-2 Owl's Eye Sign

6-2-1 The “owl's eye sign” compares the apex of the lung on the right with the apex of the lung on the left. This is the part of the lung above the clavicular shadow. In this particular example one can see an infiltrate on the right compared to the left. The two “eyes” should always look the same and when it doesn’t it is thus called the owl’s eye sign (looks like a winking owl). Incidental note is made of a pacemaker in the left chest wall.

6-2-2 This film shows a normal chest x-ray with normal apices, ie, the “owl’s eyes” appear normal and not winking.

6-3 Fissures - location

6-3-1 This is a PA view and shows fluid in the left major fissure

6-3-2 This film shows the same patient in lateral projection with fluid in the left major fissure and some calcification throughout the aorta secondary to a graft.

6-3-3 This lateral film shows to good advantage the right major fissure and the right minor fissure. There is an infiltrate in the right upper lobe which brings the right minor fissure into even better definition.

6-3-4 This film shows the patient in 6-3-3 in the PA view and you can see to good advantage the right upper lobe infiltrate. There is blunting of the costophrenic angles bilaterally, more prominent on the right than on the left, which is consistent with the infiltrate on the right.

6-3-5 This is a lateral that has been seen before, again showing fluid in the right major fissure. The minor fissure is visualized as well.

6-4 Straight Lines; implication

6-4-1 When straight lines are seen overlying or within the lung parenchyma, it is not usually a normal finding. Instead it implies that there is either an air-fluid level or a straight air-water density level. This lateral projection shows the arm shadow overlying the air in the lung causing a nearly
straight line. One can tell that it is not within the lung because it continues outside into the soft tissues and beyond. The arms should have been elevated out of view before the film was taken.

6-4-2 This straight line is a prominent hydro-pneumothorax in the right hemithorax. The white density being the water density with the darker air density above it, causing the straight line.

6-4-3 Lateral projection of the same patient again with the air fluid density. One can also see the scapulae in lateral projection overlying the vertebrae posteriorly.

6-4-4 This shows an air fluid level as well, inferiorly in the right hemithorax that could be a bronchogenic cyst. Breast shadows are noted to good advantage bilaterally; large gastric air bubble is seen.

6-4-5 Film shows the same patient in the lateral projection. The air fluid level is subtle but it is seen above the gastric bubble and apparently comes off right at a point where the posterior heart hits the diaphragm. The fluid line projects posteriorly and actually overlies the front of the vertebrae posteriorly.

6-4-6 This film shows a patient post-pneumonectomy with some volume loss on the right side, some surgical clips. This patient actually has two air fluid levels suggesting more than just the normal pneumonectomy filling with fluid. This patient had an abscess as well as the normal pneumonectomy filling with fluid, thus explaining the two air-fluid levels.

6-5 Air/Water/Bone Densities; Silhouette Sign, Spine Sign

6-5-1 This film shows under penetration. Note that the interspaces between the vertebrae cannot be seen to good advantage, because with an under penetrated film things look more light or white than they should. In the lung parenchyma under-penetration can be confused with infiltrates.

6-5-2 This is a lateral projection showing significant elevation of the right hemidiaphragm because of atelectasis of the right lower lobe.

6-5-3 This is the same patient now in the AP projection showing significant volume loss on the right with elevation of the hemidiaphragm. This finding could be confused with a right sided pleural effusion but there is not a normal meniscus sign on this film, and instead the diaphragm has a wavy appearance to it, making the presence of fluid less likely.

6-5-4 This film shows diffuse infiltrates in the lung parenchyma, worse on the left compared with the right. Due to infiltrates, the diaphragmatic shadow is not seen at all on the left and is partially obscured by the infiltrates medially on the right.

6-5-5 PA view showing right upper lobe infiltration. Note the "owl's eye" sign with the right owl's eye looking more dense than the left owl's eye. This tells us it is extending up into the apex of the lung and thus must be an infiltrate in the right upper lobe as opposed to the right middle lobe.

6-5-6 This film shows the 6-5-5 patient in the lateral view which shows the infiltrate above the minor fissure on the right which confirms that it is in the right upper lobe. It also shows the infiltrate abutting the major fissure on the right posteriorly which again helps define the right upper lobe.

6-5-7 This lateral projection which has been seen before shows the "spine sign" to good advantage. The spine should become progressively darker as you look from top to bottom of the lateral projection. This shows whitening at the very base which suggests something overlying it, in this case pleural fluid.

6-5-8 This film nicely shows subcutaneous air in the left chest wall, both inferiorly and superiorly above the clavicle. There is a large bore chest tube in the left hemithorax as well.

6-5-9 This film again shows pleural effusion and the spine sign posteriorly. Fluid in the fissure is seen as well.

6-6 Cavities

6-6-1 This film shows blebs in the right upper lobe area, as well as flattened diaphragms These findings are seen with emphysema.

6-6-2 A patient with emphysema with blebs seen primarily in the left upper lobe area. There is a tracheostomy tube in place and EKG leads on the chest wall.

6-7 Mass vs. Nodule

6-7-1 This film shows multiple nodules throughout both lung fields. Nodules are generally less than 2cm whereas masses are greater than 2cm. Note also a portacath like device in the left chest wall. These findings suggest a metastatic carcinoma to the lungs.

6-7-2 Lateral projection of the same patient. The portacath is seen again in the soft tissue structures anteriorly.
6-7-3 This film shows bilateral nodules or masses. Again this is likely metastatic carcinoma, but this time with smooth borders.

6-7-4 The lateral projection of 6-7-3 shows them within the lung parenchyma. This is a relatively under penetrated film.

6-7-5 This film shows two symmetrical smooth surfaced or smooth bordered nodules in the inferior aspects of both hemithoraces. Look again! These are areolar densities from the breasts and can be confused with intra parenchymal nodules. Further investigation of this could be done by a lateral projection which would show these outside of the lung tissue and/or placing metallic densities on the nipples, i.e., nipple markers and repeating the film.

6-7-6 This film shows a mass lesion in the right mid-lung field. The minor fissure is seen coming into this mass. The fact that the fissure is actually seen within the mass means that the mass lesion cannot be part of that fissure and actually has to be behind it posteriorly.

6-7-7 This film shows the above patient in the lateral projection confirming our suspicion; the mass is up against the chest wall posteriorly and not contiguous with the fissure.

6-8 Lobar, Lung collapse

6-8-1 This portable (AP) film shows a right upper lobe collapse. It's not a complete collapse as we still see some lung density, but the end of the minor fissure is seen curving upward. Because of the atelectasis, there is some slight elevation of the right hemidiaphragm. The word atelectasis implies volume loss and the etiology of atelectasis is typically bronchial obstruction, possibly from a mass lesion, blood clot, mucous plug or foreign body obstructing the bronchus. Note there is an endotracheal tube in place.

6-8-2 This film shows some "plate-like" atelectasis in the left mid lung field.

6-8-3 Lateral projection of the same patient. This shows the plate-like atelectasis posteriorly, just inferior to the fissure. One can often differentiate atelectasis from fluid in the major fissure because the atelectatic borders are very irregular, not smooth as they would be with pleural effusion.

6-8-4 This film shows atelectasis of the right lower lobe. This was secondary to an endobronchial lesion in the right lower lobe from a carcinoma. The differential diagnosis of just looking at this chest film would certainly include a pleural effusion. As mentioned above, the contour of the leading surface is not typical for an effusion, but an effusion could not be ruled out. A lateral projection would be helpful to differentiate these. One could also do a right lateral decubitus film to see if there was free fluid that flowed out.

6-8-5 This is a lateral projection of 6-8-4 which does show some atelectatic area posteriorly. Even with this film fluid could not be completely ruled out without a lateral decubitus film. (see 6-9-3 below).

6-9 Air Fluid Levels

6-9-1 This is a hydro-pneumothorax which shows an air fluid level in the right lung field, and above the fluid level is air with no lung markings suggesting a pneumothorax. So this is a hydro-pneumothorax.

6-9-2 This is a lateral projection showing the same. Also shows the complete absence of the right hemidiaphragm because it is silhouetted by the fluid.

6-9-3 This is a left lateral decubitus film showing a straight line. (The “L” in the upper corner is mislabeled and corrected by the larger “R”). This time it is fluid that is rolling up the chest wall, and thus creates an air-fluid contrast, when the patient is in the left lateral position. A loculated effusion (empyema, etc) would not flow like this in the lateral decubitus view. The lateral decubitus film thus demonstrates the presence of fluid that may be difficult to determine solely from the PA view. Incidental note of multiple pulmonary nodules and portacath.

6-9-4 This film is a right lateral decubitus of the same patient showing no fluid rolling up the chest wall on the right. This sequence of films thus tells us there is a non-loculated effusion on the left, and no free flowing effusion on the right.

6-9-5 This film shows an air fluid level to the right of the heart. By this location and the lack of any density on the left or more centrally, it would suggest that this is not a hiatal hernia (see 9-4-1 thru 9-4-4), but potentially a bronchogenic cyst or a pneumatocele.

6-9-6 This film is a right lateral decubitus film showing quite a bit of fluid layering up the right pleural space and creating an air-fluid interface. Again, such layering out of the fluid tells us it is not loculated and therefore more amenable to needle aspiration via a thoracentesis procedure, etc.
A thicker, non-layering effusion would instead require a large bore chest tube or surgery for drainage.

7 Free Air:
7-1 Free Air Under Diaphragm
7-1-1 Shows free air under the diaphragm particularly on the right. In order to best visualize free air, the patient must be in an upright position when the film is taken, thus forcing air to rise to the top of the thoracic cavity and thus entrapping the air just under the diaphragm.
7-1-2 The lateral projection of the same patient again shows the free air under the diaphragm.
7-1-3 This film shows free air under the right hemidiaphragm to good advantage.
7-1-4 This is the lateral projection of 7-1-3 showing the same collection of air under the right hemidiaphragm.

8 Gas Patterns:
8-1 Gastric Bubble
8-1-1 This film shows air in the fundus of the stomach with an air fluid level in the stomach. This as a normal, expected finding.
8-1-2 This AP projection shows significant volume loss of the left lung with elevated left hemidiaphragm and a large air bubble. It also shows some subcutaneous air on the left (just lateral to the ribcage) suggesting trauma.

8-2 Ileus/Obstruction
8-2-1 Shows a pattern of ileus with dilated bowel. Incidental note of an infiltrate in the right upper lobe.
8-2-2 Same patient in the lateral projection showing a very dilated bowel. Also note an infiltrate in the right upper lobe and slight pleural effusion on the left.
8-2-3 PA showing dilated bowel secondary to ileus on the left coming up under the left hemidiaphragm. There is some very smooth appearing homogenous infiltrate in the right upper lobe area.
8-2-4 Lateral projection of previous patient again shows the bowel on the left with the left hemidiaphragm higher than the right posteriorly, and showing the relatively homogenous infiltrate in the right upper lobe. In the right lung, both the major fissure and the minor fissure can be nicely seen.

9 Hila/Mediastinum:
9-1 Pulmonary Vasculature; Elevated PA Pressure
9-1-1 This film shows some infiltrate in the right lung. The pulmonary arteries are much more prominent than usual and would suggest some degree of pulmonary artery hypertension.
9-1-2 This is the lateral view of the same patient showing infiltrate. The arteries are not seen as clearly here.

9-2 Lymph Nodes
9-2-1 PA film shows significantly enlarged lymph nodes bilaterally. These are hilar nodes and a differential diagnosis would certainly include sarcoidosis or neoplasm, HIV, etc.
9-2-2 This is a lateral projection of the same patient again showing large lymph nodes in the mediastinum bilaterally.

9-3 Aorta
9-3-1 Shows the enlarged aorta suggesting an aneurysm.
9-3-2 Shows the enlarged aorta in the lateral projection, well-calcified
9-3-3 Another thoracic aortic aneurysm, also note this is a somewhat over penetrated film with hyper inflation seen.
9-3-4 Lateral projection demonstrating the same as 9-3-3.
9-3-5 This film shows an aneurysm of the aorta superiorly, obscuring part of the left apex, making a somewhat positive “owl’s eye sign”. There is also infiltrate seen in the right upper lobe.
9-3-6 This is the lateral projection of the aneurysm seen in 9-3-5.

9-4 Hiatal Hernia
9-4-1 This film shows a large hiatal hernia, certainly a sense of an air fluid level within this.
9-4-2 This is a lateral projection of the same patient which nicely demonstrates the air fluid level and the large hernia.
9-4-3 PA projection. Again, a large hiatal hernia in this patient with what looks like two different air fluid levels. Calcium noted in the aortic knob.

9-4-4 This is a lateral projection of the patient in 9-4-3.

10 Iatrogenic/Intruders

10-1 IV, Pacer, Foreign Body, Valves

10-1-1 This film shows multiple iatrogenic intruders; there is a pacemaker with the pacemaker wires, there is sternal wiring, there are metallic clips from prior surgery and there is a prosthetic valve.

10-1-2 This is a lateral projection showing all of the above intruders.

10-1-3 This film shows bilateral breast implants. These implants are not seen to the best advantage; in fact they are difficult to appreciate. The only hint that this is an abnormal shadow is that the line outlining the breast inferiorly is so smooth and not a more natural contour.

10-1-4 This is a lateral projection of the same patient which shows to much better advantage the breast implants. One would not normally see such densities on the chest wall as those seen on this film.

10-1-5 This shows an endoscopy camera in the esophagus.

10-1-6 The lateral projection shows the camera capsule in the esophagus as well.

10-1-7 This film shows a central line in the right hemithorax.

10-1-8 Again this shows a central line in the right chest. The distal tip of the central line ideally is near the right auricle of the heart, as seen here.

10-1-9 This shows a tracheostomy tube and some EKG leads. Incidental note is made that this is a patient with bullous emphysema with bullae seen primarily in the left hemithorax.

10-1-10 This shows a bullet in the left hemithorax and a large pleural effusion on the left. On the PA film alone, we are unable to tell if the bullet is within the lung parenchyma or not, so a lateral view is needed.

10-1-11 This lateral projection of the above patient nicely shows that the bullet is outside of the lung parenchyma and in the soft tissues of the back.

10-1-12 This film shows wiring in a brassiere that was not taken off prior to the film.