

Laser scanning cytometry (LSC) a perspective tool in determining S-phase fraction and DNA content in breast cancer patients

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Introduction: High proliferation rate in surgically removed breast tumours is an unfavourable prognostic factor. In node negative cases it can help distinguish patients with higher risk for distant metastases from those with a lower risk.

Patients and Methods: In a prospective study we investigated 97 breast tumours, of which 81 were invasive ductal carcinomas, 8 were invasive lobular carcinomas, and 9 tumours were of other histological types. Cells for LSC investigations were prepared from fresh, surgically removed tumours by mechanical disintegration and the suspensions were cytocentrifuged onto microscopical slides. After fixation the cells were stained with FITC conjugated anti-cytokeratin (CK-FITC) to distinguish tumour CK positive tumour cells from CK negative stroma, and with propidium iodide to stain DNA.

Results: In our group of patients, we identified three S-phase fraction (SPF) groups (<5 %, 5 to 10 %, and >10 %). As to aneuploidy, 53.8 % of the tumours were aneuploid, 36.3 % were diploid, and 9.9 % had a bimodal distribution of DNA content. Aneuploid DNA content and higher SPF values tended to be associated with larger tumour size, lymph node involvement, and higher histological grade. An attempt was made to correlate DNA content and SPF to tumour marker values (CEA, TPS, CA 15-3).

Conclusions: Our results showed that the measurement of DNA content and S-phase fraction of tumours by laser scanning cytometry completed by and correlated with the investigation of tumour markers and other biological properties of the tumour cells may be a useful tool in assessing prognosis and clinical outcome of patients with breast cancer.