



Thoracic and Cardiac Imaging / Imagerie cardiaque et imagerie thoracique

Review of Thoracic Imaging Findings Unique to Women

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Abstract

Purpose: Traditionally, indications for imaging studies of women are considered to be related to screening for and evaluation of disease of the female breast and pelvis. However, a number of chest diseases and associated intrathoracic imaging findings are unique to women and should be recognized by general radiologists, as well as chest and women-imaging specialists.

Conclusions: The sex-specific findings unique to women include normal anatomical variants, primary lung disease, complications of breast and gynaecological disease, and pregnancy-related conditions. Classification, description, and illustration of gender-specific chest imaging findings are the objective of this article.

Résumé

Objectifs : Traditionnellement, on considère que les indications des examens d'imagerie chez les femmes sont reliées au dépistage et à l'évaluation des atteintes du sein et du bassin. Néanmoins, certaines affections thoraciques et anomalies connexes découvertes à l'imagerie intrathoracique sont propres aux femmes et devraient être reconnues par les radiologistes généralistes ainsi que par les spécialistes de l'imagerie thoracique et de l'imagerie chez les femmes.

Conclusions : Les observations radiologiques propres aux femmes comprennent les variantes anatomiques normales, les pneumopathies primaires, les complications d'affections du sein et de maladies gynécologiques, ainsi que les affections liées à la grossesse. La classification, la description et l'illustration des aspects d'imagerie thoracique sexospécifiques constituent l'objet du présent article.

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Key Words: Thoracic imaging; Women imaging; Gender specific findings; Women chest

The anatomical and physiological differences between women and men are associated with sex-specific variations in the normal imaging appearance and in differences in the incidence of certain pathological conditions between the 2 groups. These differences are much more extensive than the reproductive system and breast and consist of normal anatomical variants, primary lung disease, complications of breast and gynaecological disease, and pregnancy-related conditions. A number of thoracic pathologies are exclusive

to women and should therefore be familiar to radiologists at large and to chest and women imaging experts in particular.

The goal of this article is to draw attention to what is currently known about female sex-specific chest findings, both normal and pathological. Pathologies that are predominantly seen in women, but can be found in men, as well as primary breast disease are excluded from the discussion.

Anatomical Features of the Female Chest

The female thoracic cage is generally more rounded and smaller than that of the male. Studies have shown that women have a smaller rib cage size, a greater inclination of ribs, a comparable diaphragm dome position relative to the spine and a shorter diaphragm length than males of the same height.

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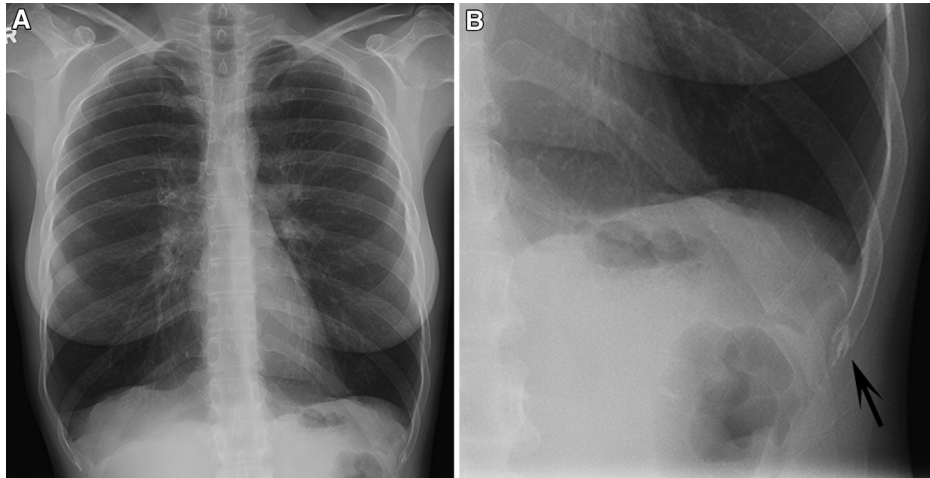


Figure 1. Normal chest radiograph (A) of a 24-year-old woman clearly reflects gender-related features due to prominent breast shadows. Also, note characteristic central pattern of costal cartilage calcification (arrow) seen on coned down and zoomed-image (B).

Female lungs tend to be smaller, but are otherwise undistinguishable from male lungs at surgery or on autopsy [1].

On chest radiography, prominent breast tissue and central pattern of costal cartilage calcification usually allow to readily identify a female patient compared to the lack of breast shadows and peripheral pattern of costal cartilage calcification in men (Figure 1) [2]. That might be important in patient identification in cases of a mislabeled study or ambiguous name. Pregnancy related thoracic anatomical changes are well recognized on imaging. These include upward displacement of the diaphragm compensated by an increased diameter of the thoracic cage that together results in shortening and widening of the lungs [1].

Developmental Anomalies and Genetic Disease

Few genetic diseases associated with chest manifestations are seen exclusively in females. The most common of these is Turner syndrome.

Turner syndrome is diagnosed in females with partial or complete absence of one X chromosome (45, XO karyotype). Characteristic thoracic findings in patient with Turner syndrome include a broad chest with widely spaced nipples and short or prematurely fused sternum, cardiovascular abnormalities, and congenital lymphoedema. The congenital cardiovascular anomalies include aortic coarctation (Figure 2), bicuspid aortic valve, aortic dilatation or aneurysm and an increased risk of aortic dissection [3].

Lymphangi leiomyomatosis

Lymphangi leiomyomatosis (LAM) is an interstitial lung disease that almost exclusively affects women of reproductive age. It may occur sporadically or in association with tuberous sclerosis complex. Progressive dyspnea, recurrent pneumothoraces, hemoptysis, and chylous pleural effusions are common clinical manifestations [4] in symptomatic patients.

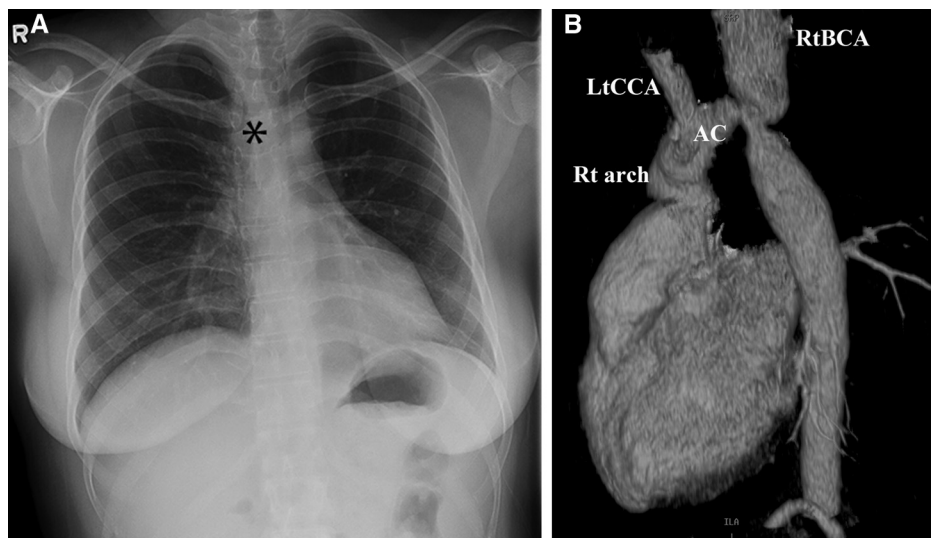


Figure 2. Turner syndrome and a complex aortic malformation. Chest radiograph (A) shows right-sided aortic arch (asterisk in A; Rt arch in B) resulting in deviation of the trachea to the left. Aortic coarctation (AC) and aneurysmal right brachiocephalic artery (RtBCA) are demonstrated on computed tomography 3D volume rendering reconstruction (B). Note is made of normal size of the left common carotid artery (LtCCA).

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