Bilateral Plasmacytoma of the Breast: A Case Report

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Introduction

Diffuse plasmacytic lesions in the breast may be primary breast carcinoma or metastases of the breast is often difficult due to the similar clinical and radiological presentation. Plasmacytomas of the breast are very rare with very few cases reported within the literature. Since 1928 only 63 cases have been reported (Magdalin et al, 2013) and few since.

Clinically breast plasmacytoma often presents as a palpable mass, occasionally with inflammatory changes such as skin thickening which may suggest abscess or inflammatory carcinoma (Kocaoglu et al, 2008). However, skin thickening was discordant in this case, however bruising to the soft tissue was a clinical indication and this is likely due to a low level pleural effusion within the breast known as thymocystectomy which can lead to increased bruising (AIC, 2017).

Definitive diagnosis is fundamental as clinical and radiological appearances are known to mimic benignity.

Multiple myeloma is a proliferative disease of the plasma cells within bone marrow, accounting for 3% of cancer in the UK which is approximately 15 new cases every day (Cancer Research UK, 2014). Management is dependent on the extension of the disease at diagnosis, and although considered incurable, treatment options have the potential to prolong survival expectancy. Therefore, clinical responsiveness and early diagnosis is essential to patient outcomes.

Differential Diagnosis

Multiple lesions within the breast can be indicative of both benign and malignant breast conditions; including fibroadenomas, cysts, fibrocysts, abscesses, lymphomas and multiple breast carcinomas (Park, 2010). Although multiple bilateral malignancies are rare, suspicious appearances should be carefully assessed with consideration to metastases or haematological processes.

The main differential diagnosis is primary breast carcinoma with similar imaging appearances; however a case of plasmacytoma was reported to consist of neoplastic epithelial cells of ductal origin on cytology (Khoblan et al, 2006). Cytology with fine needle aspiration has been shown to demonstrate plasma cells at different stages of maturation, therefore core biopsy is not always necessary, however adequate sample is required to differentiate from primary carcinoma (Selzer et al, 2011). Mammograms with the most suspicious features should be biopsied in the first instance with assessment of the overall appearances accurately reported for future patient management.

Case Report

This case reports on a secondary extramedullary manifestation of multiple myeloma within bilateral breasts without any clinical involvement and discusses the difficulty in interpretation with clinical recommendations. A 73 year old woman with a history of multiple myeloma was referred by a haematologist for breast assessment. Clinical indication stated new superficial lump with associated bruising noted in the upper outer quadrant of the right breast (RUQ). Additional information reported the patient is currently undergoing chemotherapy and has a history of pulmonary embolisms therefore taken warfarin.

Clinical examination revealed a superficial lump in the RUQ at the area of concern with overlying bruising to the breast noted. Within the right breast a further mass was identified, with an additional two masses noted in the left breast.

No history of trauma to the breast was ascertained. Comparison with previous imaging from 2014 was made, with mammography revealing bilateral ill-defined masses with indeterminate features (Fig.1). Both breasts were graded M3, indeterminate requiring further assessment.

Ultrasound of the right breast demonstrated the index lesion to be a superficial well-defined mixed echogenic mass with a further 4mm mass in the lower outer quadrant. Both lesions displayed indeterminate features (RUOQ) and subsequent biopsy performed of the index lesion (Fig.2). Examination of the left breast also identified two lesions (Fig.6) however the lesion identified in the 3 o’clock position displayed more suspicious appearances and core biopsy was therefore performed.

Imaging Appearances

Mammography and sonographic features vary considerably, with 2% of cases completely occult mammographically (Surve et al, 2010). Mammographically lesions are often noted in the breasts with irregular margins without calcification (Kocaoglu et al, 2005). Bilateral presentation of solitary or multiple well-defined round lesions usually indicates benignity rather than malignancy, with a differential diagnosis of cysts or fibroadenomas mammographically.

Sonographically, lesions appear solid with hypoechoic, hyperechoic or mixed echogenicity and often have irregular or ill-defined margins. Ultrasound acoustic variation can occur with or without posterior shadowing and is therefore useful in analysis of the lesion. Doppler can assist in indicating increased vascularity within the lesion, however distinguishing between is not definitive.

In this case the combination of sonographic features indicated well-defined round solid lesions with indeterminate features including ill-defined margins and mixed echogenicity with heterogeneous contents. The soft tissue lesion found within the right forearms had similar appearances to the breast lesions and this increased the suspicion of metastases. Considering the history and imaging features, a differential diagnosis of metastatic deposits or possibly primary breast carcinomas were the most likely conclusions.

Clinical Imaging

A further whole spine MRI scan was performed indicating the ‘raindrop’ sign classic of myeloma (Fig.6).

Metastatic bone lesions can be distinguished from myeloma bone deposits by their physiology, metastatic lesions can be lytic or blastic in nature, whereas myeloma creates lytic lesions only. This is due to the dominance of osteoclast activity with suppression of osteoblast formation (Sandrow et al, 2011). Destruction of the cortex can lead to lesions of the soft tissues. Soft tissue deposits are often an advanced presentation of myeloma disease (Lamy et al, 2000) and this correlates with the findings imaging.

The patient underwent a skeletal survey to assess the extent of the myeloma. Lytic lesions were found in the skull and face associated pathological fractures were noted. Further lesion were noted in the ribs, vertebrae and clavicles. Multiple lesions were also noted in the skull vault demonstrating the ‘raindrop’ sign of myeloma (Fig.6).

Histopathology

Multiple lesions from the breast and right forearm were biopsied and confirmed on histopathological review.

Histopathology Results

FNAB of the right breast superficial lesion confirmed the presence of clustered and single malignant cells with raised nucleo-cytoplasmic ratios, prominent nucleoli and clumped chromatin.

Core biopsy of the suspicious lesion within the left breast demonstrated heavy infiltration by plasma plasmacytoma cells forming sheets of monotonous plasma cells with enlarged round eccentrically placed nuclei. The appearances are of a malignant neoplasm and are highly suspicious of myeloma.

Overall histopathology favoured myeloma as the nature of the multiple lesions. However, due to the similarity of the disease further consultation with the Haematological Malignancy/Diagnostic Service (HMD) in Leeds was undertaken. HMD confirmed a suprapatellar biopsy of the left knee of an adequate quality breast specimen and reported the cores of tissue to contain a diffuse infiltration of atypical plasma cells, likely representing disseminated myeloma.

Management Options

In the first instance it is important to establish whether the lesions are located to the bone or extramammary and if they are solitary or multiple. This can be determined with further imaging by: low dose CT whole body or MRI whole body.

If the lesion is solitary then the patient can be referred for radiotherapy +/- surgery depending on the location and size of the plasmacytoma. If there are multiple plasmacytomas, systemic chemotherapy is used and patients are treated with conventional ‘Myeloma’ protocols.

The following investigations are considered to exclude Myeloma, including:

• serum electrophoresis
• quantification of paraproteins
• serum free light chains
• blood tests to exclude anaemia
dermal involvement
• hypercalcaemia
• bone marrow aspirate

A trephine biopsy is completed to quantify the percentage of plasma cells. Cytogenetics is undertaken to assess if there are high risk features i.e. chromosomal abnormalities t(4,14), t(14,16). If the concentration of plasma cells is greater than 5% with evidence of end organ damage then systemic chemotherapy should be considered +/- radiotherapy to the plasmacytoma.

If the patient is less than 70 years of age with good performance status, no major co-morbidities and had optimised chemotherapy, it is followed by autologous stem cell transplant which is the current standard of practice. Without a stem cell transplant, the duration of remissions is about 1.5 to 2.5 years. With a transplant, remission can last between 18 to 24 months. There is also emerging evidence that maintenance chemotherapy may further prolong the duration of remissions.

Clinical Recommendations

In this case the patient was unaware of her clinical symptoms, highlighting the importance for clinicians to be aware of haematological processes which may manifest in the breast. This case has demonstrated the unusual presentation of bilateral plasmacytomas of the breast with the following recommendations;

Clinical history review and clinical features (or history of breast cancer history)

• Radiological features resemble malignancy and can demonstrate indeterminate features with difficulty in differentiation from metastatic or primary epithelial carcinomas

• Core biopsy required however FNAB can prove useful with pathological confirmation

• Multidisciplinary team attendance.

• Overall treatment options are improving however early diagnosis is essential to improving the patient management.