The significance of cancer cells contaminating postoperative seroma

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Sixth postoperative day seromae of 142 breast cancer patients were searched for the presence of malignant cells. They were found in 32 patients. These patients showed significant propensity of developing distant metastases or having an unfavourable outcome of their disease although the size of their tumours was smaller than in women whose postoperative seromae were malignant-cell free. At the same time TNM tumour staging and axillary lymph node analyses failed to prove any difference between these two groups of breast cancer patients. Finally, the analyses of the state of patients' menstrual cycles showed that cycling women whose postoperative seroma contained malignant cells are at high risk of developing metastases or dying.

Introduction

Up to the present, despite the abundance of clinical knowledge of breast cancer, this knowledge has failed to help in either curing or predicting the outcome of malignant breast disease. Among clinicians, the most feasible factors that would substantiate a good or fair prognosis are: early diagnosis, proper staging and adequate surgical treatment, which as a rule should be followed by some kind of adjuvant therapy. Although all these facts hold true, some others, primarily tumour biology, have been poorly studied and in fact, neglected. For instance, it was only recently that the use of steroid hormones and steroid hormone receptors in breast cancer has fought its way into clinical practice [7, 8, 10]. Besides this, most surgeons are unaware of the fact that radical breast surgery, which includes regional lymph node resection, may enhance disease spreading [3] and that local recurrences following operation tend to be a result of systemically disseminated cells lodging and growing at the site of trauma rather than due to inadequate surgical technique [4]. Also, during surgery, numerous lymphatic and blood vessels are opened widely, enabling the tumour cells to contaminate the operative area [1, 12].

It is usual that, a few days after radical breast surgery, due to secrernation of injured tissues, patients develop a collection of liquid, called a seroma. Our objective was to study the presence of malignant cells in postoperative seroma and to evaluate it in the light of possible risks threatening a disease-free interval and the survival of breast cancer patients.

Patients and methods

Our study was conducted in 142 women with breast cancer with an average age of 53.5 years. At the time of admittance, 37.3 per cent of patients had regular
menstrual cycles, i.e. they were premenopausal and the other 62.7 per cent were postmenopausal women. The most frequent tumour site was in left breast (57.7 per cent) although the distribution according to anatomic quadrants was almost equal.

All patients were staged preoperatively according to UICC TNM classification [13] which showed that 8.5 per cent of the subjects were in stage T1, 62.6 per cent in T2 and 28.9 per cent in T3 stage. Palpable axillary lymph nodes were present in 63.4 per cent of patients but histological analyses revealed that only 43.7 per cent of these nodes were actually involved with the disease. All patients, regardless of their TNM stage, were treated with the same type of radical surgery, which included the removal of the entire breast, large pectoral muscle and axillary adipose and lymphoid tissue in one block [5, 9, 14]. During surgery, the primary tumour was measured and its size expressed as a mean tumour weight [6].

On the 6th day after surgery 10–20 ml of seroma were collected by a puncture through 12 gauge Oluffson canulle (Braun Melsungen, F.R. Germany). The material was immediately spun down at 3000 r.p.m. for 10 min and May–Grunwald–Giemsa stained smears were checked for the presence of malignant cells. A smear containing a single tumour cell was scored as positive. In the smears that showed the presence of malignant cells, the cells always appeared in isolation and never as clusters. The cells were 3–4 times the size of macrophages which were, as a rule the predominant cell type in most cases. Malignant cells had abundant basophilic cytoplasm with frequent small vacuolae. In most of the malignant cells observed, the nuclei were located excentrically, the chromatin patterns were coarse with indistinct nucleoli. In almost all cell types present in seroma, i.e. granulocytes, macrophages and malignant cells, marked degenerative changes were displayed.

After surgery, all patients were treated by adjuvant radiotherapy which was delivered by a betratron machine in such a way as to cover each of four typical fields with 50 Gy. After termination of radiotherapy, patients had regular checkups every 6 months for 5 consecutive years.

**Statistics**

Student's *t*-test and *χ*² analysis were applied to evaluate the results. The differences were considered positive if *P* values were 0.05 or less.

**Results**

Table 1 gives a comparison of tumour size, disease-free interval, incidence of distant metastases, and five-year mortality in relation to the presence of malignant cells in postoperative seroma of breast cancer patients. One can clearly see that the primary tumour was significantly smaller in women whose postoperative seromae contained malignant cells. Parallel to that, this group of patients experienced a higher incidence of distant metastases, although the dynamics of their occurrence was almost same in both groups (figure 1). A higher incidence of distant disease relapses was observed during the second and third year after surgery. Finally, these women showed a high propensity of unfavourable outcome of their disease that paralleled the incidence of distant disease occurrence, namely, the highest proportions of deaths were observed during the fourth year of follow up (figure 2). Interestingly, comparison of disease-free interval showed a somewhat longer, but statistically insignificant, interval in women whose malignant seromae contained malignant cells.