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Short Report

Tumour localisation with a metal coil before the administration of neo-adjuvant chemotherapy

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Summary

Complete clinical response (CR) with tumour disappearance is not uncommon after neo-adjuvant chemotherapy (NAC) for locally advanced breast cancer, avoiding 25% mastectomies by facilitating breast-conserving procedures.

We reviewed our series to understand the feasibility and utility of marking the cancer site before administering NAC. In total, 23 women (median age 47 years) with T2-4, N0-1, M0 tumours were considered unsuitable for breast conserving surgery between January 2002 and November 2003, thus received NAC following a coil placement at the core of tumour. All patients had the coil successfully inserted and no migration or infection was recorded. Eight patients (35%) had a radiological CR (rCR) including 3 (13%) with pathological CR (pCR). In total, 87% patients were managed conservatively.

The insertion of a metal coil is a simple mean to provide a landmark for localisation and excision when the breast lump becomes impalpable and radiologically undetectable after the administration of NAC.

Introduction

The increasing use of neo-adjuvant chemotherapy (NAC) for large and locally advanced breast cancer increases the rate of breast conserving surgery;[1–4] this has psychological advantages as body image is important to the patient.[5,6] Patients with operable

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breast cancer should be offered breast conserving surgery whenever possible, and axillary nodes should be removed when sentinel node biopsy is not feasible. The literature shows that approximately 30% patients achieve clinical complete response/radiological complete response (cCR/rCR), while only 13% achieve complete pathological response (pCR) (no invasive cancer in the breast and axilla[3,4,7–9]).

Recently, it was also shown that these two groups (i.e., cCR/rCR and pCR) have a different prognosis[10] and pCR is an independent and strong predictor of disease-free and overall survival.[3,4,7–11] The problem here is to identify and adequately excise the area where the cancer occurred, prior a possible complete response takes place. To accomplish this, a metallic coil can be inserted to mark the tumour bed before the start of NCA.

Objectives

We reviewed our preliminary experience on tumour/tumour-bed localisation with a metal coil to facilitate an adequate surgical excision of the tumour bed, and allow the identification of patients with pCR.

Materials and methods

A consecutive series of 23 female patients presented at our Breast Unit from January 2002 to March 2004 with a locally advanced breast cancer (T2-4, N0-1, and M0). Median age was 47 years (range 31–67 years).

All patients had pathological confirmation of the malignant nature of their disease at first outpatient assessment.

Pre-operative core biopsy showed that 20 patients (86%) had invasive ductal carcinoma and in 3 patients (14%) this was associated with DCIS.

Patients' characteristics

Fourteen patients (61%) were ER–ive and 9 patients were ER+ive. There were 15 Grade III cancers (65%), 7 Grade II, and 1 Grade I. Seventeen patients were suffering from large primary breast cancer (median size 35 mm, rage 27–57 mm) and could not be offered breast preservation, while 5 patients were considered for NAC because of advanced axillary involvement. All patients were offered a mastectomy and breast reconstruction as an alternative, but opted to undergo NAC hoping for breast conservation.

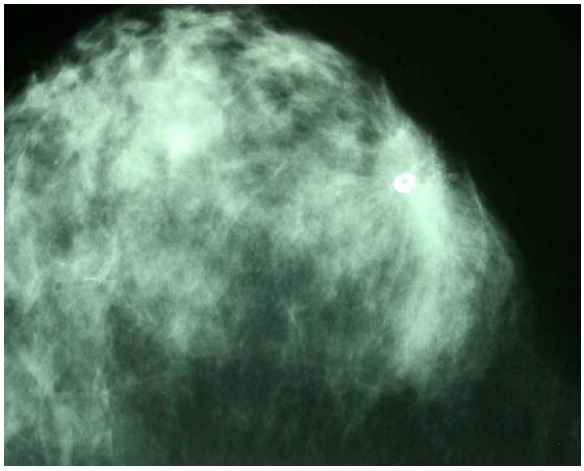

Figure 1 Mammogram showing the coil in the core of the tumour.

All patients received anthracycline-based chemotherapy after localisation of the breast primary with metal coil. The coil was placed in the core of tumour before NAC. An MRI compatible coil was introduced under local anaesthesia with aseptic technique, guided by ultrasound scan. A 19 gauge 9-cm long needle (IDLC-19, 5-9.0-4-U-DM) was used. We utilised a Cook coil® (cost £39). The markers were positioned as centrally as possible; only occasionally, in the case of very dense tumors the coil was placed slightly eccentrically.

A mammogram in two projections (medio-lateral and cranio-caudal) was performed to illustrate precise positioning of the coil with relation to the tumor (Fig. 1 showing the coil in the core of the tumour).

All tumours were re-assessed by clinical examination and imaging before surgical excision. This often required a localisation technique (i.e., guide wire or ROLL)[12] in the case of a cCR/rCR.

Surgical excision was performed aiming at 1 cm healthy margins all around the residual lesion, when present; otherwise a specimen was obtained with a diameter of 2 cm and the metal coil in the centre of it.

After surgical removal, it was our policy to X-ray the excised specimen and confirm the presence of the coil in it, while the patient was still asleep.

Definitions

For the purpose of definition, a cCR occurred when there was no evidence of tumour on physical