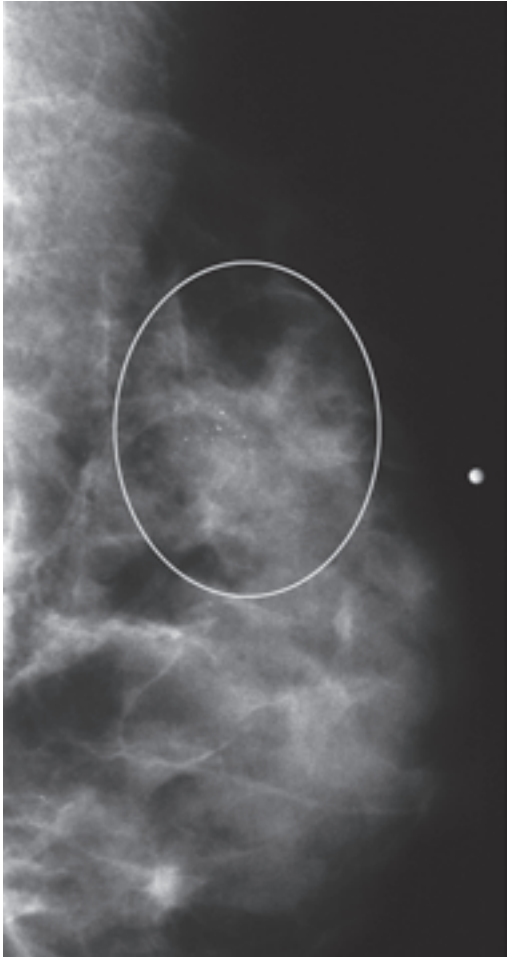
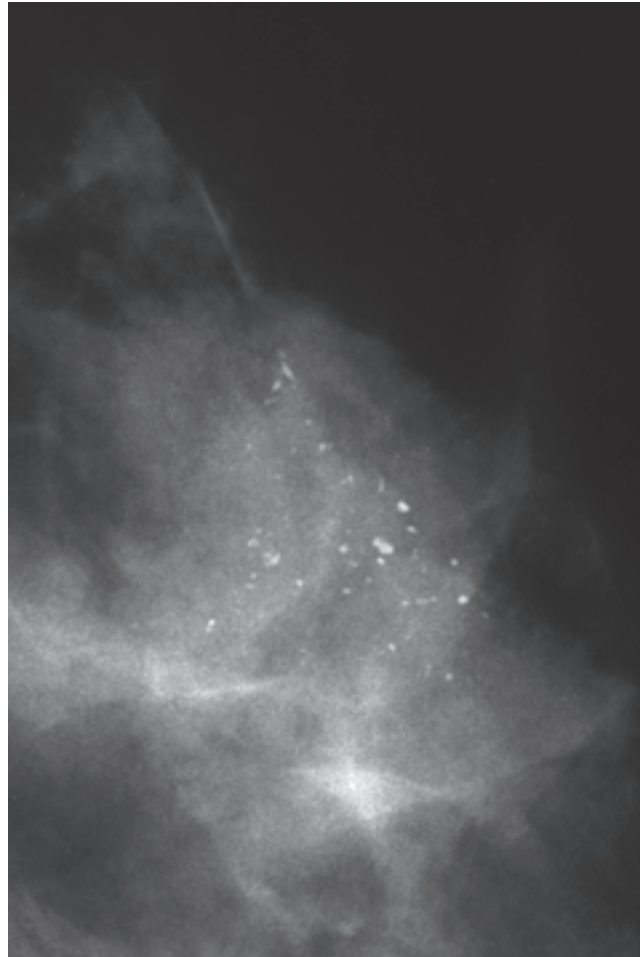


**Example 2.13**

A 36-year-old woman who recently felt a small hard lump in the upper-outer quadrant of her left breast. Clinical breast examination confirms a freely mobile, 1 cm hard tumor. There are no skin changes or discharge.

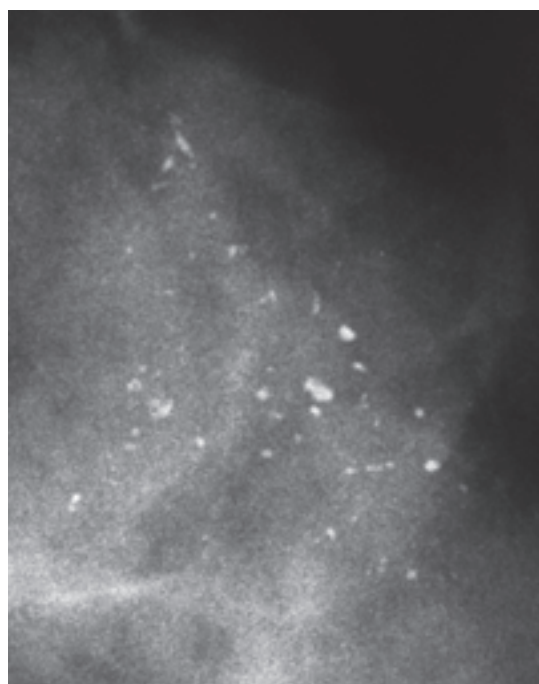


Ex. 2.13-1

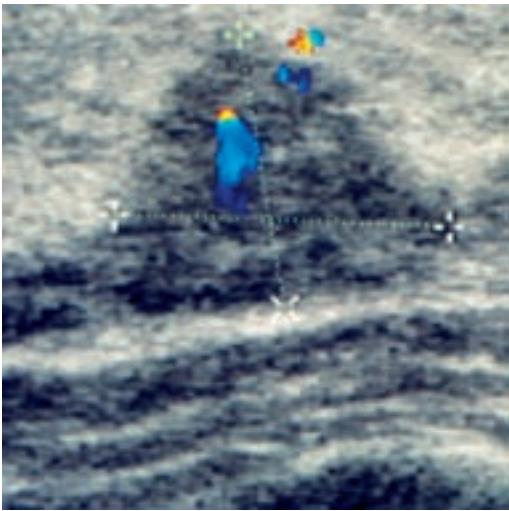


Ex. 2.13-2

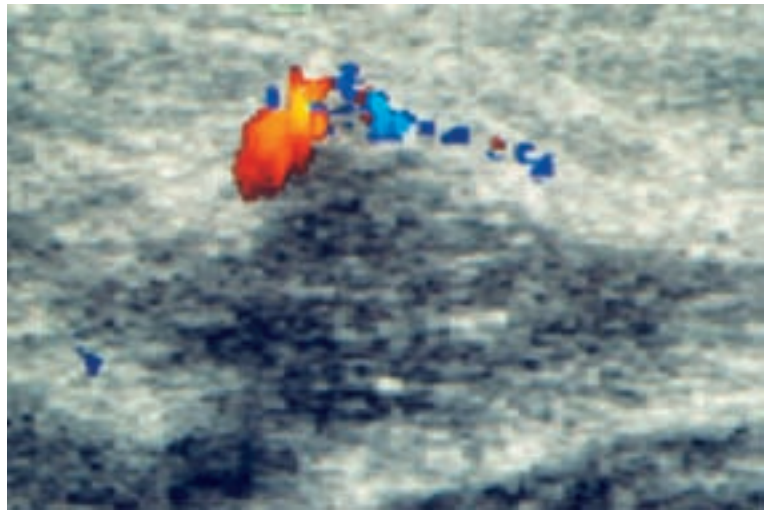
Ex. 2.13-1 to 3 Left breast, detail of the MLO projection (1) and microfocus magnification images (2 & 3) of the region with the palpable lesion. The microcalcifications in the 12 mm × 10 mm cluster vary considerably in size and density. These crushed stone–like, broken needle tip–like pleomorphic calcifications are of the mammographically malignant type.



Ex. 2.13-3

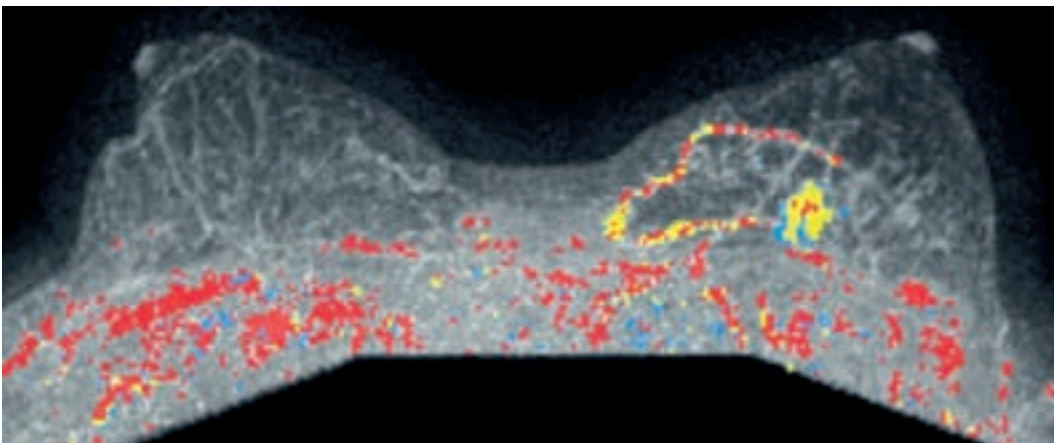


Ex. 2.13-4

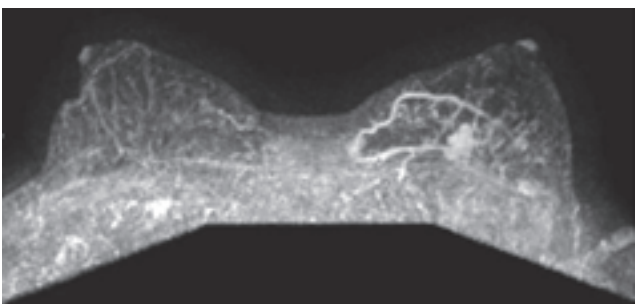


Ex. 2.13-5

Ex. 2.13-4 & 5 Breast ultrasound of the palpable lesion.



Ex. 2.13-6

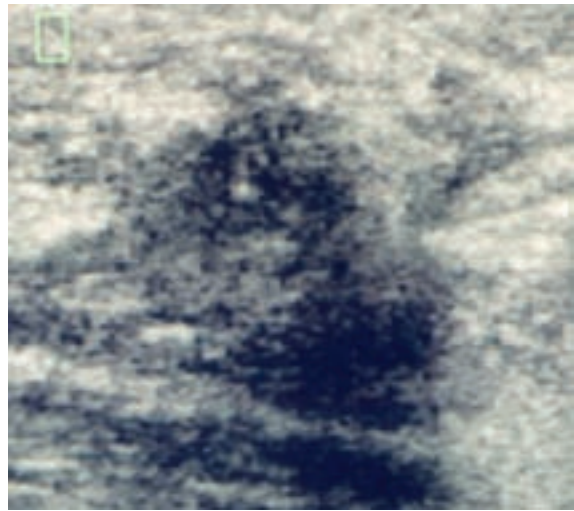


Ex. 2.13-7

Ex. 2.13-6 & 7 Breast MRI: There is a contrast enhancement corresponding to the palpable and mammographic findings, suggesting malignancy.

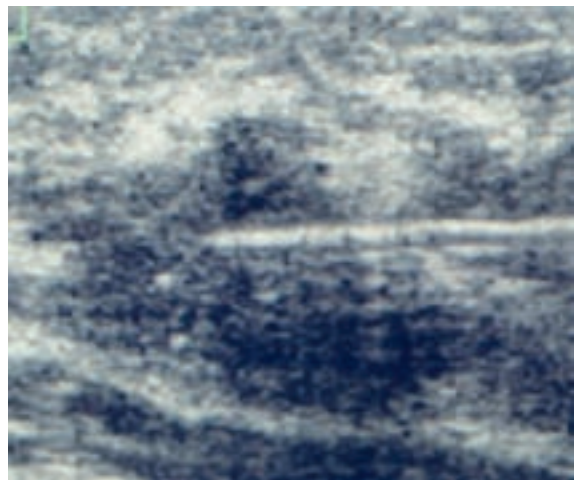
Example 2.13 continued

Ex. 2.13-8 Ultrasound image of the tumor with calcifications.



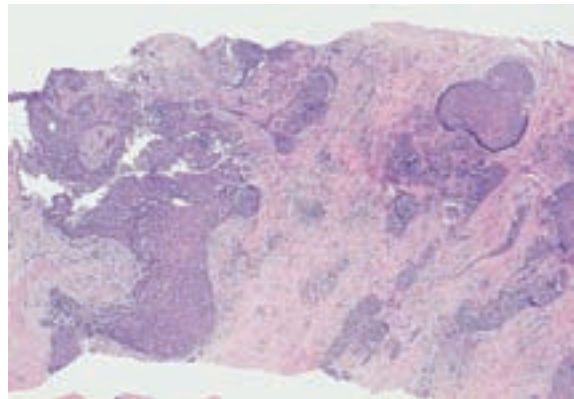
Ex. 2.13-8

Ex. 2.13-9 Ultrasound-guided 14-gauge core biopsy.

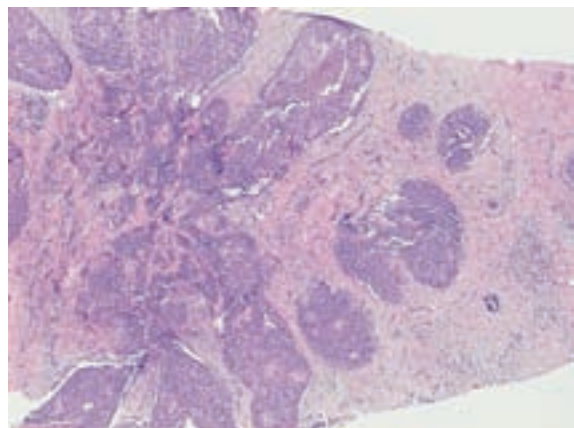


Ex. 2.13-9

Ex. 2.13-10 & 11 Histology of the core biopsy specimen: areas of in situ carcinoma.



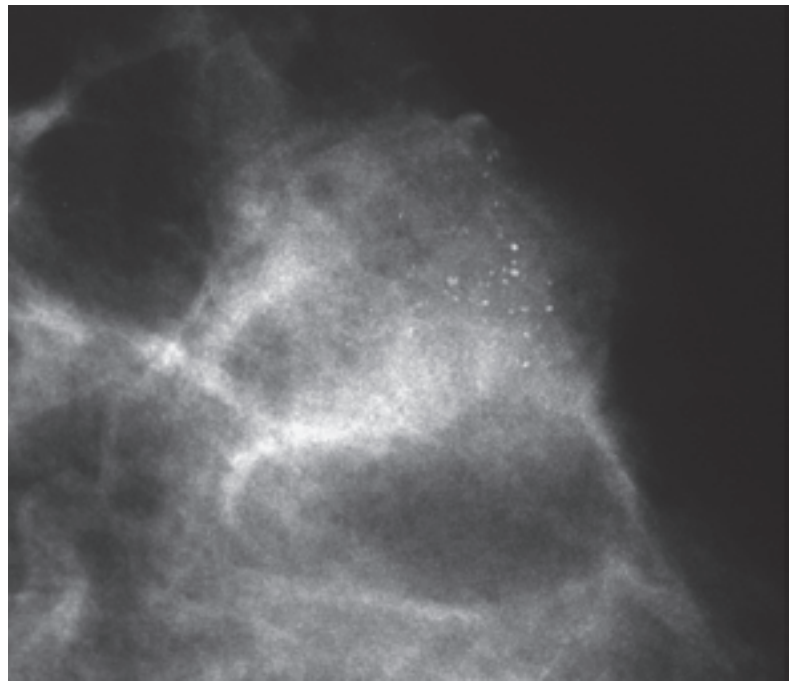
Ex. 2.13-10



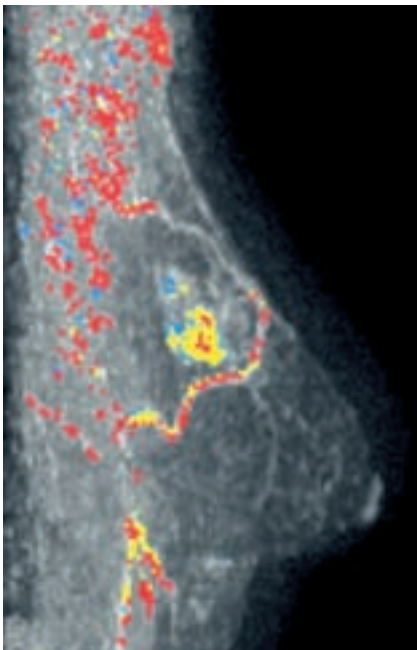
Ex. 2.13-11



Ex. 2.13-12 Detail of the left MLO projection.



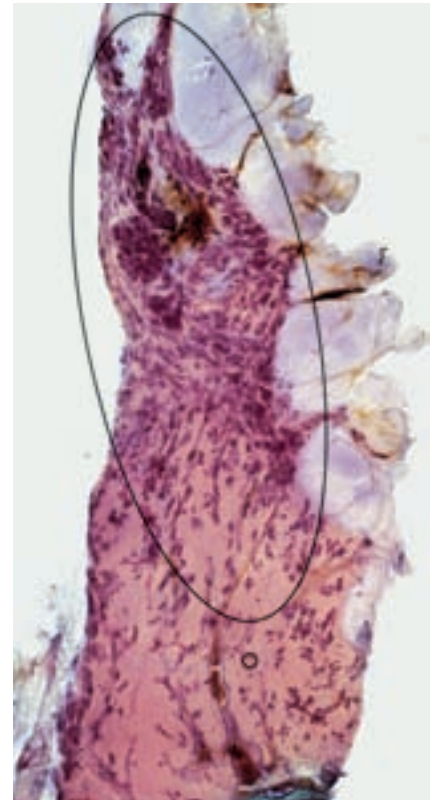
Ex. 2.13-12



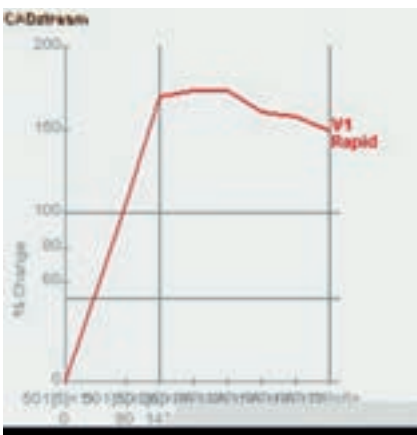
Ex. 2.13-13



Ex. 2.13-14



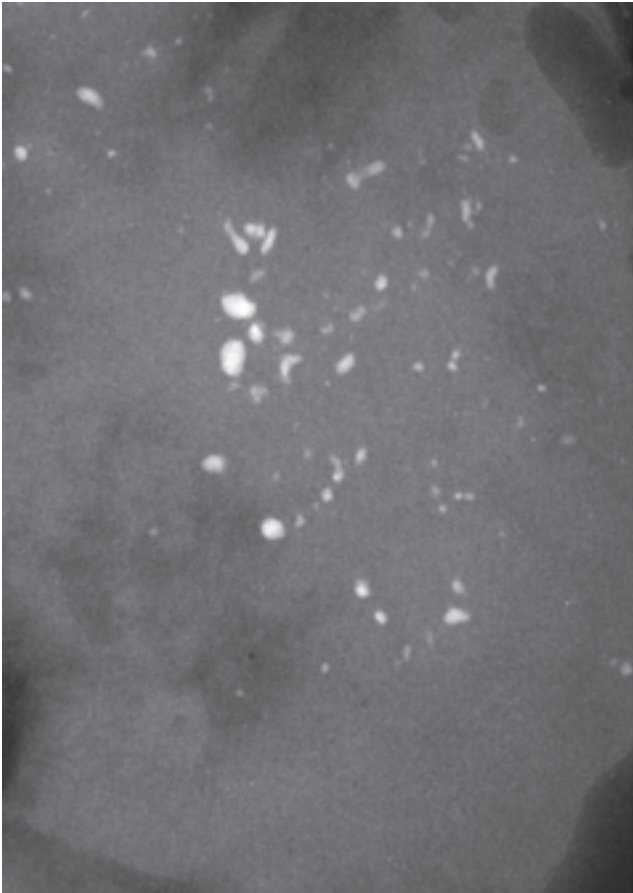
Ex. 2.13-15



Ex. 2.13-13A

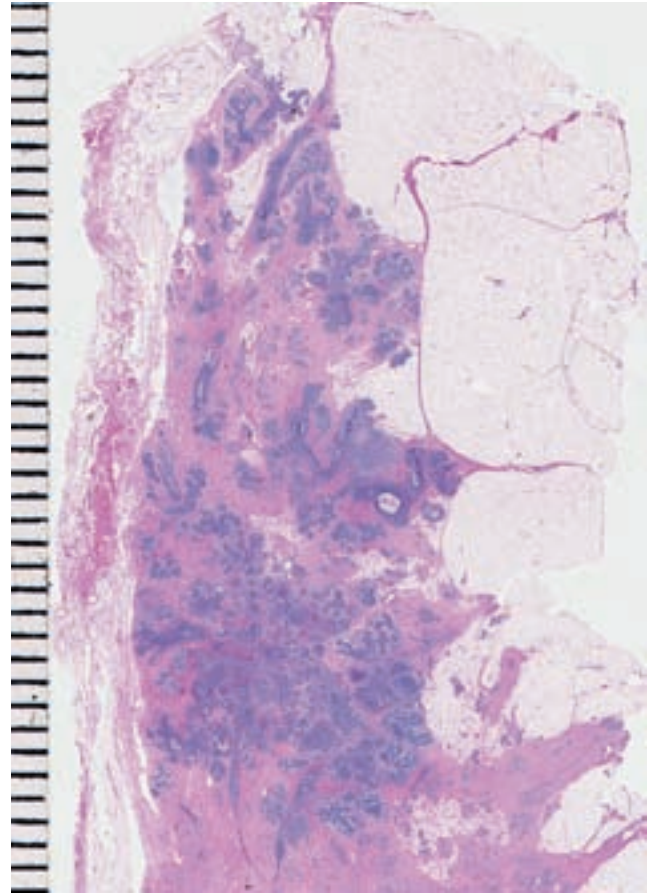
Ex. 2.13-12 to 15 Comparison of the mammogram (12), breast MRI (13), large thin-section histology (14) and subgross, large thick-section slide (15). The enhancement curve (13A) shows the pattern typical for a malignant tumor. The histological examination revealed Grade 2 & 3 in situ carcinoma over an area measuring 50 mm × 20 mm. In addition, three foci (5, 3, and 1 mm) of Grade 2 invasive carcinoma were found within the same region.

Example 2.13 continued



Ex. 2.13-16

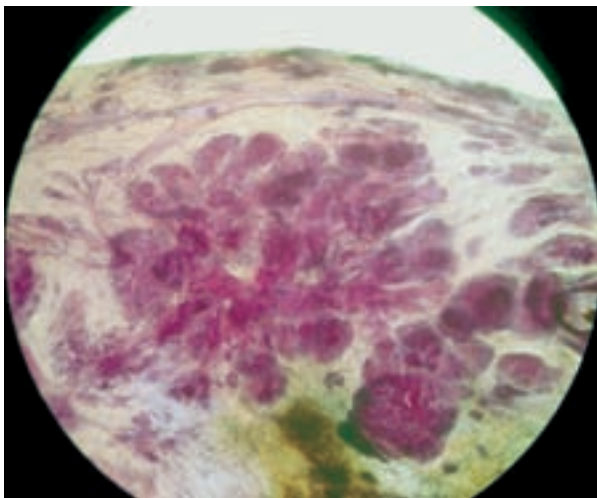
Ex. 2.13-16 Microfocus magnification of one of the surgical specimen slices that contain the calcifications.



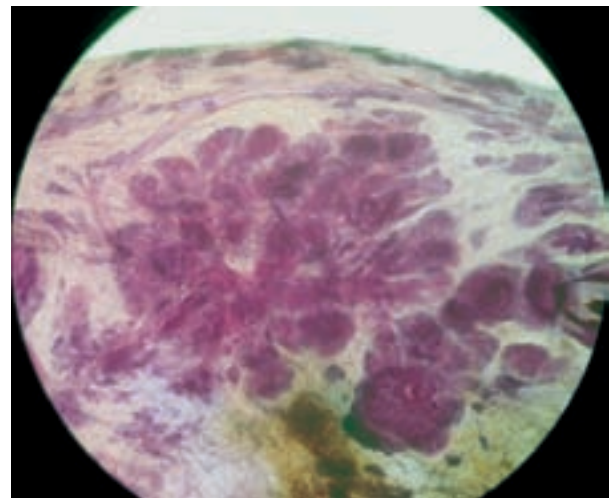
Ex. 2.13-17

Ex. 2.13-17 Detail of the large-section histology slide demonstrating the area corresponding to the calcifications seen in Ex. 2.13-16.

3D Image



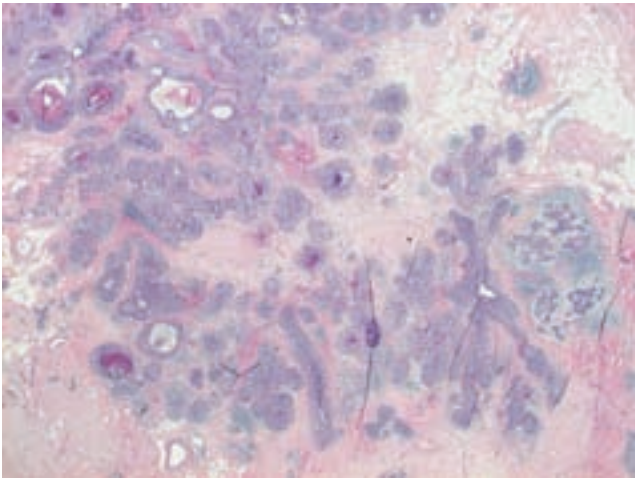
Ex. 2.13-18



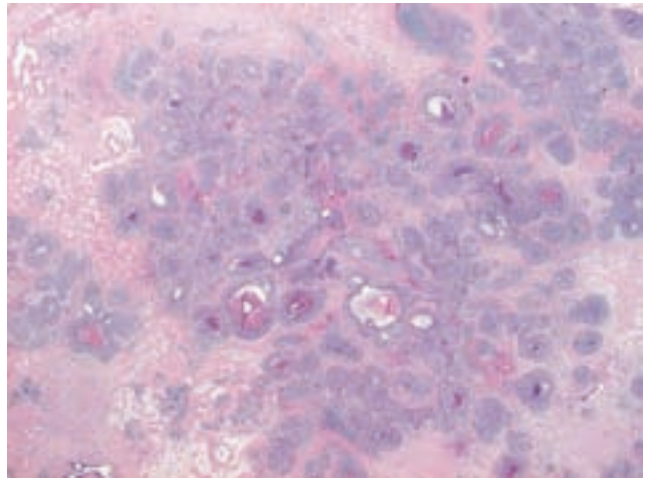
Ex. 2.13-19

Ex. 2.13-18 & 19 Subgross, thick-section histological image pair of a TDLU distended and distorted by cancer cells. Cellular details are shown at increasing magnification in Ex. 2.13-20 to 25.



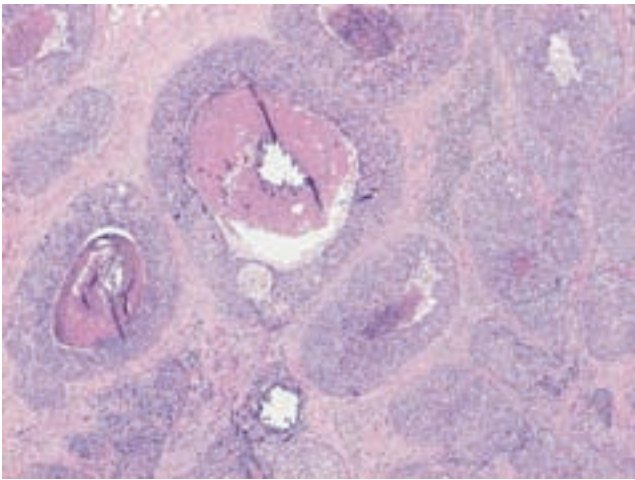


Ex. 2.13-20

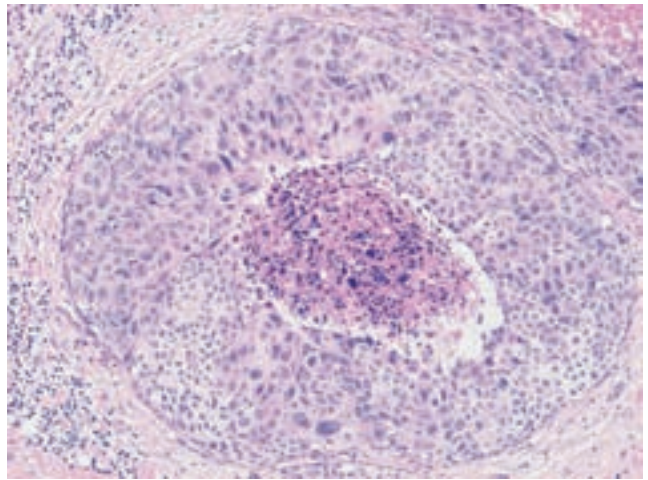


Ex. 2.13-21

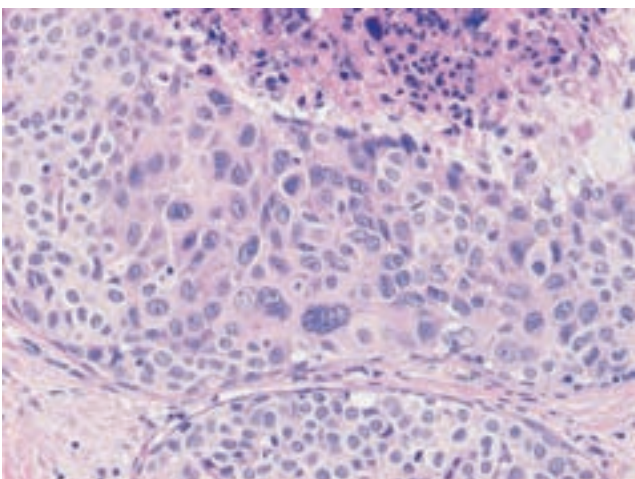
Ex. 2.13-20 & 21 Medium-power histological images of cancer-filled acini and subsegmental ducts, many of which contain amorphous calcifications.



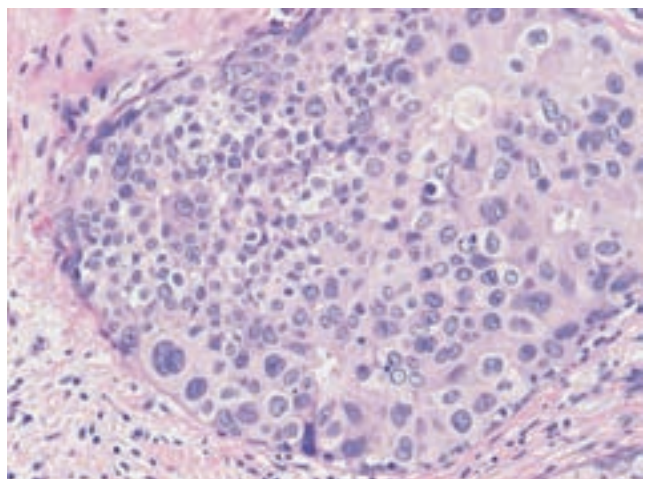
Ex. 2.13-22



Ex. 2.13-23



Ex. 2.13-24

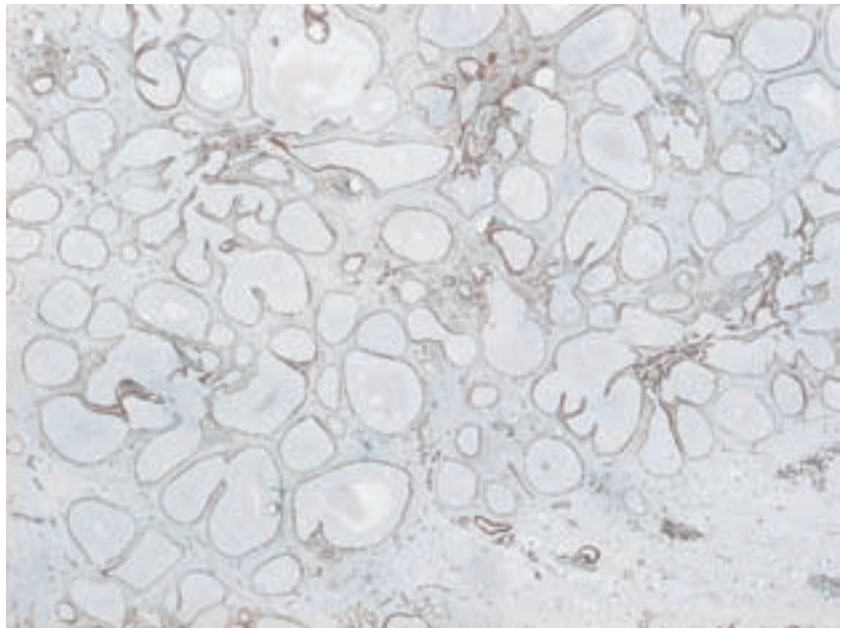


Ex. 2.13-25

Ex. 2.13-22 to 25 Higher-magnification histology images: high grade in situ carcinoma with solid cell proliferation and central necrosis.

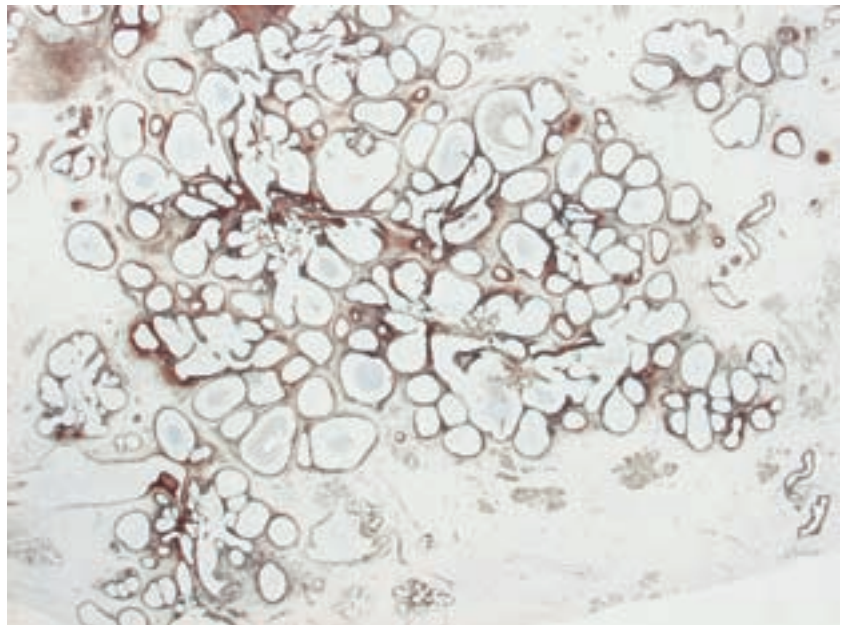
Example 2.13 continued

Ex. 2.13-26 Anti-actin staining demonstrates the maintained myoepithelial cell layer of the in situ component.



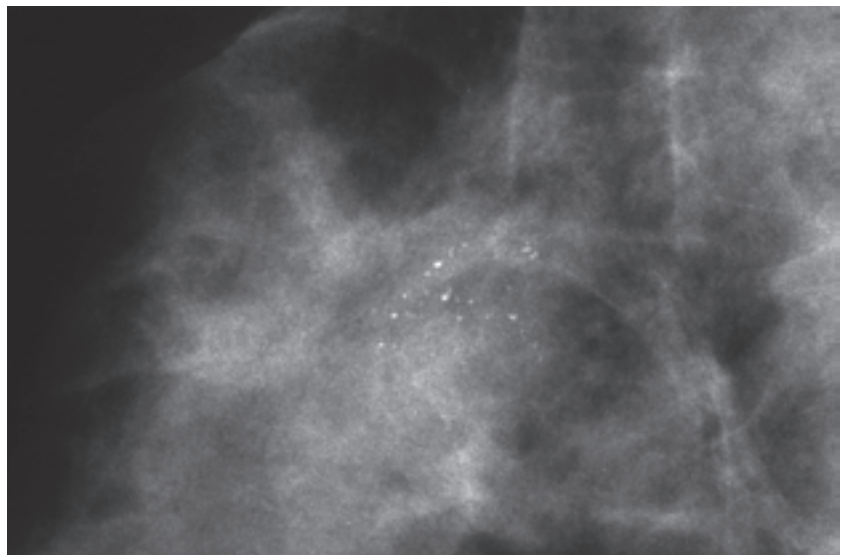
Ex. 2.13-26

Ex. 2.13-27 Tenascin C immunohistochemical staining.



Ex. 2.13-27

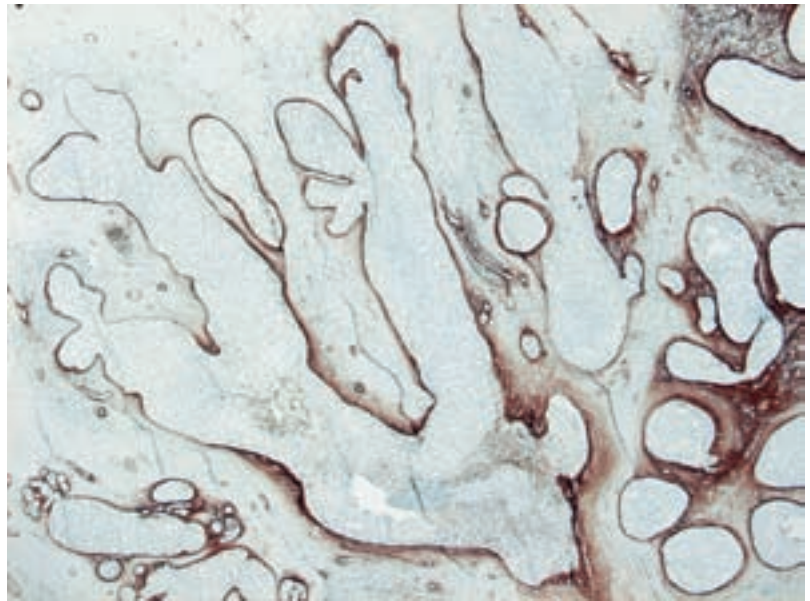
Ex. 2.13-28 Radiograph of one of the specimen slices with the microcalcifications.



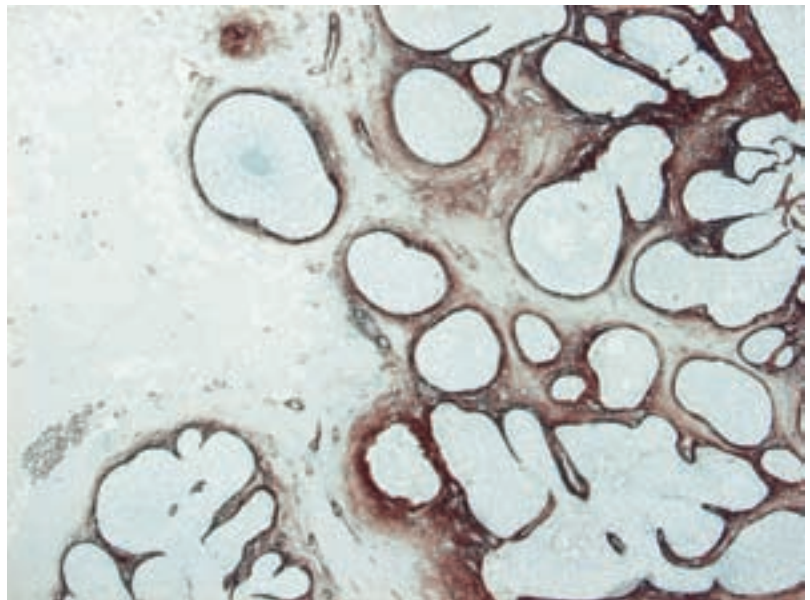
Ex. 2.13-28



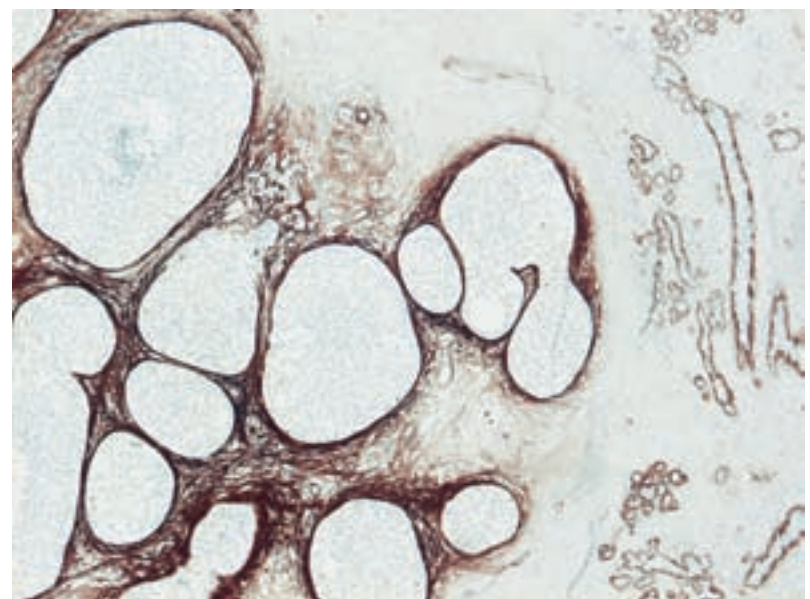
Ex. 2.13-29 to 31 Three histological slides showing focal Tenascin C overexpression, indicating neoductgenesis. No overexpression is seen in normal breast tissue (29, left side of the image; 31, right side of the image).



Ex. 2.13-29



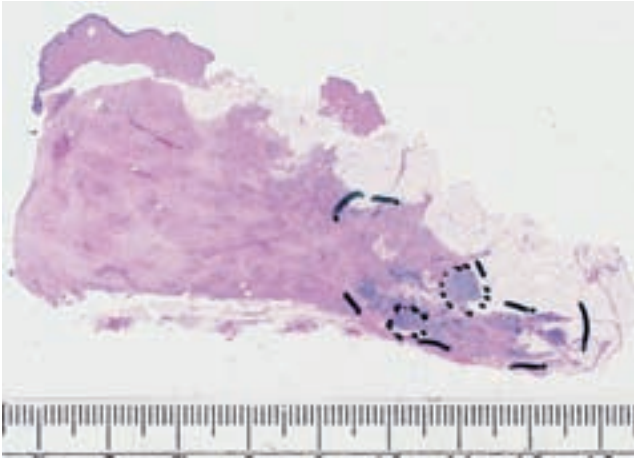
Ex. 2.13-30



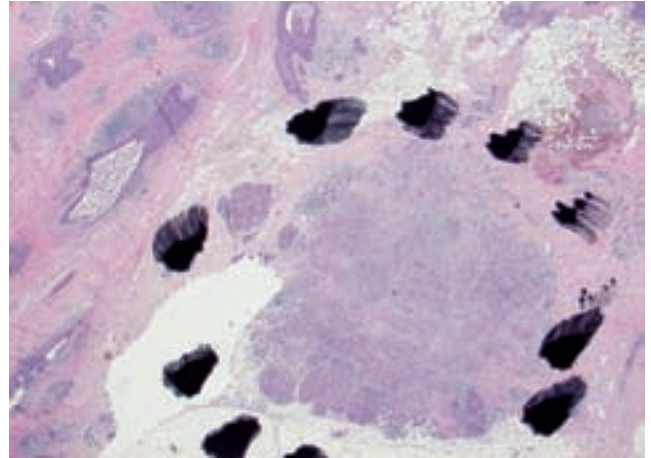
Ex. 2.13-31



Example 2.13 continued



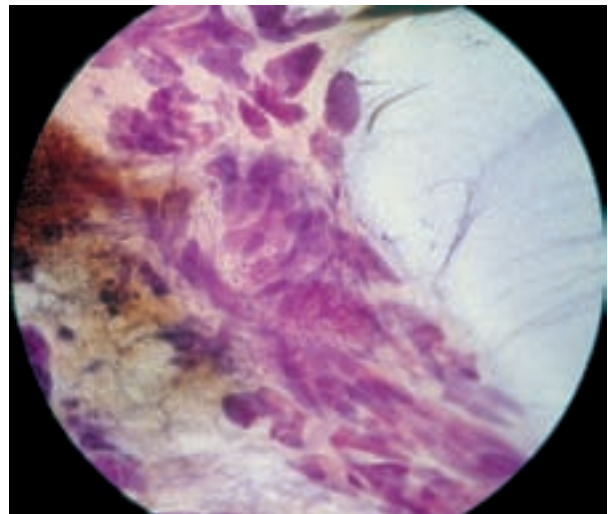
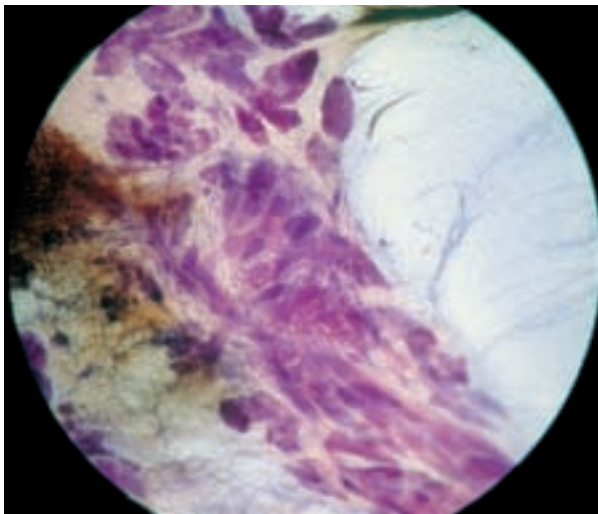
Ex. 2.13-32



Ex. 2.13-33

Ex. 2.13-32 & 33 Low-power image of one of the large-section slices (32). The pathologist has marked the extent of the disease and the invasive foci (dotted lines). Medium-power histological images of one of the invasive foci (33).

3D Image



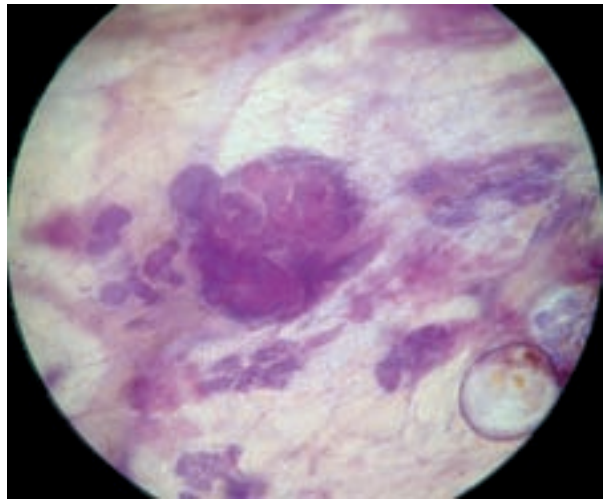
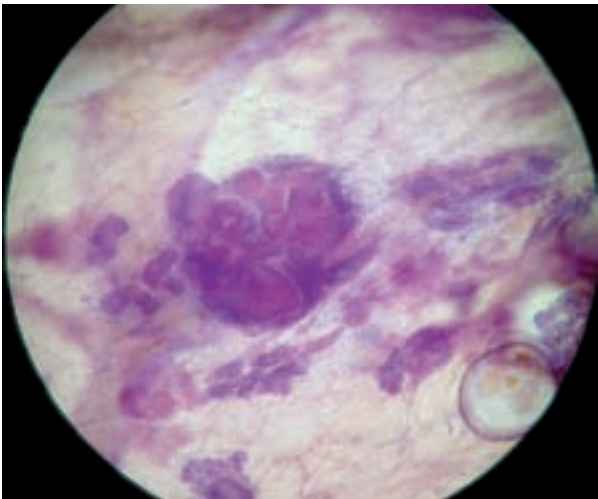
Ex. 2.13-34

Ex. 2.13-35

Ex. 2.13-34 & 35 Stereoscopic subgross, thick-section (3D) histological image pair of a small invasive carcinoma surrounded by in situ components.

**Treatment and outcome:** Mastectomy. This is a most recent case, therefore follow-up results cannot be reported yet.

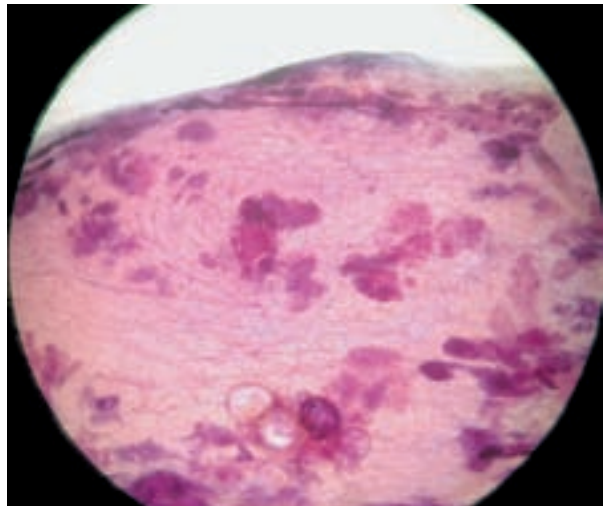
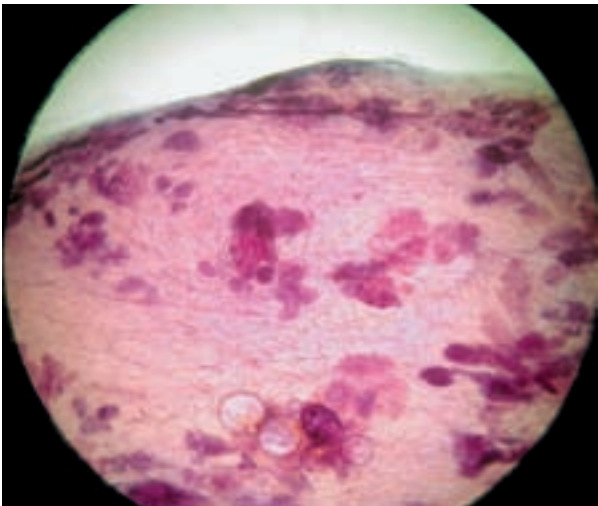
3D Image



Ex. 2.13-36

Ex. 2.13-37

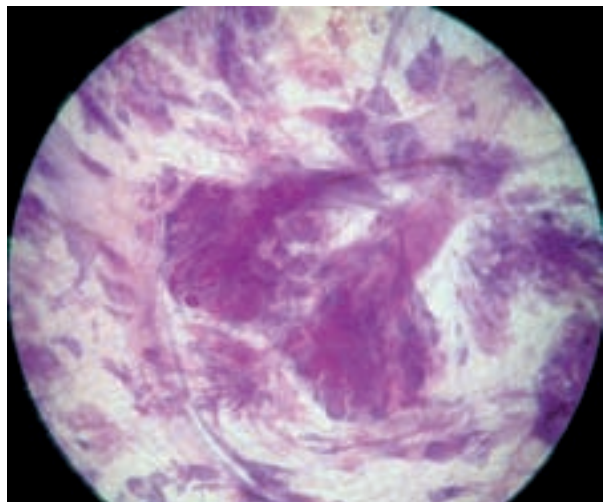
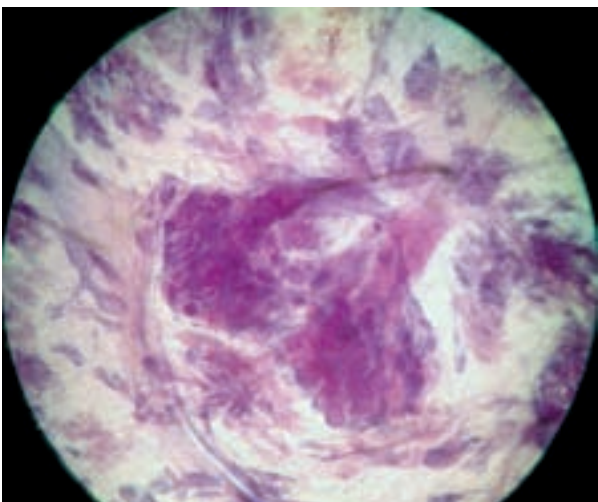
3D Image



Ex. 2.13-38

Ex. 2.13-39

3D Image



Ex. 2.13-40

Ex. 2.13-41

Ex. 2.13-36 to 41 Subgross, thick-section (3D) histological image pairs of the additional in situ carcinoma foci, 10–15 mm from each other and from the main tumor focus, spread over an area measuring 50 mm × 20 mm.