# Primary squamous cell carcinoma of the breast

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**Summary**

Primary squamous cell carcinoma of the breast is a rare neoplasm. We herein report two cases of primary squamous cell carcinoma of the breast, each with a different clinical manifestation. A 75-year-old patient with bilateral breast cancer and a 73-year-old woman with a mastitis carcinomatosa. Histopathology revealed that both tumours were squamous cell carcinomas. In the first case there was a coexisting adenocarcinoma in the contralateral breast. The diagnostic and therapeutic challenges are discussed in a review of the literature. The initial management of primary squamous cell carcinoma should be slightly different to that of more common types of breast cancer.

*Key words:* Squamous cell carcinoma; Breast.

## Introduction

The occurrence of primary squamous cell carcinoma (SCC) is less than 0.04 percent of all breast malignancies. These tumours are a variant of a metaplastic carcinoma. In general the non-glandular epithelial cells have undergone a transformation into an ultimate cell type leading to squamous cancer. Approximately 100 cases have been reported in the English literature [1-14]. The present report will describe two additional cases and review the literature.

## Case Reports

*Case 1*

A 75-year-old postmenopausal woman consulted for a painless lump in the left breast (Table 1). Clinical examination showed a 4 x 5 cm large irregular hard tumour in the left breast with a palpable axillary lymph node in the ipsilateral axilla. A second tumour of approximately 1 cm was palpated in the right breast.

A mammogram indicated a large irregular mass with poorly defined borders in the left breast highly suggestive of a malignancy. On ultrasound the tumour had a cystic appearance. A mammogram of the right breast demonstrated a stellar distortion with a nodular centre, also suggestive for a malignant tumour. The performed magnetic resonance images (MRI) confirmed the bilateral malignant tumour. In the left breast the MRI visualised an irregular tumour, without contrast captation in the centre. The latter was equivalent to intratumoural cyst formation. In the upper-outer quadrant of the right breast an irregular mass with contrast captation suggestive for a malignancy was seen. From both lesions a true-cut biopsy was performed. This showed an invasive ductal carcinoma in the right breast and a poorly differentiated carcinoma with squamous differentiation in the left breast. A subsequently performed chest X-ray, bone scintigraphy and abdominal ultrasound of the liver showed no indications of distant metastases. A left mastectomy and right lumpectomy with bilateral axillary lymph node clearance were performed. Histopathology revealed a well-differentiated ductal adenocarcinoma of 1.9 cm in the right breast with tumour invasion in one of the 11 dissected axillary lymph nodes. This tumour was positive for oestrogen and progesterone receptors. The left mastectomy specimen contained a squamous cell carcinoma of 4 x 3.7 cm with tumour necrosis. Only one of the 11 lymph nodes was invaded by tumour. She received bilateral adjuvant radiotherapy and adjuvant hormonal treatment with tamoxifen 20 mg daily for five years. Unfortunately, after 18 months the patient was diagnosed with a metastases in the right lung. At present, 24 months after the initial diagnosis the patient is alive with disease.

*Case 2*

This concerns a 73-year-old woman who consulted for a large tumour in her right breast (Table 1). According to the patient the tumour had developed over a short time. Previous mammograms of six years earlier showed no signs of malignancy. Clinical examination revealed a picture of mastitis carcinomatosa. On palpation a hard tumour was felt which encompassed almost completely the entire breast (approximately 14 cm). On the basis of chest X-ray, bone scintigraphy and abdominal ultrasound there were no indications of distant metastases. Histology of the performed biopsy revealed a malignant tumour with epitheloid features and massive necrosis. At this stage the tumour was considered inoperable. Therefore the patient received three courses of CEF (cyclophosfamide, epirubicine, 5-FU) as neo-adjuvant chemotherapy. This treatment resulted only in a small volume reduction. Therefore the treatment was changed to AC (adriamycine, cyclophosfamide). After three courses an osteoblastic bone metastasis of the sternoclavicular joint was discovered by chest X-ray. The latter was treated with radiotherapy and monthly I.V. clodronate. Six months after the initial diagnosis a mastectomy and axillary lymph node clearance were performed for local control. Histopathology showed a poorly differentiated squamous carcinoma of the breast with a diameter of 12 x 9 cm, with tumour involvement in one of the seven prelevated lymph nodes. Both oestrogen and progesterone receptors were negative. Three months later she developed multiple bone metastases, which were treated palliatively by clodronate. At present, 13 months after the initial diagnosis the patient is alive with disease.

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Table 1. — *Patient characteristics.*

| | Case 1 | Case 2 |
|---|---|---|
| Age | 75 y | 73 y |
| Parity | G2P2 | G2P2 |
| Location | Left Upper-outer | Right entire |
| Size | 4 x 3.7 cm | 12 x 9 cm |
| Histology | Pure-SCC | Predominantly SCC |
| ER, PR | Negative | Negative |
| Axillary lymph nodes | 1/10 | 1/7 |
| Treatment | ME + ALND<br>Adjuvant RT | ME + ALND<br>Neo-adjuvant CEF+AC<br>Adjuvant RT |
| Follow-up | 24 months | 13 months |
| Status | AWD | AWD |
| Metastases | Lung | Bone |

ME: mastectomy; ALND: axillary lymph node dissection; RT: radiotherapy; CEF: cyclophosfamide, epirubicine, fluorouracil; AC: adriamycine, cyclophosfamide; AWD = alive with disease.

## Discussion

The pathogenesis of SCC is puzzling because keratinising epithelium is not normally identified in breast tissue. These tumours are thought to arise from the foci of squamous metaplasia in adenocarcinoma. This is probably the reason why in many cases a ductal adenocarcinoma component is found [1]. Carcinomas are considered squamous if more than 90% of the neoplasm is squamous. In fact there are only a few pure squamous tumours. Chronic inflammation of breast tissue, like in breast abscesses, inflamed cysts, or other forms of mastitis may be involved in producing a squamous metaplasia with subsequent degeneration into SCC. They have been described after prolonged liquid silicone injection and silicone induced mastopathy [2]. Squamous metaplasia can be found in necrotic lesions such as infracted adenomas, infracted papillomas and in healing biopsy sites. SCC can also originate from epidermal or dermoid cyst or cystosarcoma phylloides of the breast [3]. An alternate hypothesis states that the primary SCC tumours develop directly from the epithelium of the mammary ducts without the process of squamous metaplasia.

There are no typical clinical features for squamous carcinoma of the breast. The age is within the same range as for general breast cancer [4]. The patients usually present with a large lump, sometimes invading in the chest or skin. The size at diagnosis varies from 1.5 to 14 cm with almost halve of the tumours greater than 5 cm in diameter. Here we find an explanation why early detection by mammography is not particularly valuable with SCC. Furthermore in a study of Francheschi *et al.* [5] none of the 1,144 biopsies they performed for positive mammograms contained SCC. This also indicates the rarity of the disease.

Invasion of the skin makes it difficult to distinguish between cutaneous origin and secondary skin involvement by a primary mammary lesion [6]. In these cases the lesion must be considered a mammarian carcinoma if the clinical history indicates that a breast mass proceeds a skin ulceration.

Mammographic findings include an irregular, lobulated mass with poorly defined borders suggestive of a malignancy. Microcalcifications is not a prominent finding, but calcification in necrotic areas can be seen [7]. On ultrasound it has the appearance of a solid hypoechoic mass with cystic components [8]. Cystic deterioration is usually seen if the tumour is larger than 2 cm. The cyst is filled with necrotic debris. We believe that this is the result of a fast growing tumour. It also demonstrates the aggressiveness of the tumour. On MRI this is reflected by well-circumscribed tumours, which contain zones of necrosis. On the basis of the MRI it is not possible to distinguish SCC from other malignant lesions of the breast [9]. In cases with the suspicion of a primary SCC of the breast, SCC of the overlaying skin as well as metastases from extramammary origins must be excluded [4]. The most common sources of metastastic squamous carcinoma in the breast are the lung, uterine cervix, bladder and oesophagus. Therefore besides a physical examination, the staging should include chest radiograph, cervix smear, CT scans of the chest and abdomen and gastroscopy. The preoperative diagnosis can reliable made by core biopsy [10]. Fine needle aspiration is generally considered insufficient to make a conclusive diagnosis.

A review of the literature indicates that breast cancers with compounds of SCC are histologically quite variable. The evidence for squamous differentiation on LM (light microscopy) is based on the presence of polygonal, eosinophilic cells with either regularly spaced intercellular bridges or keratin pearl formation as well as the absence of any invasive neoplastic glandular elements. Electron microscopy can confirm the diagnosis of "pure" SCC by the demonstration of regularly spaced desmosomes, tonofilament bundles and keratohyaline granules [11]. When tumours identified as "pure" SCC on LM are subjected to ultrastructural analysis, either separate squamous and glandular cells are present or both histological features are noted to coexist in the same cell [12]. Lymph node involvement has been found in 6% to 54% of the cases. The route of metastastic dissemination is similar to those seen in other breast cancers of no special type. Oestrogen and progesterone receptors tend to be negative [13].

Mastectomy and axillary lymph node dissection followed by adjuvant radiotherapy and or chemo/hormonal therapy has been the treatment for the majority of the reported patients. Breast conservative surgery is possible, however many of the patients present with locally advanced disease, which require a mastectomy and axillary lymph node dissection. Adjuvant radiotherapy has shown to be of little benefit despite the fact that SCC is generally radiosensitive [13]. In case number two the patient received cyclophosfamide, epirubicine, and 5-FU. A regimen of cisplatinum, adriamycin and 5-FU should be considered for tumours with a significant squamous cell component (>50%) or 'pure' SCC. It is well known that 5-FU is active in both SCC and in adenocarcinoma of the breast. The role of cisplatin in SCC is also well documented [12]. Unfortunately, both patients were referred for consultation after the initial chemotherapy

was given. Survival data is difficult to compare due to the relatively small numbers of patients reported. However when compared to other carcinomas and corrected for stage, there seems to be no difference in survival [14]. Tumour size appears to be the most important factor in the prognosis. The patients usually die from distant metastases.

## Conclusion

Squamous cell carcinoma of the breast is a rare form of breast cancer. The identification of 'pure' SCC cases appears to be clinically unimportant and no difference has to be made between 'pure' and mixed SCC regarding treatment [12]. The surgical treatment of SCC is similar to the standard guidelines for adenocarcinomas. The medical treatment differs classical adenocarcinoma and a regimen of cisplatinum, adriamycin and 5 FU should be considered the most optimal treatment. The general prognosis when corrected for tumour stage is equivalent to mammary adenocarcinomas.

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