

Radial Scar with Microcalcification Mammographic-Pathologic Correlation : Case Report

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Abstract

Radial scar, a descriptive term for a pathologic lesion, is composed of central area of fibroelastosis and distorted ducts, and peripheral zone of intraductal hyperplasia. This lesion often presents as a spiculated lesion, sometimes with microcalcifications, on mammography which may mimic malignancy such as tubular carcinoma. We report a case of radial scar with clustered microcalcifications incidentally found in the screened mammogram.

Key word : Radial Scar, Microcalcification, Mammographic Pathologic Correlation

Radial scar, a benign pseudoinfiltrative lesion of 10 mm or less in maximum diameter, is characterized by a central area of fibroelastosis from which epithelial structures radiate out in a stellate formation. Single pathology of radial scar is rare. We report a case with mammographic screen-detected radial scar placing emphasis on its mimicking to carcinoma and illustrating the mammographic feature comparable to its histopathologic appearance.

CASE REPORT

A 52-year-old female had a routine mammographic examination. Physical examination

showed no abnormality. On this mammographic examination there was a 6 mm stellate density lesion at the upper outer quadrant of the right breast. The lesion appeared lucent at the central region and the margin was spiculated, with thin linear strands extending into the surrounding soft tissue. Cluster of pleomorphic microcalcifications was shown within the area of the spiculated lesion. The mammographic findings were highly suspicious of malignancy. Needle-guided excisional biopsy was performed by stereotactic technique. Specimen radiographs confirmed that the mammographic lesion had been excised. The radiographic features of the specimen provided more details of

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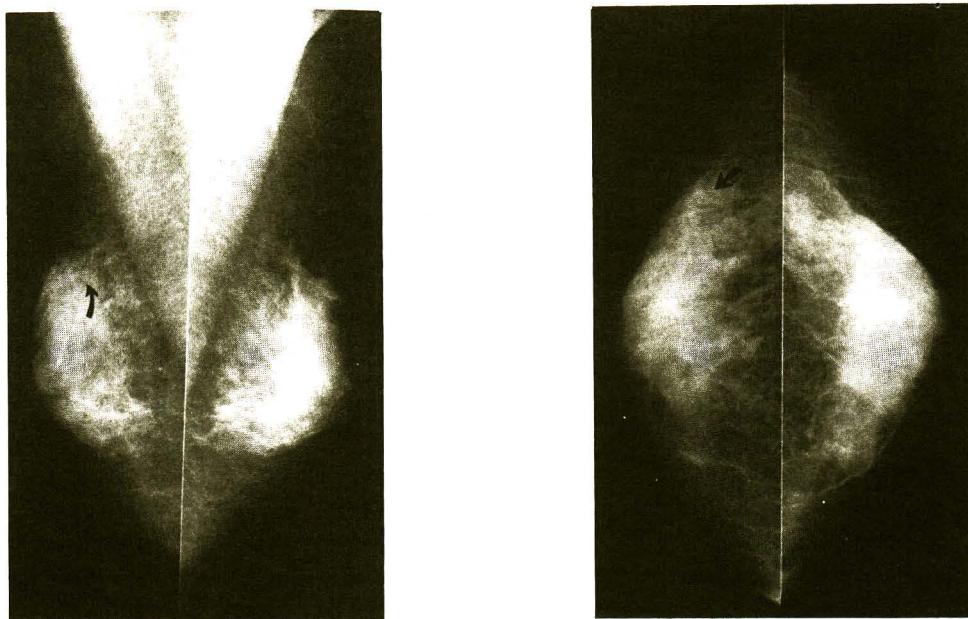


Fig. 1. (A,B) Mediolateral oblique (A) and Cranio caudal (B) views of a 52 year-old-female patient showing a spiculated lesion with clustered microcalcifications at the upper outer quadrant of the right breast.

the lesion and showed a spiculated lesion having long fibrous strands, with a small radiolucent area at the center, and contained clustered microcalcifications.

Microscopically, the radial scar, measuring 3 mm in maximum diameter, was composed of fibrosclerotic stroma and branching ducts with a stellate configuration. A few tangles of fibroelastosis were elicited in the central area. Ductal structures that were lined by ductal and myoepithelial cells, show mildly cystic dilatation, without florid epithelial hyperplasia. Some lobules were placed in the peripheral zone next to the lesion. Microcalcified bodies happened in terminal ductules of these lobules and the radial scar.

DISCUSSION

One of most common mammographic abnormalities leading to benign biopsy is architectural distortion, of which the histological correlate is radial scar⁽¹⁾. Radial scar, described by Linell *et al*⁽²¹⁾ in 1980, is a characteristic feature of benign breast mass seen as a discoid lesion with long spicules and central lucency⁽³⁾. Radial scar has

received much attention in recent years because of its similar microscopic appearance to invasive carcinoma and its premalignant potential⁽⁴⁾. Other names such as infiltrating epitheliosis, non-encapsulated sclerosing lesion, indurative mastopathy or scleroelastotic lesion can be assumed to be synonyms for radial scar⁽⁵⁾. At microscopy, the radial scars are characterized by a central fibroelastic core, containing trapped tubular and hyperplastic ducts, some of which appear to be sclerosed, with radiated fibrous bands⁽⁶⁾. Overall detection rate of radial scar is 0.3 per 1,000 mammographic examinations⁽⁵⁾. Lesion size ranges from 5 to 35 mm (mean 19 mm). Mean age of the patients in the study of Fronge *et al* was 53 years⁽⁷⁾. These lesions commonly are multiple and bilateral⁽⁸⁾. Some radiologic signs described as typical of radial scar include (9) a.) absence of a central opacity, often substituted by a radiolucent area b.) multiple elongated thin spicules radiating from the center c.) infrequency of palpable findings. Tabar and Dean described "black star of radial scar and white star of carcinoma" However, study of Mitnick⁽¹⁰⁾ *et al* revealed 4

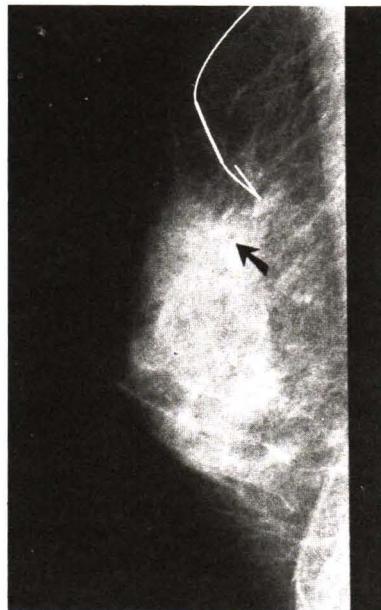
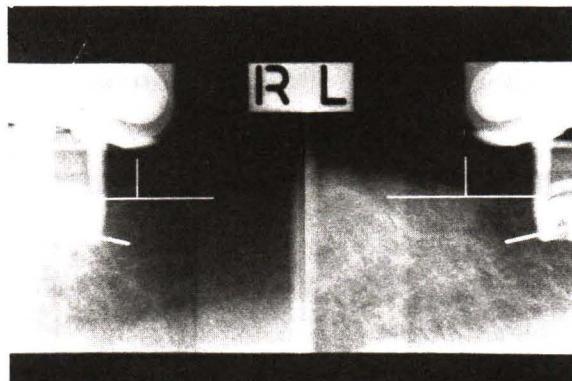


Fig. 2. (A,B) Needle-guided excisional biopsy was performed under stereotaxis. (Fig. 2A). After placing the needle for localization, the hook was located just posterior to the lesion on true lateral view (Fig. 2B).

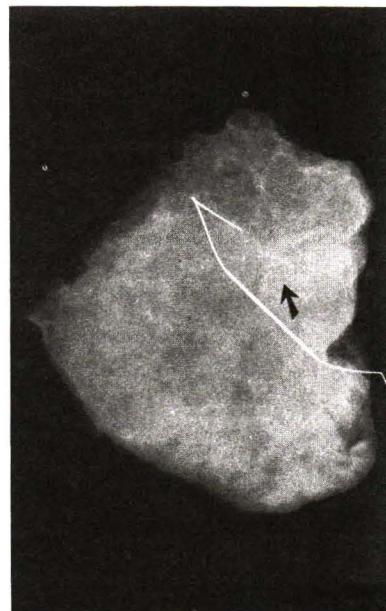


Fig. 3. The radiograph of the specimen confirmed that the lesion had been excised.

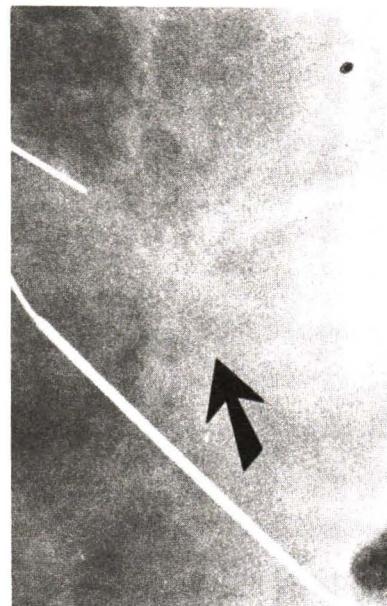


Fig. 4. Magnified view of the specimen showed a spiculated lesion with long fibrous strands, small radiolucent area at the center and contained cluster of pleomorphic microcalcifications.

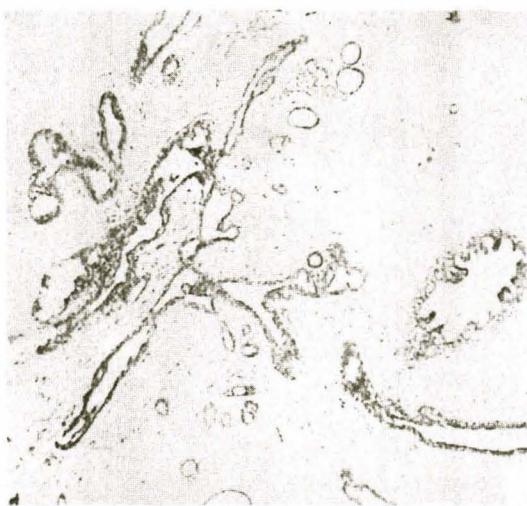


Fig. 5. (H & E original magnification x 40) Part of the radial scar, composed of fibrosclerotic stroma and branching ducts, with a stellate configuration.

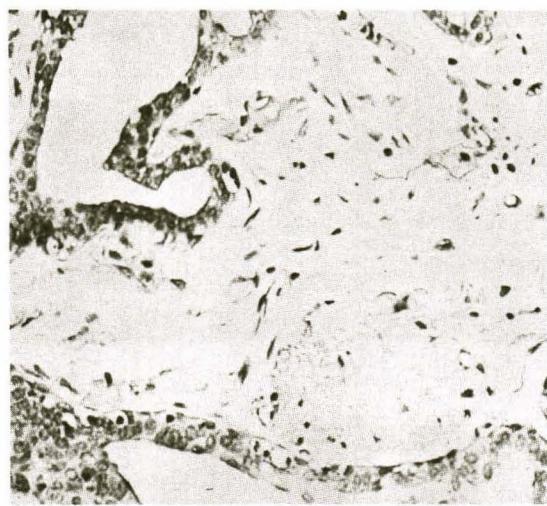


Fig. 6. Higher magnification shows tangles of fibroelastosis in the central area. (H & E original magnification x 200).

dense central regions in 9 cases of biopsy-proven radial scars. The differential diagnosis between radial scar and carcinoma in the basis of opacity of the central zone and appearance of the radiating spicules is still debatable(6).

Spiculated breast lesions may be caused by both benign and malignant processes. Spicules of benign lesions are often caused by fibrous tissue, whereas, the spicules of malignant lesions are due to tumor infiltration and desmoplastic responses(11).

Non-radiologic literature documents that histologic microcalcification are commonly seen in radial scar(12). Thus, the presence of microcalcifications within the mammographically detected radial scar should not be surprising. We present a case of clustered, pleomorphic microcalcifications which closely mimiced malignancy.

Study of Frouge *et al*(7) in 1995 concluded that there is association of radial scars with malignant lesions. (tubular carcinoma and infiltrative ductal carcinoma) Vega and Garijo suggested that radial scar has a relationship with tubular carcinoma(13), corresponding to the study of Linell *et al* who believed it to be a precursor of invasive tubular carcinoma. In 1993, Ciatto *et al* reported poor accuracy in discrimination of non-palpable radial scar and carcinoma(5).

In conclusion, the specificity of mammographic appearance of radial scar is not absolute. Final differential diagnosis from carcinoma should be based on histologic evidence. FNA or core biopsy are not a recommended method because of high rates of associated lesions distant from the central core in mammography(14). Surgical removal for tissue diagnosis is essential.

REFERENCES

1. Spencer N.J.B., Evans AJ, Galea M, et al. Pathological-Radiological Correlations in benign lesions excised during a breast screening programme. *Clinical Radiology* 1994; 49: 853-6.
2. Ciatto S, Morrone D, Catarzi S, et al. Radial scars of the breast : Review of 38 consecutive mammographic diagnoses. *Radiology* 1993; 187: 757-60.
3. Sutton D. Textbook of radiology and imaging Vol.II: 1359-73.
4. Fenoglio C, Lattes R. Sclerosing papillary proliferations in the female breast. *Cancer* 1974; 33: 691-700.
5. Linell F, Ljungberg O, Andersson I. Breast carcinoma : aspects of early stages, progression and related problems. *Acta Pathol Microbiol Scand (A)* 1980; 272 (suppl): 14-63.
6. Orel SG, Evers K, Yeh I, Troupin RH. Radial scar with microcalcifications : Radiologic-pathologic correlation. *Radiology* 1992; 479-782.
7. Frouge C, Tristant H, Guinebretiere J, et al. Mammographic lesions suggestive of radial scars : Microscopic findings in 40 cases. *Radiology* 1995; 195: 623-5.
8. Nielsen M, Christensen L, Andersen J. Radial scars in women with breast cancer. *Cancer* 1987; 59: 1019-25.
9. Tabar L, Bean PB. *Teaching atlas of mammography*. New York, NY : Thieme-Stratton. 1985: 87-136.
10. Mitnick JS, Vazquez MF, Harris MN, Roses DF. Differentiation of radial scar from scirrhouous of the breast : Mammographic-pathologic correlation *Radiology* 1989; 173: 697-700.
11. Fraquet T, De Miguel C, Cozcolluela R, Donoso L. Spiculated lesions of the breast : mammographic pathologic correlation. *Radiographics* 1993; 13: 841-52.
12. Fesher ER, Palekar AS, Kotwal N, Lipana N. A non-encapsulated sclerosing lesion of the breast *Am J Clin Pathol* 1979; 71: 240-66.
13. Anderson JA, Carter D, Linell F. A symposium on sclerosing duct lesions of the breast. *Pathol Annu* 1986; 21: 145-79.
14. Vega A, Garijo F. Radial scar and tubular carcinoma. Mammographic and sonographic and sonographic findings. *Acta Radiologica* 1993; 34: 43-7.

ภาพแมมโมแกรมและพยาธิสภาพของ radial scar (รายงานผู้ป่วย จำนวน 1 ราย)

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Radial scar เป็นพยาธิสภาพที่เกิดขึ้นภายในเต้านม โดยมีการเปลี่ยนแปลงของเนื้อเยื่อ ได้แก่ fibroelastosis, distorted ducts และ intraductal hyperplasia ซึ่งมักจะเกิดเป็นบริเวณเล็ก ๆ ที่มีขนาดไม่เกิน 1 เซ็นติเมตร มีหล่ายรายงานพบว่าพยาธิสภาพนี้จะกล้ายเป็นมะเร็งได้ในระยะเวลาต่อไป การถ่ายเอกซเรย์เต้านมมักจะพบลักษณะภาพความผิดปกติที่คล้ายกับมะเร็งของเต้านม โดยเฉพาะการพบมีกลุ่มของหินปูนขนาดเล็กมาก (microcalcifications) เกิดขึ้นภายในพยาธิสภาพนี้มีโอกาสพบได้น้อยมาก รายงานนี้ได้เสนอภาพแมมโมแกรมที่มีลักษณะเฉพาะร่วมกับการเปรียบเทียบทางพยาธิเพื่อเป็นแนวทางช่วยให้การวินิจฉัยและการรักษาที่ถูกต้อง

คำสำคัญ : Radial Scar, Microcalcification, Mammographic Pathologic Correlation

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