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Ectopic lobular breast cancer on the anterior chest wall: a rare entity

A 46-year-old woman with a rare case of infiltrating lobular carcinoma in ectopic breast tissue on the anterior chest wall is presented. Wide local excision and lymphatic mapping with, consequently, a sentinel node biopsy, seem adequate therapy for ectopic breast cancer.

Ectopic breast tissue arises from the primitive milk line, with an incidence of 0.6–6%.¹ Malignant transformation is rare.² The most frequently occurring manifestation is infiltrating ductal carcinoma, comprising 79% of all ectopic breast malignancies.³ Lobular-type and medullary-type carcinomas are seen in <10% of cases.⁴ Furthermore, most carcinomas in the ectopic breast tissue are located in the vulva and axilla (ie, 55–65%).⁵ The chest wall is the most unusual location.⁶

We present a patient with lobular carcinoma in ectopic breast tissue located on the anterior chest wall.

Case report

A 46-year-old Caucasian woman presented with a subcutaneous mass in a cicatrice of the anterior chest wall approximately 1–2 cm below the caudal rim of the mammary gland. At that location, she had undergone surgical excision of ectopic breast tissue without signs of malignancy, 22 years ago. She had noticed the present swelling 2 weeks previously, without further symptoms. She was premenopausal and had no family history of breast cancer.

Figure 1 Scar on the anterior chest wall showing a firm subcutaneous mass of approximately 4 mm diameter (arrow).

Clinical examination and x rays of both breasts and axillae were found to be normal. Clinical examination of the scar on the anterior chest wall showed a firm subcutaneous mass of approximately 4 mm in diameter (fig 1). Ultrasonography of the mass showed only scar tissue.

Excisional biopsy was performed, and pathology showed a pleomorphic lobular carcinoma in situ arising from ectopic breast parenchyma. The cells of the pleomorphic lobular carcinoma form a “single file” pattern (ie, aligned in a row) (fig 2). Immunostaining for E-cadherin was negative. The tumour was irradically excised, and showed a mitotic activity index of 13 per 2 mm², Bloom Richardson grade III, negative Her-2-neu receptor status and positive oestrogen and progesterone receptors.

Thus, re-excision of the accessory breast tissue tumour was performed after lymphatic mapping and sentinel node biopsy (fig 3). One sentinel node was identified in the ipsilateral axilla.

Final pathology showed mammary gland tissue with remnants of the aforementioned lobular carcinoma, now with negative margins. Pathology of the sentinel node biopsy showed metastasis with extranodal growth. Therefore, an axillary lymph node dissection was performed. Final pathology showed no metastases in the second echelon axillary lymph nodes.

To exclude a primary breast cancer, MRI of the mammary glands and axillary regions was

Figure 2 Pleomorphic lobular carcinoma cells forming single rows, commonly termed “Indian file”.

Figure 3 Lymphatic mapping: one sentinel node was identified in the ipsilateral axilla (arrow).

performed, showing no pathological features. The patient received adjuvant radiotherapy of the chest wall, chemotherapy (5-fluorouracil, epirubicin and cyclophosphamide), followed by hormonal treatment.

Discussion

In a review study on all published cases of ectopic breast cancer from 1865 to 1994, only three cases of ectopic breast cancer arising in the chest wall were found.⁶ Combining this with the fact that lobular carcinoma in ectopic breast cancer is seen in <10% of cases makes our patient with infiltrating lobular carcinoma in ectopic breast tissue on the anterior chest wall an exceedingly rare case.⁵

In a study on 90 cases of carcinoma in ectopic breast tissue, radical or modified mastectomy offered no advantage in outcome over wide local excision combined with regional node dissection.⁷ In our patient, local excision showed irradically excised infiltrating lobular carcinoma, therefore wide local re-excision was performed with negative margins.

Lymph node status is an important prognostic factor in breast cancer.⁸ Some authors have even reported an increased incidence of metastasis to regional lymph nodes with earlier involvement in ectopic breast cancer compared with standard breast cancer.^{9–10} However, the anatomy of lymphatic drainage of the ectopic breast is unclear. The use of lymphatic mapping may show these lymphatic pathways. In a recent study, the sentinel node technique was successful in isolating an unusual group of lymph nodes. This allowed more accurate staging of the disease and more appropriate adjuvant treatment.¹¹ In our patient, the sentinel node was located in the axilla and was positive for metastases. Completion axillary lymph node dissection was therefore performed.

In summary, we present a case of infiltrating lobular carcinoma in ectopic breast tissue on the anterior chest wall. As ectopic breast cancer is a rare entity and literature on the subject is sparse, drawing conclusions about the appropriate treatment is daunting. However, combining the data from our case with previous studies, wide local excision and lymphatic mapping with, consequently, a sentinel node

biopsy seem adequate therapy for ectopic breast cancer.

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Thyroid transcription factor-1 may be expressed in ductal adenocarcinoma of the prostate: a potential pitfall

We report a case of prostatic ductal adenocarcinoma which expressed thyroid transcription factor-1 (TTF-1) on immunohistochemical examination, and highlight the fact that this aberrant staining is a potential pitfall in the evaluation of this lesion. Prostatic core biopsy specimens from a 65-year-old man revealed an adenocarcinoma with large-calibre glands lined by stratified hyperchromatic nuclei. There was no accompanying conventional acinar adenocarcinoma and TTF-1 was distinctly positive in the nuclei of the malignant cells. This led to a search for possible lung and other primaries. When a thorough systemic investigation disclosed no evidence of other primary tumours, a radical prostatectomy was performed which revealed predominant ductal adenocarcinoma with a minor component of

acinar adenoarcinoma. TTF-1 measurement was repeated which showed staining confined to the ductal adenocarcinoma. Prostate specific antigen (PSA), PSAP and racemase were also found. Our findings underscore the increasing spectrum of lesions that may express TTF-1 on immunohistochemical examination.

TTF-1 is part of a family of homeodomain transcription factors with restricted expression in the thyroid and lung.¹⁻³ Its immunohistochemical detection has been used in diagnostic surgical pathology to distinguish thyroid and lung tumours from those of other organs.⁴⁻⁵ Specifically, antibodies to TTF-1 have been reported to be useful in distinguishing pulmonary adenocarcinoma from other primary carcinomas.⁶ TTF-1 is expressed by differentiated thyroid neoplasms.⁷ It can assist in the differential diagnostic investigation of mesothelioma from pulmonary adenocarcinoma, small cell lung carcinoma from Merkel cell carcinoma,^{2,3} and neuroendocrine tumours of the lung from well-differentiated neuroendocrine tumours at other sites.^{1,8} TTF-1 mRNA has been discovered in orbital tissues,⁹ C cells and parathyroid cells.¹⁰

More recently, nuclear TTF-1 protein expression was reported in primary and metastatic colonic adenocarcinoma,^{11,12} primary ovarian epithelial neoplasms,¹³ thyroid-like nasopharyngeal papillary adenocarcinoma,⁷ gastric atrophic gastritis and ciliated metaplasia,¹⁴ and brain ependymomas.¹⁵ Cytoplasmic TTF-1 reactivity has also been described in hepatocellular carcinoma and normal hepatocytes.¹⁶⁻¹⁸ We recently encountered a case of prostatic ductal type adenocarcinoma on core biopsy which reacted with the TTF-1 antibody leading to a search to exclude a possible primary lung adenocarcinoma.

Case report

A 65-year-old Chinese man attended for a follow-up examination for episodic gross haematuria. Flexible urethroscopy was unremarkable, but he was found to have a raised serum PSA level of 4.42 µg/l. Digital rectal examination revealed a 1 cm nodule over the left lateral prostate lobe. A transrectal ultrasound-guided 12-core prostate biopsy showed left lobe cores featuring adenocarcinoma with papillary and cribriform architecture lined by cells with hyperchromatic stratified nuclei (fig 1A, B). Some extracellular mucin was found. There was no conventional acinar adenocarcinoma or high-grade prostatic intraepithelial neoplasia. Although ductal prostatic adenocarcinoma was considered, immunohistochemistry was performed to confirm a prostatic origin of the malignant glands, as well as to rule out possible metastases from the lung and colon. Immunohistochemical examination showed nuclear reactivity for TTF-1 (Novocastra, dilution 1:50, clone: SPT24, antigen retrieval: pressure cook in citrate buffer at pH 6.0) with focal positivity for CK7, 34βE12 and CK5/6 (fig 1C). No staining was found for CK20, thyroglobulin, PSA (DAKO M075001, clone ER-PR8, IgG₁, dilution 1:400, antigen retrieval: pressure cook in microwave oven, in Tris EDTA at pH 9.0) and PSAP (DAKO M0792, clone PASE/4LJ, IgG₁, dilution 1:4000, no antigen retrieval). A comment was made to rule out the possibility of lung metastases to the prostate gland.

Chest radiography and gastrointestinal endoscopy showed no remarkable findings. CT scans of the thorax, abdomen and pelvis

revealed a 2.1 × 1.7 cm enhancing nodule in the left prostate lobe without extraprostatic extension and no enlarged pelvic lymph nodes.

The patient sought a second opinion. Repeat measurement of the serum PSA level was 5.2 µg/l. He opted for a radical prostatectomy (robot-assisted) in view of the negative search for an alternative primary tumour. The radical prostatectomy specimen showed a vague 2 cm ill-defined nodular lesion macroscopically discernible in the left lobe. Histologically, adenocarcinoma with both ductal and conventional acinar appearances was present, predominantly affecting the left lobe. Ductal type adenocarcinoma formed approximately 80% of the tumour, while acinar adenocarcinoma Gleason 4+3 constituted the rest (fig 1D, E, F). There was perineural invasion and a single lymphovascular embolus. High-grade prostatic intraepithelial neoplasia was found in the peripheral zones of both lobes posteriorly. There was focal extraprostatic extension, pT3a. Both right (×8) and left (×12) iliac lymph nodes were without metastases. Immunohistochemistry for TTF-1 (Novocastra, dilution 1:10, clone: SPT24, antigen retrieval: microwave in microwave oven, milestone T/T Mega at 98°C, 12 min in Tris-EDTA, pH 9.0) was repeated, revealing distinct nuclear positivity in the ductal adenocarcinoma cells (fig 1F). No TTF-1 reactivity was observed in the acinar adenocarcinoma. PSA (polyclonal antibody, Ventana (catalogue number 760-2506), 1:5 dilution, pre-treatment with 10 min chymotrypsin at 37°C), PSAP (PSAE/4LJ clone, Neomarkers (catalogue MS-321-P1), 1:3000 dilution, pre-treatment with 25 min microwave at power 4 in buffer tris-EDTA pH 8.7) and racemase (antibody clone 13H4, Ra DAKO dilution 1:50, microwave in microwave oven, milestone T/T Mega, at 98°C for 12 min in Ventana CC1 Solution, code No. 950-124) were expressed in both ductal and acinar adenocarcinoma elements (fig 1H).

Following this unusual observation, we subjected prostate tissue microarrays constructed from radical prostatectomies¹⁹ to TTF-1 immunohistochemical examination, all of which were negative. However, all these tissue cores were derived from acinar adenocarcinomas and no ductal patterns were included.

Postoperative recovery was uneventful. A repeat MRI/MRS scan in December 2006 revealed a lymphocoele in the right pelvic wall, while a 1.1 × 1.6 × 1.3 cm nodule was discovered in the left hemipelvis between the bladder and rectum, probably representing a haematoma or postoperative collection, although a metastatic deposit could not be radiologically excluded. Serum PSA levels in November and December 2006 were 0.96 µg/l and 1.4 µg/l, respectively, indicating a rising trend postoperatively.

Discussion

When TTF-1 was first integrated into the immunohistochemical armamentarium of diagnostic surgical pathology, it was regarded as a tissue-specific transcription factor with almost exclusive expression in the normal thyroid and lung and carcinomas derived from these tissues.³ As with several other antibodies that began their use in a similarly restrictive fashion, an increasing spectrum of lesions and tumours has been discovered to have occasional expression of TTF-1, leading to the need to be aware of exceptions and pitfalls in its interpretation. Some instances of aberrant