

CASE REPORT

Diagnostic difficulty arising from displaced epithelium after core biopsy in intracystic papillary lesions of the breast

A G Douglas-Jones, A Verghese*J Clin Pathol 2002;55:780-783*

This study reports two cases of intracystic papillary carcinoma of the breast, which had been biopsied preoperatively using a 14 gauge (14G) core biopsy needle. In each case, a needle tract containing groups of epithelial cells within granulation tissue could be identified on histology of the excised specimen. Both cases showed extracapsular tumour, which was interpreted as displacement of epithelium related to preoperative core biopsy. Subsequent axillary lymph node sampling showed no evidence of metastasis. In one case, extracapsular tumour appeared to be in blood vessels, but flattened cells lining the spaces containing tumour failed to react with factor 8 related antigen or CD34 on immunohistochemistry. It is likely that intracystic papillary carcinomas are particularly prone to this artefact because friable tumour fragments escape, accompanied by cyst fluid, when the capsule is punctured by a 14G core biopsy needle.

Preoperative diagnosis of breast lesions using the triple approach of clinical examination, imaging, and pathological investigation is important to allow planning of surgical treatment in consultation with the patient. Tissue is obtained for pathological diagnosis from breast lesions using fine needle aspiration cytology (FNAC) or core biopsies. Associated with or subsequent to these procedures there may be injection of local anaesthetic or insertion of localisation needles or sutures. It is well recognised that these procedures can result in trauma to tissue leading to haemorrhage, necrosis, infarction, and displacement of epithelium, which may cause diagnostic difficulty on histological examination of the excised specimen.^{1,2} Here, we report two cases of encysted papillary lesions of the breast, which were diagnosed by core biopsy, and in which the displacement of epithelium caused diagnostic difficulty on the histology of the excised specimen.

CASE 1**Clinical history**

A 76 year old woman presented to a symptomatic breast clinic with a mass in the left breast. Clinical examination confirmed a smooth well defined 20 mm mass, 20 mm superior to the left nipple. Mammography showed a round well defined radio-dense lesion, 20 mm in diameter, which ultrasound examination showed to be a partly cystic, partly solid lesion. Core biopsy performed using a 14 gauge (14G) needle showed a papillary tumour composed of monotypic epithelial cells on histology. The diagnosis was of an intracystic papillary lesion, probably intracystic papillary carcinoma. At multidisciplinary meeting the decision was made to offer wide local excision of the lesion and in the absence of evidence of invasion no axillary node surgery was planned. Thirty days after the diagnostic core biopsy, wide local excision of the tumour was

performed and a mass of fatty tissue weighing 95 g and measuring 70 × 65 × 40 mm was excised. No localisation wire was required and no skin was removed.

Pathological features

The cut surface of the tissue showed a well defined haemorrhagic mass, 15 mm in diameter. Histopathological examination showed an encapsulated tumour composed of malignant epithelium with a papillary architecture. No definite invasion of the capsule was seen and the appearances were those of an intracystic papillary carcinoma. In surrounding fat there was a linear area of maturing granulation tissue, with foamy macrophages and haemosiderin, indicating fat necrosis associated with the needle track of the diagnostic biopsy (fig 1A, single arrow). Within the granulation tissue associated with the needle tract there were islands of tumour cells in groups of up to 10 (fig 1C). Adjacent to the capsule of the tumour, where the needle tip would have impacted, there was loose connective tissue containing further groups of tumour cells extending 4 mm beyond the capsular surface (fig 1A, double arrow). None of the tumour groups appeared to be in blood vessels. Perl's stain for iron showed that the needle track and the cells adjacent to the capsule were associated with haemosiderin pigment. Invasion of the capsule was not demonstrated at other sites of the tumour capsule. The appearances were interpreted as intracystic papillary carcinoma with artefactual displacement of papillary epithelium into surrounding tissues secondary to core biopsy.

However, it could be argued that the findings represented stromal invasion in an area that was by chance adjacent to the needle tract. The diagnostic difficulty was explained to the patient and she chose to undergo axillary lymph node sampling. None of six lymph nodes contained tumour.

CASE 2**Clinical history**

A 69 year old woman presented with a clinically palpable lesion in the left breast adjacent to a scar from a benign breast lump excised previously. On mammography, the lesion was found to be a well defined rounded mass, 14 mm in size. Two core biopsies (14G needle) were performed under ultrasound guidance and submitted for histopathological examination. This revealed a complex papillary lesion on which no definitive diagnosis was possible and complete excision was advised. A wide local excision was performed two months later.

Abbreviations: 14G, 14 gauge; DCIS, ductal carcinoma in situ; FNAC, fine needle aspiration cytology; IHC, immunohistochemistry; SMA, smooth muscle actin

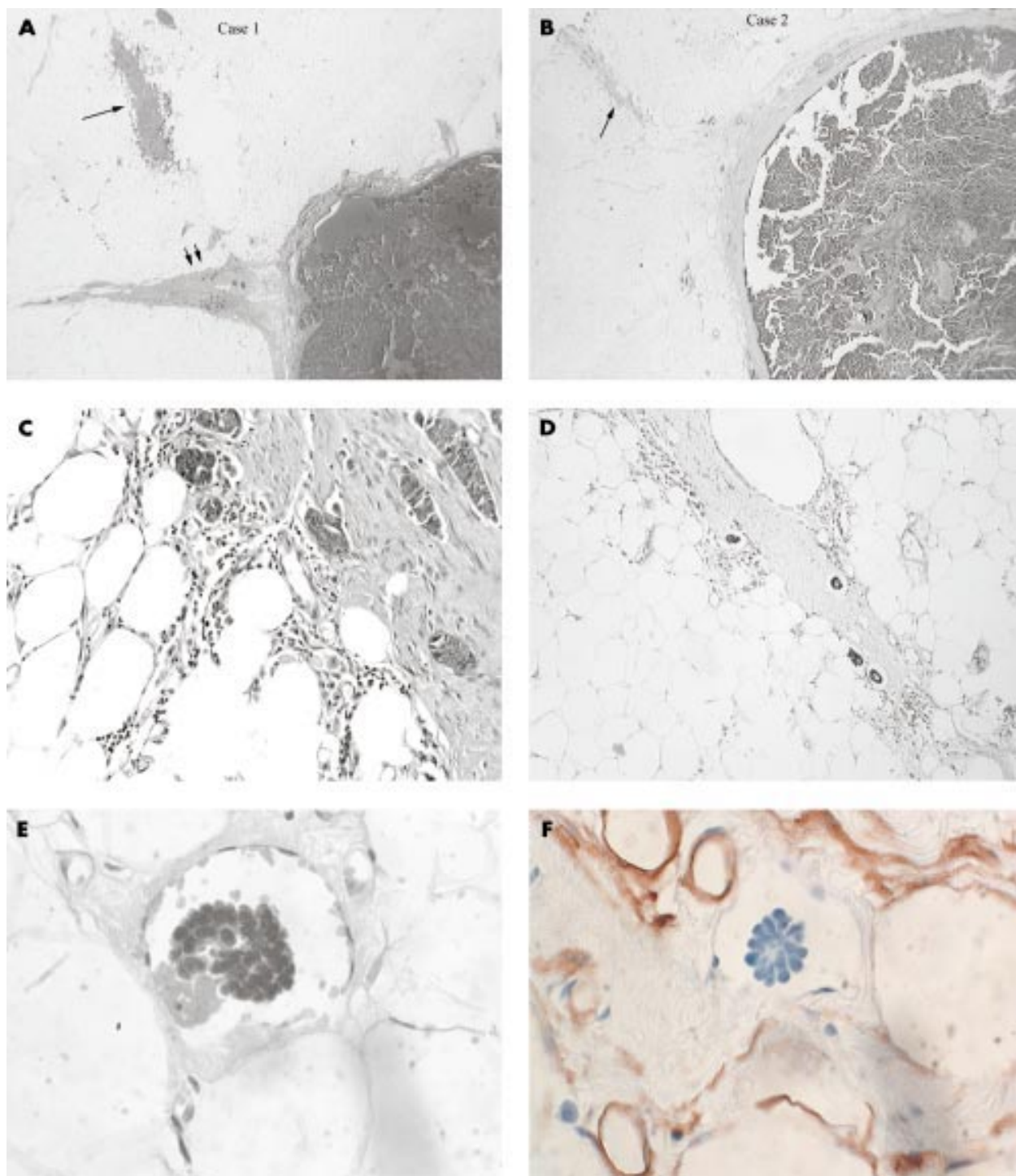


Figure 1 (A) Low power view of case 1 showing needle tract containing displaced epithelium (single arrow) directed towards the capsule of the papillary tumour and the granulation tissue and tumour adjacent to the predicted point of rupture (double arrow). (B) Low power view of case 2 showing needle tract (single arrow) directed towards the capsule of the papillary tumour. (C) Needle tract of case 1 showing granulation tissue associated with groups of displaced cells. (D) Needle tract of case 2 showing apparent vascular invasion. (E) Apparent vascular invasion in case 2. (F) Immunohistochemistry for CD34 showing no positivity in cells lining the space containing tumour.

Pathological features

The specimen measured 40 × 35 × 30 mm and weighed 15 g. On slicing, a well defined mass, 18 × 15 mm in diameter, was seen and appeared to be completely excised.

Histologically, the tumour was a well circumscribed intracystic papillary carcinoma. In addition, there were foci of papillary hyperplasia, focally amounting to atypical ductal

hyperplasia and multiple benign papillomata in the background breast tissue.

A prominent biopsy site tract showing fibrosis, evidence of haemorrhage, and fat necrosis could be identified (fig 1B). Small rounded groups of up to 20 cells were identified around the tract site and many groups appeared to be in vascular spaces lined by flattened cells (fig 1B,D,E). The lesion itself

was narrowly (2 mm) but completely excised. In view of the findings, a wider excision was recommended.

After discussion, the patient chose to have a mastectomy with node sampling. There was focal residual ADH and papillary ductal carcinoma in situ (DCIS) identified at the cavity site and none of the six nodes from the sample showed tumour.

Immunohistochemistry

Immunohistochemistry (IHC) for smooth muscle actin (SMA), factor 8 related antigen, and CD34 was performed on both tumours. The results of the SMA staining showed no evidence of a myoepithelial layer in either of the papillary tumours and no evidence of myoepithelium around the groups of tumour cells in stroma outside the main encapsulated lesion. Factor 8 related antigen IHC in case 1 showed no evidence of intravascular tumour. In case 2, the tumour cells appeared to be in vascular spaces on morphological grounds, and factor 8 related antigen and CD34 IHC was performed to confirm this morphological finding. Careful examination of the immunostaining in case 2 failed to show positivity of apparent flattened cells surrounding groups of tumour cells (fig 1E,F). Tumour in vascular spaces in case 2 could not be demonstrated immunohistochemically.

DISCUSSION

It is well recognised that needling procedures associated with the localisation and diagnosis of breast lesions cause morphological changes. These are recognised as fresh haemorrhage, fat necrosis with accumulation of vacuolated macrophages, acute and chronic inflammation, haemosiderin laden macrophages, and granulation tissue at various stages of maturation.¹ These findings may be helpful in determining the origin of fine needle aspiration cytology or needle core material on later histopathological examination of excised tissue. However, the biopsy site may not be sampled and so not be identified. In a study of 43 cases of breast carcinoma, displaced carcinomatous fragments were identified outside the main tumour mass in 28% of cases in which the initial diagnostic procedure had been performed using a 14G core biopsy needle.³ In most cases this artefact is readily appreciated histologically because the neoplastic epithelium is composed of isolated fragments in artefactual spaces within breast stroma and may be associated with other indicators of trauma, such as haemorrhage and granulation tissue. Where the diagnosis is one of invasive carcinoma, this displacement of malignant epithelium causes no diagnostic problem and is of no clinical relevance. Rare cases of implantation in skin or subcutaneous tissue have been reported.⁴ Needle track implantation of the skin after fine needle aspiration of a papillary carcinoma of the thyroid has been reported.⁵ A review of reports of tumour seeding after needle biopsy indicated that the number of passes through the tumour and the gauge of the needle were important in determining the risk of seeding. Increasing the diameter of the needle by two appeared to increase the risk of seeding 60 fold.⁶ Tumour cells lying in stroma simulating stromal invasion after FNAC of DCIS has been reported.¹ Similarly, in the two cases reported here the finding of tumour cells outside the capsule of the malignant papillary lesion was of clinical importance. Intracystic papillary carcinoma without capsular or stromal invasion and without evidence of widespread DCIS around it can be cured by local excision alone, and axillary lymph node dissection is regarded as unnecessary.⁷ If stromal invasion is present then axillary lymph node dissection should be performed.

"In the two cases reported here the finding of tumour cells outside the capsule of the malignant papillary lesion was of clinical importance"

Take home messages

- We report two cases of intracystic papillary carcinoma of the breast, which had been biopsied preoperatively using a 14 gauge (14G) core biopsy needle and in which a needle tract containing groups of epithelial cells within granulation tissue was subsequently identified
- Both cases showed extracapsular tumour, which was interpreted as displacement of epithelium related to preoperative core biopsy, but subsequent axillary lymph node sampling showed no evidence of metastasis
- It is possible that intracystic papillary carcinomas are particularly prone to this artefact because friable tumour fragments escape, accompanied by cyst fluid, when the capsule is punctured by a 14G core biopsy needle

In case 1, tumour cells were in small groups associated with granulation tissue, fat necrosis, and haemosiderin in the needle tract (fig 1A, single arrow) and adjacent to the capsule at the project point of impact of the needle tip (fig 1A, double arrow). In case 2, groups of tumour cells seemed to be in blood vessels (fig 1D,E). In both cases, axillary lymph nodes contained no tumour. However, the displacement of cells to the subcapsular sinus of lymph nodes has been described.⁸ In one study, 9.2% of 184 lesions diagnosed by FNAC showed changes such as necrosis, haemorrhage, or infarction attributable to the procedure.⁹ Interestingly, in this series one benign papilloma showed implantation of epithelial cells outside the capsule of the lesion. These cells were shown to be benign by the immunohistochemical demonstration of SMA around the epithelial clumps.⁹ In the cases reported here, SMA positivity around tumour clumps would not be expected because the lesions were judged to be malignant papillary tumours. It is possible that intracystic papillary lesions are particularly prone to the problem of epithelial displacement because of the delicate friable nature of the tumour. The lesions presented here had a cystic component and a papillary architecture. They were also sampled using 14G core biopsy needles. Once the capsule of such a lesion is punctured, cystic fluid under pressure carrying exfoliated epithelial cells may escape into the surrounding tissues and cells become incorporated into the subsequently forming granulation tissue. In one case this gave rise to pseudovascular invasion.

CONCLUSIONS

Displacement of tumour fragments has been shown to be a particular problem associated with the assessment of stromal invasion in intracystic papillary carcinomas of the breast. This may be the result of the friable nature of the tumour and intracystic pressure, which is released when the tumour is biopsied using a 14G core biopsy needle.

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REFERENCES

- 1 **Tabbara SO**, Frierson HF, Fechner RE. Diagnostic problems in tissues previously sampled by fine needle aspiration. *Am J Clin Pathol* 1991;**96**:76–80.

- 2 **Boppana S**, May M, Hoda S. Does prior fine-needle aspiration cause diagnostic difficulties in histologic evaluation of breast carcinomas? *Lab Invest* 1994;**70**:13A.
- 3 **Youngson BJ**, Liberman L, Rosen PP. Displacement of carcinomatous epithelium in surgical breast specimens following stereotaxic core biopsy. *Am J Clin Pathol* 1995;**103**:598–602.
- 4 **Glaser KS**, Weger AR, Schmid KW, *et al.* Is fine needle aspiration of tumours harmless? *Lancet* 1989;**1**:620.
- 5 **Hales MS**, Hsu FSF. Needle tract implantation of papillary carcinoma of the thyroid following aspiration biopsy. *Acta Cytol* 1990;**34**:801–4.
- 6 **Roussel F**, Dalion J, Benozio M. The risk of tumoral seeding in needle biopsies. *Acta Cytol* 1989;**33**:936–9.
- 7 **Harris KP**, Faliakou EC, Exon DJ. Treatment and outcome of intracystic papillary carcinoma of breast. *Br J Surg* 1999;**86**:1274.
- 8 **Carter BA**, Jensen RA, Simpson JF, *et al.* Benign transport of breast epithelium into axillary lymph nodes after biopsy. *Am J Clin Pathol* 2000;**113**:259–65.
- 9 **Lee KC**, Chan JKC, Ho LC. Histologic changes in the breast after fine-needle aspiration. *Am J Surg Pathol* 1994;**18**:1039–47.

ECHO

Idiopathic thrombocytopenia can mask haemophilia



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Children with idiopathic thrombocytopenia who show atypical bleeding may have underlying haemophilia. This rare finding comes from a case study of two young children. The first case was of a boy aged 2 years who developed a large and increasing bruise over both eyelids of one eye after a superficial graze. He also had many small bruises over his legs. His maternal uncle had died of a brain haemorrhage after a cycling accident, though this did not necessarily suggest a bleeding disorder in the family. A range of tests to establish clotting ability, a full blood count, and a bone marrow aspirate pointed to mild haemophilia. Treatment with vasopressin produced better clotting and high dose immunoglobulin was given to control the thrombocytopenia. Within days his platelet count had risen and the bruise became smaller. Later, his older brother was found to have haemophilia A, making their mother an obligatory carrier and suggesting that the uncle might have had the disorder.

The other case was in a 5 year old girl whose uncle had severe haemophilia. She first presented with bruising. Blood tests discounted von Willebrand's disease and showed she was a carrier for haemophilia A. She had abnormally low factor VIII-C. Four years later, after spontaneous bleeding, she was given vasopressin. Shortly afterwards she returned with severe bleeding after a minor accident and received a vasopressin infusion. She responded initially to a trial of oral steroids but eventually developed chronic idiopathic thrombocytopenia.

▲ *Archives of Disease in Childhood* 2002;**87**:227–228.



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