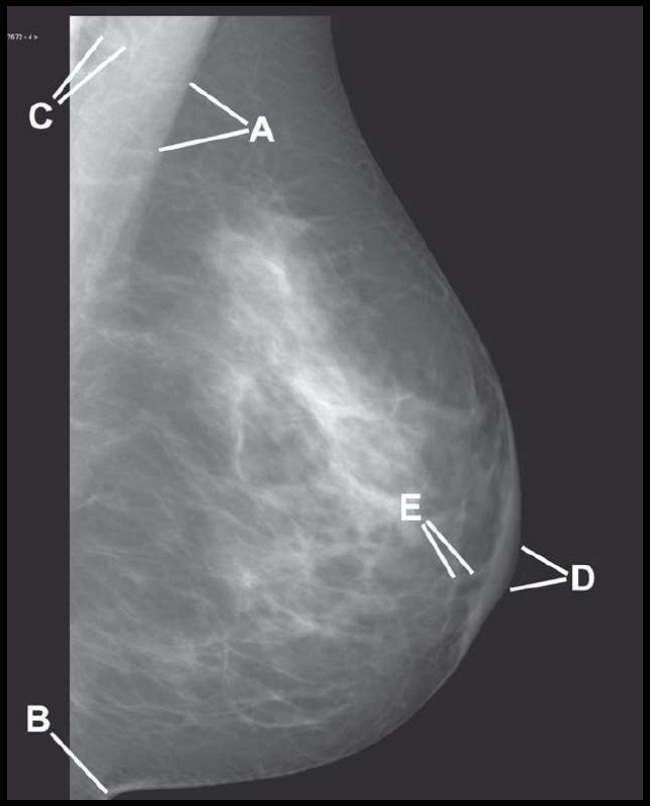
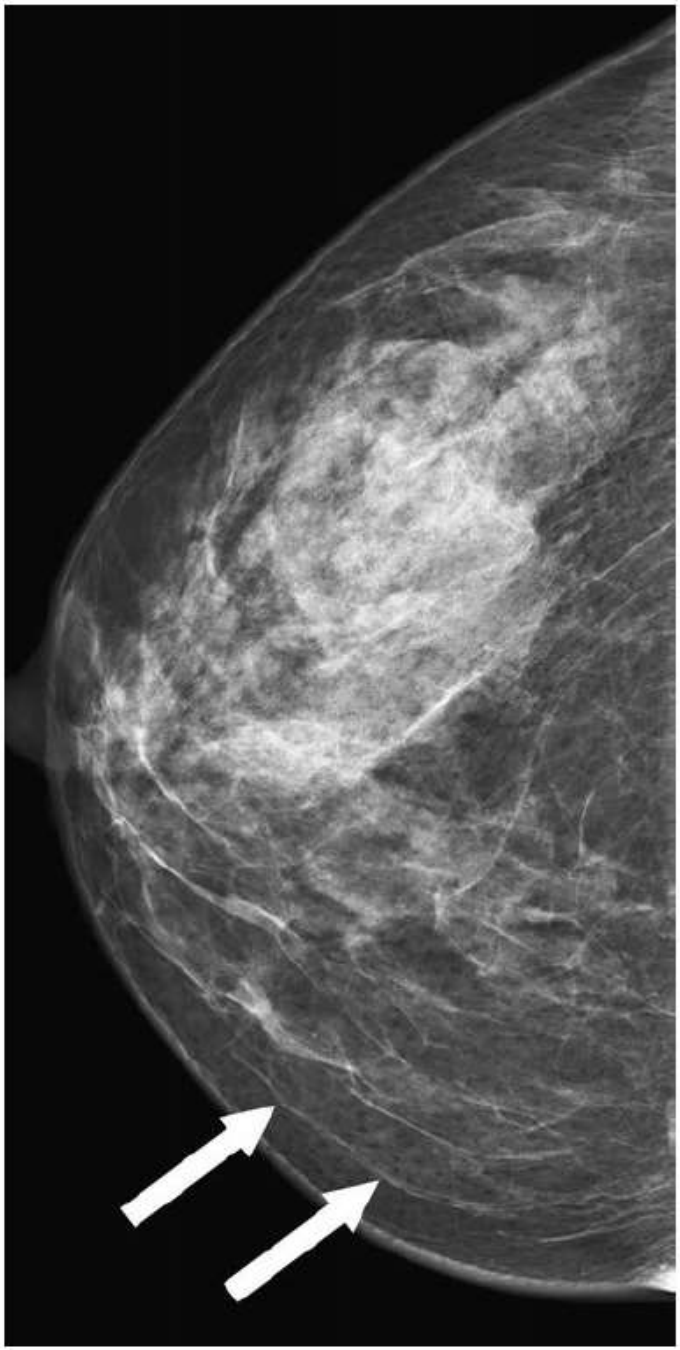
BREAST



- **Question 49:**

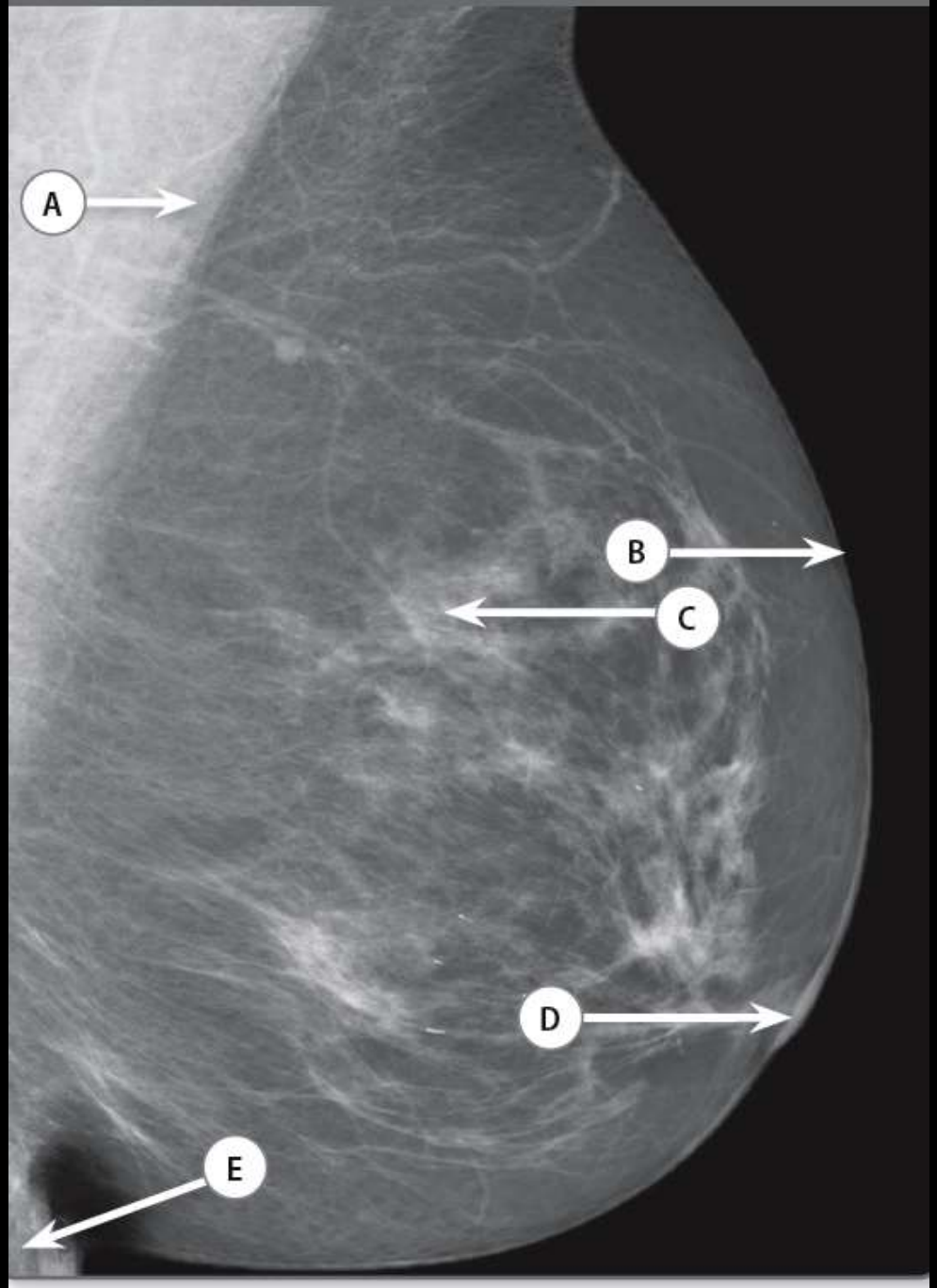


Question 49: Mammogram

Answer: Cooper ligament or suspensory ligament

- The Cooper ligament is composed of fibrous bands of connective tissue that support the glandular part of the breast.
- Anteriorly, they attach to the skin and, posteriorly, to the fascia of the pectoralis major muscle.

Case 2.33



Case 2.33

A Pectoral muscle

B Skin line

C Glandular tissue

D Nipple

E Inframammary fold

Mammogram.

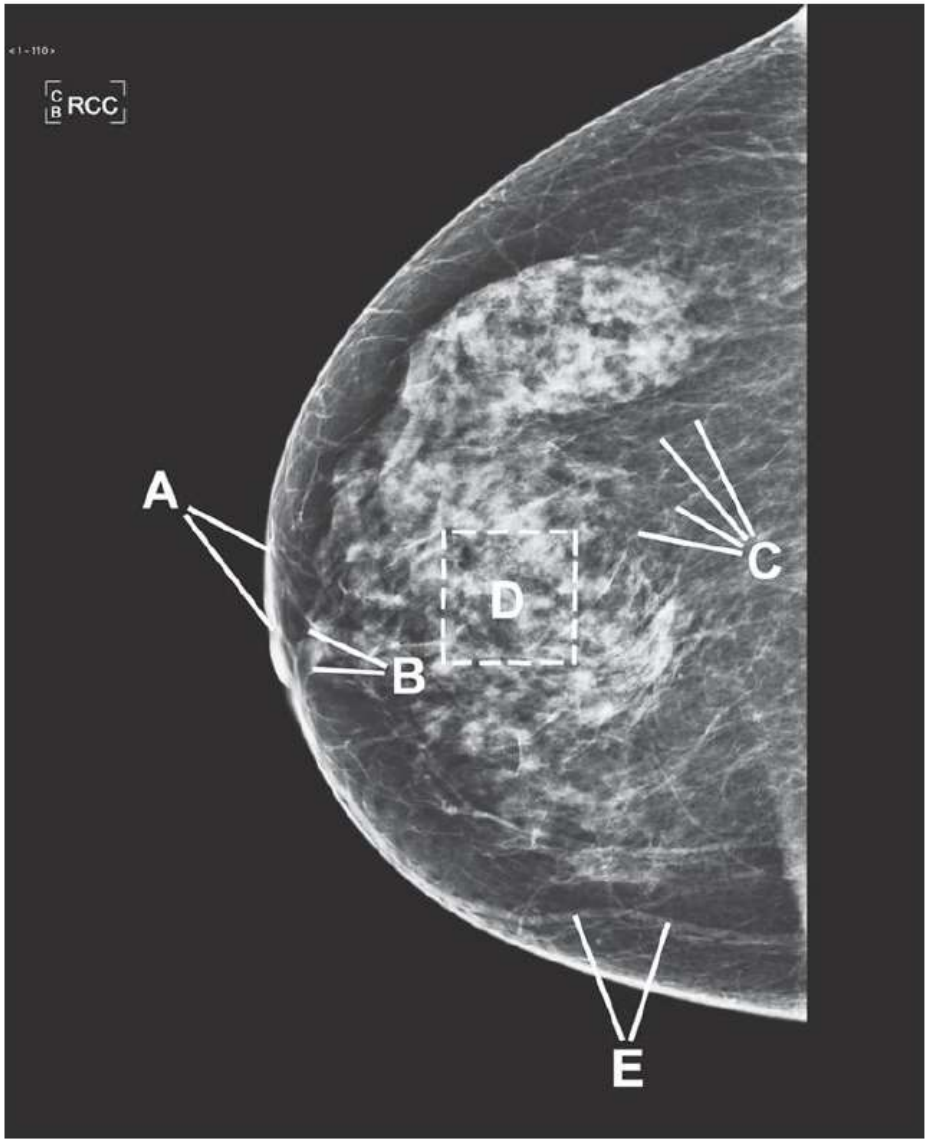
The breast lies on the 2nd to 6th ribs. It consists of fatty and glandular tissue, which is held in place by Cooper's ligaments that attach to skin and underlying pectoralis muscle fascia. It is supplied by the internal mammary artery and the lateral thoracic branch of the axillary artery. Venous drainage follows the arterial supply.

Most of the lymph drainage is to the axillary chain, with 5% draining to the internal mammary chain.

Weir J, Abrahams P. Imaging Atlas of Human Anatomy, 4th edn. Edinburgh: Mosby, 2010: 120–122.
Ryan S, McNicholas M, Eustace SJ. Anatomy for Diagnostic Imaging. Edinburgh: Saunders, 2004: 313–325.

Q11

a Name the structure labelled A
b Name the structure labelled B
c Name the structures labelled C
d Name the tissue predominant in the area labelled D
e Name the type of structure labelled E



Q11 Answers

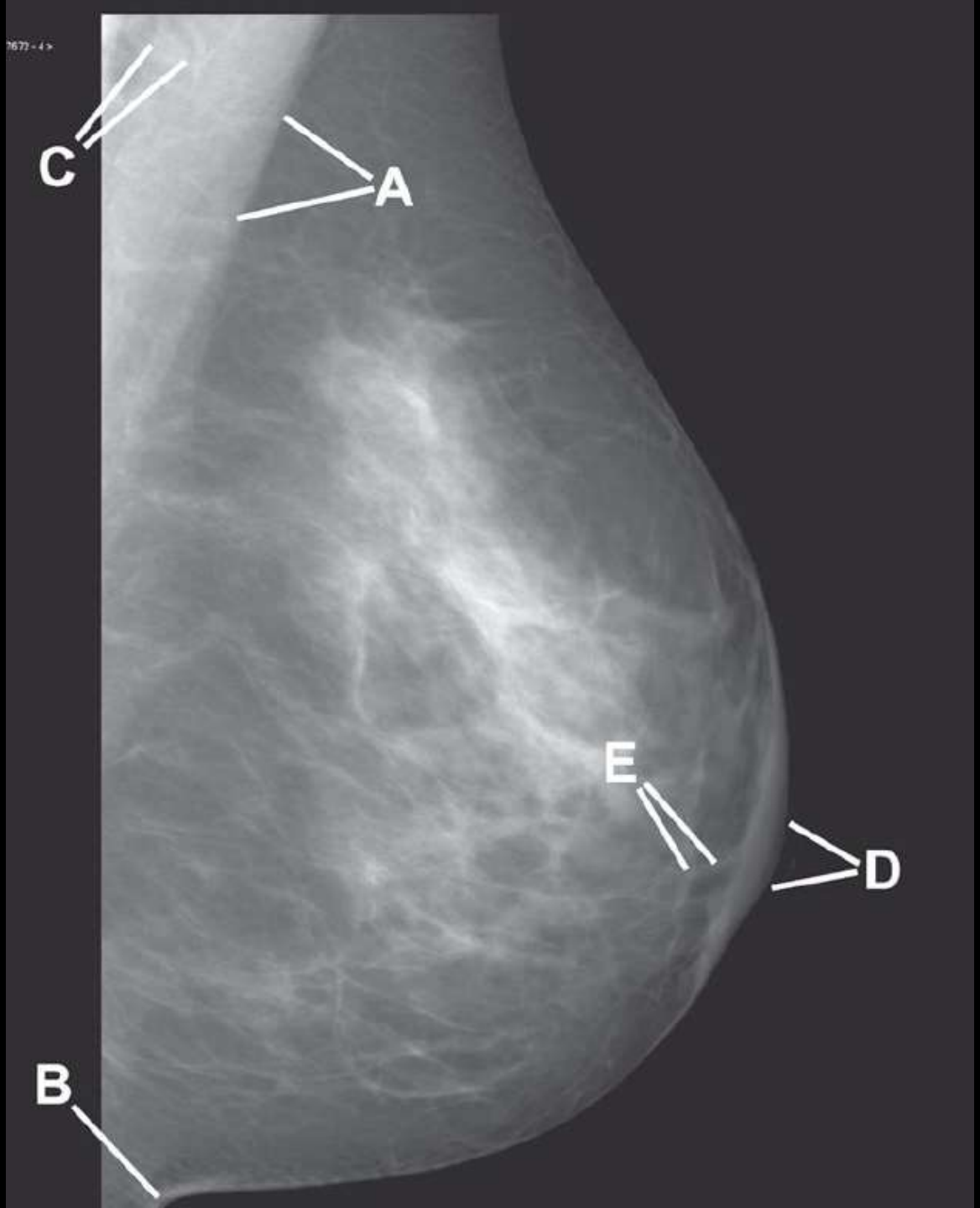
a Areola
b Retro-areolar duct
c Fibrous septae/suspensory ligaments of Cooper
d Fibro-glandular breast tissue
e Blood vessel

Mammogram left breast, cranio-caudal projection

The cranio-caudal projection is one of two views commonly used in breast radiography. Mammographic appearance of normal breast tissue depends on the proportion of fibro-glandular tissue to fat. It is usual for breasts to contain proportionally more fat with advancing age.

The skin of the areola is normally focally thickened. Retro-areolar ducts are seen as tubular densities which fan out into the breast from the nipple. Blood vessels within the breast can be very difficult to see and are only visible if surrounded by fatty tissue. Determining the type and location of a vessel is not always possible. Fine fibrous bands which run in a radial direction are another of the linear structures which are seen within the breast. These are the suspensory ligaments of Cooper which serve to support the structure of the breast.

Lymph nodes exist within the normal breast, especially within the upper outer quadrant. Normal nodes should be round or ovoid in shape, demonstrate a low soft tissue density and contain a fatty hilum.


C
A
E
D
B

Q12 Answers

a Pectoralis major muscle
b Infra-mammary skin fold
c Axillary lymph node
d Nipple
e Retro-areolar duct

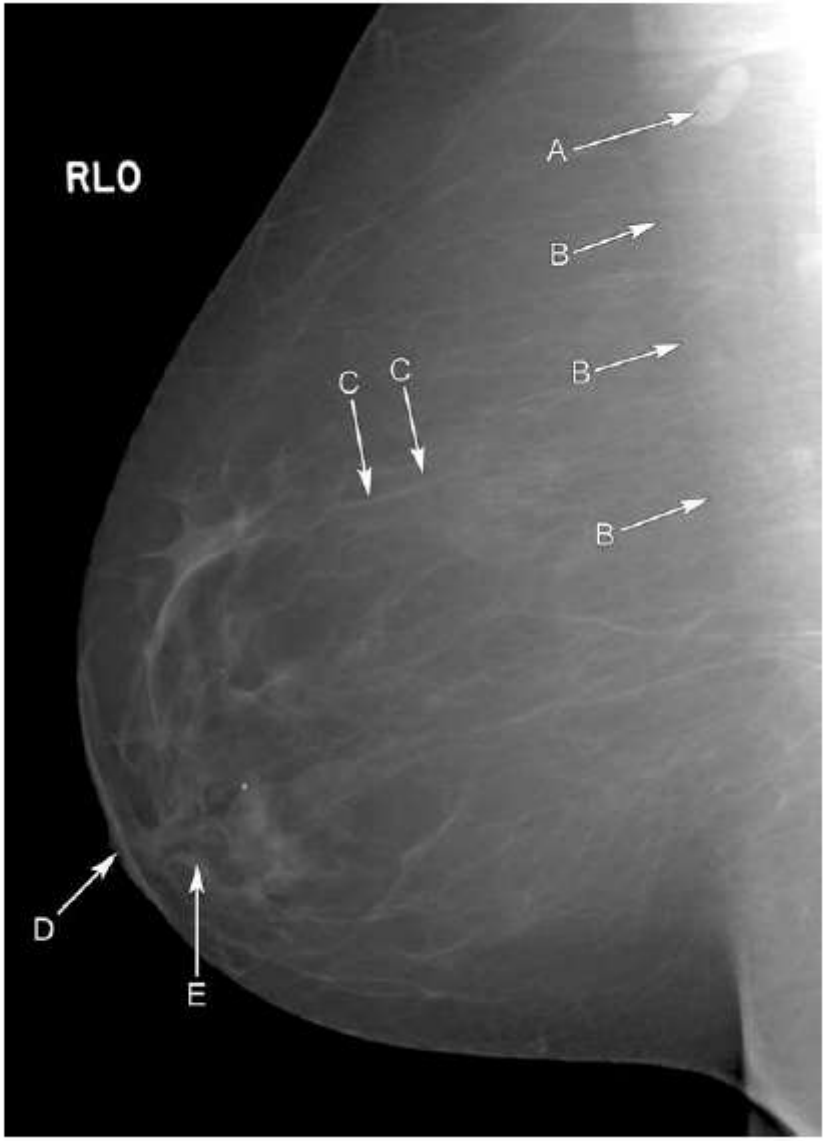
Mammogram right breast, mediolateral oblique (MLO) projection

The MLO view of the breast demonstrates the pectoralis muscle, axilla and infra-mammary fold as well as the breast. The distribution and proportion of fibro-glandular breast tissue varies between patients and there is a wide range of 'normal' appearances. Wolfe (1976) described four categories of breast parenchymal distribution: N1, primarily fatty; P1, ≤25% prominent ducts; P2, >25% prominent ducts; and DY, dense fibroglandular tissue. Although not used in everyday clinical use, these categories can be used to ensure standardization when conducting research or audit.

Axillary lymph nodes are frequently seen on MLO mammograms. Although usually larger than those seen within the breast, the presence of fatty hilum remains useful in confirming their identity.

Wolfe JN. Breast patterns as an index of risk for developing breast cancer. *Am J Roentgenol* 1976; 126:1130–1137.

Question 1.9



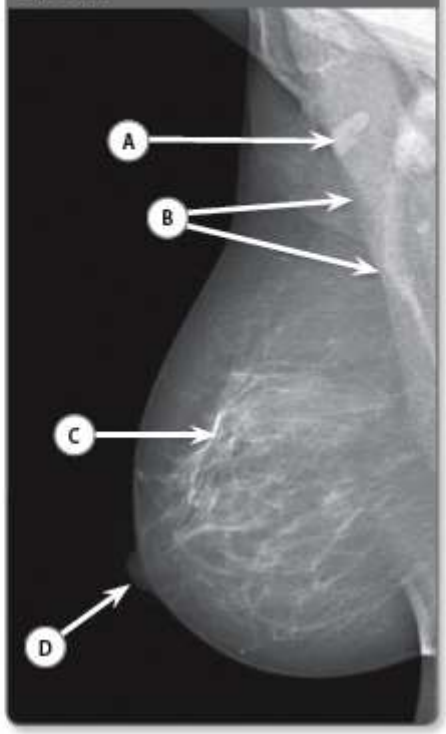
Name the structures labelled **A** to **E**.

1.9 Medial lateral oblique mammogram of the right breast

A Right axillary lymph node.
B Right pectoralis major muscle.
C Ligament of Astley Cooper (suspensory ligament of the right breast).
D Right nipple.
E Right retroareolar duct.

Retroareloar ducts radiate from the nipple and are visible in the older age group of women, owing to the replacement of glandular tissue with fatty tissue. The ligaments of Astley Cooper are connective tissue of the breast that run from the deep fascia and maintain the structure of the breast. Distortion and thickening of the ligaments can help to identify breast malignancies.

Case 5.11



Case 5.11

	QUESTION	WRITE YOUR ANSWER HERE
A	Name the structure labelled A.	
B	What muscle is labelled B?	
C	Name the structure labelled C.	
D	Name the structure labelled D.	
E	What is the tissue behind the nipple called?	

Case 5.11

A Right axillary lymph node

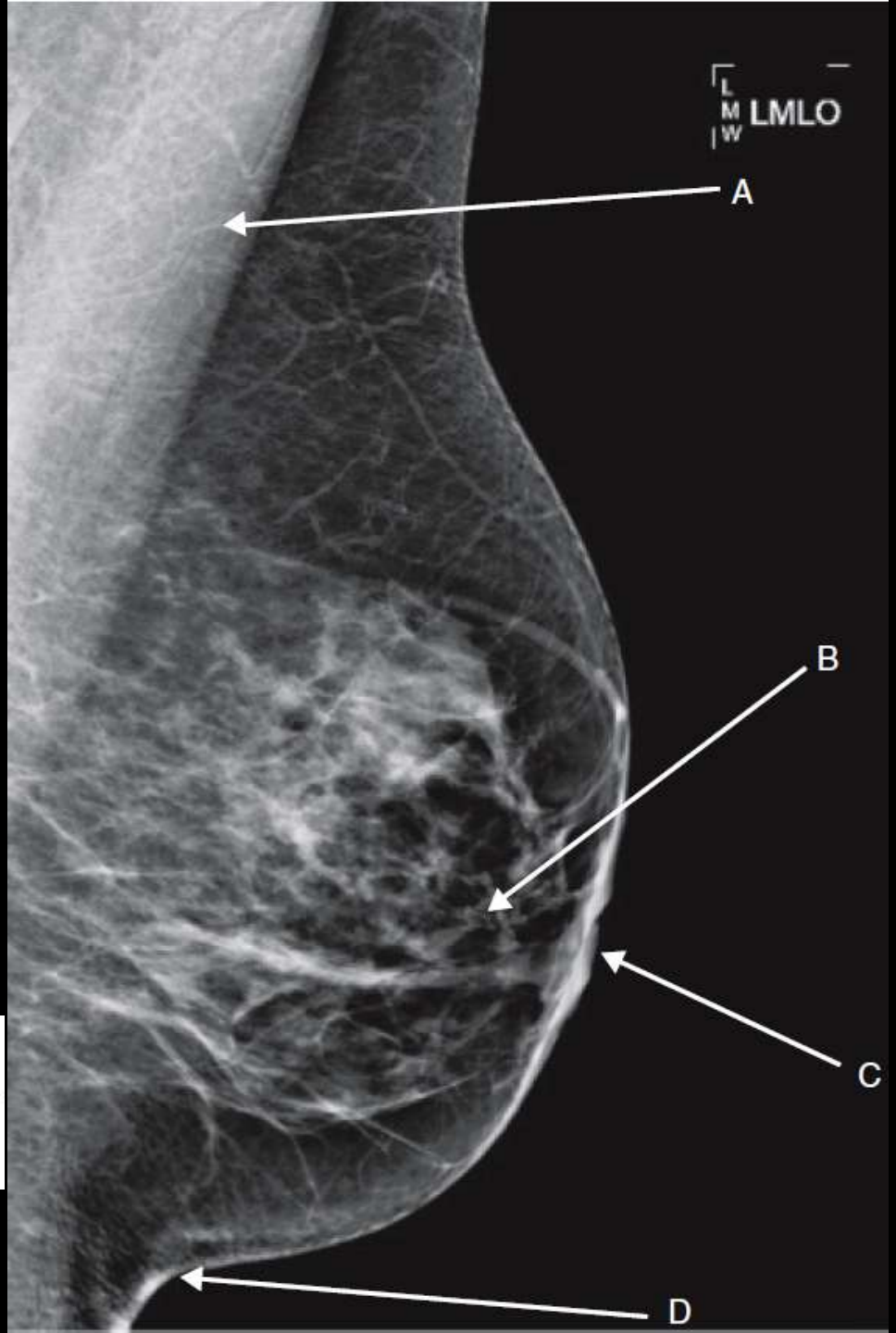
B Right pectoralis major muscle

C Right intramammary blood vessels

D Right nipple

E Retroareolar tissue

The pectoralis major muscle is seen at the base of the breast. The axillary tail of the breast and accessory breast tissue may be seen in the axilla. Normal anatomical structures such as intramammary blood vessels and lymph nodes may also be seen on mammograms. The other conventional mammographic view is the craniocaudal view which is almost orthogonal to the mediolateral oblique (MLO) view.



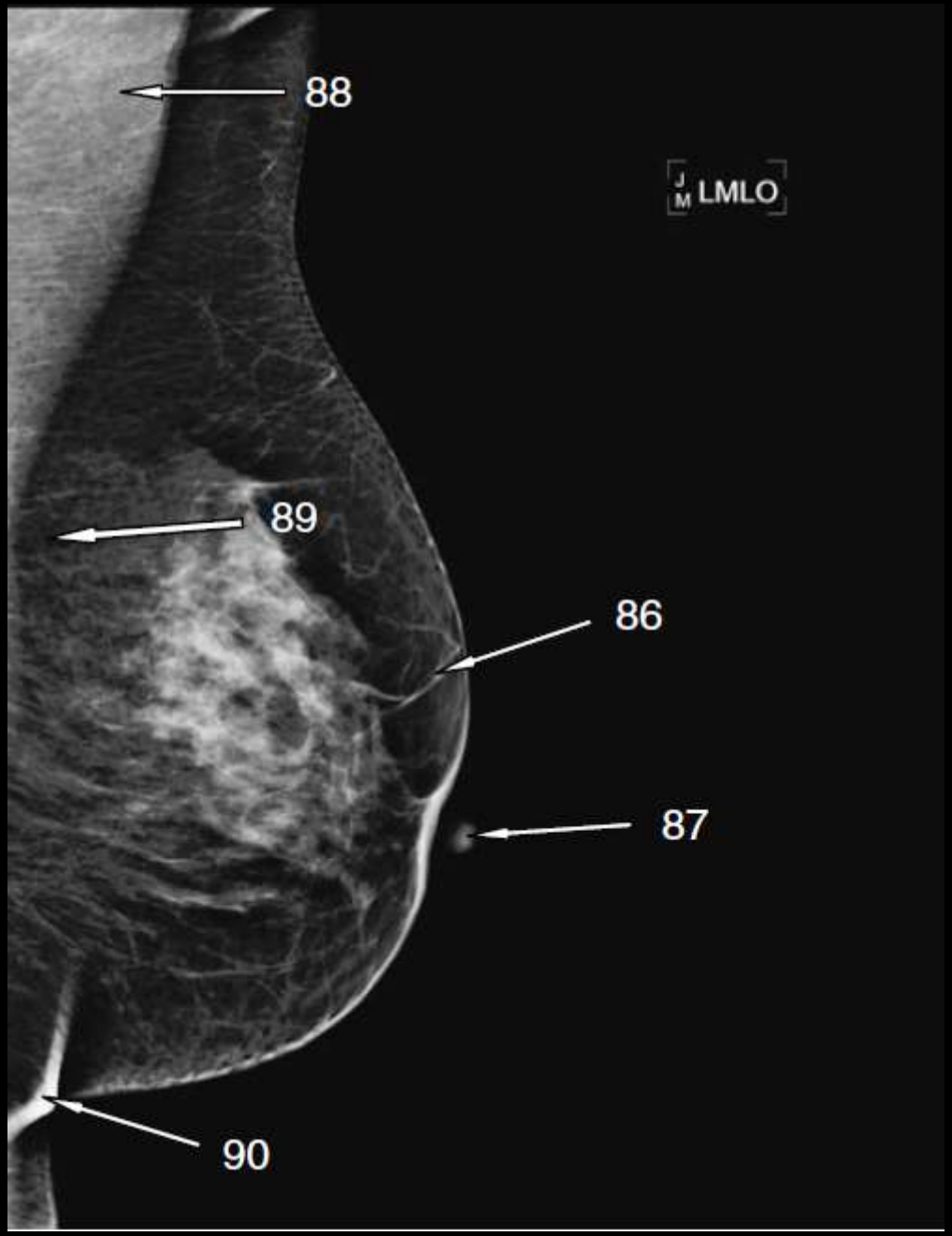
Which mammographic view has been taken?

2.18 Mammogram

(a) Left pectoralis major muscle.
(b) Subareolar area.
(c) Nipple.
(d) Infra-mammary fold.
(e) Medio-lateral oblique (MLO) view of the left breast. With a properly positioned MLO view the pectoralis muscle is seen obliquely across the top of the film extending inferiorly to the level of a line drawn perpendicularly through the nipple to the muscle (the posterior nipple line). The nipple should be in profile so the subareolar tissue is adequately imaged. The infra-mammary fold should be visible so the inferior breast has been adequately imaged.

The other view utilized in breast imaging is the cranio-caudal (CC) view.

MRI of the breast has gained widespread acceptance for the purposes of breast imaging in screening, staging in primary and recurrent cancer, biopsy, treatment response and evaluating breast augmentation.

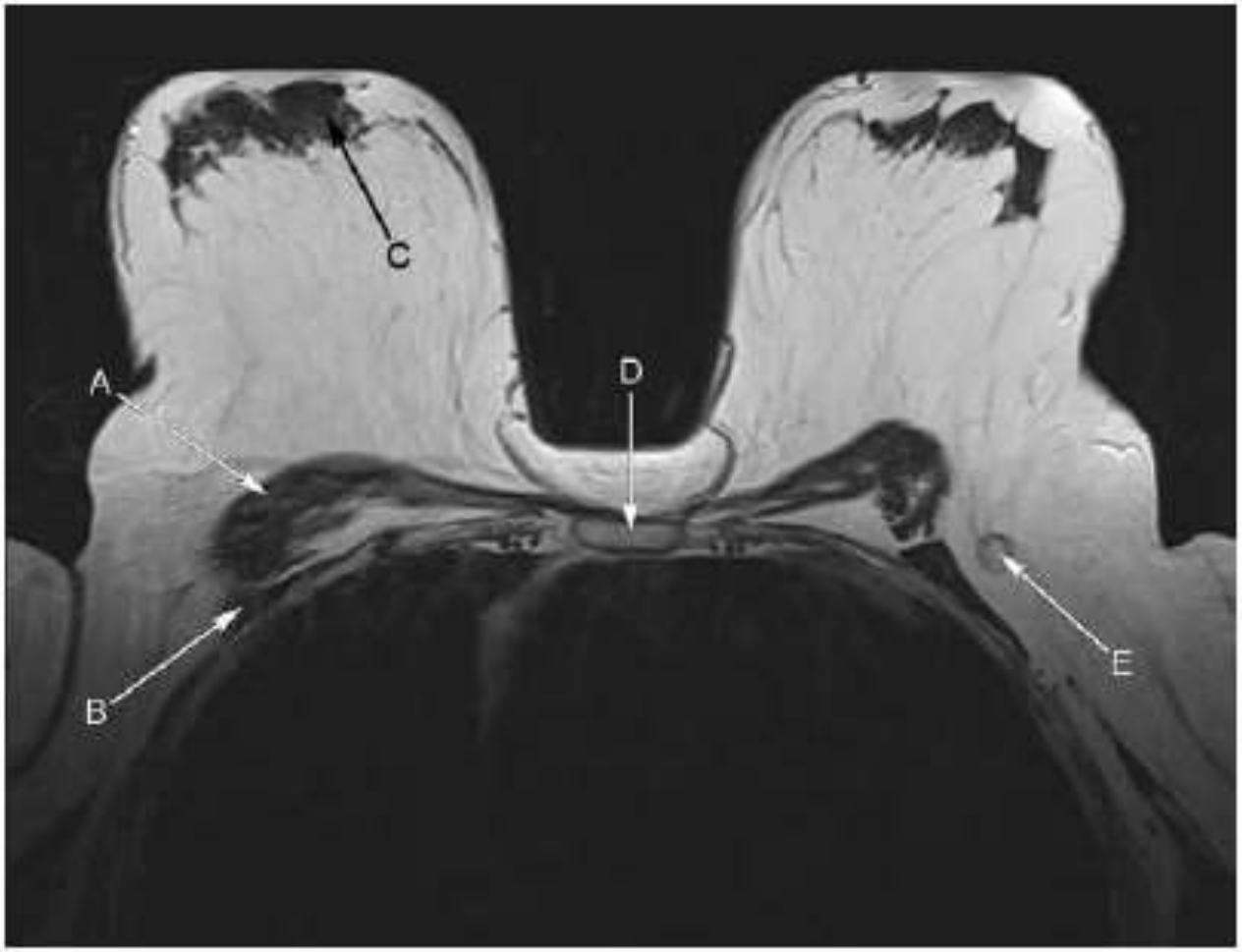

88
J
M LMLO
89
86
87
90

Mammogram

86. Cooper's ligament
87. Nipple
88. Pectoralis (major) muscle
89. Retroglandular fat
90. Inframammary skin fold

The MLO view is the pectoralis muscle should be convex anteriorly. Retroglandular fat can be seen as a lower density area between the pectoralis muscle and the anterior higher density glandular tissue of the breast anteriorly.

Question 10.15



Name the structures labelled **A** to **E**.

10.15 Axial T2 MRI of the breasts

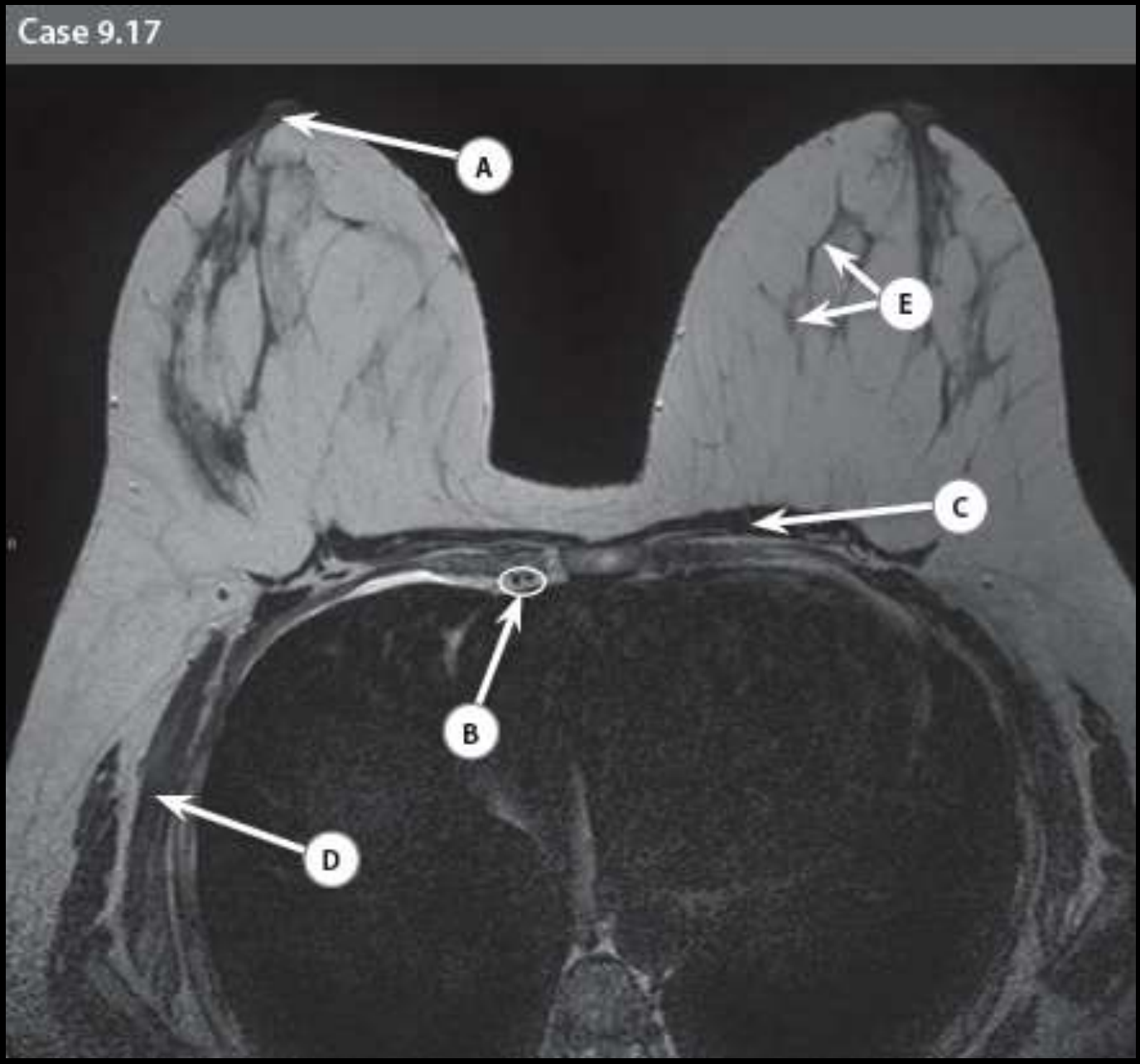
A Right pectoralis major muscle.
B Right pectoralis minor muscle.
C Right breast fibroglandular tissue.
D Sternum.
E Left axillary lymph node.

Breast MRI is performed with the breasts placed within a surface coil and the patient lying prone. On T2-weighted imaging, mammary fat is seen as high-signal intensity, and the central fibroglandular tissue is seen as low signal intensity (as demonstrated here).

About 95% of the lymphatic drainage of the breast is to the axillary chain with the remaining 5% draining to the internal mammary chain. The axillary nodes are divided into three levels according to their relationship to the pectoralis minor muscle:

Level I nodes	Lateral to pectoralis minor
Level II nodes	Posterior to pectoralis minor
Level III nodes	Medial to pectoralis minor

Case 9.17



Case 9.17

A Right nipple

B Right internal mammary/internal thoracic vessels

C Left pectoralis major muscle

D Right serratus anterior muscle

E Suspensory ligaments

MRI of the breast shows anatomical structures such as blood vessels, lymph nodes, suspensory ligaments and underlying muscular structures with great detail. Be sure to take this into consideration as a question such as this one will also likely yield questions not related to breast anatomy.

The proportion of breast tissue can vary widely and usually decreases with age, a concept known as age-related involutional change.