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Research on Microfluidic Chip Detection Method for Breast Cancer Cell Micrometastasis

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Background: To realize micrometastasis training, lysis and fluorescence detection in breast cancer cells with microfluidic chip as platform; and research on the feasibility of early detection and accurate determination of tumour micrometastasis.
Materials and Methods: The cell concentration in breast cancer cell culture RPMI-1640 solution was controlled at ~5×10^6 cells/mL or so. Cell suspension 10uL was adopted and poured into the PDMS chip, the chip was placed into the incubator for culturing, and cells were cultured in micro-channel for 24h. Then cytoperm was added for 10min, CK19 was added in turn then, the chip was placed into the incubator and incubated for 1h, FITC labeled goat anti-mouse IgG was added at dark, the liquid removal gun was used for sucking out the excess FITC labeled goat anti-mouse IgG 30min later, and PBS was repeatedly replaced for multiple times in the process for cleaning, and the chip was placed under fluorescent microscopy for detection finally.
Results: Compared with culture flask culturing cells, the adherent time for culturing MCF-7 cell chips should be short (12 hours vs 6 hours), which can be interpreted as the follows: the chip cell culturing pool is conductive to cell adherence due to larger surface-to-volume ratio. The chip was observed under fluorescence microscope, normal cells were stained for the strong green fluorescence, dead cells showed red fluorescence, and forms of living cells and dead cells were vastly different and easy to distinguish. By calculation, the proportion of living cells can be more than 95%, and core mitotic figures can be observed, which indicates that cells can maintain normal life and division under the condition of chip perfusion culture.
Conclusions: A unique rapid culture, lysis and cell inclusion CK19 fluorescence detection method of breast cancer cell micrometastasis based on PDMS chips is established, and this method meets trace, rapid and real-time requirements demanded for micrometastasis detection. The feasibility of detecting breast cancer cell micrometastases with microfluidic control chip is proved, thereby providing important accumulation for clinical application of early discovering and accurately judge tumour micrometastases.
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Infiltrating Lobular Carcinoma of the Breast − a Hospital General Experience

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Background: Invasive lobular carcinoma (ILC) is the second most common type of invasive breast cancer (BC), that comprise approximately 10% of BC and appears to have a distinct biologic and epidemiologic characteristics.
Patients and Methods: We analyzed data of 205 BC patients diagnosed of ILC who were diagnosed between January 1994 and December 2007. The objective was to determine the clinicopathological features, treatment and patterns of recurrence of ILC.
Results: Median age was 58.5 (range: 29.6–87.3). One hundred thirty six pts (66.3%) were postmenopausal, 131 pts (63.9%) underwent mastectomy and 74 (36.1%) a conservative surgical procedure.
Pathological features were: T1: 79 pts (38.5%); T2: 84 pts (41%); T3: 19 pts (9.3%); T4: 7 pts (3.4%); multifocal: 16 pts (7.8%). Nodal status N0: 131 pts (63.9%); N1: 41 pts (20%); N2: 16 pts (7.8%); N3: 17 pts (8.3%). Regarding phenotype, 90 patients (43.9%) were Luminal A; 82 pts (40%) Luminal B; 14 pts (6.8%) HER2+/RE+; 2 pts (1%) HER2+/RE-, and 7 pts (3.4%) were triple negative.
67 pts (32, 7%) didn't receive adjuvant chemotherapy (QT). Most frequent adjuvant QT received was anthracycline-based (61 pts, 29.8%) followed by CMF (42 pts, 20.5%) and anthracycline+taxane based QT (35 pts, 17.1%). 185 patients (90%) received adjuvant hormonal treatment, being the most commonly used tamoxifen (111 pts, 60%) followed by up-front aromatase inhibitors (AI) (36 pts, 19.5%), 'switch' treatment (19 pts, 10.3%), and extended AI (11 pts, 6%).
With a median follow-up of 97.3 months, 47 pts (22.9%) had a relapse, with a median disease-free survival (DFS) of 184 months. 5-year and 10-year DFS rates were 81.8% and 69.1%, respectively. T1, N0 tumours that received QT/HT/RT had a significantly lower recurrence rate ($p < 0.05$).
Most frequent metastatic site at recurrence was bone (18 pts, 38%), followed by pleuropulmonar (7 pts, 15%), liver (5 pts, 11%) and ganglionar (5 pts, 11%).

Site of relapse	N (47)
Brain	2
Bone marrow	2
Gastrointestinal	3
Contralateral breast	3
Regional recurrence	4
Pelvic	4
Ganglionar	5
Hepatic	5
Pleuropulmonar	7
Bone	18

Median overall survival (OS) was not achieved; 5-year and 10-year OS rates were 94.4% and 81%, respectively. OS was significantly better ($p < 0.05$) for T1, N0 tumours.
Conclusions: In this review of ILC patients, the most common phenotype was luminal A. Recurrence and death rates were low, being the bone the most common site of relapse.

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Influence of Adjuvant Bisphosphonates in the Treatment of Early Breast Cancer on Disease-Free Survival − Results of a Retrospective Analysis of an Unselected Single-Centre Cohort

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Background: Bisphosphonates (BIS) are a standard of care in treating patients with bone metastases for preventing skeletal-related events (SREs) and have demonstrated utility for preventing cancer treatment-induced bone loss (CTIBL). Recently, several trials have demonstrated that BIS may exert anticancer effects in adjuvant and advanced cancer settings. The aim of this retrospective analysis of an unselected single-centre cohort of women with early breast cancer was to evaluate the influence of adjuvant BIS on disease-free survival (DFS).
Material and Methods: Altogether, 1653 women (959 who received adjuvant BIS and 694 without adjuvant BIS) were investigated. All women who started a BIS treatment within the first 12 months of diagnosis and with at least 90 days of treatment were included in the BIS group. There were no significant differences in the 2 patient groups regarding tumour size, hormone receptor (HR) expression, HER-2 expression, and adjuvant treatment modalities except for nodal status. The analysis included women receiving BIS treatment, with the majority receiving zoledronic acid; some also received clodronate, ibandronate, or alendronate. DFS was defined as the time from completion of first-line therapy until the time of disease recurrence or death, whichever occurred first.
Results: DFS was significantly better in patients treated with BIS ($P = 0.01$). This was also apparent in the subgroup of patients with oestrogen receptor (ER)/progesterone receptor (PR)-positive disease ($P = 0.006$), in patients with node-positive disease ($P = 0.00002$), as well as in patients with >3 positive lymph nodes and ER/PR-positive disease ($P = 0.00001$). In this final subset, BIS-treated patients (n = 121) had 30% higher DFS at the 5-year timepoint compared with patients who did not receive adjuvant BIS (n = 56). There was no significant difference in DFS in patients with hormone-receptor-negative disease.
Conclusions: This large-scale retrospective analysis indicates a significant improvement of DFS in patients with early stage breast cancer treated with adjuvant BIS. The benefit was more pronounced in the subgroup of node-positive and ER/PR-positive disease.

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Getting Deep in the Luminal B Breast Cancer Subtype and Its Ki67 Cutoff Value

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Background: Inside luminal breast cancer (BC) group, B subclass carries a worse prognosis and is less responsive to hormonal treatment. Identification of Luminal B group, by Sorlie et al, has been less consistent